

Package ‘openintro’

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Title Datasets and Supplemental Functions from 'OpenIntro' Textbooks and Labs

Version 2.5.1

Description Supplemental functions and data for 'OpenIntro' resources, which includes open-source textbooks and resources for introductory statistics (<<https://www.openintro.org/>>). The package contains datasets used in our open-source textbooks along with custom plotting functions for reproducing book figures. Note that many functions and examples include color transparency; some plotting elements may not show up properly (or at all) when run in some versions of Windows operating system.

License GPL-3

Encoding UTF-8

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LazyDataCompression xz

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Depends R (>= 4.1.0), airports, cherryblossom, usdata

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<https://github.com/OpenIntroStat/openintro/>

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absenteeism	<i>Absenteeism from school in New South Wales</i>
-------------	---

Description

Researchers interested in the relationship between absenteeism from school and certain demographic characteristics of children collected data from 146 randomly sampled students in rural New South Wales, Australia, in a particular school year.

Usage

absenteeism

Format

A data frame with 146 observations on the following 5 variables.

eth Ethnicity, representing Aboriginal (A) or not (N).

sex Gender.

age Age bucket.

lrn Learner status, with average learner (AL) and slow learner (SL).

days Number of days absent.

Source

Venables WN, Ripley BD. 2002. Modern Applied Statistics with S. Fourth Edition. New York: Springer.

Data can also be found in the R MASS package under the dataset name quine.

Examples

```
library(ggplot2)

ggplot(absenteeism, aes(x = eth, y = days)) +
  geom_boxplot() +
  coord_flip()
```

acs12

American Community Survey, 2012

Description

Results from the US Census American Community Survey, 2012.

Usage

```
acs12
```

Format

A data frame with 2000 observations on the following 13 variables.

income Annual income.

employment Employment status.

hrs_work Hours worked per week.

race Race.

age Age, in years.

gender Gender.

citizen Whether the person is a U.S. citizen.

time_to_work Travel time to work, in minutes.
lang Language spoken at home.
married Whether the person is married.
edu Education level.
disability Whether the person is disabled.
birth_qtr The quarter of the year that the person was born, e.g. Jan thru Mar.

Source

<https://www.census.gov/programs-surveys/acs>

Examples

```
library(dplyr)
library(ggplot2)
library(broom)

# employed only
acs12_emp <- acs12 |>
  filter(
    age >= 30, age <= 60,
    employment == "employed",
    income > 0
  )

# linear model
ggplot(acs12_emp, mapping = aes(x = age, y = income)) +
  geom_point() +
  geom_smooth(method = "lm")

lm(income ~ age, data = acs12_emp) |>
  tidy()

# log-transformed model
ggplot(acs12_emp, mapping = aes(x = age, y = log(income))) +
  geom_point() +
  geom_smooth(method = "lm")

lm(log(income) ~ age, data = acs12_emp) |>
  tidy()
```

age_at_mar

Age at first marriage of 5,534 US women.

Description

Age at first marriage of 5,534 US women who responded to the National Survey of Family Growth (NSFG) conducted by the CDC in the 2006 and 2010 cycle.

Usage

```
age_at_mar
```

Format

A data frame with 5,534 observations and 1 variable.

age Age a first marriage.

Source

National Survey of Family Growth, 2006-2010 cycle, https://www.cdc.gov/nchs/nsfg/nsfg_2006_2010_puf.htm.

Examples

```
library(ggplot2)

ggplot(age_at_mar, mapping = aes(x = age)) +
  geom_histogram(binwidth = 3) +
  labs(
    x = "Age", y = "Count", title = "Age at first marriage, US Women",
    subtitle = "Source: National Survey of Family Growth Survey, 2006 - 2010"
  )
```

ames

Housing prices in Ames, Iowa

Description

Data set contains information from the Ames Assessor's Office used in computing assessed values for individual residential properties sold in Ames, IA from 2006 to 2010. See [here](#) for detailed variable descriptions.

Usage

```
ames
```

Format

A `tbl_df` with 2930 rows and 82 variables:

Order Observation number.

PID Parcel identification number - can be used with city web site for parcel review.

area Above grade (ground) living area square feet.

price Sale price in USD.

MS.SubClass Identifies the type of dwelling involved in the sale.

MS.Zoning Identifies the general zoning classification of the sale.

Lot.Frontage Linear feet of street connected to property.

Lot.Area Lot size in square feet.

Street Type of road access to property.

Alley Type of alley access to property.

Lot.Shape General shape of property.

Land.Contour Flatness of the property.

Utilities Type of utilities available.

Lot.Config Lot configuration.

Land.Slope Slope of property.

Neighborhood Physical locations within Ames city limits (map available).

Condition.1 Proximity to various conditions.

Condition.2 Proximity to various conditions (if more than one is present).

Bldg.Type Type of dwelling.

House.Style Style of dwelling.

Overall.Qual Rates the overall material and finish of the house.

Overall.Cond Rates the overall condition of the house.

Year.Built Original construction date.

Year.Remod.Add Remodel date (same as construction date if no remodeling or additions).

Roof.Style Type of roof.

Roof.Matl Roof material.

Exterior.1st Exterior covering on house.

Exterior.2nd Exterior covering on house (if more than one material).

Mas.Vnr.Type Masonry veneer type.

Mas.Vnr.Area Masonry veneer area in square feet.

Exter.Qual Evaluates the quality of the material on the exterior.

Exter.Cond Evaluates the present condition of the material on the exterior.

Foundation Type of foundation.

Bsmt.Qual Evaluates the height of the basement.

Bsmt.Cond Evaluates the general condition of the basement.

Bsmt.Exposure Refers to walkout or garden level walls.

BsmtFin.Type.1 Rating of basement finished area.

BsmtFin.SF.1 Type 1 finished square feet.

BsmtFin.Type.2 Rating of basement finished area (if multiple types).

BsmtFin.SF.2 Type 2 finished square feet.

Bsmt.Unf.SF Unfinished square feet of basement area.

Total.Bsmt.SF Total square feet of basement area.

Heating Type of heating.
Heating.QC Heating quality and condition.
Central.Air Central air conditioning.
Electrical Electrical system.
X1st.Flr.SF First Floor square feet.
X2nd.Flr.SF Second floor square feet.
Low.Qual.Fin.SF Low quality finished square feet (all floors).
Bsmt.Full.Bath Basement full bathrooms.
Bsmt.Half.Bath Basement half bathrooms.
Full.Bath Full bathrooms above grade.
Half.Bath Half baths above grade.
Bedroom.AbvGr Bedrooms above grade (does NOT include basement bedrooms).
Kitchen.AbvGr Kitchens above grade.
Kitchen.Qual Kitchen quality.
TotRms.AbvGrd Total rooms above grade (does not include bathrooms).
Functional Home functionality (Assume typical unless deductions are warranted).
Fireplaces Number of fireplaces.
Fireplace.Qu Fireplace quality.
Garage.Type Garage location.
Garage.Yr.Blt Year garage was built.
Garage.Finish Interior finish of the garage.
Garage.Cars Size of garage in car capacity.
Garage.Area Size of garage in square feet.
Garage.Qual Garage quality.
Garage.Cond Garage condition.
Paved.Drive Paved driveway.
Wood.Deck.SF Wood deck area in square feet.
Open.Porch.SF Open porch area in square feet.
Enclosed.Porch Enclosed porch area in square feet.
X3Ssn.Porch Three season porch area in square feet.
Screen.Porch Screen porch area in square feet.
Pool.Area Pool area in square feet.
Pool.QC Pool quality.
Fence Fence quality.
Misc.Feature Miscellaneous feature not covered in other categories.
Misc.Val Dollar value of miscellaneous feature.
Mo.Sold Month Sold (MM).
Yr.Sold Year Sold (YYYY).
Sale.Type Type of sale.
Sale.Condition Condition of sale.

Source

De Cock, Dean. "Ames, Iowa: Alternative to the Boston housing data as an end of semester regression project." Journal of Statistics Education 19.3 (2011).

ami_occurrences	<i>Acute Myocardial Infarction (Heart Attack) Events</i>
-----------------	--

Description

This dataset is simulated but contains realistic occurrences of AMI in NY City.

Usage

ami_occurrences

Format

A data frame with 365 observations on the following variable.

ami Number of daily occurrences of heart attacks in NY City.

Examples

```
library(ggplot2)

ggplot(ami_occurrences, mapping = aes(x = ami)) +
  geom_bar() +
  labs(
    x = "Acute Myocardial Infarction events",
    y = "Count",
    title = "Acute Myocardial Infarction events in NYC"
  )
```

antibiotics	<i>Pre-existing conditions in 92 children</i>
-------------	---

Description

Pre-existing medical conditions of 92 children involved in a study on the optimal duration of antibiotic use in treatment of tracheitis, which is an upper respiratory infection.

Usage

antibiotics

Format

A data frame with 92 observations, each representing a child, on the following variable.

condition Pre-existing medical condition.

Examples

```
library(ggplot2)

ggplot(antibiotics, aes(x = condition)) +
  geom_bar() +
  labs(
    x = "Conidition", y = "Count",
    title = "Pre-existing coniditions of children",
    subtitle = "in antibiotic use study"
  ) +
  coord_flip()
```

arbuthnot

Male and female births in London

Description

Arbuthnot's data describes male and female christenings (births) for London from 1629-1710.

Usage

```
arbuthnot
```

Format

A `tbl_df` with with 82 rows and 3 variables:

year year, ranging from 1629 to 1710

boys number of male christenings (births)

girls number of female christenings (births)

Details

John Arbuthnot (1710) used these time series data to carry out the first known significance test. During every one of the 82 years, there were more male christenings than female christenings. As Arbuthnot wondered, we might also wonder if this could be due to chance, or whether it meant the birth ratio was not actually 1:1.

Source

These data are excerpted from the Arbuthnot dataset in the [HistData](#) package.

Examples

```
library(ggplot2)
library(tidyr)

# All births
ggplot(arbuthnot, aes(x = year, y = boys + girls, group = 1)) +
  geom_line()

# Boys and girls
arbuthnot |>
  pivot_longer(cols = -year, names_to = "sex", values_to = "n") |>
  ggplot(aes(x = year, y = n, color = sex, group = sex)) +
  geom_line()
```

arenosa

arenosa

Description

Published results used RNA-Seq to investigate how cold responsiveness differs in two populations of *A. arenosa*: TBG (collected from Triberg, Germany) and KA (collected from Kasparstein, Austria). Each row corresponds to a gene; the first column contains the gene name; other columns correspond to expression measured in a plant sample. Three plants of each population were exposed to cold (vernalized, denoted by v), and three were not (non-vernalized, denoted by nv). Expression was measured in gene counts (i.e. the number of RNA transcripts present in a sample); the data were then normalized to allow comparison between samples.

Usage

arenosa

Format

A tibble with 1088 rows and 13 variables:

```
gene.name a character vector
ka.nv.1 a numeric vector
ka.nv.2 a numeric vector
ka.nv.3 a numeric vector
ka.v.1 a numeric vector
ka.v.2 a numeric vector
ka.v.3 a numeric vector
tbg.nv.1 a numeric vector
tbg.nv.2 a numeric vector
tbg.nv.3 a numeric vector
tbg.v.1 a numeric vector
tbg.v.2 a numeric vector
tbg.v.3 a numeric vector
```


Source

K Bomblies Harvard University lab.

References

Pierre Baduel, Brian Arnold, Cara M. Weisman, Ben Hunter, Kirsten Bomblies, Habitat-Associated Life History and Stress-Tolerance Variation in *Arabidopsis arenosa*, *Plant Physiology*, Volume 171, Issue 1, May 2016, Pages 437–451 <https://doi.org/10.1104/pp.15.01875><https://doi.org/10.1104/pp.15.01875>

ArrowLines

Create a Line That may have Arrows on the Ends

Description

Similar to [lines](#), this function will include endpoints that are solid points, open points, or arrows (mix-and-match ready).

Usage

```
ArrowLines(  
  x,  
  y,  
  lty = 1,  
  lwd = 2.5,  
  col = 1,  
  length = 0.1,  
  af = 3,  
  cex.pch = 1.2,  
  ends = c("a", "a"),  
  ...  
)
```

Arguments

x	A vector of the x-coordinates of the line to be drawn.
y	A vector of the y-coordinates of the line to be drawn. This vector should have the same length as that of x.
lty	The line type.
lwd	The line width.
col	The line and endpoint color.
length	If an end point is an arrow, then this specifies the sizing of the arrow. See the length argument in the arrows help file for additional details.
af	A tuning parameter for creating the arrow. Usually the default (3) will work. If no arrow is shown, make this value larger. If the arrow appears to extend off of the line, then specify a smaller value.

<code>cex.pch</code>	Plotting character size (if open or closed point at the end).
<code>ends</code>	A character vector of length 2, where the first value corresponds to the start of the line and the second to the end of the line. A value of "a" corresponds to an arrow being shown, "o" to an open circle, and "c" for a closed point.
<code>...</code>	All additional arguments are passed to the lines function.

Author(s)

David Diez

See Also[lsegments](#), [dlsegments](#), [CCP](#)**Examples**

```
CCP(xlim = c(-6, 6), ylim = c(-6, 6), ticklabs = 2)
x <- c(-2, 0, 2, 4)
y <- c(0, 3, 0, 3)
ArrowLines(x, y, col = COL[1], ends = c("c", "c"))
points(x, y, col = COL[1], pch = 19, cex = 1.2)
```

```
CCP(xlim = c(-6, 6), ylim = c(-6, 6), ticklabs = 2)
x <- c(-3, 0, 1, 3)
y <- c(2, 1, -2, 1)
ArrowLines(x, y, col = COL[1], ends = c("c", "c"))
points(x, y, col = COL[1], pch = 19, cex = 1.2)
```

```
CCP(xlim = c(-6, 6), ylim = c(-6, 6), ticklabs = 2)
x <- seq(-2, 2, 0.01)
y <- x^2 - 3
ArrowLines(x, y, col = COL[1], ends = c("c", "c"))
x <- seq(-2, 2, 1)
y <- x^2 - 3
points(x, y, col = COL[1], pch = 19, cex = 1.2)
```

ask

*How important is it to ask pointed questions?***Description**

In this experiment, each individual was asked to be a seller of an iPod (a product commonly used to store music on before smart phones...). They participant received \$10 + 5% of the sale price for participating. The iPod they were selling had frozen twice in the past inexplicably but otherwise worked fine. The prospective buyer starts off and then asks one of three final questions, depending on the seller's treatment group.

Usage`ask`**Format**

A data frame with 219 observations on the following 3 variables.

question_class The type of question: general, pos_assumption, and neg_assumption.

question The question corresponding to the `question.class`

response The classified response from the seller, either disclose or hide.

Details

The three possible questions:

- General: What can you tell me about it?
- Positive Assumption: It doesn't have any problems, does it?
- Negative Assumption: What problems does it have?

The outcome variable is whether or not the participant discloses or hides the problem with the iPod.

Source

Minson JA, Ruedy NE, Schweitzer ME. There *is* such a thing as a stupid question: Question disclosure in strategic communication.

Examples

```
library(dplyr)
library(ggplot2)

# Distribution of responses based on question type
ask |>
  count(question_class, response)

# Visualize relative frequencies of responses based on question type
ggplot(ask, aes(x = question_class, fill = response)) +
  geom_bar(position = "fill")

# Perform chi-square test
(test <- chisq.test(table(ask$question_class, ask$response)))

# Check the test's assumption around sufficient expected observations
# per table cell.
test$expected
```

`association`*Simulated data for association plots*

Description

Simulated dataset.

Usage

```
association
```

Format

A data frame with 121 observations on the following 4 variables.

x1 a numeric vector
x2 a numeric vector
x3 a numeric vector
y1 a numeric vector
y2 a numeric vector
y3 a numeric vector
y4 a numeric vector
y5 a numeric vector
y6 a numeric vector
y7 a numeric vector
y8 a numeric vector
y9 a numeric vector
y10 a numeric vector
y11 a numeric vector
y12 a numeric vector

Examples

```
library(ggplot2)

ggplot(association, aes(x = x1, y = y1)) +
  geom_point()

ggplot(association, aes(x = x2, y = y4)) +
  geom_point()

ggplot(association, aes(x = x3, y = y7)) +
  geom_point()
```

assortive_mating	<i>Eye color of couples</i>
------------------	-----------------------------

Description

Colors of the eye colors of male and female partners.

Usage

```
assortative_mating
```

Format

A data frame with 204 observations on the following 2 variables.

self_male a factor with levels blue, brown, and green

partner_female a factor with blue, brown, and green

Source

B. Laeng et al. Why do blue-eyed men prefer women with the same eye color? In: Behavioral Ecology and Sociobiology 61.3 (2007), pp. 371-384.

Examples

```
data(assortive_mating)
table(assortive_mating)
```

avandia	<i>Cardiovascular problems for two types of Diabetes medicines</i>
---------	--

Description

A comparison of cardiovascular problems for Rosiglitazone and Pioglitazone.

Usage

```
avandia
```

Format

A data frame with 227571 observations on the following 2 variables.

treatment a factor with levels Pioglitazone and Rosiglitazone

cardiovascular_problems a factor with levels no and yes

Source

D.J. Graham et al. Risk of acute myocardial infarction, stroke, heart failure, and death in elderly Medicare patients treated with rosiglitazone or pioglitazone. In: JAMA 304.4 (2010), p. 411. issn: 0098-7484.

Examples

```
table(avandia)
```

AxisInDollars

Build Better Looking Axis Labels for US Dollars

Description

Convert and simplify axis labels that are in US Dollars.

Usage

```
AxisInDollars(side, at, include.symbol = TRUE, simplify = TRUE, ...)
```

Arguments

side	An integer specifying which side of the plot the axis is to be drawn on. The axis is place as follows: 1 = below, 2 = left, 3 = above and 4 = right.
at	The points at which tick-marks are to be drawn.
include.symbol	Whether to include a dollar or percent symbol, where the symbol chosen depends on the function.
simplify	For dollars, simplify the amount to use abbreviations of "k", "m", "b", or "t" when numbers tend to be in the thousands, millions, billions, or trillions, respectively.
...	Arguments passed to axis

Value

The numeric locations on the axis scale at which tick marks were drawn when the plot was first drawn.

Author(s)

David Diez

See Also

[buildAxis](#) [AxisInDollars](#) [AxisInPercent](#)

Examples

```
x <- sample(50e6, 100)
hist(x, axes = FALSE)
AxisInDollars(1, pretty(x))
```

AxisInPercent

Build Better Looking Axis Labels for Percentages

Description

Convert and simplify axis labels that are in percentages.

Usage

```
AxisInPercent(side, at, include.symbol = TRUE, simplify = TRUE, ...)
```

Arguments

<code>side</code>	An integer specifying which side of the plot the axis is to be drawn on. The axis is place as follows: 1 = below, 2 = left, 3 = above and 4 = right.
<code>at</code>	The points at which tick-marks are to be drawn.
<code>include.symbol</code>	Whether to include a dollar or percent symbol, where the symbol chosen depends on the function.
<code>simplify</code>	For dollars, simplify the amount to use abbreviations of "k", "m", "b", or "t" when numbers tend to be in the thousands, millions, billions, or trillions, respectively.
<code>...</code>	Arguments passed to axis

Value

The numeric locations on the axis scale at which tick marks were drawn when the plot was first drawn.

Author(s)

David Diez

See Also

[buildAxis](#) [AxisInDollars](#) [AxisInDollars](#)

Examples

```
x <- sample(50e6, 100)
hist(x, axes = FALSE)
AxisInDollars(1, pretty(x))
```

babies

*The Child Health and Development Studies***Description**

The Child Health and Development Studies investigate a range of topics. One study, in particular, considered all pregnancies between 1960 and 1967 among women in the Kaiser Foundation Health Plan in the San Francisco East Bay area. We do not have ideal provenance for these data. For a better documented and more recent dataset on a similar topic with similar variables, see [births14](#). Additionally, Gestation dataset in the [mosaicData](#) package also contains similar data.

Usage

babies

Format

A data frame with 1236 rows and 8 variables:

case id number

bwt birthweight, in ounces

gestation length of gestation, in days

parity binary indicator for a first pregnancy (0 = first pregnancy)

age mother's age in years

height mother's height in inches

weight mother's weight in pounds

smoke binary indicator for whether the mother smokes

Source

These data come from Child Health and Development Studies.

babies_crawl

*Crawling age***Description**

Crawling age of babies along with the average outdoor temperature at 6 months of age.

Usage

babies_crawl

Format

A data frame with 12 observations on the following 5 variables.

birth_month A factor with levels corresponding to months

avg_crawling_age a numeric vector

sd a numeric vector

n a numeric vector

temperature a numeric vector

Source

J.B. Benson. Season of birth and onset of locomotion: Theoretical and methodological implications. In: Infant behavior and development 16.1 (1993), pp. 69-81. issn: 0163-6383.

Examples

```
library(ggplot2)

ggplot(babies_crawl, aes(x = temperature, y = avg_crawling_age)) +
  geom_point() +
  labs(x = "Temperature", y = "Average crawling age")
```

bac

Beer and blood alcohol content

Description

Here we examine data from sixteen student volunteers at Ohio State University who each drank a randomly assigned number of cans of beer.

Usage

bac

Format

A data frame with 16 observations on the following 3 variables.

student a numeric vector

beers a numeric vector

bac a numeric vector

Source

J. Malkevitch and L.M. Lesser. For All Practical Purposes: Mathematical Literacy in Today's World. WH Freeman & Co, 2008. The data origin is given in the Electronic Encyclopedia of Statistical Examples and Exercises, 1992.

Examples

```
library(ggplot2)

ggplot(bac, aes(x = beers, y = bac)) +
  geom_point() +
  labs(x = "Number of beers", y = "Blood alcohol content")
```

ball_bearing	<i>Lifespan of ball bearings</i>
--------------	----------------------------------

Description

A simulated dataset on lifespan of ball bearings.

Usage

```
ball_bearing
```

Format

A data frame with 75 observations on the following variable.

life_span Lifespan of ball bearings (in hours).

Source

Simulated data.

Examples

```
library(ggplot2)

ggplot(ball_bearing, aes(x = life_span)) +
  geom_histogram(binwidth = 1)

qqnorm(ball_bearing$life_span)
```

bdims

*Body measurements of 507 physically active individuals.***Description**

Body girth measurements and skeletal diameter measurements, as well as age, weight, height and gender, are given for 507 physically active individuals - 247 men and 260 women. These data can be used to provide statistics students practice in the art of data analysis. Such analyses range from simple descriptive displays to more complicated multivariate analyses such as multiple regression and discriminant analysis.

Usage

bdims

Format

A data frame with 507 observations on the following 25 variables.

bia_di A numerical vector, respondent's biacromial diameter in centimeters.

bii_di A numerical vector, respondent's biiliac diameter (pelvic breadth) in centimeters.

bit_di A numerical vector, respondent's bitrochanteric diameter in centimeters.

che_de A numerical vector, respondent's chest depth in centimeters, measured between spine and sternum at nipple level, mid-expiration.

che_di A numerical vector, respondent's chest diameter in centimeters, measured at nipple level, mid-expiration.

elb_di A numerical vector, respondent's elbow diameter in centimeters, measured as sum of two elbows.

wri_di A numerical vector, respondent's wrist diameter in centimeters, measured as sum of two wrists.

kne_di A numerical vector, respondent's knee diameter in centimeters, measured as sum of two knees.

ank_di A numerical vector, respondent's ankle diameter in centimeters, measured as sum of two ankles.

sho_gi A numerical vector, respondent's shoulder girth in centimeters, measured over deltoid muscles.

che_gi A numerical vector, respondent's chest girth in centimeters, measured at nipple line in males and just above breast tissue in females, mid-expiration.

wai_gi A numerical vector, respondent's waist girth in centimeters, measured at the narrowest part of torso below the rib cage as average of contracted and relaxed position.

nav_gi A numerical vector, respondent's navel (abdominal) girth in centimeters, measured at umbilicus and iliac crest using iliac crest as a landmark.

hip_gi A numerical vector, respondent's hip girth in centimeters, measured at at level of bitrochanteric diameter.

thi_gi A numerical vector, respondent's thigh girth in centimeters, measured below gluteal fold as the average of right and left girths.

bic_gi A numerical vector, respondent's bicep girth in centimeters, measured when flexed as the average of right and left girths.

for_gi A numerical vector, respondent's forearm girth in centimeters, measured when extended, palm up as the average of right and left girths.

kne_gi A numerical vector, respondent's knee diameter in centimeters, measured as sum of two knees.

cal_gi A numerical vector, respondent's calf maximum girth in centimeters, measured as average of right and left girths.

ank_gi A numerical vector, respondent's ankle minimum girth in centimeters, measured as average of right and left girths.

wri_gi A numerical vector, respondent's wrist minimum girth in centimeters, measured as average of right and left girths.

age A numerical vector, respondent's age in years.

wgt A numerical vector, respondent's weight in kilograms.

hgt A numerical vector, respondent's height in centimeters.

sex A categorical vector, 1 if the respondent is male, 0 if female.

Source

Heinz G, Peterson LJ, Johnson RW, Kerk CJ. 2003. Exploring Relationships in Body Dimensions. Journal of Statistics Education 11(2).

Examples

```
library(ggplot2)
ggplot(bdims, aes(x = hgt)) +
  geom_histogram(binwidth = 5)

ggplot(bdims, aes(x = hgt, y = wgt)) +
  geom_point() +
  labs(x = "Height", y = "Weight")

ggplot(bdims, aes(x = hgt, y = sho_gi)) +
  geom_point() +
  labs(x = "Height", y = "Shoulder girth")

ggplot(bdims, aes(x = hgt, y = hip_gi)) +
  geom_point() +
  labs(x = "Height", y = "Hip girth")
```

BG*Add background color to a plot*

Description

Overlays a colored rectangle over the entire plotting region.

Usage

```
BG(col = openintro::COL[5, 9])
```

Arguments

col Color to overlay.

See Also

[COL](#)

Examples

```
Test <- function(col) {  
  plot(1:7,  
    col = COL[1:7], pch = 19, cex = 5,  
    xlim = c(0, 8),  
    ylim = c(0, 9)  
  )  
  BG(col)  
  points(2:8, col = COL[1:7], pch = 19, cex = 5)  
  text(2, 6, "Correct Color")  
  text(6, 2, "Affected Color")  
}  
  
# Works well since black color almost fully transparent  
Test(COL[5, 9])  
  
# Works less well since transparency isn't as significant  
Test(COL[5, 6])  
  
# Pretty ugly due to overlay  
Test(COL[5, 3])  
  
# Basically useless due to heavy color gradient  
Test(COL[4, 2])
```

biontech_adolescents *Efficacy of Pfizer-BioNTech COVID-19 vaccine on adolescents*

Description

On March 31, 2021, Pfizer and BioNTech announced that "in a Phase 3 trial in adolescents 12 to 15 years of age with or without prior evidence of SARS-CoV-2 infection, the Pfizer-BioNTech COVID-19 vaccine BNT162b2 demonstrated 100% efficacy and robust antibody responses, exceeding those recorded earlier in vaccinated participants aged 16 to 25 years old, and was well tolerated." These results are from a Phase 3 trial in 2,260 adolescents 12 to 15 years of age in the United States. In the trial, 18 cases of COVID-19 were observed in the placebo group (n = 1,129) versus none in the vaccinated group (n = 1,131).

Usage

biontech_adolescents

Format

A data frame with 2260 observations on the following 2 variables.

group Study group: vaccine (Pfizer-BioNTech COVID-19 vaccine administered) or placebo.

outcome Study outcome: COVID-19 or no COVID-19.

Source

"Pfizer-Biontech Announce Positive Topline Results Of Pivotal Covid-19 Vaccine Study In Adolescents". March 21, 2021. (Retrieved April 25, 2021.)

Examples

```
library(dplyr)
library(ggplot2)

biontech_adolescents |>
  count(group, outcome)

ggplot(biontech_adolescents, aes(y = group, fill = outcome)) +
  geom_bar()
```

birds

*Aircraft-Wildlife Collisions***Description**

A collection of all collisions between aircraft in wildlife that were reported to the US Federal Aviation Administration between 1990 and 1997, with details on the circumstances of the collision.

Usage

birds

Format

A data frame with 19302 observations on the following 17 variables.

opid Three letter identification code for the operator (carrier) of the aircraft.

operator Name of the aircraft operator.

atype Make and model of aircraft.

remarks Verbal remarks regarding the collision.

phase_of_flight Phase of the flight during which the collision occurred: Approach, Climb, Descent, En Route, Landing Roll, Parked, Take-off run, Taxi.

ac_mass Mass of the aircraft classified as 2250 kg or less (1), 2251-5700 kg (2), 5701-27000 kg (3), 27001-272000 kg (4), above 272000 kg (5).

num_engs Number of engines on the aircraft.

date Date of the collision (MM/DD/YYYY).

time_of_day Light conditions: Dawn, Day, Dusk, Night.

state Two letter abbreviation of the US state in which the collision occurred.

height Feet above ground level.

speed Knots (indicated air speed).

effect Effect on flight: Aborted Take-off, Engine Shut Down, None, Other, Precautionary Landing.

sky Type of cloud cover, if any: No Cloud, Overcast, Some Cloud.

species Common name for bird or other wildlife.

birds_seen Number of birds/wildlife seen by pilot: 1, 2-10, 11-100, Over 100.

birds_struck Number of birds/wildlife struck: 0, 1, 2-10, 11-100, Over 100.

Details

The FAA National Wildlife Strike Database contains strike reports that are voluntarily reported to the FAA by pilots, airlines, airports and others. Current research indicates that only about 20% Wildlife strike reporting is not uniform as some organizations have more robust voluntary reporting procedures. Because of variations in reporting, users are cautioned that the comparisons between individual airports or airlines may be misleading.

Source

Aircraft Wildlife Strike Data: Search Tool - FAA Wildlife Strike Database. Available at <https://datahub.transportation.gov/Aviation/Aircraft-Wildlife-Strike-Data-Search-Tool-FAA-Wild/jhay-dgxy>. Retrieval date: Feb 4, 2012.

Examples

```
library(dplyr)
library(ggplot2)
library(forcats)
library(tidyr)

# Phase of the flight during which the collision occurred, tabular
birds |>
  count(phase_of_flt, sort = TRUE)

# Phase of the flight during which the collision occurred, barplot
ggplot(birds, aes(y = fct_infreq(phase_of_flt))) +
  geom_bar() +
  labs(x = "Phase of flight")

# Height summary statistics
summary(birds$height)

# Phase of flight vs. effect of crash
birds |>
  drop_na(phase_of_flt, effect) |>
  ggplot(aes(y = phase_of_flt, fill = effect)) +
  geom_bar(position = "fill") +
  labs(x = "Proportion", y = "Phase of flight", fill = "Effect")
```

births

North Carolina births, 100 cases

Description

Data on a random sample of 100 births for babies in North Carolina where the mother was not a smoker and another 50 where the mother was a smoker.

Usage

```
births
```

Format

A data frame with 150 observations on the following 14 variables.

f_age Father's age.

m_age Mother's age.

weeks Weeks at which the mother gave birth.
premature Indicates whether the baby was premature or not.
visits Number of hospital visits.
gained Weight gained by mother.
weight Birth weight of the baby.
sex_baby Gender of the baby.
smoke Whether or not the mother was a smoker.

Source

Birth records released by North Carolina in 2004.

See Also

We do not have ideal provenance for these data. For a better documented and more recent dataset on a similar topic with similar variables, see [births14](#). Additionally, [ncbirths](#) also contains similar data.

Examples

```
library(ggplot2)

ggplot(births, aes(x = smoke, y = weight)) +
  geom_boxplot()
```

births14

US births

Description

Every year, the US releases to the public a large dataset containing information on births recorded in the country. This dataset has been of interest to medical researchers who are studying the relation between habits and practices of expectant mothers and the birth of their children. This is a random sample of 1,000 cases from the dataset released in 2014.

Usage

```
births14
```

Format

A data frame with 1,000 observations on the following 13 variables.

fage Father's age in years.
mage Mother's age in years.
mature Maturity status of mother.

weeks Length of pregnancy in weeks.

premie Whether the birth was classified as premature (premie) or full-term.

visits Number of hospital visits during pregnancy.

gained Weight gained by mother during pregnancy in pounds.

weight Weight of the baby at birth in pounds.

lowbirthweight Whether baby was classified as low birthweight (low) or not (not low).

sex Sex of the baby, female or male.

habit Status of the mother as a nonsmoker or a smoker.

marital Whether mother is married or not married at birth.

whitemom Whether mom is white or not white.

Source

United States Department of Health and Human Services. Centers for Disease Control and Prevention. National Center for Health Statistics. Natality Detail File, 2014 United States. Inter-university Consortium for Political and Social Research, 2016-10-07. [doi:10.3886/ICPSR36461.v1](https://doi.org/10.3886/ICPSR36461.v1).

Examples

```
library(ggplot2)

ggplot(births14, aes(x = habit, y = weight)) +
  geom_boxplot() +
  labs(x = "Smoking status of mother", y = "Birth weight of baby (in lbs)")

ggplot(births14, aes(x = whitemom, y = visits)) +
  geom_boxplot() +
  labs(x = "Mother's race", y = "Number of doctor visits during pregnancy")

ggplot(births14, aes(x = mature, y = gained)) +
  geom_boxplot() +
  labs(x = "Mother's age category", y = "Weight gained during pregnancy")
```

blizzard_salary

Blizzard Employee Voluntary Salary Info.

Description

Employee generated anonymous survey of salary information.

Usage

```
blizzard_salary
```

Format

A data frame with 466 rows and 9 variables.

timestamp Time data was entered

status Specifies employment status.

current_title Current job title.

current_salary Current salary (in USD).

salary_type Frequency with levels year, hour, week.

percent_incr Raise given July 2020.

other_info Other information submitted by employee.

location Current office of employment.

performance_rating Most recent review performance rating.

Source

[Bloomberg - Blizzard workers share salaries in revolt over wage disparities.](#)

Examples

```
library(ggplot2)
library(dplyr)

plot_data <- blizzard_salary |>
  mutate(annual_salary = case_when(
    salary_type == "week" ~ current_salary * 52,
    salary_type == "hour" ~ current_salary * 40 * 52,
    TRUE ~ current_salary
  ))

ggplot(plot_data, aes(annual_salary)) +
  geom_histogram(binwidth = 25000, color = "white") +
  labs(
    title = "Current Salary of Blizzard Employees",
    x = "Salary",
    y = "Number of Employees"
  )
```

books

Sample of books on a shelf

Description

Simulated dataset.

Usage

```
books
```

Format

A data frame with 95 observations on the following 2 variables.

type a factor with levels fiction and nonfiction

format a factor with levels hardcover and paperback

Examples

```
table(books)
```

```
boxPlot
```

```
Box plot
```

Description

An alternative to `boxplot`. Equations are not accepted. Instead, the second argument, `fact`, is used to split the data.

Usage

```
boxPlot(
  x,
  fact = NULL,
  horiz = FALSE,
  width = 2/3,
  lwd = 1,
  lcol = "black",
  medianLwd = 2,
  pch = 20,
  pchCex = 1.8,
  col = grDevices::rgb(0, 0, 0, 0.25),
  add = FALSE,
  key = NULL,
  axes = TRUE,
  xlab = "",
  ylab = "",
  xlim = NULL,
  ylim = NULL,
  na.rm = TRUE,
  ...
)
```

Arguments

x	A numerical vector.
fact	A character or factor vector defining the grouping for side-by-side box plots.
horiz	If TRUE, the box plot is oriented horizontally.
width	The width of the boxes in the plot. Value between 0 and 1.
lwd	Width of lines used in box and whiskers.
lcol	Color of the box, median, and whiskers.
medianLwd	Width of the line marking the median.
pch	Plotting character of outliers.
pchCex	Size of outlier character.
col	Color of outliers.
add	If FALSE, a new plot is created. Otherwise, the boxplots are added to the current plot for values of TRUE or a numerical vector specifying the locations of the boxes.
key	The order in which to display the side-by-side boxplots. If locations are specified in add, then the elements of add will correspond to the elements of key.
axes	Whether to plot the axes.
xlab	Label for the x axis.
ylab	Label for the y axis.
xlim	Limits for the x axis.
ylim	Limits for the y axis.
na.rm	Indicate whether NA values should be removed.
...	Additional arguments to plot.

Author(s)

David Diez

See Also

[histPlot](#), [dotPlot](#), [densityPlot](#)

Examples

```
# univariate
boxPlot(email$num_char, ylab = "Number of characters in emails")

# bivariate
boxPlot(email$num_char, email$spam,
  xlab = "Spam",
  ylab = "Number of characters in emails"
)

# faded outliers
```

```

boxPlot(email$num_char, email$spam,
  xlab = "Spam",
  ylab = "Number of characters in emails",
  col = fadeColor("black", 18)
)

# horizontal plots
boxPlot(email$num_char, email$spam,
  horiz = TRUE,
  xlab = "Spam",
  ylab = "Number of characters in emails",
  col = fadeColor("black", 18)
)

# bivariate relationships where categorical data have more than 2 levels
boxPlot(email$num_char, email$image,
  horiz = TRUE,
  xlab = "Number of attached images",
  ylab = "Number of characters in emails",
  col = fadeColor("black", 18)
)

# key can be used to restrict to only the desired groups
boxPlot(email$num_char, email$image,
  horiz = TRUE, key = c(0, 1, 2),
  xlab = "Number of attached images (limited to 0, 1, 2)",
  ylab = "Number of characters in emails",
  col = fadeColor("black", 18)
)

# combine boxPlot and dotPlot
boxPlot(tips$tip, tips$day,
  horiz = TRUE, key = c("Tuesday", "Friday")
)
dotPlot(tips$tip, tips$day,
  add = TRUE, at = 1:2 + 0.05,
  key = c("Tuesday", "Friday")
)

# adding a box
boxPlot(email$num_char[email$spam == 0], xlim = c(0, 3))
boxPlot(email$num_char[email$spam == 1], add = 2, axes = FALSE)
axis(1, at = 1:2, labels = c(0, 1))
boxPlot(email$num_char[email$spam == 0], ylim = c(0, 3), horiz = TRUE)
boxPlot(email$num_char[email$spam == 1], add = 2, horiz = TRUE, axes = FALSE)
axis(2, at = 1:2, labels = c(0, 1))

```

Description

This function is not yet very flexible.

Usage

```
Braces(x, y, face.radians = 0, long = 1, short = 0.2, ...)
```

Arguments

x	x-coordinate of the center of the braces.
y	y-coordinate of the center of the braces.
face.radians	Radians of where the braces should face. For example, the default with <code>face.radians = 0</code> has the braces facing right. Setting to $\pi / 2$ would result in the braces facing up.
long	The units for the long dimension of the braces.
short	The units for the short dimension of the braces. This must be less than or equal to half of the long dimension.
...	Arguments passed to lines .

Author(s)

David Diez

See Also

[dlsegments](#)

Examples

```
plot(0:1, 0:1, type = "n")
Braces(0.5, 0.5, face.radians = 3 * pi / 2)
```

buildAxis

Axis function substitute

Description

The function `buildAxis` is built to provide more control of the number of labels on the axis. This function is still under development.

Usage

```
buildAxis(side, limits, n, nMin = 2, nMax = 10, extend = 2, eps = 10^-12, ...)
```

Arguments

side	The side of the plot where to add the axis.
limits	Either lower and upper limits on the axis or a dataset.
n	The preferred number of axis labels.
nMin	The minimum number of axis labels.
nMax	The maximum number of axis labels.
extend	How far the axis may extend beyond range(limits).
eps	The smallest increment allowed.
...	Arguments passed to axis

Details

The primary reason behind building this function was to allow a plot to be created with similar features but with different datasets. For instance, if a set of code was written for one dataset and the function `axis` had been utilized with pre-specified values, the axis may not match the plot of a new set of data. The function `buildAxis` addresses this problem by allowing the number of axis labels to be specified and controlled.

The axis is built by assigning penalties to a variety of potential axis setups, ranking them based on these penalties and then selecting the axis with the best score.

Value

A vector of the axis plotted.

Author(s)

David Diez

See Also

[histPlot](#), [dotPlot](#), [boxPlot](#), [densityPlot](#)

Examples

```
# ==> 0 <==#
limits <- rnorm(100, 605490, 10)
hist(limits, axes = FALSE)
buildAxis(1, limits, 2, nMax = 4)

# ==> 1 <==#
x <- seq(0, 500, 10)
y <- 8 * x + rnorm(length(x), mean = 6000, sd = 200)
plot(x, y, axes = FALSE)
buildAxis(1, limits = x, n = 5)
buildAxis(2, limits = y, n = 3)

# ==> 2 <==#
x <- 9528412 + seq(0, 200, 10)
```



```

y <- 8 * x + rnorm(length(x), mean = 6000, sd = 200)
plot(x, y, axes = FALSE)
temp <- buildAxis(1, limits = x, n = 4)
buildAxis(2, y, 3)

# ==> 3 <==#
x <- seq(367, 1251, 10)
y <- 7.5 * x + rnorm(length(x), mean = 6000, sd = 800)
plot(x, y, axes = FALSE)
buildAxis(1, limits = x, n = 4, nMin = 3, nMax = 3)
buildAxis(2, limits = y, n = 4, nMin = 3, nMax = 5)

# ==> 4 <==#
x <- seq(367, 367.1, 0.001)
y <- 7.5 * x + rnorm(length(x), mean = 6000, sd = 0.01)
plot(x, y, axes = FALSE)
buildAxis(1, limits = x, n = 4, nMin = 5, nMax = 6)
buildAxis(2, limits = y, n = 2, nMin = 3, nMax = 4)

# ==> 5 <==#
x <- seq(-0.05, -0.003, 0.0001)
y <- 50 + 20 * x + rnorm(length(x), sd = 0.1)
plot(x, y, axes = FALSE)
buildAxis(1, limits = x, n = 4, nMin = 5, nMax = 6)
buildAxis(2, limits = y, n = 4, nMax = 5)
abline(lm(y ~ x))

# ==> 6 <==#
x <- seq(-0.0097, -0.008, 0.0001)
y <- 50 + 20 * x + rnorm(length(x), sd = 0.1)
plot(x, y, axes = FALSE)
buildAxis(1, limits = x, n = 4, nMin = 2, nMax = 5)
buildAxis(2, limits = y, n = 4, nMax = 5)
abline(lm(y ~ x))

# ==> 7 <==#
x <- seq(0.03, -0.003099, -0.00001)
y <- 50 + 20 * x + rnorm(length(x), sd = 0.1)
plot(x, y, axes = FALSE)
buildAxis(1, limits = x, n = 4, nMin = 2, nMax = 5)
buildAxis(2, limits = y, n = 4, nMax = 6)
abline(lm(y ~ x))

# ==> 8 - repeat <==#
m <- runif(1) / runif(1) +
  rgamma(1, runif(1) / runif(1), runif(1) / runif(1))
s <- rgamma(1, runif(1) / runif(1), runif(1) / runif(1))
x <- rnorm(50, m, s)
hist(x, axes = FALSE)
buildAxis(1, limits = x, n = 5, nMin = 4, nMax = 6, eps = 10^-12)
if (diff(range(x)) < 10^-12) {
  cat("too small\n")
}

```

burger	<i>Burger preferences</i>
--------	---------------------------

Description

Sample burger place preferences versus gender.

Usage

```
burger
```

Format

A data frame with 500 observations on the following 2 variables.

best_burger_place Burger place.

gender a factor with levels Female and Male

Source

SurveyUSA, Results of SurveyUSA News Poll #17718, data collected on December 2, 2010.

Examples

```
table(burger)
```

calc_streak	<i>Calculate hit streaks</i>
-------------	------------------------------

Description

Calculate hit streaks

Usage

```
calc_streak(x)
```

Arguments

x A character vector of hits ("H") and misses ("M").

Value

A data frame with one column, length, containing the length of each hit streak.

Examples

```
data(kobe_basket)
calc_streak(kobe_basket$shot)
```

cancer_in_dogs	<i>Cancer in dogs</i>
----------------	-----------------------

Description

A study in 1994 examined 491 dogs that had developed cancer and 945 dogs as a control group to determine whether there is an increased risk of cancer in dogs that are exposed to the herbicide 2,4-Dichlorophenoxyacetic acid (2,4-D).

Usage

```
cancer_in_dogs
```

Format

A data frame with 1436 observations on the following 2 variables.

order a factor with levels 2, 4-D and no 2, 4-D

response a factor with levels cancer and no cancer

Source

Hayes HM, Tarone RE, Cantor KP, Jessen CR, McCurnin DM, and Richardson RC. 1991. Case-Control Study of Canine Malignant Lymphoma: Positive Association With Dog Owner's Use of 2, 4- Dichlorophenoxyacetic Acid Herbicides. Journal of the National Cancer Institute 83(17):1226-1231.

Examples

```
table(cancer_in_dogs)
```

cards	<i>Deck of cards</i>
-------	----------------------

Description

All the cards in a standard deck.

Usage

```
cards
```

Format

A data frame with 52 observations on the following 4 variables.

value a factor with levels 10 2 3 4 5 6 7 8 9 A J K Q

color a factor with levels black red

suit a factor with levels Club Diamond Heart Spade

face a logical vector

Examples

```
table(cards$value)
table(cards$color)
table(cards$suit)
table(cards$face)
table(cards$suit, cards$face)
```

cars04

cars04

Description

A data frame with 428 rows and 19 columns. This is a record of characteristics on all of the new models of cars for sale in the US in the year 2004.

Usage

```
cars04
```

Format

A data frame with 428 observations on the following 19 variables.

name The name of the vehicle including manufacturer and model.

sports_car Logical variable indicating if the vehicle is a sports car.

suv Logical variable indicating if the vehicle is an suv.

wagon Logical variable indicating if the vehicle is a wagon.

minivan Logical variable indicating if the vehicle is a minivan.

pickup Logical variable indicating if the vehicle is a pickup.

all_wheel Logical variable indicating if the vehicle is all-wheel drive.

rear_wheel Logical variable indicating if the vehicle is rear-wheel drive.

msrp Manufacturer suggested retail price of the vehicle.

dealer_cost Amount of money the dealer paid for the vehicle.

eng_size Displacement of the engine - the total volume of all the cylinders, measured in liters.

ncyl Number of cylinders in the engine.

- horsepwr** Amount of horsepower produced by the engine.
- city_mpg** Gas mileage for city driving, measured in miles per gallon.
- hwy_mpg** Gas mileage for highway driving, measured in miles per gallon.
- weight** Total weight of the vehicle, measured in pounds.
- wheel_base** Distance between the center of the front wheels and the center of the rear wheels, measured in inches.
- length** Total length of the vehicle, measured in inches.
- width** Total width of the vehicle, measured in inches.

Examples

```
library(ggplot2)

# Highway gas mileage
ggplot(cars04, aes(x = hwy_mpg)) +
  geom_histogram(
    bins = 15, color = "white",
    fill = openintro::IMSCOL["green", "full"]
  ) +
  theme_minimal() +
  labs(
    title = "Highway gas milage for cars from 2004",
    x = "Gas Mileage (miles per gallon)",
    y = "Number of cars"
  )
```

<i>cars93</i>	<i>cars93</i>
---------------	---------------

Description

A data frame with 54 rows and 6 columns. This data is a subset of the Cars93 dataset from the MASS package.

Usage

```
cars93
```

Format

A data frame with 54 observations on the following 6 variables.

- type** The vehicle type with levels large, midsize, and small.
- price** Vehicle price (USD).
- mpg_city** Vehicle mileage in city (miles per gallon).
- drive_train** Vehicle drive train with levels 4WD, front, and rear.
- passengers** The vehicle passenger capacity.
- weight** Vehicle weight (lbs).

Details

These cars represent a random sample for 1993 models that were in both *Consumer Reports* and *PACE Buying Guide*. Only vehicles of type small, midsize, and large were include.

Further description can be found in Lock (1993). Use the URL <https://jse.amstat.org/v1n1/datasets.lock.html>.

Source

Lock, R. H. (1993) 1993 New Car Data. *Journal of Statistics Education* 1(1).

Examples

```
library(ggplot2)

# Vehicle price by type
ggplot(cars93, aes(x = price)) +
  geom_histogram(binwidth = 5) +
  facet_wrap(~type)

# Vehicle price vs. weight
ggplot(cars93, aes(x = weight, y = price)) +
  geom_point()

# Milleage vs. weight
ggplot(cars93, aes(x = weight, y = mpg_city)) +
  geom_point() +
  geom_smooth()
```

cchousing

Community college housing (simulated data)

Description

These are simulated data and intended to represent housing prices of students at a community college.

Usage

```
cchousing
```

Format

A data frame with 75 observations on the following variable.

price Monthly housing price, simulated.

Examples

```
hist(cchousing$price)
```

Description

Create a Cartesian Coordinate Plane.

Usage

```
CCP(
  xlim = c(-4, 4),
  ylim = c(-4, 4),
  mar = rep(0, 4),
  length = 0.1,
  tcl = 0.007,
  xylab = FALSE,
  ticks = 1,
  ticklabs = 1,
  xpos = 1,
  ypos = 2,
  cex.coord = 1,
  cex.xylab = 1.5,
  add = FALSE
)
```

Arguments

xlim	The x-limits for the plane (vector of length 2).
ylim	The y-limits for the plane (vector of length 2).
mar	Plotting margins.
length	The length argument is passed to the arrows function and is used to control the size of the arrow.
tcl	Tick size.
xylab	Whether x and y should be shown next to the labels.
ticks	How frequently tick marks should be shown on the axes. If a vector of length 2, the first argument will correspond to the x-axis and the second to the y-axis.
ticklabs	How frequently tick labels should be shown on the axes. If a vector of length 2, the first argument will correspond to the x-axis and the second to the y-axis.
xpos	The position of the labels on the x-axis. See the pos argument in the text function for additional details.
ypos	The position of the labels on the y-axis. See the pos argument in the text function for additional details.
cex.coord	Inflation factor for font size of the coordinates, where any value larger than zero is acceptable and 1 corresponds to the default.

<code>cex.xylab</code>	Inflation factor for font size of the x and y labels, where any value larger than zero is acceptable and 1 corresponds to the default.
<code>add</code>	Indicate whether a new plot should be created (FALSE, the default) or if the Cartesian Coordinate Plane should be added to the existing plot.

Author(s)

David Diez

See Also

[lsegments](#), [dlsegments](#), [ArrowLines](#)

Examples

```
CCP()  
  
CCP(xylab = TRUE, ylim = c(-3.5, 2), xpos = 3, cex.coord = 1)  
  
CCP(xlim = c(-8, 8), ylim = c(-10, 6), ticklabs = c(2, 2), cex.xylab = 0.8)
```

<code>cdc</code>	<i>cdc</i>
------------------	------------

Description

A dataset from the 2000 Behavioral Risk Factors Surveillance System (BRFSS) conducted by the US Centers for Disease Control and Prevention used to illustrate inference on demographic data. The dataset is a random sample of 20,000 participants drawn from 350,000 interviews from that year.

Usage

`cdc`

Format

A dataframe with 20,000 rows and 9 variables:

`genhlth` Factor with levels excellent, very good good, fair, poor

`exerany` Numeric vector; 1 if the respondent exercised in the past month and 0 otherwise.

`hlthplan` Numeric; 1 if the respondent has some form of health coverage and 0 otherwise.

`smoke100` Numeric; 1 if the respondent has smoked at least 100 cigarettes in their entire life and 0 otherwise.

`height` Numeric; respondent's height in inches.

`weight` Numeric; respondent's weight in pounds.

`wt desire` Numeric; respondent's desired weight in pounds.

`age` Numeric; respondent's age in years.

`gender` Factor with two levels m f

Source

<https://www.cdc.gov/brfss/index.html>

cdc.samp	<i>cdc.samp</i>
----------	-----------------

Description

A sample of 60 individuals from the 2000 Behavioral Risk Factors Surveillance System (BRFSS) conducted by the US Centers for Disease Control.

Usage

```
cdc.samp
```

Format

A tibble with 60 rows and 9 variables:

genhlth Factor with levels excellent, very good good, fair, poor

exerany Numeric vector; 1 if the respondent exercised in the past month and 0 otherwise.

hlthplan Numeric vector; 1 if the respondent has some form of health coverage and 0 otherwise.

smoke100 Numeric; 1 if the respondent has smoked at least 100 cigarettes in their entire life and 0 otherwise.

height Numeric; respondent's height in inches.

weight Numeric; respondent's weight in pounds.

wt desire Numeric; respondent's desired weight in pounds.

age Numeric; respondent's age in years.

gender Factor with two levels m f

Source

<https://www.openintro.org/stat/data/cdc.R>

census

Random sample of 2000 U.S. Census Data

Description

A random sample of 500 observations from the 2000 U.S. Census Data.

Usage

census

Format

A data frame with 500 observations on the following 8 variables.

census_year Census Year.

state_fips_code Name of state.

total_family_income Total family income (in U.S. dollars).

age Age.

sex Sex with levels Female and Male.

race_general Race with levels American Indian or Alaska Native, Black, Chinese, Japanese, Other Asian or Pacific Islander, Two major races, White and Other.

marital_status Marital status with levels Divorced, Married/spouse absent, Married/spouse present, Never married/single, Separated and Widowed.

total_personal_income Total personal income (in U.S. dollars).

Source

<https://data.census.gov/cedsci>

Examples

```
library(dplyr)
library(ggplot2)

census |>
  filter(total_family_income > 0) |>
  ggplot(aes(x = total_family_income)) +
  geom_histogram(binwidth = 25000)
```

census.2010	<i>census.2010</i>
-------------	--------------------

Description

United States 2010 infant mortality and number of physicians by state, including the District of Columbia.

Usage

census.2010

Format

A data frame with 51 rows and 3 columns.

state Character vector vector, US State including the District of Columbia

inf.mort Numeric vector, number of deaths per 1000 live births between 1 day and 1 year of age

doctors Numeric vector, active physicians per 100,000 population

Details

Data were abstracted from the 2010 Statistical Abstract of the United States. Due to a lag in recording state level data, the infant mortality data is from 2009 and the data on physicians from 2007. Both measurements are subject to change annually, so these data are not current and should not be used for inference about infant mortality. More current data can be found at the US Centers for Disease Control and Prevention (https://www.cdc.gov/nchs/state-stats/deaths/infant-mortality.html?CDC_AAref_Val=https://www.cdc.gov/nchs/pressroom/sosmap/infant_mortality_rates/infant_mortality.htm), and in the dataset infant_mort_2022.

Source

<https://www.census.gov/library/publications/2009/compendia/statab/129ed/births-deaths-marriages-div.html>, <https://www.census.gov/library/publications/2009/compendia/statab/129ed/health-nutrition.html>

cherry	<i>Summary information for 31 cherry trees</i>
--------	--

Description

Researchers wanting to understand the relationship between these variables for black cherry trees collected data from 31 trees in the Allegheny National Forest, Pennsylvania.

Usage

cherry

Format

A data frame with 31 observations on the following 3 variables.

diam diameter in inches (at 54 inches above ground)

height height is measured in feet

volume volume in cubic feet

Source

D.J. Hand. A handbook of small data sets. Chapman & Hall/CRC, 1994.

Examples

```
library(ggplot2)
library(broom)

ggplot(cherry, aes(x = diam, y = volume)) +
  geom_point() +
  geom_smooth(method = "lm")

mod <- lm(volume ~ diam + height, cherry)
tidy(mod)
```

children_gender_stereo

Gender Stereotypes in 5-7 year old Children

Description

Stereotypes are common, but at what age do they start? This study investigates stereotypes in young children aged 5-7 years old. There are four studies reported in the paper, and all four datasets are provided here.

Usage

children_gender_stereo

Format

This data object is more unusual than most. It is a list of 4 data frames. The four data frames correspond to the data used in Studies 1-4 of the referenced paper, and these data frames each have variables (columns) that are among the following:

subject Subject ID. Note that Subject 1 in the first data frame (dataset) does **not** correspond to Subject 1 in the second data frame.

gender Gender of the subject.

age Age of the subject, in years.

trait The trait that the children were making a judgement about, which was either nice or smart.

target The age group of the people the children were making judgements about (as being either nice or smart): children or adults.

stereotype The proportion of trials where the child picked a gender target that matched the trait that was the same as the gender of the child. For example, suppose we had 18 pictures, where each picture showed 2 men and 2 women (and a different set of people in each photo). Then if we asked a boy to pick the person in each picture who they believed to be really smart, this stereotype variable would report the fraction of pictures where the boy picked a man. When a girl reviews the photos, then this stereotype variable reports the fraction of photos where she picked a woman. That is, this variable differs in meaning depending on the gender of the child. (This variable design is a little confusing, but it is useful when analyzing the data.)

high_achieve_caution The proportion of trials where the child said that children of their own gender were high-achieving in school.

interest Average score that measured the interest of the child in the game.

difference A difference score between the interest of the child in the “smart” game and their interest in the “try-hard” game.

Details

The structure of the data object is a little unusual, so we recommend reviewing the Examples section before starting your analysis.

Thank you to Nicholas Horton for pointing us to this study and the data!

Most of the results in the paper can be reproduced using the data provided here.

% TODO(David) - Add short descriptions of each study.

Source

Bian L, Leslie SJ, Cimpian A. 2017. "Gender stereotypes about intellectual ability emerge early and influence children's interests". Science 355:6323 (389-391). <https://www.science.org/doi/10.1126/science.aah6524>.

The original data may be found [here](#).

Examples

```
# This dataset is a little funny to work with.
# If wanting to review the data for a study, we
# recommend first assigning the corresponding
```

```
# data frame to a new variable. For instance,  
# below we assign the second study's data to an  
# object called `d` (d is for data!).  
d <- children_gender_stereo[[2]]
```

china	<i>Child care hours</i>
-------	-------------------------

Description

The China Health and Nutrition Survey aims to examine the effects of the health, nutrition, and family planning policies and programs implemented by national and local governments.

Usage

```
china
```

Format

A data frame with 9788 observations on the following 3 variables.

- gender** a numeric vector
- edu** a numeric vector
- child_care** a numeric vector

Source

UNC Carolina Population Center, China Health and Nutrition Survey, 2006.

Examples

```
summary(china)
```

ChiSquareTail	<i>Plot upper tail in chi-square distribution</i>
---------------	---

Description

Plot a chi-square distribution and shade the upper tail.

Usage

```
ChiSquareTail(  
  U,  
  df,  
  xlim = c(0, 10),  
  col = fadeColor("black", "22"),  
  axes = TRUE,  
  ...  
)
```

Arguments

U	Cut off for the upper tail.
df	Degrees of freedom.
xlim	Limits for the plot.
col	Color of the shading.
axes	Whether to plot an x-axis.
...	Currently ignored.

Value

Nothing is returned from the function.

Author(s)

David Diez

See Also

[normTail](#)

Examples

```
data(COL)  
ChiSquareTail(11.7,  
  7,  
  c(0, 25),  
  col = COL[1]  
)
```

`cia_factbook`*CIA Factbook Details on Countries*

Description

Country-level statistics from the US Central Intelligence Agency (CIA).

Usage`cia_factbook`**Format**

A data frame with 259 observations on the following 11 variables.

country Country name.

area Land area, in square kilometers. (1 square kilometer is 0.386 square miles)

birth_rate Birth rate, in births per 1,000 people.

death_rate Death rate, in deaths per 1,000 people.

infant_mortality_rate Infant mortality, in deaths per 1,000 live births.

internet_users Total number of internet users.

life_exp_at_birth Live expectancy at birth, in years.

maternal_mortality_rate Number of female deaths per 100,000 live births where the death is related to pregnancy or birth.

net_migration_rate Net migration rate.

population Total population.

population_growth_rate Population growth rate.

Source

CIA Factbook, Country Comparisons, 2014. <https://www.cia.gov/the-world-factbook/references/guide-to-country-comparisons/>

Examples

```
library(dplyr)
library(ggplot2)

cia_factbook_iup <- cia_factbook |>
  mutate(internet_users_percent = 100 * internet_users / population)

ggplot(cia_factbook_iup, aes(x = internet_users_percent, y = life_exp_at_birth)) +
  geom_point() +
  labs(x = "Percentage of internet users", y = "Life expectancy at birth")
```

classdata	<i>Simulated class data</i>
-----------	-----------------------------

Description

This data is simulated and is meant to represent students scores from three different lectures who were all given the same exam.

Usage

```
classdata
```

Format

A data frame with 164 observations on the following 2 variables.

m1 Represents a first midterm score.

lecture Three classes: a, b, and c.

References

OpenIntro Statistics, Chapter 8.

Examples

```
anova(lm(m1 ~ lecture, classdata))
```

cle_sac	<i>Cleveland and Sacramento</i>
---------	---------------------------------

Description

Data on a sample of 500 people from the Cleveland, OH and Sacramento, CA metro areas.

Usage

```
cle_sac
```

Format

A data frame with 500 observations representing people on the following 8 variables.

year Year the data was collected.

state State where person resides.

city City.

age Age.

sex Sex.

race Race.

marital_status Marital status.

personal_income Personal income.

Examples

```
library(ggplot2)

ggplot(cle_sac, aes(x = personal_income)) +
  geom_histogram(binwidth = 20000) +
  facet_wrap(~city)
```

climate70

Temperature Summary Data, Geography Limited

Description

A random set of monitoring locations were taken from NOAA data that had both years of interest (1948 and 2018) as well as data for both summary metrics of interest (dx70 and dx90, which are described below).

Usage

```
climate70
```

Format

A data frame with 197 observations on the following 7 variables.

station Station ID.

latitude Latitude of the station.

longitude Longitude of the station.

dx70_1948 Number of days above 70 degrees in 1948.

dx70_2018 Number of days above 70 degrees in 2018.

dx90_1948 Number of days above 90 degrees in 1948.

dx90_2018 Number of days above 90 degrees in 2018.

Details

Please keep in mind that these are two annual snapshots, and a complete analysis would consider much more than two years of data and much additional information for those years.

Source

<https://www.ncdc.noaa.gov/cdo-web>, retrieved 2019-04-24.

Examples

```
# Data sampled are from the US, Europe, and Australia.
# This geographic limitation may be due to the particular
# years considered, since locations without both 1948 and
# 2018 were discarded for this (simple) dataset.
plot(climate70$longitude, climate70$latitude)

plot(climate70$dx70_1948, climate70$dx70_2018)
abline(0, 1, lty = 2)
plot(climate70$dx90_1948, climate70$dx90_2018)
abline(0, 1, lty = 2)
hist(climate70$dx70_2018 - climate70$dx70_1948)
hist(climate70$dx90_2018 - climate70$dx90_1948)

t.test(climate70$dx70_2018 - climate70$dx70_1948)
t.test(climate70$dx90_2018 - climate70$dx90_1948)
```

climber_drugs

Climber Drugs Data.

Description

Anonymous data was collected from urine samples at huts along the climb of Mont Blanc. Several types of drugs were tested, and proportions were reported.

Usage

```
climber_drugs
```

Format

A data frame with 211 rows and 6 variables.

positive_sample Identification number of a specific urine sample.

hut Location where the sample was taken.

substance Substance detected to be present in the urine sample.

concentration Amount of substance found measured in ng/ml.

screening_analysis Indicates that the concentration was determined by screening analysis.

concomitant Indicates that this substance was always detected concomitantly with the previous one, within the same urine sample.

Source

[PLOS One - Drug Use on Mont Blanc: A Study Using Automated Urine Collection](#)

Examples

```
library(dplyr)

# Calculate the average concentration of each substance and number of occurrences.
climber_drugs |>
  group_by(substance) |>
  summarize(count = n(), mean_con = mean(concentration))

# Proportion samples in which each substance was detected.
climber_drugs |>
  group_by(substance) |>
  summarize(prop = n() / 154)
```

coast_starlight	<i>Coast Starlight Amtrak train</i>
-----------------	-------------------------------------

Description

Travel times and distances.

Usage

```
coast_starlight
```

Format

A data frame with 16 observations on the following 3 variables.

station Station.

dist Distance.

travel_time Travel time.

Examples

```
library(ggplot2)

ggplot(coast_starlight, aes(x = dist, y = travel_time)) +
  geom_point()
```

COL	<i>OpenIntro Statistics colors</i>
-----	------------------------------------

Description

These are the core colors used for the OpenIntro Statistics textbook. The blue, green, yellow, and red colors are also gray-scaled, meaning no changes are required when printing black and white copies.

Usage

COL

Format

A 7-by-13 matrix of 7 colors with thirteen fading scales: blue, green, yellow, red, black, gray, and light gray.

Source

Colors selected by OpenIntro’s in-house graphic designer, [Meenal Patel](#).

Examples

```
plot(1:7, 7:1,
     col = COL, pch = 19, cex = 6, xlab = "", ylab = "",
     xlim = c(0.5, 7.5), ylim = c(-2.5, 8), axes = FALSE
)
text(1:7, 7:1 + 0.7, paste("COL[", 1:7, "]", sep = ""), cex = 0.9)
points(1:7, 7:1 - 0.7, col = COL[, 2], pch = 19, cex = 6)
points(1:7, 7:1 - 1.4, col = COL[, 3], pch = 19, cex = 6)
points(1:7, 7:1 - 2.1, col = COL[, 4], pch = 19, cex = 6)
```

comics	<i>comics</i>
--------	---------------

Description

A data frame containing information about comic book characters from Marvel Comics and DC Comics.

Usage

comics

Format

A data frame with 21821 observations on the following 11 variables.

name Name of the character. May include: Real name, hero or villain name, alias(es) and/or which universe they live in (i.e. Earth-616 in Marvel's multiverse).

id Status of the characters identity with levels Secret, Public, No Dual and Unknown.

align Character's alignment with levels Good, Bad, Neutral and Reformed Criminals.

eye Character's eye color.

hair Character's hair color.

gender Character's gender.

gsm Character's classification as a gender or sexual minority.

alive Is the character dead or alive?

appearances Number of comic books the character appears in.

first_appear Date of publication for the comic book the character first appeared in.

publisher Publisher of the comic with levels Marvel and DC.

Examples

```
library(ggplot2)
library(dplyr)

# Good v Bad

plot_data <- comics |>
  filter(align == "Good" | align == "Bad")

ggplot(plot_data, aes(x = align, fill = align)) +
  geom_bar() +
  facet_wrap(~publisher) +
  scale_fill_manual(values = c(IMSCOL["red", "full"], IMSCOL["blue", "full"])) +
  theme_minimal() +
  labs(
    title = "Is there a balance of power",
    x = "",
    y = "Number of characters",
    fill = ""
  )
```

contTable

Generate Contingency Tables for LaTeX

Description

Input a data frame or a table, and the LaTeX output will be returned. Options exist for row and column proportions as well as for showing work.

Usage

```
contTable(
  x,
  prop = c("none", "row", "col"),
  show = FALSE,
  digits = 3,
  caption = NULL,
  label = NULL
)
```

Arguments

<code>x</code>	A data frame (with two columns) or a table.
<code>prop</code>	Indicate whether row ("r", "R", "row") or column ("c", "C", "col") proportions should be used. The default is to simply print the contingency table.
<code>show</code>	If row or column proportions are specified, indicate whether work should be shown.
<code>digits</code>	The number of digits after the decimal that should be shown for row or column proportions.
<code>caption</code>	A string that contains the table caption. The default value is NULL. If <code>x</code> is a data frame and <code>caption=NULL</code> , then <code>contTable</code> creates a sensible caption from the data frame's column names. If <code>x</code> is a table and <code>caption=NULL</code> , then the caption is an empty string.
<code>label</code>	The latex table label. The default value is NULL. If <code>x</code> is a data frame and <code>label=NULL</code> , then <code>contTable</code> creates a sensible label from the data frame's column names. If <code>x</code> is a table and <code>label=NULL</code> , then the label is an empty string.

Details

The `contTable` function makes substantial use of the [cat](#) function.

Author(s)

David Diez

See Also

[email](#), [cars93](#), [possum](#), [mariokart](#)

Examples

```
data(email)
table(email[, c("spam", "sent_email")])
contTable(email[, c("spam", "sent_email")])
```

`corr_match`*Sample datasets for correlation problems*

Description

Simulated data.

Usage

```
corr_match
```

Format

A data frame with 121 observations on the following 9 variables.

x a numeric vector

y1 a numeric vector

y2 a numeric vector

y3 a numeric vector

y4 a numeric vector

y5 a numeric vector

y6 a numeric vector

y7 a numeric vector

y8 a numeric vector

Source

Simulated dataset.

Examples

```
library(ggplot2)

ggplot(corr_match, aes(x = x, y = y1)) +
  geom_point()

cor(corr_match$x, corr_match$y1)
```

country_iso	<i>Country ISO information</i>
-------------	--------------------------------

Description

Country International Organization for Standardization (ISO) information.

Usage

```
country_iso
```

Format

A data frame with 249 observations on the following 4 variables.

country_code Two-letter ISO country code.

country_name Country name.

year Year the two-letter ISO country code was assigned.

top_level_domain op-level domain name.

Source

Wikipedia, retrieved 2018-11-18. https://en.wikipedia.org/wiki/ISO_3166-1_alpha-2

Examples

```
country_iso
```

cpr	<i>CPR dataset</i>
-----	--------------------

Description

These patients were randomly divided into a treatment group where they received a blood thinner or the control group where they did not receive a blood thinner. The outcome variable of interest was whether the patients survived for at least 24 hours.

Usage

```
cpr
```

Format

A data frame with 90 observations on the following 2 variables.

group a factor with levels control and treatment

outcome a factor with levels died and survived

Source

Efficacy and safety of thrombolytic therapy after initially unsuccessful cardiopulmonary resuscitation: a prospective clinical trial, by Bottiger et al., The Lancet, 2001.

Examples

```
table(cpr)
```

cpu	<i>CPU's Released between 2010 and 2020.</i>
-----	--

Description

Data on computer processors released between 2010 and 2020.

Usage

```
cpu
```

Format

A data frame with 875 rows and 12 variables.

company Manufacturer of the CPU.

name Model name of the processor.

codename Name given by manufacturer to all chips with this architecture.

cores Number of compute cores per processor.

threads The number of *threads* represents the number of simultaneous calculations that can be ongoing in the processor.

base_clock Base speed for the CPU in GHz.

boost_clock Single-core max speed for the CPU in GHz.

socket Specifies the type of connection to the motherboard.

process Size of the process node used in production in nm.

l3_cache Size of the level 3 cache on the processor in MB.

tdp Total draw power of the processor.

released Date which the processor was released to the public.

Source

[TechPowerUp CPU Database.](#)

Examples

```
library(ggplot2)

# CPU base speed
ggplot(cpu, aes(x = company, y = base_clock)) +
  geom_boxplot() +
  labs(
    x = "Company",
    y = "Base Clock (GHz)",
    title = "CPU base speed"
  )

# Process node size vs. boost speed
ggplot(cpu, aes(x = process, y = boost_clock)) +
  geom_point() +
  labs(
    x = "Process node size (nm)",
    y = "Boost Clock (GHz)",
    title = "Process node size vs. boost speed"
  )
```

credits

College credits.

Description

A simulated dataset of number of credits taken by college students each semester.

Usage

```
credits
```

Format

A data frame with 100 observations on the following variable.

credits Number of credits.

Source

Simulated data.

Examples

```
library(ggplot2)

ggplot(credits, aes(x = credits)) +
  geom_histogram(binwidth = 1)
```

CT2DF

*Contingency Table to Data Frame***Description**

Take a 2D contingency table and create a data frame representing the individual cases.

Usage

```
CT2DF(x, rn = row.names(x), cn = colnames(x), dfn = c("row.var", "col.var"))
```

Arguments

x	Contingency table as a matrix.
rn	Character vector of the row names.
cn	Character vector of the column names.
dfn	Character vector with 2 values for the variable representing the rows and columns.

Value

A data frame with two columns.

Author(s)

David Diez

See Also

[MosaicPlot](#)

Examples

```
a <- matrix(
  c(459, 727, 854, 385, 99, 4198, 6245, 4821, 1634, 578),
  2,
  byrow = TRUE
)
b <-
  CT2DF(
    a,
    c("No", "Yes"),
    c("Excellent", "Very good", "Good", "Fair", "Poor"),
    c("coverage", "health_status")
  )
table(b)
```

danish.ed.primary	<i>danish.ed.primary</i>
-------------------	--------------------------

Description

Data from a Danish study on triage in an emergency department (ED)

Usage

danish.ed.primary

Format

A tibble with 6249 rows and 21 variables:

mort30 numeric, 1 if patient died within 30 days of admission, 0 otherwise

triage factor, triage score given at arrival to ED. Values green, yellow, orange, red, from lowest to highest priority for treatment. The value blue normally denotes severity not warranting admission to the ED, but no participants coded blue are in these data.

age numeric, age in years, rounded to lower integer

sex factor, values female, male

albumin numeric, serum albumin, in g/L

creatinine numeric, serum creatinine, in umol/L

hemaglobin numeric, serum hemaglobin, in mmol/L

potassium numeric, serum potassium, in mmol/L

leuk.count blood leukocyte count, in 10E9/L

sodium numeric, serum sodium, in mmol/L

c.react.protein numeric, serum C-reactive protein

oxygen.sat numeric, peripheral arterial oxygen saturation, as a percent

resp.rate numeric, respiratory rate per minute

heart.rate numeric, heart rate, beats/min

systolic.bp numeric, systolic blood pressure, in mmHg

glasgow.coma.scale numeric, extent of impaired consciousness in patients with acute medical condition or trauma, scored between 3 and 15, 3 being the worst and 15 the best. Score is based on 3 subscales, best eye, verbal and motor responses.

readmit.hosp factor, readmitted to hospital within 30 days, values yes, no

days.in.hosp numeric, number of days admitted to hospital

icu.time numeric, number of days in the intensive care unit. value 99999 indicates patient not admitted to ICU

icu.status factor, patient admitted to ICU, values yes, no

Details

Data from a prospective cohort study of triage scoring for an emergency department (ED). The study examined whether the use of patient level measurements would improve an existing triage score. These data are the training data (called primary data in the original manuscript) used for model building. Some variable names have been changed for readability, but the data on 21 variables for the 6,249 participants are otherwise unchanged.

Source

doi:10.5061/dryad.m2bq5

References

Kristensen, Michael, et al. "Routine blood tests are associated with short term mortality and can improve emergency department triage: a cohort study of > 12,000 patients." *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine* 25 (2017): 1-8. <https://link.springer.com/article/10.1186/s13049-017-0458-x?report=reader>

danish.ed.validation *Data from a Danish study on triage in an emergency department (ED)*

Description

Data from a prospective cohort study of triage scoring for an emergency department (ED). The study examined whether the use of patient level measurements would improve an existing triage score. These data were used as a test set (called validation in the manuscript) to examine the performance of the model built using the training (primary) cohort. Some variable names have been changed for readability and for consistency with the primary dataset, but the data on 18 variables for the 6,383 participants are otherwise unchanged. Some variables in the primary dataset do not appear in these data.

Usage

danish.ed.validation

Format

A tibble with 6383 rows and 18 variables:

mort30 numeric, 1 if patient died within 30 days of admission, 0 otherwise

triage factor, triage score given at arrival to ED. Values blue, green, yellow, orange, red, from lowest to highest priority for treatment. The value blue normally denotes severity not warranting admission to the ED. Participants coded blue are in these data but not in the primary data.

age numeric, age in years, rounded to lower integer

sex factor, female, male

albumin numeric, serum albumin, in g/L
 creatinine numeric, serum creatinine, in umol/L
 hemaglobin numeric, serum hemaglobin, in mmol/L
 potassium numeric, serum potassium, in mmol/L
 leuk.count blood leukocyte count, in 10E9/L
 sodium numeric, serum sodium, in mmol/L
 c.react.protein numeric, serum C-reactive protein
 oxygen.sat numeric, peripheral arterial oxygen saturation, %
 resp.rate numeric, respiratory rate per minute
 heart.rate numeric, heart rate, beats/min
 systolic.bp numeric, systolic blood pressure, in mmHg
 readmit.hosp factor, readmitted to hospital within 30 days, with values yes, no
 days.in.hosp numeric, number of days admitted to hospital
 icu.status factor, patient admitted to ICU, with values yes, no

Source

[doi:10.5061/dryad.m2bq5](https://doi.org/10.5061/dryad.m2bq5)

References

Kristensen, Michael, et al. "Routine blood tests are associated with short term mortality and can improve emergency department triage: a cohort study of > 12,000 patients." *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine* 25 (2017): 1-8. <https://link.springer.com/article/10.1186/s13049-017-0458-x?report=reader>

daycare_fines

Daycare fines

Description

Researchers tested the deterrence hypothesis which predicts that the introduction of a penalty will reduce the occurrence of the behavior subject to the fine, with the condition that the fine leaves everything else unchanged by instituting a fine for late pickup at daycare centers. For this study, they worked with 10 volunteer daycare centers that did not originally impose a fine to parents for picking up their kids late. They randomly selected 6 of these daycare centers and instituted a monetary fine (of a considerable amount) for picking up children late and then removed it. In the remaining 4 daycare centers no fine was introduced. The study period was divided into four: before the fine (weeks 1–4), the first 4 weeks with the fine (weeks 5–8), the entire period with the fine (weeks 5–16), and the after fine period (weeks 17–20). Throughout the study, the number of kids who were picked up late was recorded each week for each daycare. The study found that the number of late-coming parents increased significantly when the fine was introduced, and no reduction occurred after the fine was removed.

Usage

daycare_fines

Format

A data frame with 200 observations on the following 7 variables.

center Daycare center id.

group Study group: test (fine instituted) or control (no fine).

children Number of children at daycare center.

week Week of study.

late_pickups Number of late pickups for a given week and daycare center.

study_period_4 Period of study, divided into 4 periods: before fine, first 4 weeks with fine, last 8 weeks with fine, after fine

study_period_3 Period of study, divided into 4 periods: before fine, with fine, after fine

Source

Gneezy, Uri, and Aldo Rustichini. "A fine is a price." *The Journal of Legal Studies* 29, no. 1 (2000): 1-17.

Examples

```
library(dplyr)
library(tidyr)
library(ggplot2)

# The following tables roughly match results presented in Table 2 of the source article
# The results are only off by rounding for some of the weeks
daycare_fines |>
  group_by(center, study_period_4) |>
  summarise(avg_late_pickups = mean(late_pickups), .groups = "drop") |>
  pivot_wider(names_from = study_period_4, values_from = avg_late_pickups)

daycare_fines |>
  group_by(center, study_period_3) |>
  summarise(avg_late_pickups = mean(late_pickups), .groups = "drop") |>
  pivot_wider(names_from = study_period_3, values_from = avg_late_pickups)

# The following plot matches Figure 1 of the source article
daycare_fines |>
  group_by(week, group) |>
  summarise(avg_late_pickups = mean(late_pickups), .groups = "drop") |>
  ggplot(aes(x = week, y = avg_late_pickups, group = group, color = group)) +
  geom_point() +
  geom_line()
```

dds.discr	<i>A dataset on disbursements from the California Department of Developmental Services (DDS)</i>
-----------	--

Description

The dataset represents a sample of 1,000 DDS consumers (out of a total population of approximately 250,000), and includes information about age, gender, ethnicity, and the amount of financial support per consumer provided by the DDS. The dataset is based on recorded attributes of consumers, but has been altered to maintain consumer privacy. From the Taylor and Mickel paper: "The data set originated from DDS's Client Master File. In order to remain in compliance with California State Legislation, the data have been altered to protect the rights and privacy of specific individual consumers. The provided data set is based on actual attributes of consumers."

Usage

```
dds.discr
```

Format

A dataframe with 1000 rows and 6 variables:

id Numeric, Unique identification code for each resident

age.cohort A factor, 0–5 years, 6–12 years, 13–17 years, 18–21 years, 22–50 years, and 51+ years

age Numeric, Age measured in years

gender A factor, with levels Female or Male

expenditures Numeric, Amount of expenditures spent by the State on an individual annually, measured in USD

ethnicity Factor, Ethnic group, recorded as American Indian, Asian, Black, Hispanic, Multi Race, Native Hawaiian, Other, White not Hispanic

@references Taylor, Stanley A., and Amy E. Mickel. Simpson's paradox: A data set and discrimination case study exercise. Journal of Statistics Education 22.1 (2014). Data contained in supplement B of Taylor and Mickel.

densityPlot	<i>Density plot</i>
-------------	---------------------

Description

Compute kernel density plots, written in the same structure as `boxPlot`. Histograms can be automatically added for teaching purposes.

Usage

```

densityPlot(
  x,
  fact = NULL,
  bw = "nrd0",
  histo = c("none", "faded", "hollow"),
  breaks = "Sturges",
  fading = "0E",
  fadingBorder = "25",
  lty = NULL,
  lwd = 1,
  col = c("black", "red", "blue"),
  key = NULL,
  add = FALSE,
  adjust = 1,
  kernel = c("gaussian", "epanechnikov", "rectangular", "triangular", "biweight",
    "cosine", "optcosine"),
  weights = NULL,
  n = 512,
  from,
  to,
  na.rm = FALSE,
  xlim = NULL,
  ylim = NULL,
  main = "",
  ...
)

```

Arguments

<code>x</code>	A numerical vector.
<code>fact</code>	A character or factor vector defining the grouping for data in <code>x</code> .
<code>bw</code>	Bandwidth. See <code>density</code> .
<code>histo</code>	Whether to plot a faded histogram ('faded') or hollow histogram ('hollow') in the background. By default, no histogram will be plotted.
<code>breaks</code>	The breaks argument for <code>histPlot</code> if <code>histo</code> is 'faded' or 'hollow'.
<code>fading</code>	Character value of hexadecimal, e.g. '22' or '5D', describing the amount of fading inside the rectangles of the histogram if <code>histo</code> ='faded'.
<code>fadingBorder</code>	Character value of hexadecimal, e.g. '22' or '5D', describing the amount of fading of the rectangle borders of the histogram if <code>histo</code> is 'faded' or 'hollow'.
<code>lty</code>	Numerical vector describing the line type for the density curve(s). Each element corresponds to a different level of the argument <code>fact</code> .
<code>lwd</code>	Numerical vector describing the line width for the density curve(s). Each element corresponds to a different level of the argument <code>fact</code> .

<code>col</code>	Numerical vector describing the line color for the density curve(s). Each element corresponds to a different level of the argument <code>fact</code> .
<code>key</code>	An argument to specify ordering of the factor levels.
<code>add</code>	If TRUE, the density curve is added to the plot.
<code>adjust</code>	Argument passed to <code>density</code> to adjust the bandwidth.
<code>kernel</code>	Argument passed to <code>density</code> to select the kernel used.
<code>weights</code>	Argument passed to <code>density</code> to weight observations.
<code>n</code>	Argument passed to <code>density</code> to specify the detail in the density estimate.
<code>from</code>	Argument passed to <code>density</code> specifying the lowest value to include in the density estimate.
<code>to</code>	Argument passed to <code>density</code> specifying the largest value to include in the density estimate.
<code>na.rm</code>	Argument passed to <code>density</code> specifying handling of NA values.
<code>xlim</code>	x-axis limits.
<code>ylim</code>	y-axis limits.
<code>main</code>	Title for the plot.
<code>...</code>	If <code>add=FALSE</code> , then additional arguments to <code>plot</code> .

Author(s)

David Diez

See Also[histPlot](#), [dotPlot](#), [boxPlot](#)**Examples**

```
# hollow histograms
histPlot(tips$tip[tips$day == "Tuesday"],
  hollow = TRUE, xlim = c(0, 30),
  lty = 1, main = "Tips by day"
)
histPlot(tips$tip[tips$day == "Friday"],
  hollow = TRUE, border = "red",
  add = TRUE, main = "Tips by day"
)
legend("topright",
  col = c("black", "red"),
  lty = 1:2, legend = c("Tuesday", "Friday")
)

# density plots
densityPlot(tips$tip, tips$day,
  col = c("black", "red"), main = "Tips by day"
)
legend("topright",
```

```

col = c("black", "red"),
lty = 1:2, legend = c("Tuesday", "Friday")
)

densityPlot(tips$tip,
  histo = "faded",
  breaks = 15, main = "Tips by day"
)

densityPlot(tips$tip,
  histo = "hollow",
  breaks = 30, fadingBorder = "66",
  lty = 1, main = "Tips by day"
)

```

diabetes2

Type 2 Diabetes Clinical Trial for Patients 10-17 Years Old

Description

Three treatments were compared to test their relative efficacy (effectiveness) in treating Type 2 Diabetes in patients aged 10-17 who were being treated with metformin. The primary outcome was lack of glycemic control (or not); lacking glycemic control means the patient still needed insulin, which is not the preferred outcome for a patient.

Usage

```
diabetes2
```

Format

A data frame with 699 observations on the following 2 variables.

treatment The treatment the patient received.

outcome Whether there patient still needs insulin (failure) or met a basic positive outcome bar (success).

Details

Each of the 699 patients in the experiment were randomized to one of the following treatments: (1) continued treatment with metformin (coded as met), (2) formin combined with rosiglitazone (coded as rosi), or or (3) a lifestyle-intervention program (coded as lifestyle).

Source

Zeitler P, et al. 2012. A Clinical Trial to Maintain Glycemic Control in Youth with Type 2 Diabetes. N Engl J Med.

Examples

```
lapply(diabetes2, table)
(cont.table <- table(diabetes2))
(m <- chisq.test(cont.table))
m$expected
```

dlsegments

*Create a Double Line Segment Plot***Description**

Creae a plot showing two line segments. The union or intersection of those line segments can also be generated by utilizing the `type` argument.

Usage

```
dlsegments(
  x1 = c(3, 7),
  x2 = c(5, 9),
  l = c("o", "o"),
  r = c("c", "c"),
  type = c("n", "u", "i"),
  COL = 2,
  lwd = 2.224,
  ylim = c(-0.35, 2),
  mar = rep(0, 4),
  hideOrig = FALSE
)
```

Arguments

<code>x1</code>	The endpoints of the first interval. Values larger (smaller) than 999 (-999) will be interpreted as (negative) infinity.
<code>x2</code>	The endpoints of the second interval. Values larger (smaller) than 999 (-999) will be interpreted as (negative) infinity.
<code>l</code>	A vector of length 2, where the values correspond to the left end point of each interval. A value of "o" indicates the interval is open at the left and "c" indicates the interval is closed at this end.
<code>r</code>	A vector of length 2, where the values correspond to the right end point of each interval. A value of "o" indicates the interval is open at the right and "c" indicates the interval is closed at this end.
<code>type</code>	By default, no intersection or union of the two lines will be shown (value of "n"). To show the union of the line segments, specify "u". To indicate that the intersection be shown, specify "i".
<code>COL</code>	If the union or intersection is to be shown (see the <code>type</code> argument), then this parameter controls the color that will be shown.

lwd	If the union or intersection is to be shown (see the <code>type</code> argument), then this parameter controls the width of any corresponding lines or open points in the union or intersection.
ylim	A vector of length 2 specifying the vertical plotting limits, which may be useful for fine-tuning plots. The default is <code>c(-0.35, 2)</code> .
mar	A vector of length 4 that represent the plotting margins.
hideOrig	An optional argument that to specify that the two line segments should be shown (<code>hideOrig</code> takes value <code>FALSE</code> , the default) or that they should be hidden (<code>hideOrig</code> takes value <code>TRUE</code>).

Author(s)

David Diez

See Also[lsegments](#), [CCP](#), [ArrowLines](#)**Examples**

```
dlsegments(c(-3, 3), c(1, 1000),
  r = c("o", "o"), l = c("c", "o"), COL = COL[4]
)

dlsegments(c(-3, 3), c(1, 1000),
  r = c("o", "o"), l = c("c", "o"), type = "un", COL = COL[4]
)

dlsegments(c(-3, 3), c(1, 1000),
  r = c("o", "o"), l = c("c", "o"), type = "in", COL = COL[4]
)
```

dotPlot

*Dot plot***Description**

Plot observations as dots.

Usage

```
dotPlot(
  x,
  fact = NULL,
  vertical = FALSE,
  at = 1,
  key = NULL,
  pch = 20,
```

```

    col = fadeColor("black", "66"),
    cex = 1.5,
    add = FALSE,
    axes = TRUE,
    xlim = NULL,
    ylim = NULL,
    ...
)

```

Arguments

<code>x</code>	A numerical vector.
<code>fact</code>	A character or factor vector defining the grouping for data in <code>x</code> .
<code>vertical</code>	If TRUE, the plot will be oriented vertically.
<code>at</code>	The vertical coordinate of the points, or the horizontal coordinate if <code>vertical=TRUE</code> . If <code>fact</code> is provided, then locations can be specified for each group.
<code>key</code>	The factor levels corresponding to <code>at</code> , <code>pch</code> , <code>col</code> , and <code>cex</code> .
<code>pch</code>	Plotting character. If <code>fact</code> is given, then different plotting characters can be specified for each factor level. If <code>key</code> is specified, the elements of <code>pch</code> will correspond to the elements of <code>key</code> .
<code>col</code>	Plotting character color. If <code>fact</code> is given, then different colors can be specified for each factor level. If <code>key</code> is specified, the elements of <code>col</code> will correspond to the elements of <code>key</code> .
<code>cex</code>	Plotting character size. If <code>fact</code> is given, then different character sizes can be specified for each factor level. If <code>key</code> is specified, the elements of <code>cex</code> will correspond to the elements of <code>key</code> .
<code>add</code>	If TRUE, then the points are added to the plot.
<code>axes</code>	If FALSE, no axes are plotted.
<code>xlim</code>	Limits for the x axis.
<code>ylim</code>	Limits for the y axis.
<code>...</code>	Additional arguments to be passed to <code>plot</code> if <code>add=FALSE</code> or points if <code>add=TRUE</code> .

Author(s)

David Diez

See Also

[histPlot](#), [densityPlot](#), [boxPlot](#)

Examples

```

library(dplyr)

# Price by type
dotPlot(cars93$price,

```

```

    cars93$type,
    key = c("large", "midsize", "small"),
    cex = 1:3
  )

  # Hours worked by educational attainment or degree
  gss2010_nona <- gss2010 |>
    filter(!is.na(hrs1) & !is.na(degree))

  dotPlot(gss2010_nona$hrs1,
    gss2010_nona$degree,
    col = fadeColor("black", "11")
  )

  # levels reordered
  dotPlot(gss2010_nona$hrs1,
    gss2010_nona$degree,
    col = fadeColor("black", "11"),
    key = c("LT HIGH SCHOOL", "HIGH SCHOOL", "BACHELOR", "JUNIOR COLLEGE", "GRADUATE")
  )

  # with boxPlot() overlaid
  dotPlot(mariokart$total_pr,
    mariokart$cond,
    ylim = c(0.5, 2.5), xlim = c(25, 80), cex = 1
  )
  boxPlot(mariokart$total_pr,
    mariokart$cond,
    add = 1:2 + 0.1,
    key = c("new", "used"), horiz = TRUE, axes = FALSE
  )

```

dotPlotStack

Add a Stacked Dot Plot to an Existing Plot

Description

Add a stacked dot plot to an existing plot. The locations for the points in the dot plot are returned from the function in a list.

Usage

```
dotPlotStack(x, radius = 1, seed = 1, addDots = TRUE, ...)
```

Arguments

<code>x</code>	A vector of numerical observations for the dot plot.
<code>radius</code>	The approximate distance that should separate each point.
<code>seed</code>	A random seed (integer). Different values will produce different variations.

`addDots` Indicate whether the points should be added to the plot.
`...` Additional arguments are passed to [points](#).

Value

Returns a list with a height that can be used as the upper bound of `ylim` for a plot, then also the x- and y-coordinates of the points in the stacked dot plot.

Author(s)

David Diez

See Also

[dotPlot](#), [histPlot](#)

Examples

```
#
```

dream	<i>Survey on views of the DREAM Act</i>
-------	---

Description

A SurveyUSA poll.

Usage

```
dream
```

Format

A data frame with 910 observations on the following 2 variables.

ideology a factor with levels Conservative Liberal Moderate
stance a factor with levels No Not sure Yes

Source

SurveyUSA, News Poll #18927, data collected Jan 27-29, 2012.

Examples

```
table(dream)
```

drone_blades	<i>Quadcopter Drone Blades</i>
--------------	--------------------------------

Description

Quality control dataset for quadcopter drone blades, where this data has been made up for an example.

Usage

```
drone_blades
```

Format

A data frame with 2000 observations on the following 2 variables.

supplier The supplier for the blade.

inspection The inspection conclusion.

References

OpenIntro Statistics, Third Edition and Fourth Edition.

Examples

```
library(dplyr)

drone_blades |>
  count(supplier, inspection)
```

drug_use	<i>Drug use of students and parents</i>
----------	---

Description

Summary of 445 student-parent pairs.

Usage

```
drug_use
```

Format

A data frame with 445 observations on the following 2 variables.

student a factor with levels not uses

parents a factor with levels not used

Source

Ellis GJ and Stone LH. 1979. Marijuana Use in College: An Evaluation of a Modeling Explanation. Youth and Society 10:323-334.

Examples

```
table(drug_use)
```

duke_forest	<i>Sale prices of houses in Duke Forest, Durham, NC</i>
-------------	---

Description

Data on houses that were recently sold in the Duke Forest neighborhood of Durham, NC in November 2020.

Usage

```
duke_forest
```

Format

A data frame with 98 rows and 13 variables.

address Address of house.

price Sale price, in USD.

bed Number of bedrooms.

bath Number of bathrooms.

area Area of home, in square feet.

type Type of home (all are Single Family).

year_built Year the home was built.

heating Heating sytem.

cooling Cooling system (other or central).

parking Type of parking available and number of parking spaces.

lot Area of the entire property, in acres.

hoa If the home belongs to an Home Owners Association, the associted fee (NA otherwise).

url URL of the listing.

Source

Data were collected from Zillow in November 2020.

Examples

```
library(ggplot2)

# Number of bedrooms and price
ggplot(duke_forest, aes(x = as.factor(bed), y = price)) +
  geom_boxplot() +
  labs(
    x = "Number of bedrooms",
    y = "Sale price (USD)",
    title = "Homes for sale in Duke Forest, Durham, NC",
    subtitle = "Data are from November 2020"
  )

# Area and price
ggplot(duke_forest, aes(x = area, y = price)) +
  geom_point() +
  labs(
    x = "Area (square feet)",
    y = "Sale price (USD)",
    title = "Homes for sale in Duke Forest, Durham, NC",
    subtitle = "Data are from November 2020"
  )
```

earthquakes

Earthquakes

Description

Select set of notable earthquakes from 1900 to 1999.

Usage

```
earthquakes
```

Format

A data frame with 123 rows and 7 variables.

year Year the earthquake took place.

month Month the earthquake took place.

day Day the earthquake took place

richter Magnitude of earthquake using the Richter Scale.

area City or geographic location of earthquakes.

region Country or countries if the earthquake occurred on a border.

deaths Approximate number of deaths caused by earthquake

Source

World Almanac and Book of Facts: 2011.

Examples

```
library(ggplot2)

ggplot(earthquakes, aes(x = richter, y = deaths)) +
  geom_point()

ggplot(earthquakes, aes(x = log(deaths))) +
  geom_histogram()
```

ebola_survey

Survey on Ebola quarantine

Description

In New York City on October 23rd, 2014, a doctor who had recently been treating Ebola patients in Guinea went to the hospital with a slight fever and was subsequently diagnosed with Ebola. Soon thereafter, an NBC 4 New York/The Wall Street Journal/Marist Poll asked New Yorkers whether they favored a "mandatory 21-day quarantine for anyone who has come in contact with an Ebola patient". This poll included responses of 1,042 New York adults between October 26th and 28th, 2014.

Usage

```
ebola_survey
```

Format

A data frame with 1042 observations on the following variable.

quarantine Indicates whether the respondent is in favor or against the mandatory quarantine.

Source

Poll ID NY141026 on maristpoll.marist.edu.

Examples

```
table(ebola_survey)
```

edaPlot	<i>Exploratory data analysis plot</i>
---------	---------------------------------------

Description

Explore different plotting methods using a click interface.

Usage

```
edaPlot(
  dataframe,
  Col = c("#888888", "#FF0000", "#222222", "#FFFFFF", "#CCCCC", "#3377AA")
)
```

Arguments

dataFrame	A data frame.
Col	A vector containing six colors. The colors may be given in any form.

Author(s)

David Diez

See Also

[histPlot](#), [densityPlot](#), [boxPlot](#), [dotPlot](#)

Examples

```
data(mlbbat10)
bat <- mlbbat10[mlbbat10$at_bat > 200, ]
# edaPlot(bat)

data(mariokart)
mk <- mariokart[mariokart$total_pr < 100, ]
# edaPlot(mk)
```

elmhurst	<i>Elmhurst College gift aid</i>
----------	----------------------------------

Description

A random sample of 50 students gift aid for students at Elmhurst College.

Usage

```
elmhurst
```

Format

A data frame with 50 observations on the following 3 variables.

family_income Family income of the student.

gift_aid Gift aid, in \$1000s.

price_paid Price paid by the student (tuition - gift aid).

Source

These data were sampled from a table of data for all freshman from the 2011 class at Elmhurst College that accompanied an article titled What Students Really Pay to Go to College published online by The Chronicle of Higher Education: <https://www.chronicle.com/article/what-students-really-pay-to-go-to-college?sa=true>.

Examples

```
library(ggplot2)
library(broom)

ggplot(elmhurst, aes(x = family_income, y = gift_aid)) +
  geom_point() +
  geom_smooth(method = "lm")

mod <- lm(gift_aid ~ family_income, data = elmhurst)
tidy(mod)
```

email

Data frame representing information about a collection of emails

Description

These data represent incoming emails for the first three months of 2012 for an email account (see Source).

Usage

```
email
```

Format

A email (email_sent) data frame has 3921 (1252) observations on the following 21 variables.

spam Indicator for whether the email was spam.

to_multiple Indicator for whether the email was addressed to more than one recipient.

from Whether the message was listed as from anyone (this is usually set by default for regular outgoing email).

cc Number of people cc'ed.

sent_email Indicator for whether the sender had been sent an email in the last 30 days.

time Time at which email was sent.

image The number of images attached.

attach The number of attached files.

dollar The number of times a dollar sign or the word “dollar” appeared in the email.

winner Indicates whether “winner” appeared in the email.

inherit The number of times “inherit” (or an extension, such as “inheritance”) appeared in the email.

viagra The number of times “viagra” appeared in the email.

password The number of times “password” appeared in the email.

num_char The number of characters in the email, in thousands.

line_breaks The number of line breaks in the email (does not count text wrapping).

format Indicates whether the email was written using HTML (e.g. may have included bolding or active links).

re_subj Whether the subject started with “Re:”, “RE:”, “re:”, or “rE:”

exclaim_subj Whether there was an exclamation point in the subject.

urgent_subj Whether the word “urgent” was in the email subject.

exclaim_mess The number of exclamation points in the email message.

number Factor variable saying whether there was no number, a small number (under 1 million), or a big number.

Source

David Diez’s Gmail Account, early months of 2012. All personally identifiable information has been removed.

See Also

[email50](#)

Examples

```
e <- email

# ----- Variables For Logistic Regression -----#
# Variables are modified to match
# OpenIntro Statistics, Second Edition
# As Is (7): spam, to_multiple, winner, format,
#           re_subj, exclaim_subj
# Omitted (6): from, sent_email, time, image,
#           viagra, urgent_subj, number
# Become Indicators (5): cc, attach, dollar,
#           inherit, password
e$cc <- ifelse(email$cc > 0, 1, 0)
e$attach <- ifelse(email$attach > 0, 1, 0)
```



```

e$dollar <- ifelse(email$dollar > 0, 1, 0)
e$inherit <- ifelse(email$inherit > 0, 1, 0)
e$password <- ifelse(email$password > 0, 1, 0)
# Transform (3): num_char, line_breaks, exclaim_mess
# e$num_char      <- cut(email$num_char, c(0,1,5,10,20,100))
# e$line_breaks   <- cut(email$line_breaks, c(0,10,100,500,1000))
# e$exclaim_mess  <- cut(email$exclaim_mess, c(-1,0,1,5,1000))
g <- glm(
  spam ~ to_multiple + winner + format +
    re_subj + exclaim_subj +
    cc + attach + dollar +
    inherit + password, # +
  num_char + line_breaks + exclaim_mess,
  data = e, family = binomial
)
summary(g)

# ----- Variable Selection Via AIC -----#
g. <- step(g)
plot(predict(g., type = "response"), e$spam)

# ----- Splitting num_char by html -----#
x <- log(email$num_char)
bw <- 0.004
R <- range(x) + c(-1, 1)
wt <- sum(email$format == 1) / nrow(email)
htmlAll <- density(x, bw = 0.4, from = R[1], to = R[2])
htmlNo <- density(x[email$format != 1],
  bw = 0.4,
  from = R[1], to = R[2]
)
htmlYes <- density(x[email$format == 1],
  bw = 0.4,
  from = R[1], to = R[2]
)
htmlNo$y <- htmlNo$y #* (1-wt)
htmlYes$y <- htmlYes$y #* wt + htmlNo$y
plot(htmlAll, xlim = c(-4, 6), ylim = c(0, 0.4))
lines(htmlNo, col = 4)
lines(htmlYes, lwd = 2, col = 2)

```

email50

Sample of 50 emails

Description

This is a subsample of the [email](#) dataset.

Usage

email50

Format

A data frame with 50 observations on the following 21 variables.

spam Indicator for whether the email was spam.

to_multiple Indicator for whether the email was addressed to more than one recipient.

from Whether the message was listed as from anyone (this is usually set by default for regular outgoing email).

cc Number of people cc'ed.

sent_email Indicator for whether the sender had been sent an email in the last 30 days.

time Time at which email was sent.

image The number of images attached.

attach The number of attached files.

dollar The number of times a dollar sign or the word “dollar” appeared in the email.

winner Indicates whether “winner” appeared in the email.

inherit The number of times “inherit” (or an extension, such as “inheritance”) appeared in the email.

viagra The number of times “viagra” appeared in the email.

password The number of times “password” appeared in the email.

num_char The number of characters in the email, in thousands.

line_breaks The number of line breaks in the email (does not count text wrapping).

format Indicates whether the email was written using HTML (e.g. may have included bolding or active links).

re_subj Whether the subject started with “Re:”, “RE:”, “re:”, or “rE:”

exclaim_subj Whether there was an exclamation point in the subject.

urgent_subj Whether the word “urgent” was in the email subject.

exclaim_mess The number of exclamation points in the email message.

number Factor variable saying whether there was no number, a small number (under 1 million), or a big number.

Source

David Diez’s Gmail Account, early months of 2012. All personally identifiable information has been removed.

See Also

[email](#)

Examples

```
index <- c(
  101, 105, 116, 162, 194, 211, 263, 308, 361, 374,
  375, 465, 509, 513, 571, 691, 785, 842, 966, 968,
  1051, 1201, 1251, 1433, 1519, 1727, 1760, 1777, 1899, 1920,
  1943, 2013, 2052, 2252, 2515, 2629, 2634, 2710, 2823, 2835,
  2944, 3098, 3227, 3360, 3452, 3496, 3530, 3665, 3786, 3877
)
order <- c(
  3, 33, 12, 1, 21, 15, 43, 49, 8, 6,
  34, 25, 24, 35, 41, 9, 22, 50, 4, 48,
  7, 14, 46, 10, 38, 32, 26, 18, 23, 45,
  30, 16, 17, 20, 40, 47, 31, 37, 27, 11,
  5, 44, 29, 19, 13, 36, 39, 42, 28, 2
)
d <- email[index, ][order, ]
identical(d, email50)
```

env_regulation

American Adults on Regulation and Renewable Energy

Description

Pew Research conducted a poll to find whether American adults support regulation or believe the private market will move the American economy towards renewable energy.

Usage

```
env_regulation
```

Format

A data frame with 705 observations on the following variable.

statement There were three possible outcomes for each person: "Regulations necessary", "Private marketplace will ensure", and "Don't know".

Details

The exact statements being selected were: (1) Government regulations are necessary to encourage businesses and consumers to rely more on renewable energy sources. (2) The private marketplace will ensure that businesses and consumers rely more on renewable energy sources, even without government regulations.

The actual sample size was 1012. However, the original data were not from a simple random sample; after accounting for the design, the equivalent sample size was about 705, which was what was used for the dataset here to keep things simpler for intro stat analyses.

Source

<https://www.pewresearch.org/science/2017/05/16/public-divides-over-environmental-regulation-and-environmental-protection/>

Examples

```
table(env_regulation)
```

epa2012	<i>Vehicle info from the EPA for 2012</i>
---------	---

Description

Details from the EPA.

Usage

```
epa2012
```

Format

A data frame with 1129 observations on the following 28 variables.

model_yr a numeric vector

mfr_name Manufacturer name.

division Vehicle division.

carline Vehicle line.

mfr_code Manufacturer code.

model_type_index Model type index.

engine_displacement Engine displacement.

no_cylinders Number of cylinders.

transmission_speed Transmission speed.

city_mpg City mileage.

hwy_mpg Highway mileage.

comb_mpg Combined mileage.

guzzler Whether the car is considered a "guzzler" or not, a factor with levels N and Y.

air_aspir_method Air aspiration method.

air_aspir_method_desc Air aspiration method description.

transmission Transmission type.

transmission_desc Transmission type description.

no_gears Number of gears.

trans_lockup Whether transmission locks up, a factor with levels N and Y.

trans_creeper_gear A factor with level N only.
drive_sys Drive system, a factor with levels.
drive_desc Drive system description.
fuel_usage Fuel usage, a factor with levels.
fuel_usage_desc Fuel usage description.
class Class of car.
car_truck Car or truck, a factor with levels car, 1, 2.
release_date Date of vehicle release.
fuel_cell Whether the car has a fuel cell or not, a factor with levels N, Y.

Source

Fueleconomy.gov, Shared MPG Estimates: Toyota Prius 2012.

See Also

epa2021

Examples

```
library(ggplot2)
library(dplyr)

# Variable descriptions
distinct(epa2012, air_aspir_method_desc, air_aspir_method)
distinct(epa2012, transmission_desc, transmission)
distinct(epa2012, drive_desc, drive_sys)
distinct(epa2012, fuel_usage_desc, fuel_usage)

# Guzzlers and their mileages
ggplot(epa2012, aes(x = city_mpg, y = hwy_mpg, color = guzzler)) +
  geom_point() +
  facet_wrap(~guzzler, ncol = 1)
```

epa2021

Vehicle info from the EPA for 2021

Description

Details from the EPA.

Usage

epa2021

Format

A data frame with 1108 observations on the following 28 variables.

model_yr a numeric vector
mfr_name Manufacturer name.
division Vehicle division.
carline Vehicle line.
mfr_code Manufacturer code.
model_type_index Model type index.
engine_displacement Engine displacement.
no_cylinders Number of cylinders.
transmission_speed Transmission speed.
city_mpg City mileage.
hwy_mpg Highway mileage.
comb_mpg Combined mileage.
guzzler Whether the car is considered a "guzzler" or not, a factor with levels N and Y.
air_aspir_method Air aspiration method.
air_aspir_method_desc Air aspiration method description.
transmission Transmission type.
transmission_desc Transmission type description.
no_gears Number of gears.
trans_lockup Whether transmission locks up, a factor with levels N and Y.
trans_creeper_gear A factor with level N only.
drive_sys Drive system, a factor with levels.
drive_desc Drive system description.
fuel_usage Fuel usage, a factor with levels.
fuel_usage_desc Fuel usage description.
class Class of car.
car_truck Car or truck, a factor with levels car, 1, ??, 1.
release_date Date of vehicle release.
fuel_cell Whether the car has a fuel cell or not, a factor with levels N, NA.

Source

Fuel Economy Data from [fueleconomy.gov](https://www.fueleconomy.gov). Retrieved 6 May, 2021.

See Also

epa2012

Examples

```
library(ggplot2)
library(dplyr)

# Variable descriptions
distinct(epa2021, air_aspir_method_desc, air_aspir_method)
distinct(epa2021, transmission_desc, transmission)
distinct(epa2021, drive_desc, drive_sys)
distinct(epa2021, fuel_usage_desc, fuel_usage)

# Guzzlers and their mileages
ggplot(epa2021, aes(x = city_mpg, y = hwy_mpg, color = guzzler)) +
  geom_point() +
  facet_wrap(~guzzler, ncol = 1)

# Compare to 2012
epa2021 |>
  bind_rows(epa2012) |>
  group_by(model_yr) |>
  summarise(
    mean_city = mean(city_mpg),
    mean_hwy = mean(hwy_mpg)
  )
```

esi

Environmental Sustainability Index 2005

Description

This dataset comes from the 2005 Environmental Sustainability Index: Benchmarking National Environmental Stewardship. Countries are given an overall sustainability score as well as scores in each of several different environmental areas.

Usage

esi

Format

A data frame with 146 observations on the following 29 variables.

code ISO3 country code.

country Country.

esi Environmental Sustainability Index.

system ESI core component: systems

stress ESI core component: stresses

vulner ESI core component: vulnerability

cap ESI core component: capacity
global ESI core component: global stewardship
sys_air Air quality.
sys_bio Biodiversity.
sys_lan Land.
sys_wql Water quality.
sys_wqn Water quantity.
str_air Reducing air pollution.
str_eco Reducing ecosystem stress.
str_pop Reducing population pressure.
str_was Reducing waste and consumption pressures.
str_wat Reducing water stress.
str_nrm Natural resource management.
vul_heal Environmental health.
vul_sus Basic human sustenance.
vul_dis Exposure to natural disasters.
cap_gov Environmental governance.
cap_eff Eco-efficiency.
cap_pri Private sector responsiveness.
cap_st Science and technology.
glo_col Participation in international collaboration efforts.
glo_ghg Greenhouse gas emissions.
glo_tbp Reducing transboundary environmental pressures.

Details

ESI and Component scores are presented as standard normal percentiles. Indicator scores are in the form of z-scores. See Appendix A of the report for information on the methodology and Appendix C for more detail on original data sources.

For more information on how each of the indices were calculated, see the documentation linked below.

Source

ESI Component Indicators. *2005 Environmental Sustainability Index: Benchmarking National Environmental Stewardship*, Yale Center for Environmental Law and Policy, Yale University & Center for International Earth Science Information Network (CIESIN), Columbia University

In collaboration with: World Economic Forum, Geneva, Switzerland Joint Research Centre of the European Commission, Ispra, Italy.

Available at https://www.earth.columbia.edu/news/2005/images/ESI2005_policysummary.pdf.

References

Esty, Daniel C., Marc Levy, Tanja Srebotnjak, and Alexander de Sherbinin (2005). *2005 Environmental Sustainability Index: Benchmarking National Environmental Stewardship*. New Haven: Yale Center for Environmental Law and Policy

Examples

```
library(ggplot2)

ggplot(esi, aes(x = cap_st, y = glo_col)) +
  geom_point(color = ifelse(esi$code == "USA", "red", "black")) +
  geom_text(
    aes(label = ifelse(code == "USA", as.character(code), "")),
    hjust = 1.2, color = "red"
  ) +
  labs(x = "Science and technology", y = "Participation in international collaboration efforts")

ggplot(esi, aes(x = vulner, y = cap)) +
  geom_point(color = ifelse(esi$code == "USA", "red", "black")) +
  geom_text(
    aes(label = ifelse(code == "USA", as.character(code), "")),
    hjust = 1.2, color = "red"
  ) +
  labs(x = "Vulnerability", y = "Capacity")
```

ethanol	<i>Ethanol Treatment for Tumors Experiment</i>
---------	--

Description

Experiment where 3 different treatments of ethanol were tested on the treatment of oral cancer tumors in hamsters.

Usage

```
ethanol
```

Format

A data frame with 24 observations, each representing one hamster, on the following 2 variables.

treatment Treatment the hamster received.

regress a factor with levels no yes

Details

The ethyl_cellulose and pure_ethanol treatments consisted of about a quarter of the volume of the tumors, while the pure_ethanol_16x treatment was 16x that, so about 4 times the size of the tumors.

Source

Morhard R, et al. 2017. Development of enhanced ethanol ablation as an alternative to surgery in treatment of superficial solid tumors. Scientific Reports 7:8750.

Examples

```
table(ethanol)
fisher.test(table(ethanol))
```

evals

Professor evaluations and beauty

Description

The data are gathered from end of semester student evaluations for 463 courses taught by a sample of 94 professors from the University of Texas at Austin. In addition, six students rate the professors' physical appearance. The result is a data frame where each row contains a different course and each column has information on the course and the professor who taught that course.

Usage

```
evals
```

Format

A data frame with 463 observations on the following 23 variables.

course_id Variable identifying the course (out of 463 courses).

prof_id Variable identifying the professor who taught the course (out of 94 professors).

score Average professor evaluation score: (1) very unsatisfactory - (5) excellent.

rank Rank of professor: teaching, tenure track, tenured.

ethnicity Ethnicity of professor: not minority, minority.

gender Gender of professor: female, male.

language Language of school where professor received education: English or non-English.

age Age of professor.

cls_perc_eval Percent of students in class who completed evaluation.

cls_did_eval Number of students in class who completed evaluation.

cls_students Total number of students in class.

cls_level Class level: lower, upper.

cls_profs Number of professors teaching sections in course in sample: single, multiple.

cls_credits Number of credits of class: one credit (lab, PE, etc.), multi credit.

bty_flower Beauty rating of professor from lower level female: (1) lowest - (10) highest.

bty_flupper Beauty rating of professor from upper level female: (1) lowest - (10) highest.

bty_f2upper Beauty rating of professor from second level female: (1) lowest - (10) highest.

bty_m1lower Beauty rating of professor from lower level male: (1) lowest - (10) highest.

bty_m1upper Beauty rating of professor from upper level male: (1) lowest - (10) highest.

bty_m2upper Beauty rating of professor from second upper level male: (1) lowest - (10) highest.

bty_avg Average beauty rating of professor.

pic_outfit Outfit of professor in picture: not formal, formal.

pic_color Color of professor's picture: color, black & white.

Source

Daniel S. Hamermesh, Amy Parker, Beauty in the classroom: instructors' pulchritude and putative pedagogical productivity, *Economics of Education Review*, Volume 24, Issue 4, 2005. doi:[10.1016/j.econedurev.2004.07.013](https://doi.org/10.1016/j.econedurev.2004.07.013).

Examples

```
evals
```

exams

Exam scores

Description

Exam scores from a class of 19 students.

Usage

```
exams
```

Format

A data frame with 19 observations on the following variable.

scores a numeric vector

Examples

```
hist(exams$scores)
```

`exam_grades`*Exam and course grades for statistics students*

Description

Grades on three exams and overall course grade for 233 students during several years for a statistics course at a university.

Usage

`exam_grades`

Format

A data frame with 233 observations, each representing a student.

semester Semester when grades were recorded.

sex Sex of the student as recorded on the university registration system: Man or Woman.

exam1 Exam 1 grade.

exam2 Exam 2 grade.

exam3 Exam 3 grade.

course_grade Overall course grade.

Examples

```
library(ggplot2)
library(dplyr)

# Course grade vs. each exam
ggplot(exam_grades, aes(x = exam1, y = course_grade)) +
  geom_point()

ggplot(exam_grades, aes(x = exam2, y = course_grade)) +
  geom_point()

ggplot(exam_grades, aes(x = exam2, y = course_grade)) +
  geom_point()

# Semester averages
exam_grades |>
  group_by(semester) |>
  summarise(across(exam1:course_grade, mean, na.rm = TRUE))
```

`exclusive_relationship`*Number of Exclusive Relationships*

Description

A survey conducted on a reasonably random sample of 203 undergraduates asked, among many other questions, about the number of exclusive relationships these students have been in.

Usage`exclusive_relationship`**Format**

A data frame with 218 observations on the following variable.

num Number of exclusive relationships.

Examples

```
summary(exclusive_relationship$num)
table(exclusive_relationship$num)
hist(exclusive_relationship$num)
```

`fact_opinion`*Can Americans categorize facts and opinions?*

Description

Pew Research Center conducted a survey in 2018, asking a sample of U.S. adults to categorize five factual and five opinion statements. This dataset provides data from this survey, with information on the age group of the participant as well as the number of factual and opinion statements they classified correctly (out of 5).

Usage`fact_opinion`**Format**

A data frame with 5,035 rows and 3 variables.

age_group Age group of survey participant.

fact_correct Number of factual statements classified correctly (out of 5).

opinion_correct Number of opinion statements classified correctly (out of 5).

Source

Younger Americans are better than older Americans at telling factual news statements from opinions, Pew Research Center, October 23, 2018.

Examples

```
library(ggplot2)
library(dplyr)
library(tidyr)
library(forcats)

# Distribution of fact_correct by age group
ggplot(fact_opinion, aes(x = age_group, y = fact_correct)) +
  geom_boxplot() +
  labs(
    x = "Age group",
    y = "Number correct (factual)",
    title = "Number of factual statements classified correctly by age group"
  )

# Distribution of opinion_correct by age group
ggplot(fact_opinion, aes(x = age_group, y = opinion_correct)) +
  geom_boxplot() +
  labs(
    x = "Age group",
    y = "Number correct (opinion)",
    title = "Number of opinion statements classified correctly by age group"
  )

# Replicating the figure from Pew report (see source for link)
fact_opinion |>
  mutate(
    facts = case_when(
      fact_correct <= 2 ~ "Two or fewer",
      fact_correct %in% c(3, 4) ~ "Three or four",
      fact_correct == 5 ~ "All five"
    ),
    facts = fct_relevel(facts, "Two or fewer", "Three or four", "All five"),
    opinions = case_when(
      opinion_correct <= 2 ~ "Two or fewer",
      opinion_correct %in% c(3, 4) ~ "Three or four",
      opinion_correct == 5 ~ "All five"
    ),
    opinions = fct_relevel(opinions, "Two or fewer", "Three or four", "All five")
  ) |>
  select(~fact_correct, ~opinion_correct) |>
  pivot_longer(cols = ~age_group, names_to = "question_type", values_to = "n_correct") |>
  ggplot(aes(y = fct_rev(age_group), fill = n_correct)) +
  geom_bar(position = "fill") +
  facet_wrap(~question_type, ncol = 1) +
  scale_fill_viridis_d(guide = guide_legend(reverse = TRUE)) +
  labs(
```

```

    x = "Proportion",
    y = "Age group",
    fill = "Number of\nincorrect\nclassifications"
  )

```

fadeColor

Fade colors

Description

Fade colors so they are transparent.

Usage

```
fadeColor(col, fade = "FF")
```

Arguments

col	An integer, color name, or RGB hexadecimal.
fade	The amount to fade col. This value should be a character in hexadecimal from '00' to 'FF'. The smaller the value, the greater the fading.

Author(s)

David Diez

Examples

```

data(mariokart)
new <- mariokart$cond == "new"
used <- mariokart$cond == "used"

# ===> color numbers <===#
dotPlot(mariokart$total_pr[new],
  ylim = c(0, 3), xlim = c(25, 80), pch = 20,
  col = 2, cex = 2, main = "using regular colors"
)
dotPlot(mariokart$total_pr[used], at = 2, add = TRUE, col = 4, pch = 20, cex = 2)
dotPlot(mariokart$total_pr[new],
  ylim = c(0, 3), xlim = c(25, 80),
  col = fadeColor(2, "22"), pch = 20, cex = 2,
  main = "fading the colors first"
)
dotPlot(mariokart$total_pr[used],
  at = 2, add = TRUE,
  col = fadeColor(4, "22"), pch = 20, cex = 2
)

# ===> color names <===#

```

```

dotPlot(mariokart$total_pr[new],
  ylim = c(0, 3), xlim = c(25, 80), pch = 20,
  col = "red", cex = 2, main = "using regular colors"
)
dotPlot(mariokart$total_pr[used], at = 2, add = TRUE, col = "blue", pch = 20, cex = 2)
dotPlot(mariokart$total_pr[new],
  ylim = c(0, 3), xlim = c(25, 80),
  col = fadeColor("red", "22"), pch = 20, cex = 2,
  main = "fading the colors first"
)
dotPlot(mariokart$total_pr[used],
  at = 2, add = TRUE,
  col = fadeColor("blue", "22"), pch = 20, cex = 2
)

# ==> hexadecimal <==#
dotPlot(mariokart$total_pr[new],
  ylim = c(0, 3), xlim = c(25, 80), pch = 20,
  col = "#FF0000", cex = 2, main = "using regular colors"
)
dotPlot(mariokart$total_pr[used],
  at = 2, add = TRUE, col = "#0000FF", pch = 20,
  cex = 2
)
dotPlot(mariokart$total_pr[new],
  ylim = c(0, 3), xlim = c(25, 80),
  col = fadeColor("#FF0000", "22"), pch = 20, cex = 2,
  main = "fading the colors first"
)
dotPlot(mariokart$total_pr[used],
  at = 2, add = TRUE,
  col = fadeColor("#0000FF", "22"), pch = 20, cex = 2
)

# ==> alternative: rgb function <==#
dotPlot(mariokart$total_pr[new],
  ylim = c(0, 3), xlim = c(25, 80), pch = 20,
  col = rgb(1, 0, 0), cex = 2, main = "using regular colors"
)
dotPlot(mariokart$total_pr[used],
  at = 2, add = TRUE, col = rgb(0, 0, 1),
  pch = 20, cex = 2
)
dotPlot(mariokart$total_pr[new],
  ylim = c(0, 3), xlim = c(25, 80),
  col = rgb(1, 0, 0, 1 / 8), pch = 20, cex = 2,
  main = "fading the colors first"
)
dotPlot(mariokart$total_pr[used],
  at = 2, add = TRUE,
  col = rgb(0, 0, 1, 1 / 8), pch = 20, cex = 2
)

```

family_college	<i>Simulated sample of parent / teen college attendance</i>
----------------	---

Description

A simulated dataset based on real population summaries.

Usage

```
family_college
```

Format

A data frame with 792 observations on the following 2 variables.

teen Whether the teen goes to college or not.

parents Whether the parent holds a college degree or not.

Source

Simulation based off of summary information provided at <https://eric.ed.gov/?id=ED460660>.

Examples

```
library(dplyr)

family_college |>
  count(teen, parents)
```

famuss	<i>A dataset to examine the relationship between muscle strength and the single nucleotide polymorphism (SNP) actn3.r577x.</i>
--------	--

Description

This dataset is a subset of the larger data set from the Functional SNPs Associated with Muscle Size and Strength (FAMuSS) by Thompson et.al. It contains demographic, response and coding for the SNP for the study participants. Unlike the data in the previous version of the oibiostat data package, this dataset retains the missing values. The data are also discussed in the Foulkes text. Strength was measured in both dominant and non-dominant arms before and after resistance training. The particular gene of interest was ACTN3, the "sports gene."

Usage

```
famuss
```

Format

A tibble with 1397 rows and 10 variables

ndrm.ch A numeric vector, the percent change in strength in a non-dominant arm, from before training and after.

drm.ch A numeric vector, percent change in strength in dominant arm.

sex A factor with levels Female and Male

age A numeric vector, age in years.

race A factor with levels African Am Asian Caucasian Hispanic Other

height A numeric vector, height in inches.

weight A numeric vector, weight in pounds.

actn3.r577x A factor with levels CC CT TT, that shows the genotype at residue rs540874 (location r577x) within the ACTN3 SNP.

bmi A numeric vector, body mass index

Source

Personal communication from A. Foulkes

References

Thompson PMoyna NSeip R et al. Medicine and Science in Sports and Exercise, (2004), 1132-1139, 36(7). Clarkson P, et al., Journal of Applied Physiology 99: 154-163, 2005.Pescatello L, et al. Highlights from the functional single nucleotide polymorphisms associated with human muscle size and strength or FAMuSS study, BioMed Research International 2013. Foulkes, Andrea S. Applied Statistical Genetics using R for Population Association Studies. Springer, 2009).

fastfood	<i>Nutrition in fast food</i>
----------	-------------------------------

Description

Nutrition amounts in 515 fast food items. The author of the data scraped only entrees (not sides, drinks, desserts, etc.).

Usage

fastfood

Format

A data frame with 515 observations on the following 17 variables.

restaurant Name of restaurant

item Name of item

calories Number of calories

cal_fat Calories from fat

total_fat Total fat

sat_fat Saturated fat

trans_fat Trans fat

cholesterol Cholesterol

sodium Sodium

total_carb Total carbs

fiber Fiber

sugar Suger

protein Protein

vit_a Vitamin A

vit_c Vitamin C

calcium Calcium

salad Salad or not

Source

Retrieved from [Tidy Tuesday Fast food entree data](#).

fcid	<i>Summary of male heights from USDA Food Commodity Intake Database</i>
------	---

Description

Sample of heights based on the weighted sample in the survey.

Usage

fcid

Format

A data frame with 100 observations on the following 2 variables.

height a numeric vector

num_of_adults a numeric vector

Examples

```
fcid
```

```
fheights
```

```
Female college student heights, in inches
```

Description

24 sample observations.

Usage

```
fheights
```

Format

A data frame with 24 observations on the following variable.

heights height, in inches

Examples

```
hist(fheights$heights)
```

```
fish_age
```

```
Young fish in the North Sea.
```

Description

Samples of 50 Tobis fish, or Sand Eels, were collected at three different locations in the North Sea and the number of one-year-old fish were counted.

Usage

```
fish_age
```

Format

A data frame with 300 rows and 3 variables:

year Year the fish was caught with levels 1997 and 1998.

location Site the fish was caught with levels A, B and C.

one_year_old Is the fish one-year-old, yes or no?

Source

Henrik Madsen, Paul Thyregod. 2011. Introduction to General and Generalized Linear Models
CRC Press. Boca Raton, FL. ISBN: 978-1-4200-9155-7 [Website](#)

Examples

```
library(dplyr)
library(tidyr)

# Count the number of one-year-old fish at each location.

fish_age |>
  filter(one_year_old == "yes") |>
  count(year, location) |>
  pivot_wider(names_from = location, values_from = n)
```

fish_oil_18

Findings on n-3 Fatty Acid Supplement Health Benefits

Description

The results summarize each of the health outcomes for an experiment where 12,933 subjects received a 1g fish oil supplement daily and 12,938 received a placebo daily. The experiment's duration was 5-years.

Usage

```
fish_oil_18
```

Format

The format is a list of 24 matrices. Each matrix is a 2x2 table, and below are the named items in the list, which also represent the outcomes.

major_cardio_event Major cardiovascular event. (Primary end point.)

cardio_event_expanded Cardiovascular event in expanded composite endpoint.

myocardial_infarction Total myocardial infarction. (Heart attack.)

stroke Total stroke.

cardio_death Death from cardiovascular causes.

PCI Percutaneous coronary intervention.

CABG Coronary artery bypass graft.

total_coronary_heart_disease Total coronary heart disease.

ischemic_stroke Ischemic stroke.

hemorrhagic_stroke Hemorrhagic stroke.

chd_death Death from coronary heart disease.
myocardial_infarction_death Death from myocardial infarction.
stroke_death Death from stroke.
invasive_cancer Invasive cancer of any type. (Primary end point.)
breast_cancer Breast cancer.
prostate_cancer Prostate cancer.
colorectal_cancer Colorectal cancer.
cancer_death Death from cancer.
death Death from any cause.
major_cardio_event_after_2y Major cardiovascular event, excluding the first 2 years of follow-up.
myocardial_infarction_after_2y Total myocardial infarction, excluding the first 2 years of follow-up.
invasive_cancer_after_2y Invasive cancer of any type, excluding the first 2 years of follow-up.
cancer_death_after_2y Death from cancer, excluding the first 2 years of follow-up.
death_after_2y Death from any cause, excluding the first 2 years of follow-up.

Source

Manson JE, et al. 2018. Marine n-3 Fatty Acids and Prevention of Cardiovascular Disease and Cancer. NEJMoa1811403. doi:[10.1056/NEJMoa1811403](https://doi.org/10.1056/NEJMoa1811403).

Examples

```
names(fish_oil_18)
(tab <- fish_oil_18[["major_cardio_event"]])
chisq.test(tab)
fisher.test(tab)

(tab <- fish_oil_18[["myocardial_infarction"]])
chisq.test(tab)
fisher.test(tab)
```

flow_rates

River flow data

Description

Flow rates (measured in cubic feet per second) of Clarks Creek, Leach Creek, Silver Creek, and Wildwood Creek Spring collected by volunteers of the Pierce Conservation District in the State of Washington in the US.

Usage

```
flow_rates
```

Format

A data frame with 31 rows and 3 variables.

site Location where measurements were taken.

date Date measurements were taken.

flow Flow rate of the river in cubic feet per second.

Source

[Pierce County Water Data Viewer.](#)

Examples

```
library(ggplot2)

# River flow rates by site
ggplot(flow_rates, aes(x = site, y = flow)) +
  geom_boxplot() +
  labs(
    title = "River flow rates by site",
    x = "Site",
    y = expression(paste("Flow (ft"^3 * "/s)"))
  )

# River flow rates over time
ggplot(flow_rates, aes(x = date, y = flow, color = site, shape = site)) +
  geom_point(size = 2) +
  labs(
    title = "River flow rates over time",
    x = "Date",
    y = expression(paste("Flow (ft"^3 * "/s)")),
    color = "Site", shape = "Site"
  )
```

forest.birds

A dataset to study the relationship between species abundance of birds and habitat features.

Description

Contains a subset of the variables from a larger 1987 study analyzing the effect of habitat fragmentation on bird abundance in the Latrobe Valley of southeastern Victoria, Australia. Habitat fragmentation is the process in which land development disrupts the native habitat of certain species. The dataset has variables on forest bird abundance in a forest patch (typically the response of interest) and features of patch.

Usage

```
forest.birds
```

Format

A tibble with 56 rows and 8 variables:

`abundance` Numeric vector. Average number of forest birds observed in the patch, as calculated from several independent 20-minute counting sessions.

`patch.area` Numeric vector. The area of the patch. Areas were measured in hectares; 1 hectare is 10,000 square meters and approximately 2.47 acres.

`year.of.isolation` The year the patch was isolated by fragmentation of local environment.

`dist.nearest` Numeric vector. Distance to the nearest patch, measured in kilometers.

`dist.larger` Numeric vector. Distance to the nearest patch that is larger than the current patch, measured in kilometers.

`grazing.intensity` Factor. A score indicating the extent of livestock grazing. The categories are: "light", "less than average", "average", "moderately heavy", "heavy".

`altitude` Numeric vector. Altitude of the patch, measured in meters.

`yrs.isolation` Numeric vector. Number of years of isolation at the time study was conducted (1983). Computed as 1983 - `year.of.isolation`

References

Loyn R.H. 1987 Effects of patch area and habitat on bird abundances, species numbers and tree health in fragmented Victorian forests." In *Nature Conservation: The Role of Remnants of Native Vegetation*. Saunders DA, Arnold GW, Burbridge AA, and Hopkins AJM eds. Surrey Beatty and Sons, Chipping Norton, NSW, 65-77, 1987. Logan, M 2011 *Biostatistical Design and Analysis Using R*. Wiley-Blackwell, Chapter 9

friday

Friday the 13th

Description

This dataset addresses issues of how superstitions regarding Friday the 13th affect human behavior, and whether Friday the 13th is an unlucky day. Scanlon, et al. collected data on traffic and shopping patterns and accident frequency for Fridays the 6th and 13th between October of 1989 and November of 1992.

Usage

```
friday
```


Format

A data frame with 61 observations and 6 variables.

type Type of observation, traffic, shopping, or accident.

date Year and month of observation.

sixth Counts on the 6th of the month.

thirteenth Counts on the 13th of the month.

diff Difference between the sixth and the thirteenth.

location Location where data is collected.

Details

There are three types of observations: traffic, shopping, and accident. For traffic, the researchers obtained information from the British Department of Transport regarding the traffic flows between junctions 7 to 8 and junctions 9 to 10 of the M25 motorway. For shopping, they collected the numbers of shoppers in nine different supermarkets in southeast England. For accidents, they collected numbers of emergency admissions to hospitals due to transport accidents.

Source

Scanlon, T.J., Luben, R.N., Scanlon, F.L., Singleton, N. (1993), "Is Friday the 13th Bad For Your Health?," BMJ, 307, 1584-1586. <https://dasl.datadescription.com/datafile/friday-the-13th-traffic> and <https://dasl.datadescription.com/datafile/friday-the-13th-accidents>.

Examples

```
library(dplyr)
library(ggplot2)

friday |>
  filter(type == "traffic") |>
  ggplot(aes(x = sixth)) +
  geom_histogram(binwidth = 2000) +
  xlim(110000, 140000)

friday |>
  filter(type == "traffic") |>
  ggplot(aes(x = thirteenth)) +
  geom_histogram(binwidth = 2000) +
  xlim(110000, 140000)
```

frog

*Frog Maternal Investment Based on Altitude in Tibetan Plateau***Description**

From February to April 2013, the study team studied various populations of frogs living between 2035 to 3494m above sea level in the eastern Tibetan Plateau. They located breeding ponds at various altitudes, and at each one, obtained a small sample of freshly laid egg clutches. They counted the number of eggs and weighed the clutch to determine egg weight, and approximated egg size from photographs. The data are used to estimate whether maternal investment changes at varying altitudes on the Tibetan Plateau. Investment is assessed by measuring how reproducing females allocated their energy to egg productions of size or number, all characteristics of offspring fitness. Source data on size and volume in log₁₀ scale have been converted to standard numeric scale.

Usage

frog

Format

A data frame with 431 observations on the following 6 variables.

altitude Numeric, altitude of study site in meters above sea level.

latitude Numeric, latitude of study site measured in degrees.

clutch.size Numeric, estimated number of eggs in clutch.

body.size Numeric, length of mother frog who laid the egg clutch in cm.

clutch.volume Numeric, volume of egg clutch in mm³.

egg.size Numeric, average diameter of an individual egg to the 0.01mm.

Source

[doi:10.5061/dryad.6v0c1](https://doi.org/10.5061/dryad.6v0c1)

References

Chen, W., et al. Maternal investment increases with altitude in a frog on the Tibetan Plateau. *Journal of evolutionary biology* 26.12 (2013): 2710-2715. [doi:10.1111/jeb.12271](https://doi.org/10.1111/jeb.12271)

full_body_scan	<i>Poll about use of full-body airport scanners</i>
----------------	---

Description

Poll about use of full-body airport scanners, where about 4-in-5 people supported the use of the scanners.

Usage

full_body_scan

Format

A data frame with 1137 observations on the following 2 variables.

answer a factor with levels do not know / no answer should should not

party.affiliation a factor with levels Democrat Independent Republican

Source

S. Condon. Poll: 4 in 5 Support Full-Body Airport Scanners. In: CBS News (2010).

Examples

full_body_scan

gdp_countries	<i>GDP Countries Data.</i>
---------------	----------------------------

Description

From World Bank, GDP in current U.S. dollars 1960-2020 by decade

Usage

gdp_countries

Format

A data frame with 659 rows and 9 variables.

country Name of country.

description description of data: GDP (in current US\$), GDP growth (annual %), GDP per capita (in current US\$)

year_1960 value in 1960

year_1970 value in 1970

year_1980 value in 1980

year_1990 value in 1990

year_2000 value in 2000

year_2010 value in 2010

year_2020 value in 2020

Source

World Bank

Examples

```
library(dplyr)
# don't use scientific notation
options(scipen = 999)
# List the top 10 countries by GDP (There is a row for World)
gdp_countries |>
  filter(description == "GDP") |>
  mutate(year2020 = format(year_2020, big.mark = ",")) |>
  select(country, year2020) |>
  arrange(desc(year2020)) |>
  top_n(n = 11)

# List the 10 countries with the biggest GDP per capita change from 1960 to 2020
gdp_countries |>
  filter(description == "GDP per capita") |>
  mutate(change = format(round(year_2020 - year_1960, 0), big.mark = ",")) |>
  select(country, change, year_1960, year_2020) |>
  na.omit() |>
  arrange(desc(change)) |>
  top_n(n = 10)
```

gear_company	<i>Fake data for a gear company example</i>
--------------	---

Description

Made-up data for whether a sample of two gear companies' parts pass inspection.

Usage

```
gear_company
```

Format

A data frame with 2000 observations on the following 2 variables.

company a factor with levels current prospective

outcome a factor with levels not pass

Examples

```
gear_company
```

gender_discrimination	<i>Bank manager recommendations based on gender</i>
-----------------------	---

Description

Study from the 1970s about whether gender influences hiring recommendations.

Usage

```
gender_discrimination
```

Format

A data frame with 48 observations on the following 2 variables.

gender a factor with levels female and male

decision a factor with levels not promoted and promoted

Source

Rosen B and Jerdee T. 1974. Influence of sex role stereotypes on personnel decisions. Journal of Applied Psychology 59(1):9-14.

Examples

```
library(ggplot2)

table(gender_discrimination)

ggplot(gender_discrimination, aes(y = gender, fill = decision)) +
  geom_bar(position = "fill")
```

get_it_dunn_run	<i>Get it Dunn Run, Race Times</i>
-----------------	------------------------------------

Description

Get it Dunn is a small regional run that got extra attention when a runner, Nichole Porath, made the Guinness Book of World Records for the fastest time pushing a double stroller in a half marathon. This dataset contains results from the 2017 and 2018 races.

Usage

```
get_it_dunn_run
```

Format

A data frame with 978 observations on the following 10 variables.

date Date of the run.

race Run distance.

bib_num Bib number of the runner.

first_name First name of the runner.

last_initial Initial of the runner's last name.

sex Sex of the runner.

age Age of the runner.

city City of residence.

state State of residence.

run_time_minutes Run time, in minutes.

Source

Data were collected from GSE Timing: [2018 data](#), [2017 race data](#).

Examples

```
d <- subset(
  get_it_dunn_run,
  race == "5k" & date == "2018-05-12" &
  !is.na(age) & state %in% c("MN", "WI")
)
head(d)
m <- lm(run_time_minutes ~ sex + age + state, d)
summary(m)
plot(m$fitted, m$residuals)
boxplot(m$residuals ~ d$sex)
plot(m$residuals ~ d$age)
hist(m$residuals)
```

gifted

Analytical skills of young gifted children

Description

An investigator is interested in understanding the relationship, if any, between the analytical skills of young gifted children and the following variables: father's IQ, mother's IQ, age in month when the child first said "mummy" or "daddy", age in month when the child first counted to 10 successfully, average number of hours per week the child's mother or father reads to the child, average number of hours per week the child watched an educational program on TV during the past three months, average number of hours per week the child watched cartoons on TV during the past three months. The analytical skills are evaluated using a standard testing procedure, and the score on this test is used as the response variable.

Usage

gifted

Format

A data frame with 36 observations and 8 variables.

score Score in test of analytical skills.

fatheriq Father's IQ.

motheriq Mother's IQ.

speak Age in months when the child first said "mummy" or "daddy".

count Age in months when the child first counted to 10 successfully.

read Average number of hours per week the child's mother or father reads to the child.

edutv Average number of hours per week the child watched an educational program on TV during the past three months.

cartoons Average number of hours per week the child watched cartoons on TV during the past three months.

Details

Data were collected from schools in a large city on a set of thirty-six children who were identified as gifted children soon after they reached the age of four.

Source

Graybill, F.A. & Iyer, H.K., (1994) Regression Analysis: Concepts and Applications, Duxbury, p. 511-6.

Examples

gifted

global_warming_pew	<i>Pew survey on global warming</i>
--------------------	-------------------------------------

Description

A 2010 Pew Research poll asked 1,306 Americans, "From what you've read and heard, is there solid evidence that the average temperature on earth has been getting warmer over the past few decades, or not?"

Usage

global_warming_pew

Format

A data frame with 2253 observations on the following 2 variables.

party_or_ideology a factor with levels Conservative Republican Liberal Democrat Mod/Cons Democrat Mod/Lib Republican

response Response.

Source

Pew Research Center, Majority of Republicans No Longer See Evidence of Global Warming, data collected on October 27, 2010.

Examples

global_warming_pew

`goog`*Google stock data*

Description

Google stock data from 2006 to early 2014, where data from the first day each month was collected.

Usage`goog`**Format**

A data frame with 98 observations on the following 7 variables.

date a factor with levels 2006-01-03, 2006-02-01, and so on

open a numeric vector

high a numeric vector

low a numeric vector

close a numeric vector

volume a numeric vector

adj_close a numeric vector

Source

Yahoo! Finance.

Examples`goog`

`gov_poll`*Pew Research poll on government approval ratings*

Description

The poll's focus is on Obama and then Democrats and Republicans in Congress.

Usage`gov_poll`

Format

A data frame with 4223 observations on the following 2 variables.

- poll** a factor with levels approve disapprove
- eval** a factor with levels Democrats Obama Republicans

Source

See the Pew Research website: www.people-press.org/2012/03/14/romney-leads-gop-contest-trails-in-matchup-with-obama. The counts in Table 6.19 are approximate.

Examples

gov_poll

gpa	<i>Survey of Duke students on GPA, studying, and more</i>
-----	---

Description

A survey of 55 Duke University students asked about their GPA, number of hours they study at night, number of nights they go out, and their gender.

Usage

gpa

Format

A data frame with 55 observations on the following 5 variables.

- gpa** a numeric vector
- studyweek** a numeric vector
- sleepnight** a numeric vector
- out** a numeric vector
- gender** a factor with levels female male

Examples

gpa

gpa_iq*Sample of students and their GPA and IQ*

Description

Data on 78 students including GPA, IQ, and gender.

Usage

gpa_iq

Format

A data frame with 78 observations representing students on the following 5 variables.

obs a numeric vector

gpa Grade point average (GPA).

iq IQ.

gender Gender.

concept a numeric vector

Examples

gpa_iq

gpa_study_hours*gpa_study_hours*

Description

A data frame with 193 rows and 2 columns. The columns represent the variables gpa and study_hours for a sample of 193 undergraduate students who took an introductory statistics course in 2012 at a private US university.

Usage

gpa_study_hours

Format

A data frame with 193 observations on the following 2 variables.

gpa Grade point average (GPA) of student.

study_hours Number of hours students study per week.

Details

GPA ranges from 0 to 4 points, however one student reported a GPA > 4. This is a data error but this observation has been left in the dataset as it is used to illustrate issues with real survey data. Both variables are self reported, hence may not be accurate.

Source

Collected at a private US university as part of an anonymous survey in an introductory statistics course.

Examples

```
library(ggplot2)

ggplot(gpa_study_hours, aes(x = study_hours, y = gpa)) +
  geom_point(alpha = 0.5) +
  labs(x = "Study hours/week", y = "GPA")
```

gradestv

Simulated data for analyzing the relationship between watching TV and grades

Description

This is a simulated dataset to be used to estimate the relationship between number of hours per week students watch TV and the grade they got in a statistics class.

Usage

```
gradestv
```

Format

A data frame with 25 observations on the following 2 variables.

tv Number of hours per week students watch TV.

grades Grades students got in a statistics class (out of 100).

Details

There are a few potential outliers in this dataset. When analyzing the data one should consider how (if at all) these outliers may affect the estimates of correlation coefficient and regression parameters.

Source

Simulated data

Examples

```
library(ggplot2)

ggplot(gradestv, aes(x = tv, y = grades)) +
  geom_point() +
  geom_smooth(method = "lm")
```

gsearch

*Simulated Google search experiment***Description**

The data were simulated to look like sample results from a Google search experiment.

Usage

```
gsearch
```

Format

A data frame with 10000 observations on the following 2 variables.

type a factor with levels new search no new search

outcome a factor with levels current test 1 test 2

Examples

```
library(ggplot2)

table(gsearch$type, gsearch$outcome)

ggplot(gsearch, aes(x = type, fill = outcome)) +
  geom_bar(position = "fill") +
  labs(y = "proportion")
```

gss2010

*2010 General Social Survey***Description**

Data from the 2010 General Social Survey.

Usage

```
gss2010
```

Format

A data frame with 2044 observations on the following 5 variables.

hrsrelax After an average work day, about how many hours do you have to relax or pursue activities that you enjoy

mntlhlth For how many days during the past 30 days was your mental health, which includes stress, depression, and problems with emotions, not good?

hrs1 Hours worked each week.

degree Educational attainment or degree.

grass Do you think the use of marijuana should be made legal, or not?

Source

US 2010 General Social Survey.

Examples

```
gss2010
```

```
gss_wordsum_class      gss_wordsum_class
```

Description

A data frame containing data from the General Social Survey.

Usage

```
gss_wordsum_class
```

Format

A data frame with 795 observations on the following 2 variables.

wordsum A vocabulary score calculated based on a ten question vocabulary test, where a higher score means better vocabulary. Scores range from 1 to 10.

class Self-identified social class has 4 levels: lower, working, middle, and upper class.

Examples

```
library(dplyr)

gss_wordsum_class |>
  group_by(class) |>
  summarize(mean_wordsum = mean(wordsum))
```

healthcare_law_survey *Pew Research Center poll on health care, including question variants*

Description

For example, Pew Research Center conducted a survey with the following question: "As you may know, by 2014 nearly all Americans will be required to have health insurance. People who do not buy insurance will pay a penalty while people who cannot afford it will receive financial help from the government. Do you approve or disapprove of this policy?" For each randomly sampled respondent, the statements in brackets were randomized: either they were kept in the order given above, or the two statements were reversed.

Usage

```
healthcare_law_survey
```

Format

A data frame with 1503 observations on the following 2 variables.

order a factor with levels cannot_afford_second penalty_second

response a factor with levels approve disapprove other

Source

www.people-press.org/2012/03/26/public-remains-split-on-health-care-bill-opposed-to-mandate/. Sample sizes for each polling group are approximate.

Examples

```
healthcare_law_survey
```

health_coverage	<i>Health Coverage and Health Status</i>
-----------------	--

Description

Survey responses for 20,000 responses to the Behavioral Risk Factor Surveillance System.

Usage

```
health_coverage
```

Format

A data frame with 20000 observations on the following 2 variables.

coverage Whether the person had health coverage or not.

health_status The person's health status.

Source

Office of Surveillance, Epidemiology, and Laboratory Services Behavioral Risk Factor Surveillance System, BRFSS 2010 Survey Data.

Examples

```
table(health_coverage)
```

heart_transplant	<i>Heart Transplant Data</i>
------------------	------------------------------

Description

The Stanford University Heart Transplant Study was conducted to determine whether an experimental heart transplant program increased lifespan. Each patient entering the program was designated officially a heart transplant candidate, meaning that he was gravely ill and would most likely benefit from a new heart. Then the actual heart transplant occurs between a few weeks to several months depending on the availability of a donor. Very few candidates during this waiting period show improvement and get *deselected* as a heart transplant candidate, but for the purposes of this experiment those patients were kept in the data as continuing candidates.

Usage

```
heart_transplant
```

Format

A data frame with 103 observations on the following 8 variables.

id ID number of the patient.

acceptyear Year of acceptance as a heart transplant candidate.

age Age of the patient at the beginning of the study.

survived Survival status with levels alive and dead.

survtime Number of days patients were alive after the date they were determined to be a candidate for a heart transplant until the termination date of the study

prior Whether or not the patient had prior surgery with levels yes and no.

transplant Transplant status with levels control (did not receive a transplant) and treatment (received a transplant).

wait Waiting Time for Transplant

References

Turnbull B, Brown B, and Hu M (1974). "Survivorship of heart transplant data." Journal of the American Statistical Association, vol. 69, pp. 74-80.

Examples

```
library(ggplot2)

ggplot(heart_transplant, aes(x = transplant, y = survtime)) +
  geom_boxplot() +
  labs(x = "Transplant", y = "Survival time (days)")

ggplot(heart_transplant, aes(x = transplant, fill = survived)) +
  geom_bar(position = "fill") +
  labs(x = "Transplant", y = "Proportion", fill = "Outcome")
```

helium

Helium football

Description

At the 1976 Pro Bowl, Ray Guy, a punter for the Oakland Raiders, punted a ball that hung mid-air long enough for officials to question whether the pigskin was filled with helium. The ball was found to be filled with air, but since then many have tossed around the idea that a helium-filled football would outdistance an air-filled one. Students at Ohio State University conducted an experiment to test this myth. They used two identical footballs, one air filled with air and one filled with helium. Each football was kicked 39 times and the two footballs were alternated with each kick.

Usage

```
helium
```

Format

A data frame with 39 observations on the following 3 variables.

trial Trial number.

air Distance in years for air-filled football.

helium Distance in years for helium-filled football.

Details

Lafferty, M. B. (1993), "OSU scientists get a kick out of sports controversy, "The Columbus Dispatch (November, 21, 1993), B7.

Source

Previously part of the Data and Story Library, <https://das1.datadescription.com>. Removed as of 2020.

Examples

```
boxPlot(helium$air, xlab = "air")
boxPlot(helium$helium, xlab = "helium")
```

helmet	<i>Socioeconomic status and reduced-fee school lunches</i>
--------	--

Description

Examining the relationship between socioeconomic status measured as the percentage of children in a neighborhood receiving reduced-fee lunches at school (lunch) and the percentage of bike riders in the neighborhood wearing helmets (helmet).

Usage

```
helmet
```

Format

A data frame with 12 observations representing neighborhoods on the following 2 variables.

lunch Percent of students receiving reduced-fee school lunches.

helmet Percent of bike riders wearing helmets.

Examples

```
library(ggplot2)

ggplot(helmet, aes(x = lunch, y = helmet)) +
  geom_point()
```

hfi	<i>Human Freedom Index</i>
-----	----------------------------

Description

The Human Freedom Index is a report that attempts to summarize the idea of "freedom" through a bunch of different variables for many countries around the globe. It serves as a rough objective measure for the relationships between the different types of freedom - whether it's political, religious, economical or personal freedom - and other social and economic circumstances. The Human Freedom Index is an annually co-published report by the Cato Institute, the Fraser Institute, and the Liberales Institut at the Friedrich Naumann Foundation for Freedom.

Usage

```
hfi
```

Format

A data frame with 1458 observations on the following 123 variables.

year Year

ISO_code ISO code of country

countries Name of country

region Region where country is located

pf_rol_procedural Procedural justice

pf_rol_civil Civil justice

pf_rol_criminal Criminal justice

pf_rol Rule of law

pf_ss_homicide Homicide

pf_ss_disappearances_disap Disappearances

pf_ss_disappearances_violent Violent conflicts

pf_ss_disappearances_organized Violent conflicts

pf_ss_disappearances_fatalities Terrorism fatalities

pf_ss_disappearances_injuries Terrorism injuries

pf_ss_disappearances Disappearances, conflict, and terrorism

pf_ss_women_fgm Female genital mutilation

pf_ss_women_missing Missing women

pf_ss_women_inheritance_widows Inheritance rights for widows

pf_ss_women_inheritance_daughters Inheritance rights for daughters

pf_ss_women_inheritance Inheritance

pf_ss_women Women's security

pf_ss Security and safety

pf_movement_domestic Freedom of domestic movement

pf_movement_foreign Freedom of foreign movement

pf_movement_women Women's movement

pf_movement Freedom of movement

pf_religion_estop_establish Freedom to establish religious organizations

pf_religion_estop_operate Freedom to operate religious organizations

pf_religion_estop Freedom to establish and operate religious organizations

pf_religion_harassment Harassment and physical hostilities

pf_religion_restrictions Legal and regulatory restrictions

pf_religion Religious freedom

pf_association_association Freedom of association

pf_association_assembly Freedom of assembly

pf_association_political_establish Freedom to establish political parties

pf_association_political_operate Freedom to operate political parties
pf_association_political Freedom to establish and operate political parties
pf_association_prof_establish Freedom to establish professional organizations
pf_association_prof_operate Freedom to operate professional organizations
pf_association_prof Freedom to establish and operate professional organizations
pf_association_sport_establish Freedom to establish educational, sporting, and cultural organizations
pf_association_sport_operate Freedom to operate educational, sporting, and cultural organizations
pf_association_sport Freedom to establish and operate educational, sporting, and cultural organizations
pf_association Freedom to associate and assemble with peaceful individuals or organizations
pf_expression_killed Press killed
pf_expression_jailed Press jailed
pf_expression_influence Laws and regulations that influence media content
pf_expression_control Political pressures and controls on media content
pf_expression_cable Access to cable/satellite
pf_expression_newspapers Access to foreign newspapers
pf_expression_internet State control over internet access
pf_expression Freedom of expression
pf_identity_legal Legal gender
pf_identity_parental_marriage Parental rights in marriage
pf_identity_parental_divorce Parental rights after divorce
pf_identity_parental Parental rights
pf_identity_sex_male Male-to-male relationships
pf_identity_sex_female Female-to-female relationships
pf_identity_sex Same-sex relationships
pf_identity_divorce Divor
pf_identity Identity and relationships
pf_score Personal Freedom (score)
pf_rank Personal Freedom (rank)
ef_government_consumption Government consumption
ef_government_transfers Transfers and subsidies
ef_government_enterprises Government enterprises and investments
ef_government_tax_income Top marginal income tax rate - Top marginal income tax rates
ef_government_tax_payroll Top marginal income tax rate - Top marginal income and payroll tax rate
ef_government_tax Top marginal tax rate

ef_government Size of government
ef_legal_judicial Judicial independence
ef_legal_courts Impartial courts
ef_legal_protection Protection of property rights
ef_legal_military Military interference in rule of law and politics
ef_legal_integrity Integrity of the legal system
ef_legal_enforcement Legal enforcement of contracts
ef_legal_restrictions Regulatory restrictions on the sale of real property
ef_legal_police Reliability of police
ef_legal_crime Business costs of crime
ef_legal_gender Gender adjustment
ef_legal Legal system and property rights
ef_money_growth Money growth
ef_money_sd Standard deviation of inflation
ef_money_inflation Inflation - most recent year
ef_money_currency Freedom to own foreign currency bank account
ef_money Sound money
ef_trade_tariffs_revenue Tariffs - Revenue from trade taxes (percentage of trade sector)
ef_trade_tariffs_mean Tariffs - Mean tariff rate
ef_trade_tariffs_sd Tariffs - Standard deviation of tariffs rates
ef_trade_tariffs Tariffs
ef_trade_regulatory_nontariff Regulatory trade barriers - Nontariff trade barriers
ef_trade_regulatory_compliance Regulatory trade barriers - Compliance costs of importing and exporting
ef_trade_regulatory Regulatory trade barriers
ef_trade_black Black-market exchange rates
ef_trade_movement_foreign Controls of the movement of capital and people - Foreign ownership/investment restrictions
ef_trade_movement_capital Controls of the movement of capital and people - Capital controls
ef_trade_movement_visit Controls of the movement of capital and people - Freedom of foreigners to visit
ef_trade_movement Controls of the movement of capital and people
ef_trade Freedom to trade internationally
ef_regulation_credit_ownership Credit market regulations - Ownership of banks
ef_regulation_credit_private Credit market regulations - Private sector credit
ef_regulation_credit_interest Credit market regulations - Interest rate controls/negative real interest rates
ef_regulation_credit Credit market regulation

ef_regulation_labor_minwage Labor market regulations - Hiring regulations and minimum wage

ef_regulation_labor_firing Labor market regulations - Hiring and firing regulations

ef_regulation_labor_bargain Labor market regulations - Centralized collective bargaining

ef_regulation_labor_hours Labor market regulations - Hours regulations

ef_regulation_labor_dismissal Labor market regulations - Dismissal regulations

ef_regulation_labor_conscription Labor market regulations - Conscription

ef_regulation_labor Labor market regulation

ef_regulation_business_adm Business regulations - Administrative requirements

ef_regulation_business_bureaucracy Business regulations - Bureaucracy costs

ef_regulation_business_start Business regulations - Starting a business

ef_regulation_business_bribes Business regulations - Extra payments/bribes/favoritism

ef_regulation_business_licensing Business regulations - Licensing restrictions

ef_regulation_business_compliance Business regulations - Cost of tax compliance

ef_regulation_business Business regulation

ef_regulation Economic freedom regulation score

ef_score Economic freedom score

ef_rank Economic freedom rank

hf_score Human freedom score

hf_rank Human freedom rank

hf_quartile Human freedom quartile

Details

This dataset contains information from Human Freedom Index reports from 2008-2016.

Source

Ian Vasquez and Tanja Porcnik, The Human Freedom Index 2018: A Global Measurement of Personal, Civil, and Economic Freedom (Washington: Cato Institute, Fraser Institute, and the Friedrich Naumann Foundation for Freedom, 2018). <https://www.cato.org/sites/cato.org/files/human-freedom-index-files/human-freedom-index-2016.pdf>. <https://www.kaggle.com/gsutters/the-human-freedom-index>.

histPlot	<i>Histogram or hollow histogram</i>
----------	--------------------------------------

Description

Create histograms and hollow histograms. This function permits easy color and appearance customization.

Usage

```
histPlot(
  x,
  col = fadeColor("black", "22"),
  border = "black",
  breaks = "default",
  probability = FALSE,
  hollow = FALSE,
  add = FALSE,
  lty = 2,
  lwd = 1,
  freqTable = FALSE,
  right = TRUE,
  axes = TRUE,
  xlab = NULL,
  ylab = NULL,
  xlim = NULL,
  ylim = NULL,
  ...
)
```

Arguments

x	Numerical vector or a frequency table (matrix) where the first column represents the observed values and the second column the frequencies. See also <code>freqTable</code> argument.
col	Shading of the histogram bins.
border	Color of histogram bin borders.
breaks	A vector for the bin boundaries or an approximate number of bins.
probability	If FALSE, the frequency is plotted. If TRUE, then a probability density.
hollow	If TRUE, a hollow histogram will be created.
add	If TRUE, the histogram is added to the plot.
lty	Line type. Applies only if <code>hollow=TRUE</code> .
lwd	Line width. Applies only if <code>hollow=TRUE</code> .
freqTable	Set to TRUE if x is a frequency table.

<code>right</code>	Set to FALSE to assign values of x that fall on a bin margin to the left bin. Otherwise the ties default to the right bin.
<code>axes</code>	If FALSE, the axes are not plotted.
<code>xlab</code>	Label for the x axis.
<code>ylab</code>	Label for the y axis.
<code>xlim</code>	Limits for the x axis.
<code>ylim</code>	Limits for the y axis.
<code>...</code>	Additional arguments to plot. If <code>add</code> is TRUE, these arguments are ignored.

Author(s)

David Diez

See Also[boxPlot](#), [dotPlot](#), [densityPlot](#)**Examples**

```
histPlot(tips$tip, main = "Tips")

# overlaid hollow histograms
histPlot(tips$tip[tips$day == "Tuesday"],
  probability = TRUE,
  hollow = TRUE,
  main = "Tips by day"
)
histPlot(tips$tip[tips$day == "Friday"],
  probability = TRUE,
  hollow = TRUE,
  add = TRUE,
  lty = 3,
  border = "red"
)
legend("topright",
  col = c("black", "red"),
  lty = 1:2,
  legend = c("Tuesday", "Friday")
)

# breaks and colors
histPlot(tips$tip,
  col = fadeColor("yellow", "33"),
  border = "darkblue",
  probability = TRUE,
  breaks = 30,
  lwd = 3
)
```



```
# custom breaks
brks <- c(-1, 0, 1, 2, 3, 4, seq(5, 20, 5), 22, 24, 26)
histPlot(tips$tip,
  probability = TRUE,
  breaks = brks,
  col = fadeColor("darkgoldenrod4", "33"),
  xlim = c(0, 26)
)
```

house

United States House of Representatives historical make-up

Description

The make-up of the United States House of Representatives every two years since 1789. The last Congress included is the 112th Congress, which completed its term in 2013.

Usage

```
house
```

Format

A data frame with 112 observations on the following 12 variables.

congress The number of that year's Congress

year_start Starting year

year_end Ending year

seats Total number of seats

p1 Name of the first political party

np1 Number of seats held by the first political party

p2 Name of the second political party

np2 Number of seats held by the second political party

other Other

vac Vacancy

del Delegate

res Resident commissioner

Source

Party Divisions of the House of Representatives, 1789 to Present. <https://history.house.gov/Institution/Party-Divisions/Party-Divisions>.

Examples

```
library(dplyr)
library(ggplot2)
library(forcats)

# Examine two-party relationship since 1855
house_since_1855 <- house |>
  filter(year_start >= 1855) |>
  mutate(
    p1_perc = 100 * np1 / seats,
    p2_perc = 100 * np2 / seats,
    era = case_when(
      between(year_start, 1861, 1865) ~ "Civil War",
      between(year_start, 1914, 1918) ~ "World War I",
      between(year_start, 1929, 1939) ~ "Great Depression",
      between(year_start, 1940, 1945) ~ "World War II",
      between(year_start, 1960, 1965) ~ "Vietnam War Start",
      between(year_start, 1965, 1975) ~ "Vietnam War Escalated",
      TRUE ~ NA_character_
    ),
    era = fct_relevel(
      era, "Civil War", "World War I",
      "Great Depression", "World War II",
      "Vietnam War Start", "Vietnam War Escalated"
    )
  )

ggplot(house_since_1855, aes(x = year_start)) +
  geom_rect(aes(
    xmin = year_start, xmax = lead(year_start),
    ymin = -Inf, ymax = Inf, fill = era
  )) +
  geom_line(aes(y = p1_perc, color = "Democrats")) + # Democrats
  geom_line(aes(y = p2_perc, color = "Republicans")) + # Republicans
  scale_fill_brewer(palette = "Pastel1", na.translate = FALSE) +
  scale_color_manual(
    name = "Party",
    values = c("Democrats" = "blue", "Republicans" = "red"),
    labels = c("Democrats", "Republicans")
  ) +
  theme_minimal() +
  ylim(0, 100) +
  labs(x = "Year", y = "Percentage of seats", fill = "Era")
```

housing

Simulated dataset on student housing

Description

Each observation represents a simulated rent price for a student.

Usage

housing

Format

A data frame with 75 observations on the following variable.

cost a numeric vector

Examples

housing

hsb2	<i>High School and Beyond survey</i>
------	--------------------------------------

Description

Two hundred observations were randomly sampled from the High School and Beyond survey, a survey conducted on high school seniors by the National Center of Education Statistics.

Usage

hsb2

Format

A data frame with 200 observations and 11 variables.

id Student ID.

gender Student's gender, with levels female and male.

race Student's race, with levels african american, asian, hispanic, and white.

ses Socio economic status of student's family, with levels low, middle, and high.

schtyp Type of school, with levels public and private.

prog Type of program, with levels general, academic, and vocational.

read Standardized reading score.

write Standardized writing score.

math Standardized math score.

science Standardized science score.

socst Standardized social studies score.

Source

UCLA Institute for Digital Research & Education - Statistical Consulting.

Examples

```
library(ggplot2)

ggplot(hsb2, aes(x = read - write, y = ses)) +
  geom_boxplot() +
  labs(
    x = "Difference between reading and writing scores",
    y = "Socio-economic status"
  )
```

husbands_wives

Great Britain: husband and wife pairs

Description

The Great Britain Office of Population Census and Surveys once collected data on a random sample of 170 married couples in Britain, recording the age (in years) and heights of the husbands and wives.

Usage

```
husbands_wives
```

Format

A data frame with 199 observations on the following 8 variables.

age_husband Age of husband.

age_wife Age of wife.

ht_husband Height of husband (mm).

ht_wife Height of wife (mm).

age_husb_at_marriage Age of husband at the time they married.

age_wife_at_marriage Age of wife at the time they married.

years_married Number of years married.

Source

Hand DJ. 1994. A handbook of small data sets. Chapman & Hall/CRC.

Examples

```
library(ggplot2)

ggplot(husbands_wives, aes(x = ht_husband, y = ht_wife)) +
  geom_point()
```

hyperuricemia	<i>Data from an observational study with potential predictors for uric acid levels.</i>
---------------	---

Description

These data are from a cross-sectional study examining the association of hyperuricemia with dietary magnesium in 5,168 participants in China. The study measured several other possible predictors, including body mass index (BMI, measured in kg/m^2) and are used in the chapter on logistic regression in Introductory Statistics for the Life and Biomedical Sciences (ISLBS).

Usage

hyperuricemia

Format

A tibble with 5168 rows and 8 variables:

sex Factor with levels male and female

age Numeric, measured in years

height Numeric, measured in cm

weight Numeric, Measured in kg

bmi Numeric, body mass index, weight divided by height in meters squared

uric.acid measured in micromolar/liter. Hyperuricemia (HU) was defined as uric acid ≥ 416 micromolar/L for males and ≥ 360 micromolar/L for females.

magnesium.intake Daily magnesium intake from a food frequency questionnaire, measured in mg/day

hu A factor, with levels no, hyperuricemia absent, yes, hyperuricemia present. Hyperuricemia (HU) was defined as uric acid ≥ 416 micromolar/L for males and ≥ 360 micromolar/L for females.

Source

[doi:10.5061/dryad.n5j23](https://doi.org/10.5061/dryad.n5j23)

References

Wang, Yi-lun, et al. "Association between dietary magnesium intake and hyperuricemia." PLoS One 10.11 (2015): e0141079. [doi:10.1371/journal.pone.0141079](https://doi.org/10.1371/journal.pone.0141079)

hyperuricemia.samp	Random sample of 500 cases from the hyperuricemia dataset.
--------------------	--

Description

Random sample of 500 cases from the [hyperuricemia](#) dataset.

Usage

hyperuricemia.samp

Format

A tibble with 5168 rows and 8 variables:

sex Factor with levels male and female

age Numeric, measured in years

height Numeric, measured in cm

weight Numeric, Measured in kg

bmi Numeric, body mass index, weight divided by height in meters squared

uric.acid measured in micromolar/liter. Hyperuricemia (HU) was defined as uric acid ≥ 416 micromolar/L for males and ≥ 360 micromolar/L for females.

magnesium.intake Daily magnesium intake from a food frequency questionnaire, measured in mg/day

hu A factor, with levels no, hyperuricemia absent, yes, hyperuricemia present. Hyperuricemia (HU) was defined as uric acid ≥ 416 micromolar/L for males and ≥ 360 micromolar/L for females.

Source

[doi:10.5061/dryad.n5j23](https://doi.org/10.5061/dryad.n5j23)

References

Wang, Yi-lun, et al. "Association between dietary magnesium intake and hyperuricemia." PLoS One 10.11 (2015): e0141079. [doi:10.1371/journal.pone.0141079](https://doi.org/10.1371/journal.pone.0141079)

immigration

*Poll on illegal workers in the US***Description**

910 randomly sampled registered voters in Tampa, FL were asked if they thought workers who have illegally entered the US should be (i) allowed to keep their jobs and apply for US citizenship, (ii) allowed to keep their jobs as temporary guest workers but not allowed to apply for US citizenship, or (iii) lose their jobs and have to leave the country as well as their political ideology.

Usage

immigration

Format

A data frame with 910 observations on the following 2 variables.

response a factor with levels Apply for citizenship Guest worker Leave the country Not sure

political a factor with levels conservative liberal moderate

Source

SurveyUSA, News Poll #18927, data collected Jan 27-29, 2012.

Examples

immigration

IMSCOL

*Introduction to Modern Statistics (IMS) Colors***Description**

These are the core colors used for the Introduction to Modern Statistics textbook. The blue, green, pink, yellow, and red colors are also gray-scaled, meaning no changes are required when printing black and white copies.

Usage

IMSCOL

Format

A 8-by-13 matrix of 7 colors with four fading scales: blue, green, pink, yellow, red, black, gray, and light gray.

Examples

```
plot(1:7, 7:1,
     col = IMSCOL, pch = 19, cex = 6, xlab = "", ylab = "",
     xlim = c(0.5, 7.5), ylim = c(-2.5, 8), axes = FALSE
)
text(1:7, 7:1 + 0.7, paste("IMSCOL[, 1:7, "], sep = ""), cex = 0.9)
points(1:7, 7:1 - 0.7, col = IMSCOL[, 2], pch = 19, cex = 6)
points(1:7, 7:1 - 1.4, col = IMSCOL[, 3], pch = 19, cex = 6)
points(1:7, 7:1 - 2.1, col = IMSCOL[, 4], pch = 19, cex = 6)
```

infant_mortality_2022 *United States 2022 infant mortality and number of physicians by state, including the District of Columbia.*

Description

Infant mortality data extracted from September 2023 posting of US Centers for Disease Control and Prevention. Mortality data for 2022 is listed as provisional and is subject to change. Physician data extracted from table 16 of Health United States 2019, National Center for Health Statistics (US) and represents number of physicians in patient care per 100,000 resident population in 2018, by state.

Usage

```
infant_mortality_2022
```

Format

A data frame with 51 rows and 3 columns.

state_name Character vector vector, US State including the District of Columbia

infant_mortality_rate Numeric vector, number of deaths per 1000 live births between 1 day and 1 year of age

doctors Numeric, number of physicians in patient care per 100,000 population

Source

https://www.cdc.gov/nchs/state-stats/deaths/infant-mortality.html?CDC_AAref_Val=https://www.cdc.gov/nchs/pressroom/sosmap/infant_mortality_rates/infant_mortality.htm, <https://www.ncbi.nlm.nih.gov/books/NBK569310/table/ch2.tab16/>

infmortrate	<i>Infant Mortality Rates, 2012</i>
-------------	-------------------------------------

Description

This entry gives the number of deaths of infants under one year old in 2012 per 1,000 live births in the same year. This rate is often used as an indicator of the level of health in a country.

Usage

```
infmortrate
```

Format

A data frame with 222 observations on the following 2 variables.

country Name of country.

inf_mort_rate Infant mortality rate per 1,000 live births.

Details

The data is given in decreasing order of infant mortality rates. There are a few potential outliers.

Source

CIA World Factbook, <https://www.cia.gov/the-world-factbook/field/infant-mortality-rate/country-comparison>.

Examples

```
library(ggplot2)

ggplot(infmortrate, aes(x = inf_mort_rate)) +
  geom_histogram(binwidth = 10)

ggplot(infmortrate, aes(x = inf_mort_rate)) +
  geom_density()
```

iowa

iowa

Description

A data frame containing information about the 2016 US Presidential Election for the state of Iowa.

Usage

```
iowa
```

Format

A data frame with 1386 observations on the following 5 variables.

office The office that the candidates were running for.

candidate President/Vice President pairs who were running for office.

party Political part of the candidate.

county County in Iowa where the votes were cast.

votes Number of votes received by the candidate.

Examples

```
library(ggplot2)
library(dplyr)

plot_data <- iowa |>
  filter(candidate != "Total") |>
  group_by(candidate) |>
  summarize(total_votes = sum(votes) / 1000)

ggplot(plot_data, aes(total_votes, candidate)) +
  geom_col() +
  theme_minimal() +
  labs(
    title = "2016 Presidential Election in Iowa",
    subtitle = "Popular vote",
    y = "",
    x = "Number of Votes (in thousands)"
  )
```

ipo

Facebook, Google, and LinkedIn IPO filings

Description

On Feb 1st, 2011, Facebook Inc. filed an S-1 form with the Securities and Exchange Commission as part of their initial public offering (IPO). This dataset includes the text of that document as well as text from the IPOs of two competing companies: Google and LinkedIn.

Usage

ipo

Format

The format is a list of three character vectors. Each vector contains the line-by-line text of the IPO Prospectus of Facebook, Google, and LinkedIn, respectively.

Details

Each of the three prospectuses is encoded in UTF-8 format and contains some non-word characters related to the layout of the original documents. For analysis on the words, it is recommended that the data be processed with packages such as [tidytext](#). See examples below.

Source

All IPO prospectuses are available from the U.S. Securities and Exchange Commission: [Facebook](#), [Google](#), [LinkedIn](#).

References

Zweig, J., 2020. Mark Zuckerberg: CEO For Life?. WSJ.

Examples

```
library(tidytext)
library(tibble)
library(dplyr)
library(ggplot2)
library(forcats)

# Analyzing Facebook IPO text

facebook <- tibble(text = ipo$facebook, company = "Facebook")

facebook |>
  unnest_tokens(word, text) |>
  anti_join(stop_words) |>
  count(word, sort = TRUE) |>
```

```

slice_head(n = 20) |>
ggplot(aes(y = fct_reorder(word, n), x = n, fill = n)) +
geom_col() +
labs(
  title = "Top 20 most common words in Facebook IPO",
  x = "Frequency",
  y = "Word"
)

# Comparisons to Google and LinkedIn IPO texts

google <- tibble(text = ipo$google, company = "Google")
linkedin <- tibble(text = ipo$linkedin, company = "LinkedIn")

ipo_texts <- bind_rows(facebook, google, linkedin)

ipo_texts |>
  unnest_tokens(word, text) |>
  count(company, word, sort = TRUE) |>
  bind_tf_idf(word, company, n) |>
  arrange(desc(tf_idf)) |>
  group_by(company) |>
  slice_max(tf_idf, n = 15) |>
  ungroup() |>
  ggplot(aes(tf_idf, fct_reorder(word, tf_idf), fill = company)) +
  geom_col(show.legend = FALSE) +
  facet_wrap(~company, ncol = 3, scales = "free") +
  labs(x = "tf-idf", y = NULL)

```

ipod	<i>Length of songs on an iPod</i>
------	-----------------------------------

Description

A simulated dataset on lengths of songs on an iPod.

Usage

```
ipod
```

Format

A data frame with 3000 observations on the following variable.

song_length Length of song (in minutes).

Source

Simulated data.

Examples

```
library(ggplot2)

ggplot(ipod, aes(x = song_length)) +
  geom_histogram(binwidth = 0.5)
```

iran

*iran***Description**

A data frame containing information about the 2009 Presidential Election in Iran. There were widespread claims of election fraud in this election both internationally and within Iran.

Usage

```
iran
```

Format

A data frame with 366 observations on the following 9 variables.

province Iranian province where votes were cast.

city City within province where votes were cast.

ahmadinejad Number of votes received by Ahmadinejad.

rezai Number of votes received by Rezai.

karrubi Number of votes received by Karrubi.

mousavi Number of votes received by Mousavi.

total_votes_cast Total number of votes cast.

voided_votes Number of votes that were not counted.

legitimate_votes Number of votes that were counted.

Examples

```
library(dplyr)
library(ggplot2)
library(tidyr)
library(stringr)

plot_data <- iran |>
  summarize(
    ahmadinejad = sum(ahmadinejad) / 1000,
    rezai = sum(rezai) / 1000,
    karrubi = sum(karrubi) / 1000,
    mousavi = sum(mousavi) / 1000
  ) |>
```

```
pivot_longer(
  cols = c(ahmadinejad, rezai, karrubi, mousavi),
  names_to = "candidate",
  values_to = "votes"
) |>
mutate(candidate = str_to_title(candidate))

ggplot(plot_data, aes(votes, candidate)) +
  geom_col() +
  theme_minimal() +
  labs(
    title = "2009 Iranian Presidential Election",
    x = "Number of votes (in thousands)",
    y = ""
  )
```

jury	<i>Simulated juror dataset</i>
------	--------------------------------

Description

Simulated dataset of registered voters proportions and representation on juries.

Usage

jury

Format

A data frame with 275 observations on the following variable.

race a factor with levels black hispanic other white

Examples

jury

kobe_basket	<i>Kobe Bryant basketball performance</i>
-------------	---

Description

Data from the five games the Los Angeles Lakers played against the Orlando Magic in the 2009 NBA finals.

Usage

kobe_basket

Format

A data frame with 133 rows and 6 variables:

vs A categorical vector, ORL if the Los Angeles Lakers played against Orlando

game A numerical vector, game in the 2009 NBA finals

quarter A categorical vector, quarter in the game, OT stands for overtime

time A character vector, time at which Kobe took a shot

description A character vector, description of the shot

shot A categorical vector, H if the shot was a hit, M if the shot was a miss

Details

Each row represents a shot Kobe Bryant took during the five games of the 2009 NBA finals. Kobe Bryant's performance earned him the title of Most Valuable Player and many spectators commented on how he appeared to show a hot hand.

labor_market_discrimination

Are Emily and Greg More Employable Than Lakisha and Jamal?

Description

Original data from the experiment run by Bertrand and Mullainathan (2004).

Usage

labor_market_discrimination

Format

A tibble with 4870 observations of 63 variables.

education Highest education, with levels of 0 = not reported; 1 = high school diploma; 2 = high school graduate; 3 = some college; 4 = college or more.

n_jobs Number of jobs listed on resume.

years_exp Number of years of work experience on the resume.

honors Indicator variable for which 1 = resume mentions some honors.

volunteer Indicator variable for which 1 = resume mentions some volunteering experience.

military Indicator variable for which 1 = resume mentions some military experience.

emp_holes Indicator variable for which 1 = resume mentions some employment holes.

- occup_specific** 1990 Census Occupation Code. See sources for a key.
- occup_broad** Occupation broad with levels 1 = executives and managerial occupations, 2 = administrative supervisors, 3 = sales representatives, 4 = sales workers, 5 = secretaries and legal assistants, 6 = clerical occupations
- work_in_school** Indicator variable for which 1 = resume mentions some work experience while at school
- email** Indicator variable for which 1 = email address on applicant's resume.
- computer_skills** Indicator variable for which 1 = resume mentions some computer skills.
- special_skills** Indicator variable for which 1 = resume mentions some special skills.
- first_name** Applicant's first name.
- sex** Sex, with levels of 'f' = female; 'm' = male.
- race** Race, with levels of 'b' = black; 'w' = white.
- h** Indicator variable for which 1 = high quality resume.
- l** Indicator variable for which 1 = low quality resume.
- call** Indicator variable for which 1 = applicant was called back.
- city** City, with levels of 'c' = chicago; 'b' = boston.
- kind** Kind, with levels of 'a' = administrative; 's' = sales.
- ad_id** Employment ad identifier.
- frac_black** Fraction of blacks in applicant's zip.
- frac_white** Fraction of whites in applicant's zip.
- l_med_hh_inc** Log median household income in applicant's zip.
- frac_dropout** Fraction of high-school dropouts in applicant's zip.
- frac_colp** Fraction of college degree or more in applicant's zip
- l_inc** Log per capita income in applicant's zip.
- col** Indicator variable for which 1 = applicant has college degree or more.
- expminreq** Minimum experience required, if any (in years when numeric).
- school_req** Specific education requirement, if any. 'hsg' = high school graduate, 'somcol' = some college, 'colp' = four year degree or higher
- eo** Indicator variable for which 1 = ad mentions employer is 'Equal Opportunity Employer'.
- parent_sales** Sales of parent company (in millions of US \$).
- parent_emp** Number of parent company employees.
- branch_sales** Sales of branch (in millions of US \$).
- branch_emp** Number of branch employees.
- fed** Indicator variable for which 1 = employer is a federal contractor.
- frac_black_emp_zip** Fraction of blacks in employers's zipcode.
- frac_white_emp_zip** Fraction of whites in employer's zipcode.
- l_med_hh_inc_emp_zip** Log median household income in employer's zipcode.
- frac_dropout_emp_zip** Fraction of high-school dropouts in employer's zipcode.

frac_colp_emp_zip Fraction of college degree or more in employer's zipcode.

l_inc_emp_zip Log per capita income in employer's zipcode.

manager Indicator variable for which 1 = executives or managers wanted.

supervisor Indicator variable for which 1 = administrative supervisors wanted.

secretary Indicator variable for which 1 = secretaries or legal assistants wanted.

off_support Indicator variable for which 1 = clerical workers wanted.

sales_rep Indicator variable for which 1 = sales representative wanted.

retail_sales Indicator variable for which 1 = retail sales worker wanted.

req Indicator variable for which 1 = ad mentions any requirement for job.

exp_req Indicator variable for which 1 = ad mentions some experience requirement.

com_req Indicator variable for which 1 = ad mentions some communication skills requirement.

educ_req Indicator variable for which 1 = ad mentions some educational requirement.

comp_req Indicator variable for which 1 = ad mentions some computer skill requirement.

org_req Indicator variable for which 1 = ad mentions some organizational skills requirement.

manuf Indicator variable for which 1 = employer industry is manufacturing.

trans_com Indicator variable for which 1 = employer industry is transport or communication.

bank_real Indicator variable for which 1 = employer industry is finance, insurance or real estate.

trade Indicator variable for which 1 = employer industry is wholesale or retail trade.

bus_service Indicator variable for which 1 = employer industry is business or personal services.

oth_service Indicator variable for which 1 = employer industry is health, education or social services.

miss_ind Indicator variable for which 1 = employer industry is other or unknown.

ownership Ownership status of employer, with levels of 'non-profit'; 'private'; 'public'

Details

From the summary: "We study race in the labor market by sending fictitious resumes to help-wanted ads in Boston and Chicago newspapers. To manipulate perceived race, resumes are randomly assigned African-American- or White-sounding names. White names receive 50 percent more callbacks for interviews. Callbacks are also more responsive to resume quality for White names than for African-American ones. The racial gap is uniform across occupation, industry, and employer size. We also find little evidence that employers are inferring social class from the names. Differential treatment by race still appears to be prominent in the U. S. labor market."

Source

Bertrand, Marianne, and Mullainathan, Sendhil. Replication data for: Are Emily and Greg More Employable Than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination. Nashville, TN: American Economic Association [publisher], 2004. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2019-12-06. [doi:10.3886/E116023V1](https://doi.org/10.3886/E116023V1).

NBER Working Papers

1990 Census Occupation Codes

Note: The description of the variables follows closely the labels provided in the original dataset, with small edits for clarity.

Examples

```
library(dplyr)

# Percent callback for typical White names and typical African-American names (table 1, p. 997)

labor_market_discrimination |>
  group_by(race) |>
  summarise(call_back = mean(call))
```

lab_report

*lab_report***Description**

Acts as a simplified template to common parameters passed to `rmarkdown::html_document()`.

Usage

```
lab_report(
  highlight = "pygments",
  theme = "spacelab",
  toc = TRUE,
  toc_float = TRUE,
  code_download = TRUE,
  code_folding = "show"
)
```

Arguments

highlight	Syntax highlighting style. Supported styles include "default", "tango", "pygments", "kate", "monochrome", "espresso", "zenburn", "haddock", and "textmate". Pass NULL to prevent syntax highlighting.
theme	Visual theme ("default", "cerulean", "journal", "flatly", "readable", "spacelab", "united", "cosmo", "lumen", "paper", "sandstone", "simplex", or "yeti"). Pass NULL for no theme (in this case you can use the <code>css</code> parameter to add your own styles).
toc	TRUE to include a table of contents in the output
toc_float	TRUE to float the table of contents to the left of the main document content. Rather than TRUE you may also pass a list of options that control the behavior of the floating table of contents. See the <i>Floating Table of Contents</i> section below for details.
code_download	Embed the Rmd source code within the document and provide a link that can be used by readers to download the code.

code_folding Enable document readers to toggle the display of R code chunks. Specify "none" to display all code chunks (assuming they were knit with `echo = TRUE`). Specify "hide" to hide all R code chunks by default (users can show hidden code chunks either individually or document-wide). Specify "show" to show all R code chunks by default.

LAhomes

LAhomes

Description

Data collected by Andrew Bray at Reed College on characteristics of LA Homes in 2010.

Usage

LAhomes

Format

A data frame with 1594 observations on the following 8 variables.

city City where the home is located.

type Type of home with levels Condo/Twh - condo or townhouse, SFR - single family residence, and NA

bed Number of bedrooms in the home.

bath Number of bathrooms in the home.

garage Number of cars that can be parked in the garage. Note that a value of 4 refers to 4 or more garage spaces.

sqft Squarefootage of the home.

pool Indicates if the home has a pool.

price Listing price of the home.

Examples

```
library(ggplot2)

ggplot(LAhomes, aes(sqft, price)) +
  geom_point(alpha = 0.2) +
  theme_minimal() +
  labs(
    title = "Can we predict list price from squarefootage?",
    subtitle = "Homes in the Los Angeles area",
    x = "Square feet",
    y = "List price"
  )
```

law_resume

*Gender, Socioeconomic Class, and Interview Invites***Description**

Resumes were sent out to 316 top law firms in the United States, and there were two randomized characteristics of each resume. First, the gender associated with the resume was randomized by assigning a first name of either James or Julia. Second, the socioeconomic class of the candidate was randomly assigned and represented through five minor changes associated with personal interests and other other minor details (e.g. an extracurricular activity of sailing team vs track and field). The outcome variable was whether the candidate was received an interview.

Usage

law_resume

Format

A data frame with 316 observations on the following 3 variables. Each row represents a resume sent a top law firm for this experiment.

class The resume represented irrelevant details suggesting either "low" or "high" socioeconomic class.

gender The resume implied the candidate was either "male" or "female".

outcome If the candidate received an invitation for an "interview" or "not".

Source

For a casual overview, see <https://hbr.org/2016/12/research-how-subtle-class-cues-can-backfire-on-your-re>

For the academic paper, see Tilcsik A, Rivera LA. 2016. Class Advantage, Commitment Penalty. The Gendered Effect of Social Class Signals in an Elite Labor Market. American Sociological Review 81:6 p1097-1131. doi:10.1177/0003122416668154.

Examples

```
tapply(law_resume$outcome == "interview", law_resume[, c("class", "gender")], mean)
m <- glm(I(outcome == "interview") ~ gender * class, data = law_resume, family = binomial)
summary(m)
predict(m, type = "response")
```

LEAP

Patient level data on the randomized trial Learning Early About Peanut (LEAP) allergies.

Description

This study examined whether early exposure to peanuts increased tolerance and protection from developing a peanut allergy in children who are allergic to eggs or who have severe eczema. Participants between 4 and 11 months old were randomized to either avoid versus consume peanut based products during the first three years of life. The longer title of the study is Induction of Tolerance Through Early Introduction of Peanut in High-Risk Children and can be found in <https://clinicaltrials.gov/> as study NCT00329784.

Usage

LEAP

Format

A data frame with 640 rows and 7 columns

`participant.ID` Character vector, unique identifier for each participant.

`stratum` Factor, outcome of a skin prick test (SPT) conducted before randomization, with levels SPT-Negative, participant shows no evidence of peanut allergy, and SPT-Positive, evidence of a peanut allergy. Participants were randomized separately within each stratum. The primary analysis of the study is typically restricted to the SPT-Negative group.

`treatment.group` Factor, randomized assignment for each participant, with levels Peanut Avoidance and Peanut Consumption.

`age.months` Participant age in months at randomization.

`sex` Factor, sex of participant with levels Female and Male

`primary.ethnicity` Factor variable with levels Asian, Black, Other, Mixed, and White.

`overall.V60.outcome` Factor, indicating whether after 5 years, the participant had an allergic reaction in the OFC, with levels for having a reaction to a peanut based oral food challenge, with levels (FAIL OFC) (allergic reaction), (PASS OFC) (no allergic reaction)

Details

More variables are available at the site in the source.

Source

These data are a subset of variables from the file ADSTART0_2015-03-03_14-20-10.txt, available by downloading study files from <https://www.immport.org/shared/study/SDY660>

References

Du Toit, George, et al. "Randomized trial of peanut consumption in infants at risk for peanut allergy." *New England Journal of Medicine* 372.9 (2015): 803-813. doi 10.1056/nejmoa1414850

lecture_learning

Lecture Delivery Method and Learning Outcomes

Description

Data was collected from 276 students in a university psychology course to determine the effect of lecture delivery method on learning. Students were presented a live lecture by the professor on one day and a pre-recorded lecture on a different topic by the same professor on a different day. Survey data was collected during the lectures to determine mind wandering, interest, and motivation. Students were also ultimately asked about the preferred lecture delivery method. Finally, students completed an assessment at the end of the lecture to determine memory recall.

Usage

lecture_learning

Format

A data frame with 552 rows and 8 variables.

student Identification number of a specific student. Each identification appears twice because same student heard both lecture delivery methods.

gender Gender of student. Recorded a binary variable with levels Male and Female in the study.

method Delivery method of lecture was either in-person(Live) or pre-recorded(Video).

mindwander An indicator of distraction during the lecture. It is a proportion of six mind wandering probes during the lecture when a student answered yes that mind wandering had just occurred.

memory An indicator of recall of information provided during the lecture. It is the proportion of correct answers in a six question assessment given at the end of the lecture presentation.

interest A Likert scale that gauged student interest level concerning the lecture.

motivation_both After experiencing both lecture delivery methods, students were asked about which method they were most motivated to remain attentive.

motivation_single After a single lecture delivery experience, this Likert scale was used to gauge motivation to remain attentive during the lecture.

Source

PLOS One

Examples

```

library(dplyr)
library(ggplot2)

# Calculate the average memory test proportion by lecture delivery method
# and gender.
lecture_learning |>
  group_by(method, gender) |>
  summarize(average_memory = mean(memory), count = n(), .groups = "drop")

# Compare visually the differences in memory test proportions by delivery
# method and gender.
ggplot(lecture_learning, aes(x = method, y = memory, fill = gender)) +
  geom_boxplot() +
  theme_minimal() +
  labs(
    title = "Difference in memory test proportions",
    x = "Method",
    y = "Memory",
    fill = "Gender"
  )

# Use a paired t-test to determine whether memory test proportion score
# differed by delivery method. Note that paired t-tests are identical
# to one sample t-test on the difference between the Live and Video methods.
learning_diff <- lecture_learning |>
  tidyr::pivot_wider(id_cols = student, names_from = method, values_from = memory) |>
  mutate(time_diff = Live - Video)
t.test(time_diff ~ 1, data = learning_diff)

# Calculating the proportion of students who were most motivated to remain
# attentive in each delivery method.
lecture_learning |>
  count(motivation_both) |>
  mutate(proportion = n / sum(n))

```

lego_population	<i>Population of Lego Sets for Sale between Jan. 1, 2018 and Sept. 11, 2020.</i>
-----------------	--

Description

Data about Lego Sets for sale. Based on JSDSE article by Anna Peterson and Laura Ziegler Data from their article was scrapped from multiple sources including brickset.com

Usage

```
lego_population
```

Format

A data frame with 1304 rows and 14 variables.

item_number Set Item number

set_name Name of the set.

theme Set theme: Duplo, City or Friends.

pieces Number of pieces in the set.

price Recommended retail price from LEGO.

amazon_price Price of the set at Amazon.

year Year that it was produced.

ages LEGO's recommended ages of children for the set

pages Pages in the instruction booklet.

minifigures Number of LEGO people in the data, if unknown "NA" was recorded.

packaging Type of packaging: bag, box, etc.

weight Weight of the set of LEGOS in pounds and kilograms.

unique_pieces Number of pieces classified as unique in the instruction manual.

size Size of the lego pieces: Large if safe for small children and Small for older children.

Source

Peterson, A. D., & Ziegler, L. (2021). Building a multiple linear regression model with LEGO brick data. *Journal of Statistics and Data Science Education*, 29(3), 1-7. doi:10.1080/26939169.2021.1946450

BrickInstructions.com. (n.d.). Retrieved February 2, 2021 from

Brickset. (n.d.). BRICKSET: Your LEGO® set guide. Retrieved February 2, 2021 from

Examples

```
library(ggplot2)
library(dplyr)

lego_population |>
  filter(theme == "Friends" | theme == "City") |>
  ggplot(aes(x = pieces, y = amazon_price)) +
  geom_point(alpha = 0.3) +
  labs(
    x = "Pieces in the Set",
    y = "Amazon Price",
    title = "Amazon Price vs Number of Pieces in Lego Sets",
    subtitle = "Friends and City Themes"
  )
```


lego_sample

*Sample of Lego Sets***Description**

Data about Lego Sets for sale. Based on JSDSE article by Anna Peterson and Laura Ziegler Data from their article was scrapped from multiple sources including brickset.com

Usage

lego_sample

Format

A data frame with 75 rows and 15 variables.

item_number Set Item number

set_name Name of the set.

theme Set theme: Duplo, City or Friends.

pieces Number of pieces in the set.

price Recommended retail price from LEGO.

amazon_price Price of the set at Amazon.

year Year that it was produced.

ages LEGO's recommended ages of children for the set

pages Pages in the instruction booklet.

minifigures Number of LEGO people in the data, if unknown "NA" was recorded.

packaging Type of packaging: bag, box, etc.

weight Weight of the set of LEGOS in pounds and kilograms.

unique_pieces Number of pieces classified as unique in the instruction manual.

size Size of the lego pieces: Large if safe for small children and Small for older children.

Source

Peterson, A. D., & Ziegler, L. (2021). Building a multiple linear regression model with LEGO brick data. *Journal of Statistics and Data Science Education*, 29(3), 1-7. doi:10.1080/26939169.2021.1946450

BrickInstructions.com. (n.d.). Retrieved February 2, 2021 from

Brickset. (n.d.). BRICKSET: Your LEGO® set guide. Retrieved February 2, 2021 from

Examples

```
library(ggplot2)
library(dplyr)

lego_sample |>
  filter(theme == "Friends" | theme == "City") |>
  ggplot(aes(x = pieces, y = amazon_price)) +
  geom_point(alpha = 0.3) +
  labs(
    x = "Pieces in the Set",
    y = "Amazon Price",
    title = "Amazon Price vs Number of Pieces in Lego Sets",
    subtitle = "Friends and City Themes"
  )
```

leg_mari

Legalization of Marijuana Support in 2010 California Survey

Description

In a 2010 Survey USA poll, 70% of the 119 respondents between the ages of 18 and 34 said they would vote in the 2010 general election for Prop 19, which would change California law to legalize marijuana and allow it to be regulated and taxed.

Usage

```
leg_mari
```

Format

A data frame with 119 observations on the following variable.

response One of two values: oppose or support.

Source

Survey USA, Election Poll #16804, data collected July 8-11, 2010.

Examples

```
table(leg_mari)
```

life_exp	<i>life_exp</i>
----------	-----------------

Description

A data frame with 3142 rows and 4 columns. County level data for life expectancy and median income in the United States.

Usage

```
life_exp
```

Format

A data frame with 3142 observations on the following 4 variables.

state Name of the state.

county Name of the county.

expectancy Life expectancy in the county.

income Median income in the county, measured in US \$.

Examples

```
library(ggplot2)

# Income V Expectancy
ggplot(life_exp, aes(x = income, y = expectancy)) +
  geom_point(color = openintro::IMSCOL["green", "full"], alpha = 0.2) +
  theme_minimal() +
  labs(
    title = "Is there a relationship between median income and life expectancy?",
    x = "Median income (US $)",
    y = "Life Expectancy (year)"
  )
```

linResPlot	<i>Create simple regression plot with residual plot</i>
------------	---

Description

Create a simple regression plot with residual plot.

Usage

```
linResPlot(
  x,
  y,
  axes = FALSE,
  wBox = TRUE,
  wLine = TRUE,
  lCol = "#00000088",
  lty = 1,
  lwd = 1,
  main = "",
  xlab = "",
  ylab = "",
  marRes = NULL,
  col = fadeColor(4, "88"),
  pch = 20,
  cex = 1.5,
  yR = 0.1,
  ylim = NULL,
  subset = NULL,
  ...
)
```

Arguments

<code>x</code>	Predictor variable.
<code>y</code>	Outcome variable.
<code>axes</code>	Whether to plot axis labels.
<code>wBox</code>	Whether to plot boxes around each plot.
<code>wLine</code>	Add a regression line.
<code>lCol</code>	Line color.
<code>lty</code>	Line type.
<code>lwd</code>	Line width.
<code>main</code>	Title for the top plot.
<code>xlab</code>	x-label.
<code>ylab</code>	y-label.
<code>marRes</code>	Margin for the residuals plot.
<code>col</code>	Color of the points.
<code>pch</code>	Plotting character of points.
<code>cex</code>	Size of points.
<code>yR</code>	An additional vertical stretch factor on the plot.
<code>ylim</code>	y-limits.
<code>subset</code>	Boolean vector, if wanting a subset of the data.
<code>...</code>	Additional arguments passed to both plots.

See Also[makeTube](#)**Examples**

```
# Currently seems broken for this example.
n <- 25
x <- runif(n)
y <- 5 * x + rnorm(n)
myMat <- rbind(matrix(1:2, 2))
myW <- 1
myH <- c(1, 0.45)
par(mar = c(0.35, 0.654, 0.35, 0.654))
layout(myMat, myW, myH)
linResPlot(x, y, col = COL[1, 2])
```

lizard_habitat

*Field data on lizards observed in their natural habitat***Description**

Data on here lizard was observed and the level of sunlight. The data are collected on *Sceloporus occidentalis* (western fence lizards) by Stephen C. Adolph in 1983 (in desert and mountain sites) and by Dee Asbury in 2002-3 (in valley site).

Usage

```
lizard_habitat
```

Format

A data frame with 332 observations on the following 2 variables.

site Site of lizard observation: desert, mountain, or valley.

sunlight Sunlight level at time of observation: sun (lizard was observed perching in full sunlight), partial (lizard was observed perching with part of its body in the sun, part in the shade), shade (lizard was observed perching in the shade).

Source

Adolph, S. C. 1990. Influence of behavioral thermoregulation on microhabitat use by two *Sceloporus* lizards. *Ecology* 71: 315-327. Asbury, D.A., and S. C. Adolph. 2007. Behavioral plasticity in an ecological generalist: microhabitat use by western fence lizards. *Evolutionary Ecology Research* 9:801-815.

Examples

```
library(ggplot2)

# Frequencies
table(lizard_habitat)

# Stacked bar plots
ggplot(lizard_habitat, aes(y = site, fill = sunlight)) +
  geom_bar(position = "fill") +
  labs(x = "Proportion")
```

lizard_run

*Lizard speeds***Description**

Data on top speeds measured on a laboratory race track for two species of lizards: Western fence lizard (*Sceloporus occidentalis*) and Sagebrush lizard (*Sceloporus graciosus*).

Usage

```
lizard_run
```

Format

A data frame with 48 observations on the following 3 variables.

top_speed Top speed of lizard, meters per second.

common_name Common name: Western fence lizard and Sagebrush lizard.

scientific_name Scientific name (Genus and species): *Sceloporus occidentalis* and *Sceloporus graciosus*.

Source

Adolph, S. C. 1987. Physiological and behavioral ecology of the lizards *Sceloporus occidentalis* and *Sceloporus graciosus*. Dissertation. University of Washington, Seattle, Washington, USA.

Examples

```
library(ggplot2)
library(dplyr)

# Top speed by species
ggplot(lizard_run, aes(x = top_speed, color = common_name, fill = common_name)) +
  geom_density(alpha = 0.5)

# Top speed summary statistics by species
lizard_run |>
  group_by(common_name) |>
```

```
summarise(  
  n      = n(),  
  mean   = mean(top_speed),  
  sd     = sd(top_speed)  
)
```

lmPlot*Linear regression plot with residual plot*

Description

Plot data, the linear model, and a residual plot simultaneously.

Usage

```
lmPlot(  
  x,  
  y,  
  xAxis = 0,  
  yAxis = 4,  
  resAxis = 3,  
  resSymm = TRUE,  
  wBox = TRUE,  
  wLine = TRUE,  
  lCol = "#00000088",  
  lty = 1,  
  lwd = 1,  
  xlab = "",  
  ylab = "",  
  marRes = NULL,  
  col = "#22558888",  
  pch = 20,  
  cex = 1.5,  
  xR = 0.02,  
  yR = 0.1,  
  xlim = NULL,  
  ylim = NULL,  
  subset = NULL,  
  parCustom = FALSE,  
  myHeight = c(1, 0.45),  
  plots = c("both", "mainOnly", "resOnly"),  
  highlight = NULL,  
  hlCol = NULL,  
  hlCex = 1.5,  
  hlPch = 20,  
  na.rm = TRUE,  
  ...  
)
```

Arguments

<code>x</code>	The x coordinates of points in the plot.
<code>y</code>	The y coordinates of points in the plot.
<code>xAxis</code>	The maximum number of x axis labels.
<code>yAxis</code>	The maximum number of y axis labels.
<code>resAxis</code>	The maximum number of y axis labels in the residual plot.
<code>resSymm</code>	Boolean determining whether the range of the residual plot should be symmetric about zero.
<code>wBox</code>	Boolean determining whether a box should be added around each plot.
<code>wLine</code>	Boolean determining whether to add a regression line to the plot.
<code>lCol</code>	The color of the regression line to be added.
<code>lty</code>	The line type of the regression line to be added.
<code>lwd</code>	The line width of the regression line to be added.
<code>xlab</code>	A label for the x axis.
<code>ylab</code>	A label for the y axis
<code>marRes</code>	Margin specified for the residuals.
<code>col</code>	Color of points.
<code>pch</code>	Plotting character.
<code>cex</code>	Plotting character size.
<code>xR</code>	Scaling the limits of the x axis. Ignored if <code>xlim</code> specified.
<code>yR</code>	Scaling the limits of the y axis. Ignored if <code>ylim</code> specified.
<code>xlim</code>	Limits for the x axis.
<code>ylim</code>	Limits for the y axis.
<code>subset</code>	A subset of the data to be used for the linear model.
<code>parCustom</code>	If TRUE, then the plotting margins are not modified automatically. This value should also be TRUE if the plots are being placed within a plot of multiple panels.
<code>myHeight</code>	A numerical vector of length 2 representing the ratio of the primary plot to the residual plot, in height.
<code>plots</code>	Not currently utilized.
<code>highlight</code>	Numerical vector specifying particular points to highlight.
<code>hlCol</code>	Color of highlighted points.
<code>hlCex</code>	Size of highlighted points.
<code>hlPch</code>	Plotting characters of highlighted points.
<code>na.rm</code>	Remove cases with NA values.
<code>...</code>	Additional arguments to plot.

Author(s)

David Diez

See Also[makeTube](#)**Examples**

```
lmPlot(satgpa$sat_sum, satgpa$fy_gpa)

lmPlot(gradestv$tv, gradestv$grades,
  xAxis = 4,
  xlab = "time watching TV", yR = 0.2, highlight = c(1, 15, 20)
)
```

loans_full_schema	<i>Loan data from Lending Club</i>
-------------------	------------------------------------

Description

This dataset represents thousands of loans made through the Lending Club platform, which is a platform that allows individuals to lend to other individuals. Of course, not all loans are created equal. Someone who is a essentially a sure bet to pay back a loan will have an easier time getting a loan with a low interest rate than someone who appears to be riskier. And for people who are very risky? They may not even get a loan offer, or they may not have accepted the loan offer due to a high interest rate. It is important to keep that last part in mind, since this dataset only represents loans actually made, i.e. do not mistake this data for loan applications!

Usage

```
loans_full_schema
```

Format

A data frame with 10,000 observations on the following 55 variables.

emp_title Job title.

emp_length Number of years in the job, rounded down. If longer than 10 years, then this is represented by the value 10.

state Two-letter state code.

homeownership The ownership status of the applicant's residence.

annual_income Annual income.

verified_income Type of verification of the applicant's income.

debt_to_income Debt-to-income ratio.

annual_income_joint If this is a joint application, then the annual income of the two parties applying.

verification_income_joint Type of verification of the joint income.

debt_to_income_joint Debt-to-income ratio for the two parties.

delinq_2y Delinquencies on lines of credit in the last 2 years.

months_since_last_delinq Months since the last delinquency.

earliest_credit_line Year of the applicant's earliest line of credit

inquiries_last_12m Inquiries into the applicant's credit during the last 12 months.

total_credit_lines Total number of credit lines in this applicant's credit history.

open_credit_lines Number of currently open lines of credit.

total_credit_limit Total available credit, e.g. if only credit cards, then the total of all the credit limits. This excludes a mortgage.

total_credit_utilized Total credit balance, excluding a mortgage.

num_collections_last_12m Number of collections in the last 12 months. This excludes medical collections.

num_historical_failed_to_pay The number of derogatory public records, which roughly means the number of times the applicant failed to pay.

months_since_90d_late Months since the last time the applicant was 90 days late on a payment.

current_accounts_delinq Number of accounts where the applicant is currently delinquent.

total_collection_amount_ever The total amount that the applicant has had against them in collections.

current_installment_accounts Number of installment accounts, which are (roughly) accounts with a fixed payment amount and period. A typical example might be a 36-month car loan.

accounts_opened_24m Number of new lines of credit opened in the last 24 months.

months_since_last_credit_inquiry Number of months since the last credit inquiry on this applicant.

num_satisfactory_accounts Number of satisfactory accounts.

num_accounts_120d_past_due Number of current accounts that are 120 days past due.

num_accounts_30d_past_due Number of current accounts that are 30 days past due.

num_active_debit_accounts Number of currently active bank cards.

total_debit_limit Total of all bank card limits.

num_total_cc_accounts Total number of credit card accounts in the applicant's history.

num_open_cc_accounts Total number of currently open credit card accounts.

num_cc_carrying_balance Number of credit cards that are carrying a balance.

num_mort_accounts Number of mortgage accounts.

account_never_delinq_percent Percent of all lines of credit where the applicant was never delinquent.

tax_liens a numeric vector

public_record_bankrupt Number of bankruptcies listed in the public record for this applicant.

loan_purpose The category for the purpose of the loan.

application_type The type of application: either individual or joint.

loan_amount The amount of the loan the applicant received.

term The number of months of the loan the applicant received.

interest_rate Interest rate of the loan the applicant received.

installment Monthly payment for the loan the applicant received.

grade Grade associated with the loan.

sub_grade Detailed grade associated with the loan.

issue_month Month the loan was issued.

loan_status Status of the loan.

initial_listing_status Initial listing status of the loan. (I think this has to do with whether the lender provided the entire loan or if the loan is across multiple lenders.)

disbursement_method Disbursement method of the loan.

balance Current balance on the loan.

paid_total Total that has been paid on the loan by the applicant.

paid_principal The difference between the original loan amount and the current balance on the loan.

paid_interest The amount of interest paid so far by the applicant.

paid_late_fees Late fees paid by the applicant.

Source

This data comes from Lending Club, which provided a very large, open set of data on the people who received loans through their platform. This company has rebranded to Happen Bank as of April 2026.

Examples

loans_full_schema

london_boroughs	<i>London Borough Boundaries</i>
-----------------	----------------------------------

Description

This dataset contains the coordinates of the boundaries of all 32 boroughs of the Greater London area.

Usage

london_boroughs

Format

A data frame with 45341 observations on the following 3 variables.

borough Name of the borough.

x The "easting" component of the coordinate, see details.

y The "northing" component of the coordinate, see details.

Details

Map data was made available through the Ordnance Survey Open Data initiative. The data use the **National Grid** coordinate system, based upon eastings (x) and northings (y) instead of longitude and latitude.

The name variable covers all 32 boroughs in Greater London: Barking & Dagenham, Barnet, Bexley, Brent, Bromley, Camden, Croydon, Ealing, Enfield, Greenwich, Hackney, Hammersmith & Fulham, Haringey, Harrow, Havering, Hillingdon, Hounslow, Islington, Kensington & Chelsea, Kingston, Lambeth, Lewisham, Merton, Newham, Redbridge, Richmond, Southwark, Sutton, Tower Hamlets, Waltham Forest, Wandsworth, Westminster

Source

<https://data.london.gov.uk/dataset/ordnance-survey-code-point>

Contains Ordnance Survey data released under the **Open Government License, OGL v2**.

See Also

london_murders

Examples

```
library(dplyr)
library(ggplot2)

# Calculate number of murders by borough
london_murders_counts <- london_murders |>
  group_by(borough) |>
  add_tally()

london_murders_counts
## Not run:
# Add number of murders to geographic boundary data
london_boroughs_murders <- inner_join(london_boroughs, london_murders_counts, by = "borough")

# Map murders
ggplot(london_boroughs_murders) +
  geom_polygon(aes(x = x, y = y, group = borough, fill = n), colour = "white") +
  scale_fill_distiller(direction = 1) +
  labs(x = "Easting", y = "Northing", fill = "Number of murders")

## End(Not run)
```

london_murders

London Murders, 2006-2011

Description

This dataset contains the victim name, age, and location of every murder recorded in the Greater London area by the Metropolitan Police from January 1, 2006 to September 7, 2011.

Usage

london_murders

Format

A data frame with 838 observations on the following 5 variables.

forename First name(s) of the victim.

age Age of the victim.

date Date of the murder (YYYY-MM-DD).

year Year of the murder.

borough The London borough in which the murder took place. See the Details section for a list of all the boroughs.

Details

To visualize this dataset using a map, see the [london_boroughs](#) dataset, which contains the latitude and longitude of polygons that define the boundaries of the 32 boroughs of Greater London.

The borough variable covers all 32 boroughs in Greater London: Barking & Dagenham, Barnet, Bexley, Brent, Bromley, Camden, Croydon, Ealing, Enfield, Greenwich, Hackney, Hammersmith & Fulham, Haringey, Harrow, Havering, Hillingdon, Hounslow, Islington, Kensington & Chelsea, Kingston, Lambeth, Lewisham, Merton, Newham, Redbridge, Richmond, Southwark, Sutton, Tower Hamlets, Waltham Forest, Wandsworth, Westminster

Source

<https://www.theguardian.com/news/datablog/2011/oct/05/murder-london-list#data>

References

Inspired by [The Guardian Datablog](#).

Examples

```
library(dplyr)
library(ggplot2)
library(lubridate)

london_murders |>
  mutate(
    day_count = as.numeric(date - ymd("2006-01-01")),
    date_cut = cut(day_count, seq(0, 2160, 90))
  ) |>
  group_by(date_cut) |>
  add_tally() |>
  ggplot(aes(x = date_cut, y = n)) +
  geom_col() +
  theme(axis.text.x = element_blank(), axis.ticks.x = element_blank()) +
  labs(x = "Date from 01/2006 - 09/2011", y = "Number of deaths per 90 days")
```

loop	<i>Output a message while inside a loop</i>
------	---

Description

NOTE: `utils::txtProgressBar()` and `utils::setTxtProgressBar()` are better. Output a message while inside a for loop to update the user on progress. This function is useful in tracking progress when the number of iterations is large or the procedures in each iteration take a long time.

Usage

```
loop(i, n = NULL, every = 1, extra = NULL)
```

Arguments

- i The index value used in the loop.
- n The last entry in the loop.
- every The number of loops between messages.
- extra Additional information to print.

Author(s)

David Diez

See Also

[myPDF](#)

Examples

```
for (i in 1:160) {  
  loop(i, 160, 20, paste("iter", i))  
}
```

<code>lsegments</code>	<i>Create a Line Segment Plot</i>
------------------------	-----------------------------------

Description

Creae a simple plot showing a line segment.

Usage

```
lsegments(
  x = c(3, 7),
  l = "o",
  r = "c",
  ticks = TRUE,
  labs = 1,
  add = 0,
  ylim = c(-0.75, 0.25)
)
```

Arguments

<code>x</code>	The endpoints of the interval. Values larger (smaller) than 999 (-999) will be interpreted as (negative) infinity.
<code>l</code>	Indicate whether the left end point should be open ("o") or closed ("c").
<code>r</code>	Indicate whether the right end point should be open ("o") or closed ("c").
<code>ticks</code>	Indicate whether to show tick marks (TRUE) or not (FALSE).
<code>labs</code>	The position for the point labels. Set to 0 if no labels should be shown.
<code>add</code>	Indicate whether the line segment should be added to an existing plot (TRUE) or a new plot should be created (FALSE).
<code>ylim</code>	A vector of length 2 specifying the vertical plotting limits, which may be useful for fine-tuning plots. The default is <code>c(-0.75, 0.25)</code> .

Author(s)

David Diez

See Also

[dlsegments](#), [CCP](#), [ArrowLines](#)

Examples

```
lsegments(c(2, 7), "o", "c", ylim = c(-0.3, 0.2))

lsegments(c(5, 7), "c", "c", ylim = c(-0.3, 0.2))

lsegments(c(4, 1000), "o", "o", ylim = c(-0.3, 0.2))
```

mail_me*Influence of a Good Mood on Helpfulness*

Description

This study investigated whether finding a coin influenced a person's likelihood of mailing a sealed but addressed letter that appeared to have been accidentally left in a conspicuous place. Several variables were collected during the experiment, including two randomized variables of whether there was a coin to be found and whether the letter already had a stamp on it.

Usage

mail_me

Format

A data frame with 42 observations on the following 4 variables.

stamped a factor with levels no yes

found_coin a factor with levels coin no_coin

gender a factor with levels female male

mailed_letter a factor with levels no yes

Details

The precise context was in a phone booth (this study is from the 1970s!), where a person who entered a phone booth would find a dime in the phone tray, which would be sufficient to pay for their phone call. There was also a letter next to the phone, which sometimes had a stamp on it.

Source

Levin PF, Isen AM. 1975. Studies on the Effect of Feeling Good on Helping. *Sociometry* 31(1), p141-147.

Examples

```
table(mail_me)
(x <- table(mail_me[, c("mailed_letter", "found_coin")]))
chisq.test(x)

(x <- table(mail_me[, c("mailed_letter", "stamped")]))
chisq.test(x)

m <- glm(mailed_letter ~ stamped + found_coin + gender,
  data = mail_me,
  family = binomial
)
summary(m)
```

major_survey*Survey of Duke students and the area of their major*

Description

Survey of 218 students, collecting information on their GPAs and their academic major.

Usage

```
major_survey
```

Format

A data frame with 218 observations on the following 2 variables.

gpa Grade point average (GPA).

major Area of academic major.

Examples

```
library(ggplot2)

ggplot(major_survey, aes(x = major, y = gpa)) +
  geom_boxplot()
```

makeTube*Regression tube*

Description

Produce a linear, quadratic, or nonparametric tube for regression data.

Usage

```
makeTube(
  x,
  y,
  Z = 2,
  R = 1,
  col = "#00000022",
  border = "#00000000",
  type = c("lin", "quad", "robust"),
  stDev = c("constant", "linear", "other"),
  length.out = 99,
  bw = "default",
  plotTube = TRUE,
```

```

    addLine = TRUE,
    ...
)

```

Arguments

x	x coordinates.
y	y coordinates.
Z	Number of standard deviations out from the regression line to extend the tube.
R	Control of how far the tube extends to the left and right.
col	Fill color of the tube.
border	Border color of the tube.
type	The type of model fit to the data. Here 'robust' results in a nonparametric estimate.
stDev	Choices are constant variance ('constant'), the standard deviation of the errors changes linearly ('linear'), or the standard deviation of the errors should be estimated using nonparametric methods ('other').
length.out	The number of observations used to build the regression model. This argument may be increased to increase the smoothing of a quadratic or nonparametric curve.
bw	Bandwidth used if type='robust' or homosk=FALSE.
plotTube	Whether the tube should be plotted.
addLine	Whether the linear model should be plotted.
...	Additional arguments passed to the lines function if addLine=TRUE.

Value

X	x coordinates for the regression model.
Y	y coordinates for the regression model.
tubeX	x coordinates for the boundary of the tube.
tubeY	y coordinates for the boundary of the tube.

Author(s)

David Diez

See Also

[lmPlot](#)

Examples

```

# possum example
plot(possum$total_l, possum$head_l)
makeTube(possum$total_l, possum$head_l, 1)
makeTube(possum$total_l, possum$head_l, 2)
makeTube(possum$total_l, possum$head_l, 3)

# grades and TV example
plot(gradestv)
makeTube(gradestv$tv, gradestv$grades, 1.5)
plot(gradestv)
makeTube(gradestv$tv, gradestv$grades, 1.5, stDev = "o")
plot(gradestv)
makeTube(gradestv$tv, gradestv$grades, 1.5, type = "robust")
plot(gradestv)
makeTube(gradestv$tv, gradestv$grades, 1.5, type = "robust", stDev = "o")

# what can go wrong with a basic least squares model
# 1
x <- runif(100)
y <- 25 * x - 20 * x^2 + rnorm(length(x), sd = 1.5)
plot(x, y)
makeTube(x, y, type = "q")
# 2
x <- c(-0.6, -0.46, -0.091, runif(97))
y <- 25 * x + rnorm(length(x))
y[2] <- y[2] + 8
y[1] <- y[1] + 1
plot(x, y, ylim = range(y) + c(-10, 5))
makeTube(x, y)
# 3
x <- runif(100)
y <- 5 * x + rnorm(length(x), sd = x)
plot(x, y)
makeTube(x, y, stDev = "l", bw = 0.03)

```

malaria

Malaria Vaccine Trial

Description

Volunteer patients were randomized into one of two experiment groups where they would receive an experimental vaccine or a placebo. They were subsequently exposed to a drug-sensitive strain of malaria and observed to see whether they came down with an infection.

Usage

```
malaria
```

Format

A data frame with 20 observations on the following 2 variables.

treatment Whether a person was given the experimental vaccine or a placebo.

outcome Whether the person got an infection or no infection.

Details

In this study, volunteer patients were randomized into one of two experiment groups: 14 patients received an experimental vaccine or 6 patients received a placebo vaccine. Nineteen weeks later, all 20 patients were exposed to a drug-sensitive malaria virus strain; the motivation of using a drug-sensitive strain of virus here is for ethical considerations, allowing any infections to be treated effectively.

Source

Lyke et al. 2017. PfSPZ vaccine induces strain-transcending T cells and durable protection against heterologous controlled human malaria infection. PNAS 114(10):2711-2716. doi:[10.1073/pnas.1615324114](https://doi.org/10.1073/pnas.1615324114).

Examples

```
library(dplyr)

# Calculate conditional probabilities of infection after vaccine/placebo
malaria |>
  count(treatment, outcome) |>
  group_by(treatment) |>
  mutate(prop = n / sum(n))

# Fisher's exact test
fisher.test(table(malaria))
```

male_heights

Sample of 100 male heights

Description

Random sample based on Food Commodity Intake Database distribution

Usage

```
male_heights
```

Format

A data frame with 100 observations on the following variable.

heights a numeric vector

References

What We Eat In America - Food Commodity Intake Database. Available at <https://fcid.foodrisk.org/>.

Examples

```
male_heights
```

male_heights_fcid	<i>Random sample of adult male heights</i>
-------------------	--

Description

This sample is based on data from the USDA Food Commodity Intake Database.

Usage

```
male_heights_fcid
```

Format

A data frame with 100 observations on the following variable.

height_inch Height, in inches.

Source

Simulated based on data from USDA.

Examples

```
data(male_heights_fcid)
histPlot(male_heights_fcid$height_inch)
```

mammals	<i>Sleep in Mammals</i>
---------	-------------------------

Description

This dataset includes data for 39 species of mammals distributed over 13 orders. The data were used for analyzing the relationship between constitutional and ecological factors and sleeping in mammals. Two qualitatively different sleep variables (dreaming and non dreaming) were recorded. Constitutional variables such as life span, body weight, brain weight and gestation time were evaluated. Ecological variables such as severity of predation, safety of sleeping place and overall danger were inferred from field observations in the literature.

Usage

mammals

Format

A data frame with 62 observations on the following 11 variables.

species Species of mammals

body_wt Total body weight of the mammal (in kg)

brain_wt Brain weight of the mammal (in g)

non_dreaming Number of hours of non dreaming sleep

dreaming Number of hours of dreaming sleep

total_sleep Total number of hours of sleep

life_span Life span (in years)

gestation Gestation time (in days)

predation An index of how likely the mammal is to be preyed upon. 1 = least likely to be preyed upon. 5 = most likely to be preyed upon.

exposure An index of the how exposed the mammal is during sleep. 1 = least exposed (e.g., sleeps in a well-protected den). 5 = most exposed.

danger An index of how much danger the mammal faces from other animals. This index is based upon Predation and Exposure. 1 = least danger from other animals. 5 = most danger from other animals.

Source

<https://gksmyth.github.io/ozdasl/general/sleep.txt>

References

T. Allison and D. Cicchetti, "Sleep in mammals: ecological and constitutional correlates," Arch. Hydrobiol, vol. 75, p. 442, 1975.

Examples

```
library(ggplot2)

ggplot(mammals, aes(x = log(body_wt), y = log(brain_wt))) +
  geom_point() +
  geom_smooth(method = "lm") +
  labs(x = "Log of body weight", y = "Log of brain weight")
```

mammogram*Experiment with Mammogram Randomized*

Description

An experiment where 89,835 women were randomized to either get a mammogram or a non-mammogram breast screening. The response measured was whether they had died from breast cancer within 25 years.

Usage

```
mammogram
```

Format

A data frame with 89835 observations on the following 2 variables.

treatment a factor with levels control mammogram

breast_cancer_death a factor with levels no yes

Source

Miller AB. 2014. Twenty five year follow-up for breast cancer incidence and mortality of the Canadian National Breast Screening Study: randomised screening trial. BMJ 2014;348:g366.

Examples

```
table(mammogram)
chisq.test(table(mammogram))
```

manhattan*manhattan*

Description

A data frame containing data on apartment rentals in Manhattan.

Usage

```
manhattan
```

Format

A data frame with 20 observations on the following 1 variable.

rent Monthly rent for a 1 bedroom apartment listed as "For rent by owner".

Examples

```
library(ggplot2)

ggplot(manhattan, aes(rent)) +
  geom_histogram(color = "white", binwidth = 300) +
  theme_minimal() +
  labs(
    title = "Rent in Manhattan",
    subtitle = "1 Bedroom Apartments",
    x = "Rent (in US$)",
    caption = "Source: Craigslist"
  )
```

marathon

*New York City Marathon Times (outdated)***Description**

Marathon times of male and female winners of the New York City Marathon 1970-1999. See [nyc_marathon](#) for a more updated dataset. We recommend not using this dataset since the data source has been taken off the web.

Usage

```
marathon
```

Format

A data frame with 60 observations on the following 3 variables.

year Year

gender Gender

time Running time (in hours)

Source

Data source has been removed.

Examples

```
library(ggplot2)

ggplot(marathon, aes(x = time)) +
  geom_histogram(binwidth = 0.15)

ggplot(marathon, aes(y = time, x = gender)) +
  geom_boxplot()
```


mariokart

*Wii Mario Kart auctions from Ebay***Description**

Auction data from Ebay for the game Mario Kart for the Nintendo Wii. This data was collected in early October 2009.

Usage

mariokart

Format

A data frame with 143 observations on the following 12 variables. All prices are in US dollars.

id Auction ID assigned by Ebay.

duration Auction length, in days.

n_bids Number of bids.

cond Game condition, either new or used.

start_pr Start price of the auction.

ship_pr Shipping price.

total_pr Total price, which equals the auction price plus the shipping price.

ship_sp Shipping speed or method.

seller_rate The seller's rating on Ebay. This is the number of positive ratings minus the number of negative ratings for the seller.

stock_photo Whether the auction feature photo was a stock photo or not. If the picture was used in many auctions, then it was called a stock photo.

wheels Number of Wii wheels included in the auction. These are steering wheel attachments to make it seem as though you are actually driving in the game. When used with the controller, turning the wheel actually causes the character on screen to turn.

title The title of the auctions.

Details

There are several interesting features in the data. First off, note that there are two outliers in the data. These serve as a nice example of what one should do when encountering an outlier: examine the data point and remove it only if there is a good reason. In these two cases, we can see from the auction titles that they included other items in their auctions besides the game, which justifies removing them from the dataset.

This dataset includes all auctions for a full week in October 2009. Auctions were included in the dataset if they satisfied a number of conditions. (1) They were included in a search for "wii mario kart" on ebay.com, (2) items were in the Video Games > Games > Nintendo Wii section of Ebay, (3) the listing was an auction and not exclusively a "Buy it Now" listing (sellers sometimes offer

an optional higher price for a buyer to end bidding and win the auction immediately, which is an *optional* Buy it Now auction), (4) the item listed was the actual game, (5) the item was being sold from the US, (6) the item had at least one bidder, (7) there were no other items included in the auction with the exception of racing wheels, either generic or brand-name being acceptable, and (8) the auction did not end with a Buy It Now option.

Source

Ebay.

Examples

```
library(ggplot2)
library(broom)
library(dplyr)

# Identify outliers
ggplot(mariokart, aes(x = total_pr, y = cond)) +
  geom_boxplot()

# Replot without the outliers
mariokart |>
  filter(total_pr < 80) |>
  ggplot(aes(x = total_pr, y = cond)) +
  geom_boxplot()

# Fit a multiple regression models
mariokart_no <- mariokart |> filter(total_pr < 80)
m1 <- lm(total_pr ~ cond + stock_photo + duration + wheels, data = mariokart_no)
tidy(m1)
m2 <- lm(total_pr ~ cond + stock_photo + wheels, data = mariokart_no)
tidy(m2)
m3 <- lm(total_pr ~ cond + wheels, data = mariokart_no)
tidy(m3)

# Fit diagnostics
aug_m3 <- augment(m3)

ggplot(aug_m3, aes(x = .fitted, y = .resid)) +
  geom_point() +
  geom_hline(yintercept = 0, linetype = "dashed") +
  labs(x = "Fitted values", y = "Residuals")

ggplot(aug_m3, aes(x = .fitted, y = abs(.resid))) +
  geom_point() +
  geom_hline(yintercept = 0, linetype = "dashed") +
  labs(x = "Fitted values", y = "Absolute value of residuals")

ggplot(aug_m3, aes(x = 1:nrow(aug_m3), y = .resid)) +
  geom_point() +
  geom_hline(yintercept = 0, linetype = "dashed") +
  labs(x = "Order of data collection", y = "Residuals")
```

```

ggplot(aug_m3, aes(x = cond, y = .resid)) +
  geom_boxplot() +
  labs(x = "Condition", y = "Residuals")

ggplot(aug_m3, aes(x = wheels, y = .resid)) +
  geom_point() +
  labs(
    x = "Number of wheels", y = "Residuals",
    title = "Notice curvature"
  )

```

mcas

A dataset containing the school-level percentage of students scoring proficient or advanced in the 2018 Grade 10 Mathematics test in the Massachusetts Comprehensive Assessment System, along with characteristics of the school.

Description

The Massachusetts Comprehensive Assessment System (MCAS, <https://www.doe.mass.edu/mcas/>) uses state-wide testing to assess whether school districts, schools, and students are meeting expectations. This dataset records the percentage of students scoring proficient or advanced in the 2018 Mathematics test. School-level variables include possible predictors of test performance such as the demographics of the student population and administrative features of the school.

Usage

mcas

Format

A data frame with 356 rows and 21 columns.

PA_perc Numeric, percentage of students scoring proficient or advanced.

average_class_size Numeric, average class size in the school, regardless of subject.

average_math_class_size Numeric, average size of math classes in the school.

student_teacher_ratio Numeric, average student-teacher ratio in the school.

attendance_rate Numeric, the number of full-time equivalent student-days attended by full-time students in grades 1-10 as a percentage of the total number of possible student-days during the period.

number_of_students Numeric, the total number of students including special education beyond grade 12.

largest_minority Character, largest minority group.

school_name Character, school name.

district_name Character, Massachusetts school district.

english_learner Numeric, percentage of students for whom the first language is other than English and who cannot perform ordinary classroom work in English.

students_disabilities Numeric, percentage of students in the school with an individual education plan (IEP) identifying special learning needs

econ_dis Numeric, percentage of students from economically disadvantaged background. Determined based on student participation in one or more of the following state-administered programs: the Supplemental Nutrition Assistance Program (SNAP); the Transitional Assistance for Families with Dependent Children (TAFDC); the Department of Children and Families' (DCF) foster care program; and Medicaid.

african_american Numeric, percentage of students in the school having origins in any of the black racial groups of Africa.

asian Numeric, percentage of students having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent.

white Numeric, percentage of students having origins in any of the original peoples of Europe, the Middle East, or North Africa.

hispanic Numeric, percentage of students of Cuban, Mexican, Puerto Rican, South or Central American descent, or other Spanish culture or origin, regardless of race.

native_american Numeric, percentage of students having origins in any of the original peoples of North and South America (including Central America), and who maintain tribal affiliation or community attachment.

native_hawaiian_pacific_islander Numeric, percentage of students having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

multi_race_non_hispanic Numeric, percentage of students selecting more than one racial category and non-Hispanic.

exp_per_pupil Numeric, amount spent by the school district per pupil, in dollars. Calculated by dividing a district's operating expenditures by its average pupil membership.

majority Character, coded white if $\geq 50\%$ of the students in the school are in racial category white, otherwise coded minority

Source

<https://profiles.doe.mass.edu/statereport/>

mcu_films

Marvel Cinematic Universe films

Description

A list of Marvel Cinematic Universe films through the Infinity saga. The Infinity saga is a 23 movie storyline spanning from Ironman in 2008 to Endgame in 2019.

Usage

mcu_films

Format

A data frame with 23 rows and 7 variables.

movie Title of the movie.

length_hrs Length of the movie: hours portion.

length_min Length of the movie: minutes portion.

release_date Date the movie was released in the US.

opening_weekend_us Box office totals for opening weekend in the US.

gross_us All box office totals in US.

gross_world All box office totals world wide.

Details

Box office figures are not adjusted to a specific year. They are from the year the film was released.

Source

Internet Movie Database

Examples

```
library(ggplot2)
library(scales)

ggplot(mcu_films, aes(x = opening_weekend_us, y = gross_us)) +
  geom_point() +
  labs(
    title = "MCU Box Office Totals: Opening weekend vs. all-time",
    x = "Opening weekend totals (USD in millions)",
    y = "All-time totals (USD)"
  ) +
  scale_x_continuous(labels = label_dollar(scale = 1 / 1000000)) +
  scale_y_continuous(labels = label_dollar(scale = 1 / 1000000))
```

midterms_house

President's party performance and unemployment rate

Description

Covers midterm elections.

Usage

```
midterms_house
```

Format

A data frame with 29 observations on the following 5 variables.

year Year.

potus The president in office.

party President's party: Democrat or Republican.

unemp Unemployment rate.

house_change Change in House seats for the President's party.

Details

An older version of this data is at [unemploy_pres](#).

Source

Wikipedia.

Examples

```
library(ggplot2)

ggplot(midterms_house, aes(x = unemp, y = house_change)) +
  geom_point()
```

migraine

Migraines and acupuncture

Description

Experiment involving acupuncture and sham acupuncture (as placebo) in the treatment of migraines.

Usage

```
migraine
```

Format

A data frame with 89 observations on the following 2 variables.

group a factor with levels control treatment

pain_free a factor with levels no yes

Source

G. Allais et al. Ear acupuncture in the treatment of migraine attacks: a randomized trial on the efficacy of appropriate versus inappropriate acupoints. In: Neurological Sci. 32.1 (2011), pp. 173-175.

Examples

migraine

military

US Military Demographics

Description

This dataset contains demographic information on every member of the US armed forces including gender, race, and rank.

Usage

military

Format

A data frame with 1,414,593 observations on the following 6 variables.

grade The status of the service member as enlisted officer or warrant officer.

branch The branch of the armed forces: air force, army, marine corps, navy.

gender Whether the service member is female or male.

race The race identified by the service member: ami/aln (american indian/alaskan native), asian, black, multi (multi-ethnic), p/i (pacific islander), unk (unknown), or white.

hisp Whether a service member identifies with being hispanic (TRUE) or not (FALSE).

rank The numeric rank of the service member (higher number indicates higher rank).

Details

The branches covered by this dataset include the Army, Navy, Air Force, and Marine Corps. Demographic information on the Coast Guard is contained in the original dataset but has not been included here.

Source

Data provided by the Department of Defense and made available at <https://catalog-old.data.gov/dataset/personnel-trends-by-gender-race>, retrieved 2012-02-20.

Examples

```
## Not run:
library(dplyr)
library(ggplot2)
library(forcats)

# Proportion of females in military branches
military |>
  ggplot(aes(x = branch, fill = gender)) +
  geom_bar(position = "fill") +
  labs(
    x = "Branch", y = "Proportion", fill = "Gender",
    title = "Proportion of females in military branches"
  )

# Proportion of army officer females across ranks
military |>
  filter(
    grade == "officer",
    branch == "army"
  ) |>
  ggplot(aes(x = factor(rank), fill = fct_rev(gender))) +
  geom_bar(position = "fill") +
  labs(
    x = "Rank", y = "Proportion", fill = "Gender",
    title = "Proportion of army officer females across ranks"
  )

## End(Not run)
```

mlb

*Salary data for Major League Baseball (2010)***Description**

Salary data for Major League Baseball players in the year 2010.

Usage

mlb

Format

A data frame with 828 observations on the following 4 variables.

player Player name

team Team

position Field position

salary Salary (in \$1000s)

Source

<https://databases.usatoday.com/mlb-salaries/>, retrieved 2011-02-23.

Examples

```
# ----- Basic Histogram ----- #
hist(mlb$salary / 1000,
     breaks = 15,
     main = "", xlab = "Salary (millions of dollars)", ylab = "",
     axes = FALSE,
     col = "#22558844"
)
axis(1, seq(0, 40, 10))
axis(2, c(0, 500))
axis(2, seq(100, 400, 100), rep("", 4), tcl = -0.2)

# ----- Histogram on Log Scale ----- #
hist(log(mlb$salary / 1000),
     breaks = 15,
     main = "", xlab = "log(Salary)", ylab = "",
     axes = FALSE, col = "#22558844"
)
axis(1) # , seq(0, 40, 10))
axis(2, seq(0, 300, 100))

# ----- Box plot of log(salary) against position ----- #
boxPlot(log(mlb$salary / 1000), mlb$position, horiz = TRUE, ylab = "")
```

mlbbat10

Major League Baseball Player Hitting Statistics for 2010

Description

Major League Baseball Player Hitting Statistics for 2010.

Usage

```
mlbbat10
```

Format

A data frame with 1199 observations on the following 19 variables.

name Player name

team Team abbreviation

position Player position

game Number of games

at_bat Number of at bats
run Number of runs
hit Number of hits
double Number of doubles
triple Number of triples
home_run Number of home runs
rbi Number of runs batted in
total_base Total bases, computed as $3HR + 23B + 1*2B + H$
walk Number of walks
strike_out Number of strikeouts
stolen_base Number of stolen bases
caught_stealing Number of times caught stealing
obp On base percentage
slg Slugging percentage ($\text{total_base} / \text{at_bat}$)
bat_avg Batting average

Source

<https://www.mlb.com>, retrieved 2011-04-22.

Examples

```

library(ggplot2)
library(dplyr)
library(scales)

mlbbat10_200 <- mlbbat10 |>
  filter(mlbbat10$at_bat > 200)

# On-base percentage across positions
ggplot(mlbbat10_200, aes(x = position, y = obp, fill = position)) +
  geom_boxplot(show.legend = FALSE) +
  scale_y_continuous(labels = label_number(suffix = "%", accuracy = 0.01)) +
  labs(
    title = "On-base percentage across positions",
    y = "On-base percentage across positions",
    x = "Position"
  )

# Batting average across positions
ggplot(mlbbat10_200, aes(x = bat_avg, fill = position)) +
  geom_density(alpha = 0.5) +
  labs(
    title = "Batting average across positions",
    fill = NULL,
    y = "Batting average",
    x = "Position"
  )

```

```

)

# Mean number of home runs across positions
mlbbat10_200 |>
  group_by(position) |>
  summarise(mean_home_run = mean(home_run)) |>
  ggplot(aes(x = position, y = mean_home_run, fill = position)) +
  geom_col(show.legend = FALSE) +
  labs(
    title = "Mean number of home runs across positions",
    y = "Home runs",
    x = "Position"
  )

# Runs batted in across positions
ggplot(mlbbat10_200, aes(x = run, y = obp, fill = position)) +
  geom_boxplot(show.legend = FALSE) +
  labs(
    title = "Runs batted in across positions",
    y = "Runs",
    x = "Position"
  )

```

mlb_players_18

*Batter Statistics for 2018 Major League Baseball (MLB) Season***Description**

Batter statistics for 2018 Major League Baseball season.

Usage

```
mlb_players_18
```

Format

A data frame with 1270 observations on the following 19 variables.

name Player name

team Team abbreviation

position Position abbreviation: 1B = first base, 2B = second base, 3B = third base, C = catcher, CF = center field (outfield), DH = designated hitter, LF = left field (outfield), P = pitcher, RF = right field (outfield), SS = shortstop.

games Number of games played.

AB At bats.

R Runs.

H Hits.

doubles Doubles.
triples Triples.
HR Home runs.
RBI Runs batted in.
walks Walks.
strike_outs Strike outs.
stolen_bases Stolen bases.
caught_stealing_base Number of times caught stealing a base.
AVG Batting average.
OBP On-base percentage.
SLG Slugging percentage.
OPS On-base percentage plus slugging percentage.

Source

<https://www.mlb.com/stats>

See Also

[mlbbat10](#), [mlb](#)

Examples

```
d <- subset(mlb_players_18, !position %in% c("P", "DH") & AB >= 100)
dim(d)

# ----- Per Position, No Further Grouping ----- #
plot(d$OBP ~ as.factor(d$position))
model <- lm(OBP ~ as.factor(position), d)
summary(model)
anova(model)

# ----- Simplified Analysis, Fewer Positions ----- #
pos <- list(
  c("LF", "CF", "RF"),
  c("1B", "2B", "3B", "SS"),
  "C"
)
POS <- c("OF", "IF", "C")
table(d$position)

# ----- On-Base Percentage Across Positions ----- #
out <- c()
gp <- c()
for (i in 1:length(pos)) {
  these <- which(d$position %in% pos[[i]])
  out <- c(out, d$OBP[these])
  gp <- c(gp, rep(POS[i], length(these)))
}
```

```

}
plot(out ~ as.factor(gp))
summary(lm(out ~ as.factor(gp)))
anova(lm(out ~ as.factor(gp)))

```

mlb_teams

Major League Baseball Teams Data.

Description

A subset of data on Major League Baseball teams from Lahman's Baseball Database. The full dataset is available in the [Lahman R package](#).

Usage

```
mlb_teams
```

Format

A data frame with 2784 rows and 41 variables.

year Year of play.

league_id League the team plays in with levels AL (American League) and NL (National League).

division_id Division the team plays in with levels W (west), E (east) and C (central).

rank Team's rank in their division at the end of the regular season.

games_played Games played.

home_games Games played at home.

wins Number of games won.

losses Number of games lost.

division_winner Did the team win their division? Levels of Y (yes) and N (no).

wild_card_winner Was the team a wild card winner. Levels of Y (yes) and N (no).

league_winner Did the team win their league? Levels of Y (yes) and N (no).

world_series_winner Did the team win the World Series? Levels of Y (yes) and N (no).

runs_scored Number of runs scored during the season.

at_bats Number of at bats during the season.

hits Number of hits during the season. Includes singles, doubles, triples and homeruns.

doubles Number of doubles hit.

triples Number of triples hit.

homeruns Homeruns by batters.

walks Number of walks.

strikeouts_by_batters Number of batters struckout.

stolen_bases Number of stolen bases.

caught_stealing Number of base runners caught stealing.

batters_hit_by_pitch Number of batters hit by a pitch.

sacrifice_flies Number of sacrifice flies.

opponents_runs_scored Number of runs scored by opponents.

earned_runs_allowed Number of earned runs allowed.

earned_run_average Earned run average.

complete_games Number of games where a single pitcher played the entire game.

shutouts Number of shutouts.

saves Number of saves.

outs_pitches Number of outs pitched for the season (number of innings pitched times 3).

hits_allowed Number of hits made by opponents.

homeruns_allowed Number of homeruns hit by opponents.

walks_allowed Number of opponents who were walked.

strikeouts_by_pitchers Number of opponents who were struckout.

errors Number of errors.

double_plays Number of double plays.

fielding_percentage Teams fielding percentage.

team_name Full name of team.

ball_park Home ballpark name.

home_attendance Home attendance total.

Source

Lahmans Baseball Database

Examples

```
library(dplyr)

# List the World Series winning teams for each year
mlb_teams |>
  filter(world_series_winner == "Y") |>
  select(year, team_name, ball_park)

# List the teams with their average number of wins and losses
mlb_teams |>
  group_by(team_name) |>
  summarize(mean_wins = mean(wins), mean_losses = mean(losses)) |>
  arrange((team_name))
```

`mn_police_use_of_force`*Minneapolis police use of force data.*

Description

From Minneapolis, data from 2016 through August 2021

Usage`mn_police_use_of_force`**Format**

A data frame with 12925 rows and 13 variables.

response_datetime DateTime of police response.

problem Problem that required police response.

is_911_call Whether response was initiated by call to 911.

primary_offense Offense of subject.

subject_injury Whether subject was injured Yes/No/null.

force_type Type of police force used.

force_type_action Detail of police force used.

race Race of subject.

sex Gender of subject.

age Age of subject.

type_resistance Resistance to police by subject.

precinct Precinct where response occurred.

neighborhood Neighborhood where response occurred.

Source

Minneapolis

Examples

```
library(dplyr)
library(ggplot2)

# List percent of total for each race
mn_police_use_of_force |>
  count(race) |>
  mutate(percent = round(n / sum(n) * 100, 2)) |>
  arrange(desc(percent))
```

```
# Display use of force count by three races
race_sub <- c("Asian", "White", "Black")
ggplot(
  mn_police_use_of_force |> filter(race %in% race_sub),
  aes(force_type, ..count..)
) +
  geom_point(stat = "count", size = 4) +
  coord_flip() +
  facet_grid(race ~ .) +
  labs(
    x = "Force Type",
    y = "Number of Incidents"
  )
```

MosaicPlot

Custom Mosaic Plot

Description

Plot a mosaic plot custom built for a particular figure.

Usage

```
MosaicPlot(
  formula,
  data,
  col = "#00000022",
  border = 1,
  dir = c("v", "h"),
  off = 0.01,
  cex.axis = 0.7,
  col.dir = "v",
  flip = c("v"),
  ...
)
```

Arguments

formula	Formula describing the variable relationship.
data	Data frame for the variables, optional.
col	Colors for plotting.
border	Ignored.
dir	Ignored.
off	Fraction of white space between each box in the plot.
cex.axis	Axis label size.
col.dir	Direction to lay out colors.

<code>flip</code>	Whether to flip the ordering of the vertical ("v") and/or horizontal ("h") ordering in the plot.
<code>...</code>	Ignored.

Author(s)

David Diez

Examples

```
data(email)
data(COL)
email$spam <- ifelse(email$spam == 0, "not\nspam", "spam")
MosaicPlot(number ~ spam, email, col = COL[1:3], off = 0.02)
```

 movies

movies

Description

A dataset with information about movies released in 2003.

Usage

```
movies
```

Format

A data frame with 140 observations on the following 5 variables.

movie Title of the movie.

genre Genre of the movie.

score Critics score of the movie on a 0 to 100 scale.

rating MPAA rating of the film.

box_office Millions of dollars earned at the box office in the US and Canada.

Source

Investigating Statistical Concepts, Applications and Methods

Examples

```
library(ggplot2)

ggplot(movies, aes(score, box_office, color = genre)) +
  geom_point() +
  theme_minimal() +
  labs(
    title = "Does a critic score predict box office earnings?",
    x = "Critic rating",
    y = "Box office earnings (millions US$",
    color = "Genre"
  )
```

mtl

Medial temporal lobe (MTL) and other data for 26 participants

Description

The data are from a convenience sample of 25 women and 10 men who were middle-aged or older. The purpose of the study was to understand the relationship between sedentary behavior and thickness of the medial temporal lobe (MTL) in the brain.

Usage

```
mtl
```

Format

A data frame with 35 observations on the following 23 variables.

subject ID for the individual.

sex Gender, which takes values F (female) or M (male).

ethnic Ethnicity, simplified to Caucasian and Other.

educ Years of educational.

e4grp APOE-4 status, taking a value of E4 or Non-E4.

age Age, in years.

mmse Score from the Mini-Mental State Examination, which is a global cognition evaluation.

ham_a Score on the Hamilton Rating Scale for anxiety.

ham_d Score on the Hamilton Rating Scale for depression.

dig_sym We (the authors of this R package) are unsure as to the meaning of this variable.

delay_vp We (the authors of this R package) are unsure as to the meaning of this variable.

bfr_selective_reminding_delayed We (the authors of this R package) are unsure as to the meaning of this variable.

sitting Self-reported time sitting per day, averaged to the nearest hour.

met_minwk Metabolic equivalent units score (activity level). A score of 0 means "no activity" while 3000 is considered "high activity".

ipa_qgrp Classification of METminwk into Low or High.

aca1 Thickness of the CA1 subregion of the MTL.

aca23dg Thickness of the CA23DG subregion of the MTL.

ae_cort Thickness of a subregion of the MTL.

a_fusi_cort Thickness of the fusiform gyrus subregion of the MTL.

a_ph_cort Thickness of the perirhinal cortex subregion of the MTL.

a_pe_cort Thickness of the entorhinal cortex subregion of the MTL.

asubic Thickness of the subiculum subregion of the MTL.

total Total MTL thickness.

Source

Siddarth P, Burggren AC, Eyre HA, Small GW, Merrill DA. 2018. Sedentary behavior associated with reduced medial temporal lobe thickness in middle-aged and older adults. PLoS ONE 13(4): e0195549. doi:10.1371/journal.pone.0195549.

Thank you to Professor Silas Bergen of Winona State University for pointing us to this dataset!

References

A New York Times article references this study. <https://www.nytimes.com/2018/04/19/opinion/standing-up-at-your-desk-could-make-you-smarter.html>

Examples

```
library(ggplot2)

ggplot(mtl, aes(x = ipa_qgrp, y = met_minwk)) +
  geom_boxplot()
```

murders

Data for 20 metropolitan areas

Description

Population, percent in poverty, percent unemployment, and murder rate.

Usage

```
murders
```

Format

A data frame with 20 metropolitan areas on the following 4 variables.

population Population.

perc_pov Percent in poverty.

perc_unemp Percent unemployed.

annual_murders_per_mil Number of murders per year per million people.

Source

We do not have provenance for these data hence recommend not using them for analysis.

Examples

```
library(ggplot2)

ggplot(murders, aes(x = perc_pov, y = annual_murders_per_mil)) +
  geom_point() +
  labs(
    x = "Percent in poverty",
    y = "Number of murders per year per million people"
  )
```

myPDF

Custom PDF function

Description

A similar function to pdf and png, except that different defaults are provided, including for the plotting parameters.

Usage

```
myPDF(
  fileName,
  width = 5,
  height = 3,
  mar = c(3.9, 3.9, 1, 1),
  mgp = c(2.8, 0.55, 0),
  las = 1,
  tcl = -0.3,
  ...
)
```

Arguments

fileName	File name for the image to be output. The name should end in .pdf.
width	The width of the image file (inches). Default: 5.
height	The height of the image file (inches). Default: 3.
mar	Plotting margins. To change, input a numerical vector of length 4.
mgp	Margin graphing parameters. To change, input a numerical vector of length 3. The first argument specifies where x and y labels are placed; the second specifies the axis labels are placed; and the third specifies how far to pull the entire axis from the plot.
las	Orientation of axis labels. Input 0 for the default.
tcl	The tick mark length as a proportion of text height. The default is -0.5.
...	Additional arguments to par.

Author(s)

David Diez

See Also

[edaPlot](#)

Examples

```
# save a plot to a PDF
# myPDF("myPlot.pdf")
histPlot(mariokart$total_pr)
# dev.off()

# save a plot to a PNG
# myPNG("myPlot.png")
histPlot(mariokart$total_pr)
# dev.off()
```

nba_finals

NBA Finals History

Description

This dataset contains information about the teams who played in the NBA Finals from 1950 - 2022.

Usage

```
nba_finals
```

Format

A data frame with 73 rows and 9 variables:

year The year in which the Finals took place.

winner The team who won the series.

western_wins Number of series wins by the Western Conference Champions.

eastern_wins Number of series wins by the Eastern Conference Champions.

western_champions Team that won the Western Conference title and played in the Finals.

eastern_champions Team that won the Eastern Conference title and played in the Finals.

western_coach Coach of the Western Conference champions.

eastern_coach Coach of the Eastern Conference champions.

home_court Which conference held home court advantage for the series.

Source

[Wikipedia: List of NBA Champions](#)

Examples

```
library(dplyr)
library(ggplot2)
library(tidyr)

# Top 5 Appearing Coaches
nba_finals |>
  pivot_longer(
    cols = c("western_coach", "eastern_coach"),
    names_to = "conference", values_to = "coach"
  ) |>
  count(coach, sort = TRUE) |>
  slice_head(n = 5)

# Top 5 Winning Coaches
nba_finals |>
  mutate(
    winning_coach = case_when(
      western_wins == 4 ~ western_coach,
      eastern_wins == 4 ~ eastern_coach
    )
  ) |>
  count(winning_coach, sort = TRUE) |>
  slice_head(n = 5)
```

nba_finals_teams	<i>NBA Finals Team Summary</i>
------------------	--------------------------------

Description

A dataset with individual team summaries for the NBA Finals series from 1950 to 2022. To win the Finals, a team must win 4 games. The maximum number of games in a series is 7.

Usage

```
nba_finals_teams
```

Format

A data frame with 33 rows and 7 variables:

team Team name.
win Number of NBA Championships won.
loss Number of NBA Championships lost.
apps Number of NBA Finals appearances.
pct Win percentage.
years_won Years in which the team won a Championship.
years_lost Years in which the team lost a Championship.

Details

Notes:

1. The Chicago Stags folded in 1950, the Washington Capitols in 1951 and the Baltimore Bullets in 1954.
2. This list uses current team names. For example, the Seattle SuperSonics are not on the list as that team moved and became the Oklahoma City Thunder.

Source

[List of NBA Champions.](#)

Examples

```
library(ggplot2)
library(dplyr)
library(openintro)

teams_with_apps <- nba_finals_teams |>
  filter(apps != 0)

ggplot(teams_with_apps, aes(x = win)) +
```

```
geom_histogram(binwidth = 2) +  
labs(  
  title = "Number of NBA Finals series wins",  
  x = "Number of wins",  
  y = "Number of teams"  
)  
  
ggplot(teams_with_apps, aes(x = apps, y = win)) +  
  geom_point(alpha = 0.3) +  
  labs(  
    title = "Can we predict how many NBA Championships a  
team has based on the number of appearances?",  
    x = "Number of NBA Finals appearances",  
    y = "Number of NBA Finals series wins"  
  )
```

nba_heights

NBA Player heights from 2008-9

Description

Heights of all NBA players from the 2008-9 season.

Usage

```
nba_heights
```

Format

A data frame with 435 observations (players) on the following 4 variables.

last_name Last name.

first_name First name.

h_meters Height, in meters.

h_in Height, in inches.

Source

Collected from **NBA**.

Examples

```
qqnorm(nba_heights$h_meters)
```

nba_players_19	<i>NBA Players for the 2018-2019 season</i>
----------------	---

Description

Summary information from the NBA players for the 2018-2019 season.

Usage

```
nba_players_19
```

Format

A data frame with 494 observations on the following 7 variables.

first_name First name.

last_name Last name.

team Team name

team_abbr 3-letter team abbreviation.

position Player position.

number Jersey number.

height Height, in inches.

Source

<https://www.nba.com/players>

Examples

```
hist(nba_players_19$height, 20)
table(nba_players_19$team)
```

ncbirths	<i>North Carolina births, 1000 cases</i>
----------	--

Description

In 2004, the state of North Carolina released to the public a large dataset containing information on births recorded in this state. This dataset has been of interest to medical researchers who are studying the relation between habits and practices of expectant mothers and the birth of their children. This is a random sample of 1,000 cases from this dataset.

Usage

```
ncbirths
```

Format

A data frame with 1000 observations on the following 13 variables.

fage Father's age in years.

mage Mother's age in years.

mature Maturity status of mother.

weeks Length of pregnancy in weeks.

premie Whether the birth was classified as premature (premie) or full-term.

visits Number of hospital visits during pregnancy.

gained Weight gained by mother during pregnancy in pounds.

weight Weight of the baby at birth in pounds.

lowbirthweight Whether baby was classified as low birthweight (low) or not (not low).

gender Gender of the baby, female or male.

habit Status of the mother as a nonsmoker or a smoker.

marital Whether mother is married or not married at birth.

whitemom Whether mom is white or not white.

See Also

We do not have ideal provenance for these data. For a better documented and more recent dataset on a similar topic with similar variables, see [births14](#).

Examples

```
library(ggplot2)

ggplot(ncbirths, aes(x = habit, y = weight)) +
  geom_boxplot() +
  labs(x = "Smoking status of mother", y = "Birth weight of baby (in lbs)")

ggplot(ncbirths, aes(x = whitemom, y = visits)) +
  geom_boxplot() +
  labs(x = "Mother's race", y = "Number of doctor visits during pregnancy")

ggplot(ncbirths, aes(x = mature, y = gained)) +
  geom_boxplot() +
  labs(x = "Mother's age category", y = "Weight gained during pregnancy")
```

nhanes.samp

Random sample of 200 observations from the dataset NHANES.

Description

The dataset NHANES (US National Health and Nutrition Examination Study) is part of the CRAN package NHANES (author Randall Purim, rpruim@calvin.edu) and contains 76 variables on 100,000 participants from surveys conducted between 2009 and 2012. The surveys are part of a series conducted by the US National Center for Health Statistics (NCHS) since the 1960's. See the NHANES package documentation for more information about the surveys.

Usage

```
nhanes.samp
```

Format

A dataframe with 200 rows and 76 variables

Details

The dataset NHANES is a weighted sample from the full survey dataset constructed so that it may be treated as a random sample of the US population. The dataset nhanes.samp contains data from a random sample of size 200 from NHANES and all 76 variables. See the NHANES package for variable definitions and coding.

Source

<https://CRAN.R-project.org/package=NHANES>.

References

Pruim R (2015). *NHANES: Data from the US National Health and Nutrition Examination Study*. R package version 2.1.0,

nhanes.samp.adult

Selection of participants 21 years of age or older from nhanes.samp.

Description

The dataset NHANES (US National Health and Nutrition Examination Study) is part of the CRAN package NHANES (author Randall Purim, rpruim@calvin.edu) and contains 76 variables on 100,000 participants from surveys conducted between 2009 and 2012. The surveys are part of a series conducted by the US National Center for Health Statistics (NCHS) since the 1960's. See the NHANES package documentation for more information about the surveys.

Usage

```
nhanes.samp.adult
```

Format

A dataframe with 135 rows and 76 variables

Details

The dataset NHANES is a weighted sample from the full survey dataset constructed so that it may be treated as a random sample of the US population. The dataset `nhanes.samp.adult` contains data from the 135 participants 21 years of age or older from the `nhanes.samp` dataset. See the NHANES package for variable definitions and coding.

Source

<https://CRAN.R-project.org/package=NHANES>.

References

Pruim R (2015). *NHANES: Data from the US National Health and Nutrition Examination Study*. R package version 2.1.0,

`nhanes.samp.adult.500` *A random sample of 500 participants age 21 or older from the full NHANES data.*

Description

The dataset NHANES (US National Health and Nutrition Examination Study) is part of the CRAN package NHANES (author Randall Purim, rpruim@calvin.edu) and contains 76 variables on 100,000 participants from surveys conducted between 2009 and 2012. The surveys are part of a series conducted by the US National Center for Health Statistics (NCHS) since the 1960's. See the NHANES package documentation for more information about the surveys.

Usage

```
nhanes.samp.adult.500
```

Format

A dataframe with 500 rows and 76 variables

Details

The dataset NHANES is a weighted sample from the full survey dataset constructed so that it may be treated as a random sample of the US population. The dataset `nhanes.samp.adult.500` contains data from 500 participants 21 years of age or older randomly sampled from the NHANES dataset. See the NHANES package for variable definitions and coding.

Source

<https://CRAN.R-project.org/package=NHANES>.

References

Pruim R (2015). *NHANES: Data from the US National Health and Nutrition Examination Study*. R package version 2.1.0,

normTail	<i>Normal distribution tails</i>
----------	----------------------------------

Description

Produce a normal (or t) distribution and shaded tail.

Usage

```
normTail(
  m = 0,
  s = 1,
  L = NULL,
  U = NULL,
  M = NULL,
  df = 1000,
  curveColor = 1,
  border = 1,
  col = "#CCCCCC",
  xlim = NULL,
  ylim = NULL,
  xlab = "",
  ylab = "",
  digits = 2,
  axes = 1,
  detail = 999,
  xLab = c("number", "symbol"),
  cex.axis = 1,
  xAxisIncr = 1,
  add = FALSE,
  ...
)
```

Arguments

m	Numerical value for the distribution mean.
s	Numerical value for the distribution standard deviation.
L	Numerical value representing the cutoff for a shaded lower tail.

U	Numerical value representing the cutoff for a shaded upper tail.
M	Numerical value representing the cutoff for a shaded central region.
df	Numerical value describing the degrees of freedom. Default is 1000, which results in a nearly normal distribution. Small values may be useful to emphasize small tails.
curveColor	The color for the distribution curve.
border	The color for the border of the shaded area.
col	The color for filling the shaded area.
xlim	Limits for the x axis.
ylim	Limits for the y axis.
xlab	A title for the x axis.
ylab	A title for the y axis.
digits	The maximum number of digits past the decimal to use in axes values.
axes	A numeric value denoting whether to draw both axes (3), only the vertical axes (2), only the horizontal axes (1, the default), or no axes (0).
detail	A number describing the number of points to use in drawing the normal curve. Smaller values correspond to a less smooth curve but reduced memory usage in the final file.
xLab	If "number", then the axis is drawn at the mean, and every standard deviation out until the third standard deviation. If "symbol", then Greek letters are used for standard deviations from three standard deviations from the mean.
cex.axis	Numerical value controlling the size of the axis labels.
xAxisIncr	A number describing how often axis labels are placed, scaled by standard deviations. This argument is ignored if xLab = "symbol".
add	Boolean indicating whether to add this normal curve to the existing plot.
...	Additional arguments to plot.

Author(s)

David Diez

See Also[buildAxis](#)**Examples**

```
normTail(3, 2, 5)
normTail(3, 2, 1, xLab = "symbol")
normTail(3, 2, M = 1:2, xLab = "symbol", cex.axis = 0.8)
normTail(3, 2, U = 5, axes = FALSE)
normTail(L = -1, U = 2, M = c(0, 1), axes = 3, xAxisIncr = 2)
normTail(
  L = -1, U = 2, M = c(0, 1),
  xLab = "symbol", cex.axis = 0.8, xAxisIncr = 2
)
```

nuclear_survey	<i>Nuclear Arms Reduction Survey</i>
----------------	--------------------------------------

Description

A simple random sample of 1,028 US adults in March 2013 found that 56\ support nuclear arms reduction.

Usage

```
nuclear_survey
```

Format

A data frame with 1028 observations on the following variable.

arms_reduction Responses of favor or against.

Source

Gallup report: In U.S., 56 percent Favor U.S.-Russian Nuclear Arms Reductions. Available at <https://news.gallup.com/poll/161198/favor-russian-nuclear-arms-reductions.aspx>.

Examples

```
table(nuclear_survey)
```

nyc	<i>nyc</i>
-----	------------

Description

Zagat is a public survey where anyone can provide scores to a restaurant. The scores from the general public are then gathered to produce ratings. This dataset contains a list of 168 NYC restaurants and their Zagat Ratings.

Usage

```
nyc
```

Format

A data frame with 168 observations on the following 6 variables.

restaurant Name of the restaurant.

price Price of a meal for two, with drinks, in US \$.

food Zagat rating for food.

decor Zagat rating for decor.

service Zagat rating for service.

east Indicator variable for location of the restaurant. 0 = west of 5th Avenue, 1 = east of 5th Avenue

Details

For each category the scales are as follows:

0 - 9: poor to fair 10 - 15: fair to good 16 - 19: good to very good 20 - 25: very good to excellent

25 - 30: extraordinary to perfection

Examples

```
library(dplyr)
library(ggplot2)

location_labs <- c("West", "East")
names(location_labs) <- c(0, 1)

ggplot(nyc, mapping = aes(x = price, group = east, fill = east)) +
  geom_boxplot(alpha = 0.5) +
  facet_grid(east ~ ., labeller = labeller(east = location_labs)) +
  labs(
    title = "Is food more expensive east of 5th Avenue?",
    x = "Price (US$)"
  ) +
  guides(fill = "none") +
  theme_minimal() +
  theme(axis.text.y = element_blank())
```

nycflights

Flights data

Description

On-time data for a random sample of flights that departed NYC (i.e. JFK, LGA or EWR) in 2013.

Usage

```
nycflights
```


Format

A `tbl_df` with 32,735 rows and 16 variables:

year,month,day Date of departure.

dep_time,arr_time Departure and arrival times, local tz.

dep_delay,arr_delay Departure and arrival delays, in minutes. Negative times represent early departures/arrivals.

hour,minute Time of departure broken in to hour and minutes.

carrier Two letter carrier abbreviation. See `airlines` in the `nycflights13` package for more information or google the airline code.

tailnum Plane tail number.

flight Flight number.

origin,dest Origin and destination. See `airports` in the `nycflights13` package for more information or google airport the code.

air_time Amount of time spent in the air.

distance Distance flown.

Source

Hadley Wickham (2014). `nycflights13`: Data about flights departing NYC in 2013. R package version 0.1.

Examples

```
library(dplyr)

# Longest departure delays
nycflights |>
  select(flight, origin, dest, dep_delay, arr_delay) |>
  arrange(desc(dep_delay))

# Longest arrival delays
nycflights |>
  select(flight, origin, dest, dep_delay, arr_delay) |>
  arrange(desc(arr_delay))
```

nyc_marathon

New York City Marathon Times

Description

Marathon times of runners in the Men and Women divisions of the New York City Marathon, 1970 - 2023.

Usage

```
nyc_marathon
```

Format

A data frame with 108 observations on the following 7 variables.

year Year of marathom.

name Name of winner.

country Country of winner.

time Running time (HH:MM:SS).

time_hrs Running time (in hours).

division Division: Men or Women.

note Note about the race or the winning time.

Source

Wikipedia, [List of winners of the New York City Marathon](#). Retrieved 6 November, 2023.

Examples

```
library(ggplot2)

ggplot(nyc_marathon, aes(x = year, y = time_hrs, color = division, shape = division)) +
  geom_point()
```

offshore_drilling	<i>California poll on drilling off the California coast</i>
-------------------	---

Description

A 2010 survey asking a randomly sample of registered voters in California for their position on drilling for oil and natural gas off the Coast of California.

Usage

```
offshore_drilling
```

Format

A data frame with 827 observations on the following 2 variables.

position a factor with levels do not know oppose support

college_grad a factor with levels no yes

Source

Survey USA, Election Poll #16804, data collected July 8-11, 2010.

Examples

```
offshore_drilling
```

openintro_colors	<i>OpenIntro colors</i>
------------------	-------------------------

Description

A character string of full colors from `IMSCOL[,1]`

Usage

```
openintro_colors
```

Format

A named character string with 9 elements: "blue", "green", "pink", "yellow", "red", "black", "gray", "lgray"

Examples

```
openintro_colors
```

```
openintro_colors["blue"]
```

openintro_cols	<i>Function to extract OpenIntro IMS colors as hex codes</i>
----------------	--

Description

Uses full colors from [IMSCOL](#)

Usage

```
openintro_cols(...)
```

Arguments

... Character names of [openintro_colors](#)

Examples

```
openintro_cols("blue")
```

```
openintro_cols("red")
```

openintro_pal	<i>Return function to interpolate an OpenIntro IMS color palette</i>
---------------	--

Description

Not exported

Usage

```
openintro_pal(palette = "main", reverse = FALSE, ...)
```

Arguments

palette	Character name of palette in openintro_palettes
reverse	Boolean indicating whether the palette should be reversed
...	Additional arguments to pass to grDevices::colorRampPalette()

openintro_palettes	<i>OpenIntro palettes</i>
--------------------	---------------------------

Description

A list with OpenIntro color palettes

Usage

```
openintro_palettes
```

Format

A list with 8 color palettes: main, two, three, four, five, cool, hot, gray

Examples

```
openintro_palettes

openintro_palettes$main
openintro_palettes$three
openintro_palettes$cool
openintro_palettes$hot
```

opportunity_cost	<i>Opportunity cost of purchases</i>
------------------	--------------------------------------

Description

In a study on opportunity cost, 150 students were given the following statement: "Imagine that you have been saving some extra money on the side to make some purchases, and on your most recent visit to the video store you come across a special sale on a new video. This video is one with your favorite actor or actress, and your favorite type of movie (such as a comedy, drama, thriller, etc.). This particular video that you are considering is one you have been thinking about buying for a long time. It is available for a special sale price of \$14.99. What would you do in this situation? Please circle one of the options below." Half of the students were given the following two options: (A) Buy this entertaining video. (B) Not buy this entertaining video. The other half were given the following two options (note the modified option B): (A) Buy this entertaining video. (B) Not buy this entertaining video. Keep the \$14.99 for other purchases. The results of this study are in this dataset.

Usage

```
opportunity_cost
```

Format

A data frame with 150 observations on the following 2 variables.

group a factor with levels control and treatment

decision a factor with levels buy video and not buy video

Source

Frederick S, Novemsky N, Wang J, Dhar R, Nowlis S. 2009. Opportunity Cost Neglect. *Journal of Consumer Research* 36: 553-561.

Examples

```
library(ggplot2)

table(opportunity_cost)

ggplot(opportunity_cost, aes(y = group, fill = decision)) +
  geom_bar(position = "fill")
```

 opp_insights_colleges *College education and upward mobility*

Description

Opportunity Insights (<https://opportunityinsights.org/>) is a research initiative with the goal of understanding upward mobility in the United States by studying barriers to economic opportunity and translating findings into policy recommendations. These data consist of a subset on an anonymized dataset gathered in 2017 on all college students in the United States from 1999 - 2013 (30 million students) study to examine the association of higher education system and upward mobility. The data includes parental income distributions and student earnings outcomes by college. The data in this package do not include tiers 12 (less than two year schools of any type), 13 (students attending college with insufficient data), and 14 (students not in college between the ages of 19-22). Monetary values are measured in 2015 dollars; i.e. adjusted for inflation to 2015 dollars.

Usage

```
opp_insights_colleges
```

Format

A dataframe with 2153 rows and 26 columns

`super_opeid` Numeric, a college or university identifier constructed by the Opportunity Insights team based on tax records. It is similar but not identical to the U.S. Department of Education's Office of Postsecondary Education ID (OPEID) and different from the ID in the Integrated Postsecondary Education Data System (IPEDS).

`name` Character vector, college name

`region` Factor, with levels 1 (Northeast), 2 (Midwest), 3 (South), 4 (West)

`state` Character vector, two letter state ID

`tier_name` Character vector, selectivity and type of college with 8 values, Ivy Plus, Other elite schools (private and public), Highly selective public, Highly selective private, Selective public, Selective private, Nonselective 4-year public, Nonselective 4-year private, Two-year (public and private not-for-profit), Four-year for-profit, Two-year for-profit

`type` Factor with 3 levels, public, private non-profit, for-profit

`exp_instr_pc_2013` Numeric, instructional expenditures per student in 2013

`ipeds_enrollment_2013` Numeric, total undergraduate enrollment in Fall 2013

`sticker_price_2013` Numeric, average annual cost of attendance in 2013

`scorecard_netprice_2013` Numeric, net annual cost of attendance for bottom income quintile in 2013

`grad_rate_150_p_2013` Numeric, percentage of students graduating within 150% of normal time in 2013

`avgfacsal_2013` Numeric, average faculty salary in 2013

sat_avg_2013 Numeric, average SAT scores (scaled to 1600) in 2013
 endowment_pc_2000 endowment assets per student in 2000
 mr_kq5_pq1 Numeric, mobility rate, top 20% of the income distribution
 mr_ktop1_pq1 Numeric, mobility rate, top 1% of the income distribution
 par_median Numeric, median parent household income
 par_q1 Numeric, fraction of parents in first (bottom) income quintile
 par_q2 Numeric, fraction of parents in second income quintile
 par_q3 Numeric, fraction of parents in third income quintile
 par_q4 Numeric, fraction of parents in fourth income quintile
 par_q5 Numeric, fraction of parents in fifth income quintile
 par_top5pc Numeric, fraction of parents in top 5% of income distribution
 par_top1pc Numeric, fraction of parents in top 1% of income distribution
 k_median Numeric, median child individual earnings in 2014 (at age 34)
 k_top5pc Numeric, fraction of children in top 5% of income distribution
 k_top1pc Numeric, fraction of children in top 1% of income distribution

Source

Tables mrc_table2.csv and mrc_table10.csv from <https://opportunityinsights.org/data/>

References

Chetty, Raj, et al. "Income segregation and intergenerational mobility across colleges in the United States." *The Quarterly Journal of Economics* 135.3 (2020): 1567-1633.

opp_insights_colleges_4year

Data from [opp_insights_colleges](#) that is restricted to 4-year, not-for-profit colleges.

Description

Data from [opp_insights_colleges](#) that is restricted to 4-year, not-for-profit colleges.

Usage

opp_insights_colleges_4year

Format

A dataframe with 1285 rows and 26 variables

`super_opeid` Numeric, a college or university identifier constructed by the Opportunity Insights team based on tax records. It is similar but not identical to the U.S. Department of Education's Office of Postsecondary Education ID (OPEID) and different from the ID in the Integrated Postsecondary Education Data System (IPEDS).

`name` Character vector, college name

`region` Factor, with levels 1 (Northeast), 2 (Midwest), 3 (South), 4 (West)

`state` Character vector, two letter state ID

`tier_name` Character vector, selectivity and type of college with 8 values, Ivy Plus, Other elite schools (private and public), Highly selective public, Highly selective private, Selective public, Selective private, Nonselective 4-year public, Nonselective 4-year private, Two-year (public and private not-for-profit), Four-year for-profit, Two-year for-profit

`type` Factor with 3 levels, public, private non-profit, for-profit

`exp_instr_pc_2013` Numeric, instructional expenditures per student in 2013

`ipeds_enrollment_2013` Numeric, total undergraduate enrollment in Fall 2013

`sticker_price_2013` Numeric, average annual cost of attendance in 2013

`scorecard_netprice_2013` Numeric, net annual cost of attendance for bottom income quintile in 2013

`grad_rate_150_p_2013` Numeric, percentage of students graduating within 150% of normal time in 2013

`avgfacsal_2013` Numeric, average faculty salary in 2013

`sat_avg_2013` Numeric, average SAT scores (scaled to 1600) in 2013

`endowment_pc_2000` endowment assets per student in 2000

`mr_kq5_pq1` Numeric, mobility rate, top 20% of the income distribution

`mr_ktop1_pq1` Numeric, mobility rate, top 1% of the income distribution

`par_median` Numeric, median parent household income

`par_q1` Numeric, fraction of parents in first (bottom) income quintile

`par_q2` Numeric, fraction of parents in second income quintile

`par_q3` Numeric, fraction of parents in third income quintile

`par_q4` Numeric, fraction of parents in fourth income quintile

`par_q5` Numeric, fraction of parents in fifth income quintile

`par_top5pc` Numeric, fraction of parents in top 5% of income distribution

`par_top1pc` Numeric, fraction of parents in top 1% of income distribution

`k_median` Numeric, median child individual earnings in 2014 (at age 34)

`k_top5pc` Numeric, fraction of children in top 5% of income distribution

`k_top1pc` Numeric, fraction of children in top 1% of income distribution

Source

Tables mrc_table2.csv and mrc_table10.csv from <https://opportunityinsights.org/data/>

References

Chetty, Raj, et al. "Income segregation and intergenerational mobility across colleges in the United States." *The Quarterly Journal of Economics* 135.3 (2020): 1567-1633.

orings

1986 Challenger disaster and O-rings

Description

On January 28, 1986, a routine launch was anticipated for the Challenger space shuttle. Seventy-three seconds into the flight, disaster happened: the shuttle broke apart, killing all seven crew members on board. An investigation into the cause of the disaster focused on a critical seal called an O-ring, and it is believed that damage to these O-rings during a shuttle launch may be related to the ambient temperature during the launch. The table below summarizes observational data on O-rings for 23 shuttle missions, where the mission order is based on the temperature at the time of the launch.

Usage

```
orings
```

Format

A data frame with 23 observations on the following 4 variables.

mission Shuttle mission number.

temperature Temperature, in Fahrenheit.

damaged Number of damaged O-rings (out of 6).

undamaged Number of undamaged O-rings (out of 6).

Source

<https://archive.ics.uci.edu/dataset/92/challenger+usa+space+shuttle+o+ring>

Examples

```
library(dplyr)
library(forcats)
library(tidyr)
library(broom)
```

```
# This is a wide data frame. You can convert it to a long
# data frame to predict probability of O-ring damage based
```

```
# on temperature using logistic regression.

orings_long <- orings |>
  pivot_longer(cols = c(damaged, undamaged), names_to = "outcome", values_to = "n") |>
  uncount(n) |>
  mutate(outcome = fct_relevel(outcome, "undamaged", "damaged"))

orings_mod <- glm(outcome ~ temperature, data = orings_long, family = "binomial")
tidy(orings_mod)
```

oscars

*Oscar winners, 1929 to 2018***Description**

Best actor and actress Oscar winners from 1929 to 2018

Usage

```
oscars
```

Format

A data frame with 182 observations on the following 10 variables.

oscar_no Oscar ceremony number.

oscar_yr Year the Oscar ceremony was held.

award Best actress or Best actor.

name Name of winning actor or actress.

movie Name of movie actor or actress got the Oscar for.

age Age at which the actor or actress won the Oscar.

birth_pl US State where the actor or actress was born, country if foreign.

birth_date Birth date of actor or actress.

birth_mo Birth month of actor or actress.

birth_d Birth day of actor or actress.

birth_y Birth year of actor or actress.

Details

Although there have been only 84 Oscar ceremonies until 2012, there are 85 male winners and 85 female winners because ties happened on two occasions (1933 for the best actor and 1969 for the best actress).

Source

Journal of Statistical Education, <https://jse.amstat.org/datasets/oscars.dat.txt>, updated through 2019 using information from Oscars.org and Wikipedia.org.

Examples

```
library(ggplot2)
library(dplyr)

ggplot(oscars, aes(x = award, y = age)) +
  geom_boxplot()

ggplot(oscars, aes(x = factor(birth_mo))) +
  geom_bar()

oscars |>
  count(birth_pl, sort = TRUE)
```

outliers

Simulated datasets for different types of outliers

Description

Data sets for showing different types of outliers

Usage

```
outliers
```

Format

A data frame with 50 observations on the following 5 variables.

x a numeric vector

y a numeric vector

x_inf a numeric vector

y_lev a numeric vector

y_out a numeric vector

Examples

```
outliers
```

paralympic_1500	<i>Race time for Olympic and Paralympic 1500m.</i>
-----------------	--

Description

Compiled gold medal times for the 1500m race in the Olympic Games and the Paralympic Games. The times given for contestants competing in the Paralympic Games are for athletes with different visual impairments; T11 indicates fully blind (with an option to race with a guide-runner) with T12 and T13 as lower levels of visual impairment.

Usage

```
paralympic_1500
```

Format

A data frame with 83 rows and 10 variables.

year Year the games took place.

city City of the games.

country_of_games Country of the games.

division Division: Men or Women.

type Type.

name Name of the athlete.

country_of_athlete Country of athlete.

time Time of gold medal race, in m:s.

time_min Time of gold medal race, in decimal minutes (min + sec/60).

Source

<https://www.paralympic.org/> and https://en.wikipedia.org/wiki/1500_metres_at_the_Olympics.

Examples

```
library(ggplot2)
library(dplyr)

paralympic_1500 |>
  mutate(
    sight_level = case_when(
      type == "T11" ~ "total impairment",
      type == "T12" ~ "some impairment",
      type == "T13" ~ "some impairment",
      type == "Olympic" ~ "no impairment"
    )
  )
```

```

) |>
filter(division == "Men", year > 1920) |>
filter(type == "Olympic" | type == "T11") |>
ggplot(aes(x = year, y = time_min, color = sight_level, shape = sight_level)) +
  geom_point() +
  scale_x_continuous(breaks = seq(1924, 2020, by = 8)) +
  labs(
    title = "Men's Olympic and Paralympic 1500m race times",
    x = "Year",
    y = "Time of Race (minutes)",
    color = "Sight level",
    shape = "Sight level"
  )

```

penelope

Guesses at the weight of Penelope (a cow)

Description

The data was collected by the Planet Money podcast to test a theory about crowd-sourcing. Penelope's actual weight was 1,355 pounds.

Usage

```
penelope
```

Format

A data frame with 17,184 observations on the following variable.

weight Guesses of Penelope's weight, in pounds.

Source

<https://www.npr.org/sections/money/2015/08/07/429720443/17-205-people-guessed-the-weight-of-a-cow-1>

Examples

```

library(ggplot2)

ggplot(penelope, aes(x = weight)) +
  geom_histogram(binwidth = 250)

summary(penelope$weight)

```

penetrating_oil

*What's the best way to loosen a rusty bolt?***Description**

The channel Project Farm on YouTube investigated penetrating oils and other options for loosening rusty bolts. Eight options were evaluated, including a control group, to determine which was most effective.

Usage

penetrating_oil

Format

A data frame with 30 observations on the following 2 variables.

treatment The different treatments tried: none (control), Heat (via blow torch), Acetone/ATF, AeroKroil, Liquid Wrench, PB Blaster, Royal Purple, and WD-40.

torque Torque required to loosen the rusty bolt, which was measured in foot-pounds.

Source

<https://www.youtube.com/watch?v=xUEob2oAKVs>

Examples

```
m <- lm(torque ~ treatment, data = penetrating_oil)
anova(m)

# There are 28 pairwise comparisons to be made.
xbar <- tapply(penetrating_oil$torque, penetrating_oil$treatment, mean)
n <- tapply(penetrating_oil$torque, penetrating_oil$treatment, length)
s <- summary(m)$sigma
df <- summary(m)$df[1]

diff <- c()
se <- c()
k <- 0
N <- length(n)
K <- N * (N - 1) / 2
for (i in 1:(N - 1)) {
  for (j in (i + 1):N) {
    k <- k + 1
    diff[k] <- xbar[i] - xbar[j]
    se[k] <- s * sqrt(1 / n[i] + 1 / n[j])
    if (2 * K * pt(-abs(diff[k] / se[k]), df) < 0.05) {
      cat("0.05 - ", names(n)[c(i, j)], "\n")
    } else if (2 * K * pt(-abs(diff[k] / se[k]), df) < 0.1) {
```

```

      cat("0.1 - ", names(n)[c(i, j)], "\n")
    } else if (2 * K * pt(-abs(diff[k] / se[k]), df) < 0.2) {
      cat("0.2 - ", names(n)[c(i, j)], "\n")
    } else if (2 * K * pt(-abs(diff[k] / se[k]), df) < 0.3) {
      cat("0.3 - ", names(n)[c(i, j)], "\n")
    }
  }
}

# Smallest p-value using Bonferroni
min(2 * K * pt(-abs(diff / se), df))

# Better pairwise comparison method.
anova(m1 <- aov(torque ~ treatment, data = penetrating_oil))
TukeyHSD(m1)

```

penny_ages

Penny Ages

Description

Sample of pennies and their ages. Taken in 2004.

Usage

```
penny_ages
```

Format

A data frame with 648 observations on the following 2 variables.

year Penny's year.

age Age as of 2004.

Examples

```
hist(penny_ages$year)
```

pew_energy_2018

Pew Survey on Energy Sources in 2018

Description

US-based survey on support for expanding six different sources of energy, including solar, wind, offshore drilling, hydrolic fracturing ("fracking"), coal, and nuclear.

Usage

pew_energy_2018

Format

The format is: List of 6 \$ solar_panel_farms : List of responses on solar farms. \$ wind_turbine_farms : List of responses on wind turbine farms. \$ offshore_drilling : List of responses on offshore drilling. \$ hydrolic_fracturing : List of responses on hydrolic fracturing. \$ coal_mining : List of responses on coal mining. \$ nuclear_power_plants: List of responses on nuclear.

Details

We did not have access to individual responses in original dataset, so we took the published percentages and backed out the breakdown

Source

<https://www.pewresearch.org/science/2018/05/14/majorities-see-government-efforts-to-protect-the-environment/>

Examples

```
data(pew_energy_2018)
lapply(pew_energy_2018, head)
lapply(pew_energy_2018, length)
lapply(pew_energy_2018, table)
Prop <- function(x) {
  table(x) / length(x)
}
lapply(pew_energy_2018, Prop)
```

photo_classify	<i>Photo classifications: fashion or not</i>
----------------	--

Description

This is a simulated dataset for photo classifications based on a machine learning algorithm versus what the true classification is for those photos. While the data are not real, they resemble performance that would be reasonable to expect in a well-built classifier.

Usage

```
photo_classify
```

Format

A data frame with 1822 observations on the following 2 variables.

mach_learn The prediction by the machine learning system as to whether the photo is about fashion or not.

truth The actual classification of the photo by a team of humans.

Details

The hypothetical ML algorithm has a precision of 90\ photos it claims are fashion, about 90\ The recall of the ML algorithm is about 64\ about fashion, it correctly predicts that they are about fashion about 64\ of the time.

Source

The data are simulated / hypothetical.

Examples

```
data(photo_classify)
table(photo_classify)
```

piracy	<i>Piracy and PIPA/SOPA</i>
--------	-----------------------------

Description

This dataset contains observations on all 100 US Senators and 434 of the 325 US Congressional Representatives related to their support of anti-piracy legislation that was introduced at the end of 2011.

Usage

piracy

Format

A data frame with 534 observations on the following 8 variables.

name Name of legislator.

party Party affiliation as democrat (D), Republican (R), or Independent (I).

state Two letter state abbreviation.

money_pro Amount of money in dollars contributed to the legislator's campaign in 2010 by groups generally thought to be supportive of PIPA/SOPA: movie and TV studios, record labels.

money_con Amount of money in dollars contributed to the legislator's campaign in 2010 by groups generally thought to be opposed to PIPA/SOPA: computer and internet companies.

years Number of years of service in Congress.

stance Degree of support for PIPA/SOPA with levels Leaning No, No, Undecided, Unknown, Yes

chamber Whether the legislator is a member of either the house or senate.

Details

The Stop Online Piracy Act (SOPA) and the Protect Intellectual Property Act (PIPA) were two bills introduced in the US House of Representatives and the US Senate, respectively, to curtail copyright infringement. The bill was controversial because there were concerns the bill limited free speech rights. ProPublica, the independent and non-profit news organization, compiled this dataset to compare the stance of legislators towards the bills with the amount of campaign funds that they received from groups considered to be supportive of or in opposition to the legislation.

For more background on the legislation and the formulation of money_pro and money_con, read the documentation on ProPublica, linked below.

Source

<https://projects.propublica.org/sopa> The list may be slightly out of date since many politician's perspectives on the legislation were in flux at the time of data collection.

Examples

```
library(dplyr)
library(ggplot2)

pipa <- filter(piracy, chamber == "senate")

pipa |>
  group_by(stance) |>
  summarise(money_pro_mean = mean(money_pro, na.rm = TRUE)) |>
  ggplot(aes(x = stance, y = money_pro_mean)) +
  geom_col() +
  labs(
    x = "Stance", y = "Average contribution, in $",
```

```

    title = "Average contribution to the legislator's campaign in 2010",
    subtitle = "by groups supportive of PIPA/SOPA (movie and TV studios, record labels)"
  )

ggplot(pipa, aes(x = stance, y = money_pro)) +
  geom_boxplot() +
  labs(
    x = "Stance", y = "Contribution, in $",
    title = "Contribution by groups supportive of PIPA/SOPA",
    subtitle = "Movie and TV studios, record labels"
  )

ggplot(pipa, aes(x = stance, y = money_con)) +
  geom_boxplot() +
  labs(
    x = "Stance", y = "Contribution, in $",
    title = "Contribution by groups opposed to PIPA/SOPA",
    subtitle = "Computer and internet companies"
  )

pipa |>
  filter(
    money_pro > 0,
    money_con > 0
  ) |>
  mutate(for_pipa = ifelse(stance == "yes", "yes", "no")) |>
  ggplot(aes(x = money_pro, y = money_con, color = for_pipa)) +
  geom_point() +
  scale_color_manual(values = c("gray", "red")) +
  scale_y_log10() +
  scale_x_log10() +
  labs(
    x = "Contribution by pro-PIPA groups",
    y = "Contribution by anti-PIPA groups",
    color = "For PIPA"
  )

```

playing_cards

Table of Playing Cards in 52-Card Deck

Description

A table describing each of the 52 cards in a deck.

Usage

playing_cards

Format

A data frame with 52 observations on the following 2 variables.

number The number or card type.

suit Card suit, which takes one of four values: Club, Diamond, Heart, or Spade.

face_card Whether the card counts as a face card.

Source

This extremely complex dataset was generated from scratch.

Examples

```
playing_cards <- data.frame(
  number = rep(c(2:10, "J", "Q", "K", "A"), 4),
  suit = rep(c("Spade", "Diamond", "Club", "Heart"), rep(13, 4))
)
playing_cards$face_card <-
  ifelse(playing_cards$number %in% c(2:10, "A"), "no", "yes")
```

PlotWLine

Plot data and add a regression line

Description

Plot data and add a regression line.

Usage

```
PlotWLine(
  x,
  y,
  xlab = "",
  ylab = "",
  col = fadeColor(4, "88"),
  cex = 1.2,
  pch = 20,
  n = 4,
  nMax = 4,
  yR = 0.1,
  axes = TRUE,
  ...
)
```

Arguments

x	Predictor variable.
y	Outcome variable.
xlab	x-axis label.
ylab	y-axis label.
col	Color of points.
cex	Size of points.
pch	Plotting character.
n	The preferred number of axis labels.
nMax	The maximum number of axis labels.
yR	y-limit buffer factor.
axes	Boolean to indicate whether or not to include axes.
...	Passed to plot.

See Also

[makeTube](#)

Examples

```
PlotWLine(1:10, seq(-5, -2, length.out = 10) + rnorm(10))
```

pm25_2011_durham	<i>Air quality for Durham, NC</i>
------------------	-----------------------------------

Description

Daily air quality is measured by the air quality index (AQI) reported by the Environmental Protection Agency in 2011.

Usage

```
pm25_2011_durham
```

Format

A data frame with 449 observations on the following 20 variables.

- date** Date
- aqs_site_id** The numeric site ID.
- poc** A numeric vector, the Parameter Occurance Code.
- daily_mean_pm2_5_concentration** A numeric vector with the average daily concentration of fine particulates, or particulate matter 2.5.

units A character vector with value ug/m3 LC.

daily_aqi_value A numeric vector with the daily air quality index.

daily_obs_count A numeric vector.

percent_complete A numeric vector.

aqs_parameter_code A numeric vector.

aqs_parameter_desc A factor with levels PM2.5 – Local Conditions and Acceptable PM2.5 AQI & Speciation Mass.

cbsa_code A numeric vector.

cbsa_name A character vector with value Durham, NC.

state_code A numeric vector.

state A character vector with value North Carolina.

county_code A numeric vector.

county A character vector with value Durham.

site_latitude A numeric vector of the latitude.

site_longitude A numeric vector of the longitude.

csa_code a numeric vector

csa_name a factor with levels Raleigh-Durham-Cary, NC

Source

US Environmental Protection Agency, AirData, 2011. <https://www.epa.gov/outdoor-air-quality-data>

Examples

```
library(ggplot2)

ggplot(pm25_2011_durham, aes(x = date, y = daily_mean_pm2_5_concentration, group = 1)) +
  geom_line()
```

pm25_2022_durham	<i>Air quality for Durham, NC</i>
------------------	-----------------------------------

Description

Daily air quality is measured by the air quality index (AQI) reported by the Environmental Protection Agency in 2022.

Usage

```
pm25_2022_durham
```

Format

A data frame with 356 observations on the following 20 variables.

date Date.

aqs_site_id The numeric site ID.

poc A numeric vector, the Parameter Occurance Code.

daily_mean_pm2_5_concentration A numeric vector with the average daily concentration of fine particulates, or particulate matter 2.5.

units A character vector with value ug/m3 LC.

daily_aqi_value A numeric vector with the daily air quality index.

daily_obs_count A numeric vector.

percent_complete A numeric vector.

aqs_parameter_code A numeric vector.

aqs_parameter_desc A factor vector with level PM2.5 - Local Conditions.

cbsa_code A numeric vector.

cbsa_name A character vector with value Durham-Chapel Hill, NC.

state_code A numeric vector.

state A character vector with value North Carolina.

county_code A numeric vector.

county A character vector with value Durham.

site_latitude A numeric vector of the latitude.

site_longitude A numeric vector of the longitude.

site_name A character vector with value Durham Armory.

Source

US Environmental Protection Agency, AirData, 2022. <https://www.epa.gov/outdoor-air-quality-data>

Examples

```
library(ggplot2)

ggplot(pm25_2022_durham, aes(x = date, y = daily_mean_pm2_5_concentration, group = 1)) +
  geom_line()
```

poker	<i>Poker winnings during 50 sessions</i>
-------	--

Description

Poker winnings (and losses) for 50 days by a professional poker player.

Usage

poker

Format

A data frame with 49 observations on the following variable.

winnings Poker winnings and losses, in US dollars.

Source

Anonymity has been requested by the player.

Examples

```
library(ggplot2)

ggplot(poker, aes(x = winnings)) +
  geom_histogram(binwidth = 250)
```

possum	<i>Possums in Australia and New Guinea</i>
--------	--

Description

Data representing possums in Australia and New Guinea. This is a copy of the dataset by the same name in the DAAG package, however, the dataset included here includes fewer variables.

Usage

possum

Format

A data frame with 104 observations on the following 8 variables.

site The site number where the possum was trapped.

pop Population, either Vic (Victoria) or other (New South Wales or Queensland).

sex Gender, either m (male) or f (female).

age Age.

head_l Head length, in mm.

skull_w Skull width, in mm.

total_l Total length, in cm.

tail_l Tail length, in cm.

Source

Lindenmayer, D. B., Viggers, K. L., Cunningham, R. B., and Donnelly, C. F. 1995. Morphological variation among columns of the mountain brushtail possum, *Trichosurus caninus* Ogilby (Phalangeridae: Marsupiala). *Australian Journal of Zoology* 43: 449-458.

Examples

```
library(ggplot2)

# Skull width vs. head length
ggplot(possum, aes(x = head_l, y = skull_w)) +
  geom_point()

# Total length vs. sex
ggplot(possum, aes(x = total_l, fill = sex)) +
  geom_density(alpha = 0.5)
```

ppp_201503

US Poll on who it is better to raise taxes on

Description

A poll of 691 people, with party affiliation collected, asked whether they think it's better to raise taxes on the rich or raise taxes on the poor.

Usage

```
ppp_201503
```

Format

A data frame with 691 observations on the following 2 variables.

party Political party affiliation.

taxes Support for who to raise taxes on.

Source

Public Policy Polling, Americans on College Degrees, Classic Literature, the Seasons, and More, data collected Feb 20-22, 2015.

Examples

```
library(ggplot2)

ggplot(ppp_201503, aes(x = party, fill = taxes)) +
  geom_bar(position = "fill") +
  labs(x = "Party", x = "Proportion", fill = "Taxes")
```

present

Birth counts

Description

An updated version of the historical Arbuthnot dataset. Numbers of boys and girls born in the United States between 1940 and 2002.

Usage

```
present
```

Format

A data frame with 63 observations on the following 3 variables.

year Year.

boys Number of boys born.

girls Number of girls born.

Source

Mathews, T. J., and Brady E. Hamilton. "Trend analysis of the sex ratio at birth in the United States." National vital statistics reports 53.20 (2005): 1-17.

Examples

```
library(ggplot2)

ggplot(present, mapping = aes(x = year, y = boys / girls)) +
  geom_line()
```

president	<i>United States Presidential History</i>
-----------	---

Description

Summary of the changes in the president and vice president for the United States of America.

Usage

president

Format

A data frame with 67 observations on the following 5 variables.

potus President of the United States

party Political party of the president

start Start year

end End year

vpotus Vice President of the United States

Source

Presidents of the United States (table) – infoplease.com (visited: Nov 2nd, 2010)

<https://www.infoplease.com/us/government/executive-branch/presidents> and <https://www.infoplease.com/us/government/executive-branch/vice-presidents>

Examples

president

prevend	<i>Data with Ruff Figural Fluency Test (RFFT) scores with demographic predictors and statin use.</i>
---------	--

Description

Data from the Prevention of RENal and Vascular END-stage Disease (PREVEND) study, which took place in the Netherlands. The study collected various demographic and cardiovascular risk factors. This dataset is from the third survey, which participants completed in 2003-2006; data are provided for 4,095 individuals who completed cognitive testing with RFFT.

Usage

prevend

Format

A tibble with 4095 rows and 31 variables:

Caselnr case number, numeric

Age Numeric, age in years, recorded at time of enrollment.

Gender Numeric vector: 0 = males; 1 = females.

Ethnicity Numeric vector: 0 = Western European; 1 = African; 2 = Asian; 3 = Other.

Education Highest level of education. Numeric: 0 primary school; 1 = lower secondary education; 3 = university.

RFFT Numeric, performance on the Ruff Figural Fluency Test. Scores range from 0 (worst) to 175 (best).

VAT Numeric, Visual Association Test score. The VAT is a learning task based on image recognition. Scores may range from 0 (worst) to 12 (best)

CVD History of cardiovascular event. Numeric vector: 0 = No; 1 = Yes.

DM Diabetes mellitus (Type 2 diabetes) status at enrollment. Numeric vector: 0 = No; 1 = Yes.

Smoking Smoking status at enrollment. numeric vector: 0 = No; 1 = Yes.

Hypertension status of hypertension at enrollment. Numeric vector: 0 = No; 1 = Yes.

BMI Numeric, body mass index, weight divided by height-squared, in kg/m²

SBP Numeric, systolic blood pressure, in mmHg

DBP Numeric, diastolic blood pressure, in mmHg

MAP Numeric, mean arterial pressure, in mmHg

eGFR Numeric, estimated glomerular filtration rate, a measure of kidney function. Low values indicate possible kidney damage, in mL/min.

Albuminuria.1 Albuminuria (mg/24hr) in two categories. Numeric vector: 0 = (< 30); 1 = (≥ 30)

Albuminuria.2 Albuminuria (mg/24hr) in three categories. Numeric: 0 = (0 to < 10), 1 = (10 to < 30); 3 = (≥ 30).

Chol Numeric, total cholesterol, in mmol/L.

HDL Numeric, HDL cholesterol, in mmol/L.

Statin Statin use at enrollment. Numeric vector: 0 = No; 1 = Yes.

Solubility Statin solubility. Numeric vector: 0 = lipophilic; 1 = hydrophilic; 2 = no statin use. NA indicates statin solubility is missing.

Days Numeric, total duration of statin use, in days. -1 indicates participant did not use statins

Years Numeric, total duration of statin use, in years. -1 indicates participant did not use statins.

DDD Defined daily dose of the statin. Numeric vector: From the PLOS One paper, "DDD is defined by the WHO as the drug units representing dosages with approximately similar efficacy. One DDD corresponds to the following dosage for each statin respectively: Simvastatin 30 mg, Pravastatin 30 mg, Fluvastatin 60 mg, Atorvastatin 20 mg and Rosuvastatin 10 mg."

FRS Framingham risk score. Numeric vector. The score, a measure of risk for a cardiovascular event within 10 years. Higher values imply increased use. For details see D’Agostino RBS, Vasan RS, Pencina MJ, Wolf PA, Cobain M, et al. (2008) General cardiovascular risk profile for use in primary care: The Framingham Heart Study. *Circulation* 117: 743–753.

PS Propensity score of statin use. Numeric vector. See the PLOS One paper for the model used to calculate the score

PSquint Quintile of PS. Numeric vector.

GRS Indicator for random sample of 1638 Groningen residents in the study. Numeric vector.

Match_1 Numeric, statin users and non-users matched 1:1 on age and educational level. Matched pairs share a common integer label. -1 indicates participant not matched.

Match_2 Numeric, statin users and non-users matched 1:1 on Framingham risk score. Matched pairs share a common integer label. -1 indicates participant not matched

Source

[doi:10.5061/dryad.6qs53](https://doi.org/10.5061/dryad.6qs53)

References

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0115755>

prevend.samp

Random sample of size 500 from the prevend dataset

Description

Random sample of size 500 from the 4,095 cases in the prevend dataset with all 31 variables.

Usage

prevend.samp

Format

A tibble with 500 rows and 31 variables:

Casenr case number, numeric

Age Numeric, age in years, recorded at time of enrollment.

Gender Numeric vector: 0 = males; 1 = females.

Ethnicity Numeric vector: 0 = Western European; 1 = African; 2 = Asian; 3 = Other.

Education Highest level of education. Numeric: 0 primary school; 1 = lower secondary education; 3 = university.

RFFT Numeric, performance on the Ruff Figural Fluency Test. Scores range from 0 (worst) to 175 (best).

- VAT Numeric, Visual Association Test score. The VAT is a learning task based on image recognition. Scores may range from 0 (worst) to 12 (best)
- CVD History of cardiovascular event. Numeric vector: 0 = No; 1 = Yes.
- DM Diabetes mellitus (Type 2 diabetes) status at enrollment. Numeric vector: 0 = No; 1 = Yes.
- Smoking Smoking status at enrollment. numeric vector: 0 = No; 1 = Yes.
- Hypertension status of hypertension at enrollment. Numeric vector: 0 = No; 1 = Yes.
- BMI Numeric, body mass index, weight divided by height-squared, in kg/m^2
- SBP Numeric, systolic blood pressure, in mmHg
- DBP Numeric, diastolic blood pressure, in mmHg
- MAP Numeric, mean arterial pressure, in mmHg
- eGFR Numeric, estimated glomerular filtration rate, a measure of kidney function. Low values indicate possible kidney damage, in mL/min.
- Albuminuria.1 Albuminuria (mg/24hr) in two categories. Numeric vector: 0 = (< 30); 1 = (≥ 30)
- Albuminuria.2 Albuminuria (mg/24hr) in three categories. Numeric: 0 = (0 to < 10), 1 = (10 to < 30); 3 = (≥ 30).
- Chol Numeric, total cholesterol, in mmol/L.
- HDL Numeric, HDL cholesterol, in mmol/L.
- Statin Statin use at enrollment. Numeric vector: 0 = No; 1 = Yes.
- Solubility Statin solubility. Numeric vector: 0 = lipophilic; 1 = hydrophilic; 2 = no statin use. NA indicates statin solubility is missing.
- Days Numeric, total duration of statin use, in days. -1 indicates participant did not use statins
- Years Numeric, total duration of statin use, in years. -1 indicates participant did not use statins.
- DDD Defined daily dose of the statin. Numeric vector: From the PLOS One paper, "DDD is defined by the WHO as the drug units representing dosages with approximately similar efficacy. One DDD corresponds to the following dosage for each statin respectively: Simvastatin 30 mg, Pravastatin 30 mg, Fluvastatin 60 mg, Atorvastatin 20 mg and Rosuvastatin 10 mg."
- FRS Framingham risk score. Numeric vector. The score, a measure of risk for a cardiovascular event within 10 years. Higher values imply increased use. For details see D'Agostino RBS, Vasan RS, Pencina MJ, Wolf PA, Cobain M, et al. (2008) General cardiovascular risk profile for use in primary care: The Framingham Heart Study. *Circulation* 117: 743–753.
- PS Propensity score of statin use. Numeric vector. See the PLOS One paper for the model used to calculate the score
- PSquint Quintile of PS. Numeric vector.
- GRS Indicator for random sample of 1638 Groningen residents in the study. Numeric vector.
- Match_1 Numeric, statin users and non-users matched 1:1 on age and educational level. Matched pairs share a common integer label. -1 indicates participant not matched.
- Match_2 Numeric, statin users and non-users matched 1:1 on Framingham risk score. Matched pairs share a common integer label. -1 indicates participant not matched

Source

[doi:10.5061/dryad.6qs53](https://doi.org/10.5061/dryad.6qs53)

References

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0115755>

prison

Prison isolation experiment

Description

Subjects from Central Prison in Raleigh, NC, volunteered for an experiment involving an "isolation" experience. The goal of the experiment was to find a treatment that reduces subjects' psychopathic deviant T scores. This score measures a person's need for control or their rebellion against control, and it is part of a commonly used mental health test called the Minnesota Multiphasic Personality Inventory (MMPI) test.

Usage

prison

Format

A data frame with 14 observations on the following 6 variables.

pre_trt1 Pre-treatment 1.

post_trt1 Post-treatment 1.

pre_trt2 Pre-treatment 2.

post_trt2 Post-treatment 2.

pre_trt3 Pre-treatment 3.

post_trt3 Post-treatment 3.

Source

<https://stat.duke.edu/datasets/prison-isolation>

Examples

prison

prius_mpg

User reported fuel efficiency for 2017 Toyota Prius Prime

Description

Fueleconomy.gov, the official US government source for fuel economy information, allows users to share gas mileage information on their vehicles. These data come from 19 users sharing gas mileage on their 2017 Toyota Prius Prime. Note that these data are user estimates and since the sources data cannot be verified, the accuracy of these estimates are not guaranteed.

Usage

prius_mpg

Format

A data frame with 19 observations on the following 10 variables.

average_mpg Average mileage as estimated by the user.

state US State the user lives in.

stop_and_go Proportion of stop and go driving.

highway Proportion of highway driving.

last_updated Date estimate was last updated.

Source

Fueleconomy.gov, <https://www.fueleconomy.gov/mpg/MPG.do?action=mpgData&vehicleID=38531&browser=true&details=on>, retrieved 2019-04-14.

Examples

```
library(ggplot2)
library(dplyr)

ggplot(prius_mpg, aes(x = average_mpg)) +
  geom_histogram(binwidth = 25)
```

qqnormsim

Generate simulated QQ plots

Description

Create a 3 x 3 grid of quantile-quantile plots, the first of which corresponds to the input data. The other eight plots arise from simulating random normal data with the same mean, standard deviation, and length as the data. For use in comparing known-normal qqplots to an observed qqplot to assess normality.

Usage

```
qqnormsim(sample, data)
```

Arguments

sample	the variable to be plotted.
data	data frame to use.

Value

A 3 x 3 grid of qqplots.

race_justice

Yahoo! News Race and Justice poll results

Description

Results from a Yahoo! News poll conducted by YouGov on May 29-31, 2020. In total 1060 U.S. adults were asked a series of questions regarding race and justice in the wake of the killing of George Floyd by a police officer. Results in this dataset are percentages for the question, "Do you think Blacks and Whites receive equal treatment from the police?" For this particular question there were 1059 respondents.

Usage

```
race_justice
```

Format

A data frame with 1,059 rows and 2 variables.

race_eth Race/ethnicity of respondent, with levels White, Black, Hispanic, and Other.

response Response to the question "Do you think Black and White people receive equal treatment from the police?", with levels Yes, No, and Not sure.

Source

Yahoo! News Race and Justice - May 31, 2020.

Examples

```
library(ggplot2)
library(dplyr)

# Conditional probabilities of response for each race/ethnicity
race_justice |>
  count(race_eth, response) |>
  group_by(race_eth) |>
  mutate(prop = n / sum(n))

# Stacked bar plot of counts
ggplot(race_justice, aes(x = race_eth, fill = response)) +
  geom_bar() +
  labs(
    x = "Race / ethnicity",
    y = "Count",
    title = "Do you think Black and White people receive
equal treatment from the police?",
    fill = "Response"
  )

# Stacked bar plot of proportions
ggplot(race_justice, aes(x = race_eth, fill = response)) +
  geom_bar(position = "fill") +
  labs(
    x = "Race / ethnicity",
    y = "Proportion",
    title = "Do you think Black and White people receive
equal treatment from the police?",
    fill = "Response"
  )
```

reddit_finance

Reddit Survey on Financial Independence.

Description

A reduced set of the official results of the 2020 FI Survey from Reddit (r/financialindependence). Only responses that represent the respondent (not other contributors in the household) are listed. Does not include retired individuals. As per instructed, respondents give dollar values in their native currency.

Usage

reddit_finance

Format

A data frame with 1998 rows and 65 variables.

num_incomes How many individuals contribute to your household income?

pan_inc_chg As a result of the pandemic, did your earned income increase, decrease, or remain the same?

pan_inc_chg_pct By how much did your earned income change?

pan_exp_chg As a result of the pandemic, did your expenses increase, decrease, or remain the same?

pan_exp_chg_pct By how much did your expenses change?

pan_fi_chg As a result of the pandemic, did your FI (financially independent) number...

pan_ret_date_chg As a result of the pandemic, did your planned RE (retirement) date...

pan_financial_impact Overall, how would you characterize the pandemic's impact on your finances?

political With which political party do you most closely identify? You do not need to be registered with a party to select it, answer based on your personal views.

race_eth What is your race/ethnicity? Select all that apply.

gender What is your gender?

age What is your age?

edu What is the highest level of education you have completed?

rel_status What is your relationship status?

children Do you have children?

country What country are you in?

fin_indy Are you financially independent? Meaning you do not need to work for money, regardless of whether you work for money.

fin_indy_num At what amount invested will you consider yourself Financially Independent? (What is your FI number?)

fin_indy_pct What percent FI are you? (What percent of your FI number do you currently have?)

retire_invst_num At what amount invested do you intend to retire? (What is your RE number)

tgt_sf_wthdrw_rt What is your target safe withdrawal rate? (If your answer is 3.5%, enter it as 3.5)

max_retire_sup How much annual income do you expect to have from the sources you selected in question T5 at the point where you are utilizing all of them (or a majority if you do not intend to use all at the same time)? Enter your answer as a dollar amount.

retire_exp How much money (from your savings and other sources) do you intend to spend each year once you are retired? Enter your answer as a dollar amount.

whn_fin_indy_num At what amount invested did you consider yourself Financially Independent? (AKA what was your "FI number")

fin_indy_lvl Which of the following would you have considered yourself at the time you reached Financial Independence:

retire_age At what age do you intend to retire?

stp_wnn_fin_indy Do you intend to stop working for money when you reach financial independence?

industry Which of the following best describes the industry in which you currently or most recently work(ed)?

employer Which of the following best describes your current or most recent employer?

role Which of the following best describes your current or most recent job role?

ft_status What is your current employment status? - Full Time

pt_status What is your current employment status? - Part Time, Regular

gig_status What is your current employment status? -Side Gig, Intermittent

ne_status What is your current employment status? -Not Employed

edu_status What is your current educational status?

housing What is your current housing situation?

home_value Primary residence value.

brokerage_accts_tax Brokerage accounts (Taxable).

retirement_accts_tax Retirement accounts (Tax Advantaged).

cash Cash / cash equivalents (Savings, Checking, C.D.s, Money Market).

invst_accts Dedicated Savings/Investment Accounts (Healthcare, Education).

spec_crypto Speculation (Crypto, P2P Lending, Gold, etc.).

invst_prop_bus_own investment properties / owned business(es).

other_val Other assets.

student_loans Outstanding student loans.

mortgage Outstanding mortgage / HELOC.

auto_loan Outstanding auto loans.

credit_personal_loan Outstanding credit cards / personal loans.

medical_debt Outstanding medical debt.

invst_prop_bus_own_debt Debt from investment properties / owned business.

other_debt Debt from other sources.

2020_gross_inc What was your 2020 gross (pre-tax, pre-deductions) annual household income?

2020_housing_exp Housing expenses(rent, mortgage, insurance, taxes, upkeep).

2020_utilities_exp Utilities expenses(phone, internet, gas, electric, water, sewer).

2020_transp_exp Transportation expenses(car payment, bus / subway tickets, gas, insurance, maintenance).

2020_necessities_exp Necessities expenses(Groceries, Clothing, Personal Care, Household Supplies).

2020_lux_exp Luxury expenses (Restaurants/Dining, Entertainment, Hobbies, Travel, Pets, Gifts).

2020_child_exp Children expenses(child care, soccer team, etc.).

2020_debt_repay Debt repayment (excluding mortgage/auto).

2020_invst_save Investments / savings.

2020_charity Charity / Tithing.

2020_healthcare_exp Healthcare expenses(direct costs, co-pays, insurance you pay).

2020_taxes Taxes (the sum of all taxes paid, including amounts deducted from paychecks).

2020_edu_exp Education expenses.

2020_other_exp Other expenses.

Source

Reddit Official 2020 FI Survey Results, https://www.reddit.com/r/financialindependence/comments/m1q8ia/official_2020_fi_

Examples

```
library(ggplot2)

# Histogram of Expected Retirement Age.
ggplot(reddit_finance, aes(retire_age)) +
  geom_bar(na.rm = TRUE) +
  labs(
    title = "At what age do you expect to retire?",
    x = "Age Bracket",
    y = "Number of Respondents"
  )

# Histogram of Dollar Amount at Which FI was reached.
ggplot(reddit_finance, aes(whn_fin_indy_num)) +
  geom_histogram(na.rm = TRUE, bins = 20) +
  labs(
    title = "At what amount invested did you consider\nyourself Financially Independent?",
    x = "Dollar Amount (in local currency)",
    y = "Number of Respondents"
  )
```

resume

Which resume attributes drive job callbacks?

Description

This experiment data comes from a study that sought to understand the influence of race and gender on job application callback rates. The study monitored job postings in Boston and Chicago for several months during 2001 and 2002 and used this to build up a set of test cases. Over this time period, the researchers randomly generating resumes to go out to a job posting, such as years of experience and education details, to create a realistic-looking resume. They then randomly assigned a name to the resume that would communicate the applicant's gender and race. The first names chosen for the study were selected so that the names would predominantly be recognized as belonging to black or white individuals. For example, Lakisha was a name that their survey indicated would be interpreted as a black woman, while Greg was a name that would generally be interpreted to be associated with a white male.

Usage

resume

Format

A data frame with 4870 observations, representing 4870 resumes, over 30 different variables that describe the job details, the outcome (received_callback), and attributes of the resume.

job_ad_id Unique ID associated with the advertisement.

job_city City where the job was located.

job_industry Industry of the job.

job_type Type of role.

job_fed_contractor Indicator for if the employer is a federal contractor.

job_equal_opp_employer Indicator for if the employer is an Equal Opportunity Employer.

job_ownership The type of company, e.g. a nonprofit or a private company.

job_req_any Indicator for if any job requirements are listed. If so, the other job_req_* fields give more detail.

job_req_communication Indicator for if communication skills are required.

job_req_education Indicator for if some level of education is required.

job_req_min_experience Amount of experience required.

job_req_computer Indicator for if computer skills are required.

job_req_organization Indicator for if organization skills are required.

job_req_school Level of education required.

received_callback Indicator for if there was a callback from the job posting for the person listed on this resume.

firstname The first name used on the resume.

race Inferred race associated with the first name on the resume.

gender Inferred gender associated with the first name on the resume.

years_college Years of college education listed on the resume.

college_degree Indicator for if the resume listed a college degree.

honors Indicator for if the resume listed that the candidate has been awarded some honors.

worked_during_school Indicator for if the resume listed working while in school.

years_experience Years of experience listed on the resume.

computer_skills Indicator for if computer skills were listed on the resume. These skills were adapted for listings, though the skills were assigned independently of other details on the resume.

special_skills Indicator for if any special skills were listed on the resume.

volunteer Indicator for if volunteering was listed on the resume.

military Indicator for if military experience was listed on the resume.

employment_holes Indicator for if there were holes in the person's employment history.

has_email_address Indicator for if the resume lists an email address.

resume_quality Each resume was generally classified as either lower or higher quality.

Details

Because this is an experiment, where the race and gender attributes are being randomly assigned to the resumes, we can conclude that any statistically significant difference in callback rates is causally linked to these attributes.

Do you think it's reasonable to make a causal conclusion? You may have some health skepticism. However, do take care to appreciate that this was an experiment: the first name (and so the inferred race and gender) were randomly assigned to the resumes, and the quality and attributes of a resume were assigned independent of the race and gender. This means that any effects we observe are in fact causal, and the effects related to race are both statistically significant and very large: white applicants had about a 50\

Do you still have doubts lingering in the back of your mind about the validity of this study? Maybe a counterargument about why the standard conclusions from this study may not apply? The article summarizing the results was exceptionally well-written, and it addresses many potential concerns about the study's approach. So if you're feeling skeptical about the conclusions, please find the link below and explore!

Source

Bertrand M, Mullainathan S. 2004. "Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination". The American Economic Review 94:4 (991-1013). [doi:10.3386/w9873](https://doi.org/10.3386/w9873).

See Also

[resume](#)

Examples

```
head(resume, 5)

# Some checks to confirm balance between race and
# other attributes of a resume. There should be
# some minor differences due to randomness, but
# each variable should be (and is) generally
# well-balanced.
table(resume$race, resume$years_college)
table(resume$race, resume$college_degree)
table(resume$race, resume$honors)
table(resume$race, resume$worked_during_school)
table(resume$race, resume$years_experience)
table(resume$race, resume$computer_skills)
table(resume$race, resume$special_skills)
table(resume$race, resume$volunteer)
table(resume$race, resume$military)
table(resume$race, resume$employment_holes)
table(resume$race, resume$has_email_address)
table(resume$race, resume$resume_quality)

# Regarding the callback outcome for race,
# we observe a very large difference.
```

```

tapply(
  resume$received_callback,
  resume[c("race", "gender")],
  mean
)

# Natural question: is this statistically significant?
# A proper analysis would take into account the
# paired nature of the data. For each ad, let's
# compute the following statistic:
#   <callback rate for white candidates>
#   - <callback rate for black candidates>
# First construct the callbacks for white and
# black candidates by ad ID:
table(resume$race)
cb_white <- with(
  subset(resume, race == "white"),
  tapply(received_callback, job_ad_id, mean)
)
cb_black <- with(
  subset(resume, race == "black"),
  tapply(received_callback, job_ad_id, mean)
)
# Next, compute the differences, where the
# names(cb_white) part ensures we matched up the
# job ad IDs.
diff <- cb_white - cb_black[names(cb_white)]
# Finally, we can apply a t-test on the differences:
t.test(diff)
# There is very strong evidence of an effect.

# Here's a similar check with gender. There are
# more female-inferred candidates used on the resumes.
table(resume$gender)
cb_male <- with(
  subset(resume, gender == "m"),
  tapply(received_callback, job_ad_id, mean)
)
cb_female <- with(
  subset(resume, gender == "f"),
  tapply(received_callback, job_ad_id, mean)
)
diff <- cb_female - cb_male[names(cb_female)]
# The `na.rm = TRUE` part ensures we limit to jobs
# where both a male and female resume were sent.
t.test(diff, na.rm = TRUE)
# There is no statistically significant difference.

# Was that the best analysis? Absolutely not!
# However, the analysis was unbiased. To get more
# precision on the estimates, we could build a
# multivariate model that includes many characteristics
# of the resumes sent, e.g. years of experience.

```



```
# Since those other characteristics were assigned  
# independently of the race characteristics, this  
# means the race finding will almost certainly will  
# hold. However, it is possible that we'll find  
# more interesting results with the gender investigation.
```

`res_demo_1`*Simulated data for regression*

Description

Simulated data for regression

Usage`res_demo_1`**Format**

A data frame with 100 observations on the following 3 variables.

x a numeric vector

y_lin a numeric vector

y_fan_back a numeric vector

Examples`res_demo_1`

`res_demo_2`*Simulated data for regression*

Description

Simulated data for regression

Usage`res_demo_2`**Format**

A data frame with 300 observations on the following 3 variables.

x a numeric vector

y_fan a numeric vector

y_log a numeric vector

Examples

```
res_demo_2
```

rosling_responses

Sample Responses to Two Public Health Questions

Description

Public health has improved and evolved, but has the public's knowledge changed with it? This dataset explores sample responses for two survey questions posed by Hans Rosling during lectures to a wide array of well-educated audiences.

Usage

```
rosling_responses
```

Format

A data frame with 278 rows and 3 variables:

question ID for the question being posed.

response Noting whether the response was correct or incorrect.

prob_random_correct The probability the person would have guessed the answer correctly if they were guessing completely randomly.

Source

The samples we describe are plausible based on the exact rates observed in larger samples. For more info on the actual rates observed, visit <https://www.gapminder.org>.

Another relevant reference is a book by Hans Rosling, Anna Rosling Ronnlund, and Ola Rosling called [Factfulness](#).

Examples

```
frac_correct <- tapply(
  rosling_responses$response == "correct",
  rosling_responses$question,
  mean
)
frac_correct
n <- table(rosling_responses$question)
n
expected <- tapply(
  rosling_responses$prob_random_correct,
  rosling_responses$question,
  mean
)
```

```
# Construct confidence intervals.
se <- sqrt(frac_correct * (1 - frac_correct) / n)
# Lower bounds.
frac_correct - 1.96 * se
# Upper bounds.
frac_correct + 1.96 * se

# Construct Z-scores and p-values.
z <- (frac_correct - expected) / se
pt(z, df = n - 1)
```

russian_influence_on_us_election_2016

Russians' Opinions on US Election Influence in 2016

Description

Survey of Russian citizens on whether they believed their government tried to influence the 2016 US election. The survey was taken in Spring 2018 by Pew Research.

Usage

```
russian_influence_on_us_election_2016
```

Format

A data frame with 506 observations on the following variable.

influence_2016 Response of the Russian survey participant to the question of whether their government tried to influence the 2016 election in the United States.

Details

The actual sample size was 1000. However, the original data were not from a simple random sample; after accounting for the design, the equivalent sample size was 506, which was what was used for the dataset here to keep things simpler for intro stat analyses.

Source

<https://www.pewresearch.org/global/2018/08/21/russians-say-their-government-did-not-try-to-influence-the-2016-us-election/>

Examples

```
table(russian_influence_on_us_election_2016)
```

`salinity`*Salinity in Bimini Lagoon, Bahamas*

Description

Data collected at three different water masses in the Bimini Lagoon, Bahamas.

Usage`salinity`**Format**

A data frame with 30 rows and 2 variables.

site_number Location where measurements were taken.

salinity_ppt Salinity value in parts per thousand.

Source

Till, R. (1974) Statistical Methods for the Earth Scientist: An Introduction. London: Macmillan, 104.

Examples

```
library(ggplot2)
library(broom)

ggplot(salinity, aes(x = salinity_ppt)) +
  geom_dotplot() +
  facet_wrap(~site_number, ncol = 1)

tidy(aov(salinity_ppt ~ site_number, data = salinity))
```

`satgpa`*SAT and GPA data*

Description

SAT and GPA data for 1000 students at an unnamed college.

Usage`satgpa`

Format

A data frame with 1000 observations on the following 6 variables.

sex Gender of the student.

sat_v Verbal SAT percentile.

sat_m Math SAT percentile.

sat_sum Total of verbal and math SAT percentiles.

hs_gpa High school grade point average.

fy_gpa First year (college) grade point average.

Source

Educational Testing Service originally collected the data.

References

<https://chance.dartmouth.edu/course/Syllabi/Princeton96/ETSValidation.html>

Examples

```
library(ggplot2)
library(broom)

# Verbal scores
ggplot(satgpa, aes(x = sat_v, fy_gpa)) +
  geom_point() +
  geom_smooth(method = "lm") +
  labs(
    x = "Verbal SAT percentile",
    y = "First year (college) grade point average"
  )

mod <- lm(fy_gpa ~ sat_v, data = satgpa)
tidy(mod)

# Math scores
ggplot(satgpa, aes(x = sat_m, fy_gpa)) +
  geom_point() +
  geom_smooth(method = "lm") +
  labs(
    x = "Math SAT percentile",
    y = "First year (college) grade point average"
  )

mod <- lm(fy_gpa ~ sat_m, data = satgpa)
tidy(mod)
```

sat_improve	<i>Simulated data for SAT score improvement</i>
-------------	---

Description

Fake data for score improvements from students who took a course from an SAT score improvement company.

Usage

```
sat_improve
```

Format

A data frame with 30 observations on the following variable.

sat_improve a numeric vector

Examples

```
sat_improve
```

sa_gdp_elec	<i>Sustainability and Economic Indicators for South Africa.</i>
-------------	---

Description

Includes yearly data on gdp, gni, co2 emissions, start up costs.

Usage

```
sa_gdp_elec
```

Format

A data frame with 16 rows and 7 variables.

year Year data collected.

access_elec Access to electricity as a percentage of the population.

startup cost of business startup procedures as a percent of GNI.

co2 CO2 emission in kt (kiloton).

gdp GDP per capita, PPP in constant 2017 international dollars.

gni GNI per capita, PPP in constant 2017 international dollars.

co2_kg_ppp kg per 2017 PPP dollars of GDP.

Source

- [World Bank I](#)
- [World Bank II](#)
- [Carbon Dioxide Information Analysis Center, Environmental Sciences Division, Oak Ridge National Laboratory](#)

Examples

```
library(ggplot2)

ggplot(sa_gdp_elec, aes(year, access_elec)) +
  geom_point(alpha = 0.3) +
  labs(
    x = "Year",
    y = "Percent of Population",
    title = "Access to Electricity in South Africa 2003 - 2018"
  )
```

scale_color_openintro *Color scale constructor for OpenIntro IMS colors*

Description

Color scale constructor for OpenIntro IMS colors

Usage

```
scale_color_openintro(palette = "main", discrete = TRUE, reverse = FALSE, ...)
```

Arguments

palette	Character name of palette in openintro_palettes
discrete	Boolean indicating whether color aesthetic is discrete or not
reverse	Boolean indicating whether the palette should be reversed
...	Additional arguments passed to ggplot2::discrete_scale() or ggplot2::scale_color_gradientn() used respectively when discrete is TRUE or FALSE

Examples

```
library(ggplot2)

# Categorical variable with three levels
ggplot(evals, aes(
  x = bty_avg, y = score,
  color = rank, shape = rank
)) +
```

```

    geom_jitter(size = 2, alpha = 0.6) +
    scale_color_openintro("three")

# Categorical variable with two levels
ggplot(evals, aes(
  x = bty_avg, y = score,
  color = language, shape = language
)) +
  geom_jitter(size = 2, alpha = 0.6) +
  scale_color_openintro("two")

# Continuous variable
# Generates a palette, but not recommended
ggplot(evals, aes(
  x = bty_avg, y = score,
  color = score
)) +
  geom_jitter(size = 2, alpha = 0.8) +
  scale_color_openintro(discrete = FALSE)

# For continuous palettes
# use scale_color_gradient instead
ggplot(evals, aes(
  x = bty_avg, y = score,
  color = score
)) +
  geom_jitter(size = 2) +
  scale_color_gradient(low = IMSCOL["blue", "full"], high = IMSCOL["blue", "f6"])

ggplot(evals, aes(
  x = bty_avg, y = score,
  color = cls_perc_eval
)) +
  geom_jitter(size = 2) +
  scale_color_gradient(low = COL["red", "full"], high = COL["red", "f8"])

```

scale_fill_openintro *Fill scale constructor for OpenIntro IMS colors*

Description

Fill scale constructor for OpenIntro IMS colors

Usage

```
scale_fill_openintro(palette = "main", discrete = TRUE, reverse = FALSE, ...)
```


Arguments

palette	Character name of palette in openintro_palettes
discrete	Boolean indicating whether color aesthetic is discrete or not
reverse	Boolean indicating whether the palette should be reversed
...	Additional arguments passed to ggplot2::discrete_scale() or ggplot2::scale_fill_gradientn() used respectively when discrete is TRUE or FALSE

Examples

```
library(ggplot2)
library(dplyr)

# Categorical variable with two levels
ggplot(evals, aes(x = ethnicity, fill = ethnicity)) +
  geom_bar() +
  scale_fill_openintro("two")

# Categorical variable with three levels
ggplot(evals, aes(x = rank, fill = rank)) +
  geom_bar() +
  scale_fill_openintro("three")

# Continuous variable with levels
# Generates a palette, but may not be the best palette
# in terms of color-blind and grayscale friendliness
ggplot(diamonds, aes(x = clarity, fill = clarity)) +
  geom_bar() +
  scale_fill_openintro()

# For continuous palettes
# use scale_color_gradient instead
ggplot(evals, aes(
  x = bty_avg, y = score,
  color = score
)) +
  geom_jitter(size = 2) +
  scale_color_gradient(low = IMSCOL["blue", "full"], high = IMSCOL["blue", "f6"])

ggplot(evals, aes(
  x = bty_avg, y = score,
  color = cls_perc_eval
)) +
  geom_jitter(size = 2) +
  scale_color_gradient(low = IMSCOL["green", "full"], high = IMSCOL["green", "f6"])
```

Description

On June 28, 2012 the U.S. Supreme Court upheld the much debated 2010 healthcare law, declaring it constitutional. A Gallup poll released the day after this decision indicates that 46% of 1,012 Americans agree with this decision.

Usage

```
scotus_healthcare
```

Format

A data frame with 1012 observations on the following variable.

response Response values reported are agree and other.

Source

Gallup, Americans Issue Split Decision on Healthcare Ruling, retrieved 2012-06-28.

Examples

```
table(scotus_healthcare)
```

seattlepets

Names of pets in Seattle

Description

Names of registered pets in Seattle, WA, between 2003 and 2018, provided by the city's Open Data Portal.

Usage

```
seattlepets
```

Format

A data frame with 52,519 rows and 7 variables:

license_issue_date Date the animal was registered with Seattle

license_number Unique license number

animal_name Animal's name

species Animal's species (dog, cat, goat, etc.)

primary_breed Primary breed of the animal

secondary_breed Secondary breed if mixed

zip_code Zip code animal is registered in

Source

These data come from Seattle's Open Data Portal, <https://data.seattle.gov/Community/Seattle-Pet-Licenses/jguv-t9rb>

sex_discrimination	<i>Bank manager recommendations based on sex</i>
--------------------	--

Description

Study from the 1970s about whether sex influences hiring recommendations.

Usage

```
sex_discrimination
```

Format

A data frame with 48 observations on the following 2 variables.

sex a factor with levels female and male

decision a factor with levels not promoted and promoted

Source

Rosen B and Jerdee T. 1974. Influence of sex role stereotypes on personnel decisions. Journal of Applied Psychology 59(1):9-14.

Examples

```
library(ggplot2)

table(sex_discrimination)

ggplot(sex_discrimination, aes(y = sex, fill = decision)) +
  geom_bar(position = "fill")
```

simpsons_paradox_covid

Simpson's Paradox: Covid

Description

A dataset on Delta Variant Covid-19 cases in the UK. This dataset gives a great example of Simpson's Paradox. When aggregating results without regard to age group, the death rate for vaccinated individuals is higher – but they have a much higher risk population. Once we look at populations with more comparable risks (breakout age groups), we see that the vaccinated group tends to be lower risk in each risk-bucketed group and that many of the higher risk patients had gotten vaccinated. The dataset was brought to OpenIntro's attention by Matthew T. Brenneman of Embry-Riddle Aeronautical University. Note: some totals in the original source differ as there were some cases that did not have ages associated with them.

Usage

simpsons_paradox_covid

Format

A data frame with 286,166 rows and 3 variables:

age_group Age of the person. Levels: under 50, 50 +.

vaccine_status Vaccination status of the person. Note: the vaccinated group includes those who were only partially vaccinated. Levels: vaccinated, unvaccinated

outcome Did the person die from the Delta variant? Levels: death and survived.

Source

[Public Health England: Technical briefing 20](#)

Examples

```
library(dplyr)
library(scales)
# Calculate the mortality rate for all cases by vaccination status
simpsons_paradox_covid |>
  group_by(vaccine_status, outcome) |>
  summarize(count = n()) |>
  ungroup() |>
  group_by(vaccine_status) |>
  mutate(total = sum(count)) |>
  filter(outcome == "death") |>
  select(c(vaccine_status, count, total)) |>
  mutate(mortality_rate = label_percent(accuracy = 0.01)(round(count / total, 4))) |>
  select(-c(count, total))
```

```
# Calculate mortality rate by age group and vaccination status
simpsons_paradox_covid |>
  group_by(age_group, vaccine_status, outcome) |>
  summarize(count = n()) |>
  ungroup() |>
  group_by(age_group, vaccine_status) |>
  mutate(total = sum(count)) |>
  filter(outcome == "death") |>
  select(c(age_group, vaccine_status, count, total)) |>
  mutate(mortality_rate = label_percent(accuracy = 0.01)(round(count / total, 4))) |>
  select(-c(count, total))
```

simulated_dist	<i>Simulated datasets, not necessarily drawn from a normal distribution.</i>
----------------	--

Description

Data were simulated in R, and some of the simulations do not represent data from actual normal distributions.

Usage

```
simulated_dist
```

Format

The format is: List of 4 \$ d1: dataset of 100 observations. \$ d2: dataset of 50 observations. \$ d3: num dataset of 500 observations. \$ d4: dataset of 15 observations. \$ d5: num dataset of 25 observations. \$ d6: dataset of 50 observations.

Examples

```
data(simulated_dist)
lapply(simulated_dist, qqnorm)
```

simulated_normal	<i>Simulated datasets, drawn from a normal distribution.</i>
------------------	--

Description

Data were simulated using [rnorm](#).

Usage

```
simulated_normal
```

Format

The format is: List of 3 \$ n40 : 40 observations from a standard normal distribution. \$ n100: 100 observations from a standard normal distribution. \$ n400: 400 observations from a standard normal distribution.

Examples

```
data(simulated_normal)
lapply(simulated_normal, qqnorm)
```

simulated_scatter	<i>Simulated data for sample scatterplots</i>
-------------------	---

Description

Fake data.

Usage

```
simulated_scatter
```

Format

A data frame with 500 observations on the following 3 variables.

group Group, representing data for a specific plot.

x x-value.

y y-value.

Examples

```
library(ggplot2)

ggplot(simulated_scatter, aes(x = x, y = y)) +
  geom_point() +
  facet_wrap(~group)
```

sinusitis	<i>Sinusitis and antibiotic experiment</i>
-----------	--

Description

Researchers studying the effect of antibiotic treatment for acute sinusitis to one of two groups: treatment or control.

Usage

```
sinusitis
```

Format

A data frame with 166 observations on the following 2 variables.

group a factor with levels control and treatment

self_reported_improvement a factor with levels no and yes

Source

J.M. Garbutt et al. Amoxicillin for Acute Rhinosinusitis: A Randomized Controlled Trial. In: JAMA: The Journal of the American Medical Association 307.7 (2012), pp. 685-692.

Examples

```
sinusitis
```

sleep_deprivation	<i>Survey on sleep deprivation and transportation workers</i>
-------------------	---

Description

The National Sleep Foundation conducted a survey on the sleep habits of randomly sampled transportation workers and a control sample of non-transportation workers.

Usage

```
sleep_deprivation
```

Format

A data frame with 1087 observations on the following 2 variables.

sleep a factor with levels <6, 6-8, and >8

profession a factor with levels bus / taxi / limo drivers, control, pilots, train operators, truck drivers

Source

National Sleep Foundation, 2012 Sleep in America Poll: Transportation Workers' Sleep, 2012.

<https://www.sleepfoundation.org/professionals/sleep-american-polls/2012-sleep-america-poll-transportation-workers-sleep>

Examples

```
sleep_deprivation
```

smallpox

Smallpox vaccine results

Description

A sample of 6,224 individuals from the year 1721 who were exposed to smallpox in Boston. Some of them had received a vaccine (inoculated) while others had not. Doctors at the time believed that inoculation, which involves exposing a person to the disease in a controlled form, could reduce the likelihood of death.

Usage

```
smallpox
```

Format

A data frame with 6224 observations on the following 2 variables.

result Whether the person died or lived.

inoculated Whether the person received inoculated.

Source

Fenner F. 1988. Smallpox and Its Eradication (History of International Public Health, No. 6). Geneva: World Health Organization. ISBN 92-4-156110-6.

Examples

```
data(smallpox)
table(smallpox)
```

smoking*UK Smoking Data*

Description

Survey data on smoking habits from the UK. The dataset can be used for analyzing the demographic characteristics of smokers and types of tobacco consumed.

Usage

smoking

Format

A data frame with 1691 observations on the following 12 variables.

gender Gender with levels Female and Male.

age Age.

marital_status Marital status with levels Divorced, Married, Separated, Single and Widowed.

highest_qualification Highest education level with levels A Levels, Degree, GCSE/CSE, GCSE/O Level, Higher/Sub Degree, No Qualification, ONC/BTEC and Other/Sub Degree

nationality Nationality with levels British, English, Irish, Scottish, Welsh, Other, Refused and Unknown.

ethnicity Ethnicity with levels Asian, Black, Chinese, Mixed, White and Refused Unknown.

gross_income Gross income with levels Under 2,600, 2,600 to 5,200, 5,200 to 10,400, 10,400 to 15,600, 15,600 to 20,800, 20,800 to 28,600, 28,600 to 36,400, Above 36,400, Refused and Unknown.

region Region with levels London, Midlands & East Anglia, Scotland, South East, South West, The North and Wales

smoke Smoking status with levels No and Yes

amt_weekends Number of cigarettes smoked per day on weekends.

amt_weekdays Number of cigarettes smoked per day on weekdays.

type Type of cigarettes smoked with levels Packets, Hand-Rolled, Both/Mainly Packets and Both/Mainly Hand-Rolled

Source

National STEM Centre, Large Datasets from stats4schools, <https://www.stem.org.uk/resources/elibrary/resource/28452/large-datasets-stats4schools>.

Examples

```
library(ggplot2)

ggplot(smoking, aes(x = amt_weekends)) +
  geom_histogram(binwidth = 5)

ggplot(smoking, aes(x = amt_weekdays)) +
  geom_histogram(binwidth = 5)

ggplot(smoking, aes(x = gender, fill = smoke)) +
  geom_bar(position = "fill")

ggplot(smoking, aes(x = marital_status, fill = smoke)) +
  geom_bar(position = "fill")
```

snowfall

Snowfall at Paradise, Mt. Rainier National Park

Description

Annual snowfall data for Paradise, Mt. Rainier National Park. To include a full winter season, snowfall is recorded from July 1 to June 30. Data from 1943-1946 not available due to road closure during World War II. Records also unavailable from 1948-1954.

Usage

```
snowfall
```

Format

A data frame with 100 rows and 3 variables.

year_start The year snowfall measurement began on July 1.

year_end The year snowfall measurement ended on June 30.

total_snow Snowfall measured in inches.

Source

[National Parks Services.](#)

Examples

```
library(ggplot2)

ggplot(snowfall, aes(x = total_snow)) +
  geom_histogram(binwidth = 50) +
  labs(
    title = "Annual Snowfall",
```

```

      subtitle = "Paradise, Mt. Rainier National Park",
      x = "Snowfall (in.)",
      y = "Number of Years",
      caption = "Source: National Parks Services"
    )

ggplot(snowfall, aes(x = year_start, y = total_snow, group = 1)) +
  geom_line() +
  labs(
    title = "Annual Snowfall",
    subtitle = "Paradise, Mt. Rainier National Park",
    y = "Snowfall (in.)",
    x = "Year",
    caption = "Source: National Parks Services"
  )

```

socialexp

Social experiment

Description

A "social experiment" conducted by a TV program questioned what people do when they see a very obviously bruised woman getting picked on by her boyfriend. On two different occasions at the same restaurant, the same couple was depicted. In one scenario the woman was dressed "provocatively" and in the other scenario the woman was dressed "conservatively". The table below shows how many restaurant diners were present under each scenario, and whether or not they intervened.

Usage

```
socialexp
```

Format

A data frame with 45 observations on the following 2 variables.

intervene Whether other diners intervened or not.

scenario How the woman was dressed.

Examples

```
table(socialexp)
```

`soda`

*soda***Description**

A randomly generated dataset of soda preference (cola or orange) based on location.

Usage

```
soda
```

Format

A data frame with 60 observations on the following 2 variables.

drink Soda preference, cola or orange.

location Is the person from the West coast or East coast?

Examples

```
library(dplyr)

soda |>
  count(location, drink)
```

`solar`

*Energy Output From Two Solar Arrays in San Francisco***Description**

The data provide the energy output for several months from two roof-top solar arrays in San Francisco. This city is known for having highly variable weather, so while these two arrays are only about 1 mile apart from each other, the Inner Sunset location tends to have more fog.

Usage

```
solar
```

Format

A data frame with 284 observations on the following 3 variables. Each row represents a single day for one of the arrays.

location Location for the array.

date Date.

kwh Number of kWh

Details

The Haight-Ashbury array is a 10.4 kWh array, while the Inner Sunset array is a 2.8 kWh array. The kWh units represents kilowatt-hours, which is the unit of energy that typically is used for electricity bills. The cost per kWh in San Francisco was about \$0.25 in 2016.

Source

These data were provided by Larry Rosenfeld, a resident in San Francisco.

Examples

```
solar.is <- subset(solar, location == "Inner_Sunset")
solar.ha <- subset(solar, location == "Haight_Ashbury")
plot(solar.is$date, solar.is$kwh, type = "l", ylim = c(0, max(solar$kwh)))
lines(solar.ha$date, solar.ha$kwh, col = 4)

d <- merge(solar.ha, solar.is, by = "date")
plot(d$date, d$kwh.x / d$kwh.y, type = "l")
```

sowc_child_mortality *SOWC Child Mortality Data.*

Description

Child mortality data from UNICEF's State of the World's Children 2019 Statistical Tables.

Usage

```
sowc_child_mortality
```

Format

A data frame with 195 rows and 19 variables.

countries_and_areas Country or area name.

under5_mortality_1990 Under-5 mortality rate (deaths per 1,000 live births) in 1990.

under5_mortality_2000 Under-5 mortality rate (deaths per 1,000 live births) in 2000.

under5_mortality_2018 Under-5 mortality rate (deaths per 1,000 live births) in 2018.

under5_reduction Annual rate of reduction in under-5 mortality rate (%)2000–2018.

under5_mortality_2018_male Under-5 mortality rate male (deaths per 1,000 live births) 2018.

under5_mortality_2018_female Under-5 mortality rate female (deaths per 1,000 live births) 2018.

infant_mortality_1990 Infant mortality rate (deaths per 1,000 live births) 1990

infant_mortality_2018 Infant mortality rate (deaths per 1,000 live births) 2018

neonatal_mortality_1990 Neonatal mortality rate (deaths per 1,000 live births) 1990.

neonatal_mortality_2000 Neonatal mortality rate (deaths per 1,000 live births) 2000.

neonatal_mortality_2018 Neonatal mortality rate (deaths per 1,000 live births) 2018.

prob_dying_age5to14_1990 Probability of dying among children aged 5–14 (deaths per 1,000 children aged 5) 1990.

prob_dying_age5to14_2018 Probability of dying among children aged 5–14 (deaths per 1,000 children aged 5) 2018.

under5_deaths_2018 Annual number of under-5 deaths (thousands) 2018.

neonatal_deaths_2018 Annual number of neonatal deaths (thousands) 2018.

neonatal_deaths_percent_under5 Neonatal deaths as proportion of all under-5 deaths (%) 2018.

age5to14_deaths_2018 Number of deaths among children aged 5–14 (thousands) 2018.

Source

United Nations Children’s Emergency Fund (UNICEF)

Examples

```
library(dplyr)
library(ggplot2)

# List countries and areas whose children aged 5 and under have a higher probability of dying in
# 2018 than they did in 1990
sowc_child_mortality |>
  mutate(decrease_prob_dying = prob_dying_age5to14_1990 - prob_dying_age5to14_2018) |>
  select(countries_and_areas, decrease_prob_dying) |>
  filter(decrease_prob_dying < 0) |>
  arrange(decrease_prob_dying)

# List countries and areas and their relative rank for neonatal mortality in 2018
sowc_child_mortality |>
  mutate(rank = round(rank(-neonatal_mortality_2018))) |>
  select(countries_and_areas, rank, neonatal_mortality_2018) |>
  arrange(rank)
```

sowc_demographics	<i>SOWC Demographics Data.</i>
-------------------	--------------------------------

Description

Demographic data from UNICEF’s State of the World’s Children 2019 Statistical Tables.

Usage

```
sowc_demographics
```

Format

A data frame with 202 rows and 18 variables.

countries_and_areas Country or area name.

total_pop_2018 Population in 2018 in thousands.

under18_pop_2018 Population under age 18 in 2018 in thousands.

under5_pop_2018 Population under age 5 in 2018 in thousands.

pop_growth_rate_2018 Rate at which population is growing in 2018.

pop_growth_rate_2030 Rate at which population is estimated to grow in 2030.

births_2018 Number of births in 2018 in thousands.

fertility_2018 Number of live births per woman in 2018. A total fertility level of 2.1 is called replacement level and represents a level at which the population would remain the same size.

life_expectancy_1970 Life expectancy at birth in 1970.

life_expectancy_2000 Life expectancy at birth in 2000.

life_expectancy_2018 Life expectancy at birth in 2018.

dependency_ratio_total The ratio of the not-working-age population to the working-age population of 15 - 64 years.

dependency_ratio_child The ratio of the under 15 population to the working-age population of 15 - 64 years.

dependency_ratio_oldage The ratio of the over 64 population to the working-age population of 15 - 64 years.

percent_urban_2018 Percent of population living in urban areas.

pop_urban_growth_rate_2018 Annual urban population growth rate from 2000 to 2018.

pop_urban_growth_rate_2030 Estimated annual urban population growth rate from 2018 to 2030.

migration_rate Net migration rate per 1000 population from 2015 to 2020.

Source

United Nations Children's Emergency Fund (UNICEF)

Examples

```
library(dplyr)
library(ggplot2)

# List countries and areas' life expectancy, ordered by rank of life expectancy in 2018
sowc_demographics |>
  mutate(life_expectancy_change = life_expectancy_2018 - life_expectancy_1970) |>
  mutate(rank_life_expectancy = round(rank(-life_expectancy_2018), 0)) |>
  select(
    countries_and_areas, rank_life_expectancy, life_expectancy_2018,
    life_expectancy_change
  ) |>
  arrange(rank_life_expectancy)
```

```
# List countries and areas' migration rate and population, ordered by rank of migration rate
sowc_demographics |>
  mutate(rank = round(rank(migration_rate))) |>
  mutate(population_millions = total_pop_2018 / 1000) |>
  select(countries_and_areas, rank, migration_rate, population_millions) |>
  arrange(rank)

# Scatterplot of life expectancy v population in 2018
ggplot(sowc_demographics, aes(life_expectancy_1970, life_expectancy_2018, size = total_pop_2018)) +
  geom_point(alpha = 0.5) +
  labs(
    title = "Life Expectancy",
    subtitle = "1970 v. 2018",
    x = "Life Expectancy in 1970",
    y = "Life Expectancy in 2018",
    size = "2018 Total Population"
  )
```

sowc_maternal_newborn *SOWC Maternal and Newborn Health Data.*

Description

Data from UNICEF's State of the World's Children 2019 Statistical Tables.

Usage

```
sowc_maternal_newborn
```

Format

A data frame with 202 rows and 18 variables.

countries_and_areas Country or area name.

life_expectancy_female Life expectancy: female in 2018.

family_planning_1549 Demand for family planning satisfied with modern methods (%) 2013–2018 Women aged 15 to 49.

family_planning_1519 Demand for family planning satisfied with modern methods (%) 2013–2018 Women aged 15 to 19.

adolescent_birth_rate Adolescent birth rate 2013 to 2018.

births_age_18 Births by age 18 (%) 2013 to 2018.

antenatal_care_1 Antenatal care (%) 2013 to 2018 At least one visit.

antenatal_care_4_1549 Antenatal care (%) 2013 to 2018 At least four visits Women aged 15 to 49.

antenatal_care_4_1519 Antenatal care (%) 2013 to 2018 At least four visits Women aged 15 to 19.

delivery_care_attendant_1549 Delivery care (%) 2013 to 2018 Skilled birth attendant Women aged 15 to 49.

delivery_care_attendant_1519 Delivery care (%) 2013 to 2018 Skilled birth attendant Women aged 15 to 19.

delivery_care_institutional Delivery care (%) 2013 to 2018 Institutional delivery.

c_section Delivery care (%) 2013–2018 C-section.

postnatal_health_newborns Postnatal health check(%) 2013 to 2018 For newborns.

postnatal_health_mothers Postnatal health check(%) 2013 to 2018 For mothers.

maternal_deaths_2017 Maternal mortality 2017 Number of maternal deaths.

maternal_mortality_ratio_2017 Maternal mortality 2017 Maternal Mortality Ratio.

risk_maternal_death_2017 Maternal mortality 2017 Lifetime risk of maternal death (1 in X).

Source

United Nations Children's Emergency Fund (UNICEF)

Examples

```
library(dplyr)
library(ggplot2)

# List countries and lifetime risk of maternal death (1 in X), ranked
sowc_maternal_newborn |>
  mutate(rank = round(rank(risk_maternal_death_2017), 0)) |>
  select(countries_and_areas, rank, risk_maternal_death_2017) |>
  arrange(rank)

# Graph scatterplot of Maternal Mortality Ratio 2017 and Antenatal Care 4+ Visits %
sowc_maternal_newborn |>
  select(antenatal_care_4_1549, maternal_mortality_ratio_2017) |>
  remove_missing(na.rm = TRUE) |>
  ggplot(aes(antenatal_care_4_1549, maternal_mortality_ratio_2017)) +
  geom_point(alpha = 0.5) +
  labs(
    title = "Antenatal Care and Mortality",
    x = "Antenatal Care 4+ visits %",
    y = "Maternal Mortality Ratio"
  )
```

Description

Fifty companies were randomly sampled from the 500 companies in the S&P 500, and their financial information was collected on March 8, 2012.

Usage

sp500

Format

A data frame with 50 observations on the following 12 variables.

market_cap Total value of all company shares, in millions of dollars.

stock The name of the stock (e.g. AAPL for Apple).

ent_value Enterprise value, which is an alternative to market cap that also accounts for things like cash and debt, in millions of dollars.

trail_pe The market cap divided by the earnings (profits) over the last year.

forward_pe The market cap divided by the forecasted earnings (profits) over the next year.

ev_over_rev Enterprise value divided by the company's revenue.

profit_margin Percent of earnings that are profits.

revenue Revenue, in millions of dollars.

growth Quarterly revenue growth (year over year), in millions of dollars.

earn_before Earnings before interest, taxes, depreciation, and amortization, in millions of dollars.

cash Total cash, in millions of dollars.

debt Total debt, in millions of dollars.

Source

Yahoo! Finance, retrieved 2012-03-08.

Examples

```
library(ggplot2)

ggplot(sp500, aes(x = ent_value, y = earn_before)) +
  geom_point() +
  labs(x = "Enterprise value", y = "Earnings")

ggplot(sp500, aes(x = ev_over_rev, y = forward_pe)) +
  geom_point() +
  labs(
    x = "Enterprise value / revenue, logged",
    y = "Market cap / forecasted earnings, logged"
  )

ggplot(sp500, aes(x = ent_value, y = earn_before)) +
  geom_point() +
  scale_x_log10() +
  scale_y_log10() +
  labs(x = "Enterprise value", y = "Earnings")

ggplot(sp500, aes(x = ev_over_rev, y = forward_pe)) +
```

```

geom_point() +
scale_x_log10() +
scale_y_log10() +
labs(
  x = "Enterprise value / revenue, logged",
  y = "Market cap / forecasted earnings, logged"
)

```

sp500_1950_2018

Daily observations for the S&P 500

Description

Data runs from 1950 to near the end of 2018.

Usage

```
sp500_1950_2018
```

Format

A data frame with 17346 observations on the following 7 variables.

Date Date of the form "YYYY-MM-DD".

Open Opening price.

High Highest price of the day.

Low Lowest price of the day.

Close Closing price of the day.

Adj.Close Adjusted price at close after accounting for dividends paid out.

Volume Trading volume.

Source

Yahoo! Finance

Examples

```

data(sp500_1950_2018)
sp500.ten.years <- subset(
  sp500_1950_2018,
  "2009-01-01" <= as.Date(Date) & as.Date(Date) <= "2018-12-31"
)
d <- diff(sp500.ten.years$Adj.Close)
mean(d > 0)

```

sp500_seq

S&P 500 stock data

Description

Daily stock returns from the S&P500 for 1990-2011 can be used to assess whether stock activity each day is independent of the stock's behavior on previous days. We label each day as Up or Down (D) depending on whether the market was up or down that day. For example, consider the following changes in price, their new labels of up and down, and then the number of days that must be observed before each Up day.

Usage

```
sp500_seq
```

Format

A data frame with 2948 observations on the following variable.

race a factor with levels 1, 2, 3, 4, 5, 6, and 7+

Source

[Google Finance](#).

Examples

```
sp500_seq
```

speed_gender_height

Speed, gender, and height of 1325 students

Description

1,325 UCLA students were asked to fill out a survey where they were asked about their height, fastest speed they have ever driven, and gender.

Usage

```
speed_gender_height
```

Format

A data frame with 1325 observations on the following 3 variables.

speed a numeric vector

gender a factor with levels female and male

height a numeric vector

Examples

```
speed_gender_height
```

```
ssd_speed
```

```
SSD read and write speeds
```

Description

User submitted data on 1TB solid state drives (SSD).

Usage

```
ssd_speed
```

Format

A data frame with 54 rows and 7 variables.

brand Brand name of the drive.

model Model name of the drive.

samples Number of user submitted benchmarks.

form_factor Physical form of the drive with levels 2.5, m.2, and mSATA.

nvme If a drive uses the *nvme* protocol this value is 1, 0 if it does not.

read Average read speed from user benchmarks in MB/s.

write Average write speed from user benchmarks in MB/s.

Source

[UserBenchmark](#), retrieved September 1, 2020.

Examples

```
library(ggplot2)
library(dplyr)

ssd_speed |>
  count(form_factor)

ssd_speed |>
  filter(form_factor != "mSATA") |>
  ggplot(aes(x = read, y = write, color = form_factor)) +
  geom_point() +
  labs(
    title = "Average read vs. write speed of SSDs",
    x = "Read speed (MB/s)",
    y = "Write speed (MB/s)"
  ) +
  facet_wrap(~form_factor, ncol = 1, scales = "free") +
  guides(color = FALSE)
```

`starbucks`*Starbucks nutrition*

Description

Nutrition facts for several Starbucks food items

Usage

```
starbucks
```

Format

A data frame with 77 observations on the following 7 variables.

item Food item.

calories Calories.

fat a numeric vector

carb a numeric vector

fiber a numeric vector

protein a numeric vector

type a factor with levels bakery, bistro box, hot breakfast, parfait, petite, salad, and sandwich

Source

<https://www.starbucks.com/menu>, retrieved 2011-03-10.

Examples

```
starbucks
```

`stats_scores`*Final exam scores for twenty students*

Description

Scores range from 57 to 94.

Usage

```
stats_scores
```

Format

A data frame with 20 observations on the following variable.

scores a numeric vector

Examples

```
stats_scores
```

stem_cell	<i>Embryonic stem cells to treat heart attack (in sheep)</i>
-----------	--

Description

Does treatment using embryonic stem cells (ESCs) help improve heart function following a heart attack? Each sheep in the study was randomly assigned to the ESC or control group, and the change in their hearts' pumping capacity was measured in the study. A positive value corresponds to increased pumping capacity, which generally suggests a stronger recovery.

Usage

```
stem_cell
```

Format

A data frame with 18 observations on the following 3 variables.

trmt a factor with levels ctrl esc

before a numeric vector

after a numeric vector

Source

[doi:10.1016/S01406736\(05\)673801](https://doi.org/10.1016/S01406736(05)673801)

Examples

```
stem_cell
```

stent30

Stents for the treatment of stroke

Description

An experiment that studies effectiveness of stents in treating patients at risk of stroke with some unexpected results. `stent30` represents the results 30 days after stroke and `stent365` represents the results 365 days after stroke.

Usage

```
stent30
```

Format

A data frame with 451 observations on the following 2 variables.

group a factor with levels control and treatment

outcome a factor with levels no event and stroke

Source

Chimowitz MI, Lynn MJ, Derdeyn CP, et al. 2011. Stenting versus Aggressive Medical Therapy for Intracranial Arterial Stenosis. *New England Journal of Medicine* 365:993- 1003. doi:10.1056/NEJMoal105335. NY Times article reporting on the study: <https://www.nytimes.com/2011/09/08/health/research/08stent.html>.

Examples

```
# 30-day results
table(stent30)
```

```
# 365-day results
table(stent365)
```

stocks_18

Monthly Returns for a few stocks

Description

Monthly return data for a few stocks, which covers stock prices from November 2015 through October 2018.

Usage

```
stocks_18
```


Format

A data frame with 36 observations on the following 3 variables.

date First day of the month corresponding to the returns.

goog Google stock price change.

cat Caterpillar stock price change.

xom Exxon Mobil stock price change.

Source

Yahoo! Finance, direct download.

Examples

```
d <- stocks_18
dim(d)
apply(d[, 2:3], 2, mean)
apply(d[, 2:3], 2, sd)
```

student_housing

Community college housing (simulated data, 2015)

Description

These are simulated data and intended to represent housing prices of students at a college.

Usage

```
student_housing
```

Format

A data frame with 175 observations on the following variable.

price Monthly housing price, simulated.

Examples

```
set.seed(5)
generate_student_housing <- data.frame(
  price = round(rnorm(175, 515, 65) + exp(rnorm(175, 4.2, 1)))
)
hist(student_housing$price, 20)
t.test(student_housing$price)
mean(student_housing$price)
sd(student_housing$price)
identical(student_housing, generate_student_housing)
```

student_sleep	<i>Sleep for 110 students (simulated)</i>
---------------	---

Description

A simulated dataset for how much 110 college students each slept in a single night.

Usage

```
student_sleep
```

Format

A data frame with 110 observations on the following variable.

hours Number of hours slept by this student (simulated).

Source

Simulated data.

Examples

```
set.seed(2)
x <- exp(c(
  rnorm(100, log(7.5), 0.15),
  rnorm(10, log(10), 0.196)
))
x <- round(x - mean(x) + 7.42, 2)

identical(x, student_sleep$hours)
```

sugar.levels.A	<i>Simulated fasting blood sugar levels for 100 residents of a hypothetical neighborhood labeled A.</i>
----------------	---

Description

Simulated individual fasting blood sugar levels (nmol/L) drawn from a normal distribution. Generally, normal fasting blood sugar level are between 3.0 - 5.6 nmol/L; levels in the range 5.6 - 6.9 nmol/L are considered pre-diabetes. These data and sugar.levels.B are used in the Unit 4 lab of Introductory Statistics for the Life and Biomedical Sciences (ISLBS). See https://github.com/dave-harrington/oi_biostat_labs for the full set of labs.

Usage

```
sugar.levels.A
```

Format

A tibble with 100 rows and 1 variable

fasting.blood.sugar Numeric, simulated fasting blood sugar in nmol/L

sugar.levels.B	<i>Simulated fasting blood sugar levels for 100 residents of a hypothetical neighborhood labeled B.</i>
----------------	---

Description

Simulated individual fasting blood sugar levels (nmol/L) drawn from a normal distribution. Generally, normal fasting blood sugar level are between 3.0 - 5.6 nmol/L; levels in the range 5.6 - 6.9 nmol/L are considered pre-diabetes. These data and sugar.levels.B are used in the Unit 4 lab of Introductory Statistics for the Life and Biomedical Sciences (ISLBS). See https://github.com/dave-harrington/oi_biostat_labs for the full set of labs.

Usage

```
sugar.levels.B
```

Format

A tibble with 100 rows and 1 variable

fasting.blood.sugar Numeric, simulated fasting blood sugar in nmol/L

sulphinpyrazone	<i>Treating heart attacks</i>
-----------------	-------------------------------

Description

Experiment data for studying the efficacy of treating patients who have had a heart attack with Sulphinpyrazone.

Usage

```
sulphinpyrazone
```

Format

A data frame with 1475 observations on the following 2 variables.

group a factor with levels control treatment

outcome a factor with levels died lived

Source

Anturane Reinfarction Trial Research Group. 1980. Sulfipyrazone in the prevention of sudden death after myocardial infarction. New England Journal of Medicine 302(5):250-256.

Examples

sulphinpyrazone

supreme_court	<i>Supreme Court approval rating</i>
---------------	--------------------------------------

Description

Summary of a random survey of 976 people.

Usage

supreme_court

Format

A data frame with 976 observations on the following variable.

answer a factor with levels approve and not

Source

<https://www.nytimes.com/2012/06/08/us/politics/44-percent-of-americans-approve-of-supreme-court-in.html>

Examples

supreme_court

swim	<i>Swim velocities using different types of swimsuits</i>
------	---

Description

Data from an experiment comparing maximum swim velocities when swimmers are wearing a wetsuit versus a regular swimsuit. Paired measurements on the velocities on each of 12 participants. Data includes swimmer’s biological sex and indication of whether the swimmer was a triathlete or just a swimmer. These data are also contained in the package Lock5Data

Usage

swim

Format

A dataframe with 12 rows and 6 columns

swimmer.number Numeric, index of a swimmer

swimmer.sex Factor, with levels male, female

swimmer.class Factor, classification of swimmer, with levels swimmer, triathlete

wet.suit.velocity Numeric, maximum velocity wearing a wet suit, in meters/sec

swim.suit.velocity Numeric, maximum velocity wearing a swim suit, in meters/sec

velocity.diff Numeric, wet.suit.velocity - swim.suit.velocity

Source

[doi:10.1016/S14402440\(00\)800420](https://doi.org/10.1016/S14402440(00)800420)

References

Table 3 of De Lucas, Ricardo Dantas, et al. The effects of wet suits on physiological and biomechanical indices during swimming. *Journal of Science and Medicine in Sport* 3.1 (2000): 1-8.

tb.interruption	<i>Data used to model a triage scoring scale for a Danish emergency department.</i>
-----------------	---

Description

The Lackey study was a prospective cohort study of adult smear-positive tuberculosis (TB) patients enrolled between January 2010 and December 2011 with no prior TB disease. Data from the cohort was used to model the association of several predictors with a treatment interruption before the complete courses of therapy. The analysis of treatment outcome in original article uses methods for binary data. A time-to-event analysis might be more appropriate but the dataset does not have data sufficient for that analysis.

Usage

tb.interruption

Format

A tibble with 1293 rows and 18 variables:

id Character vector, unique participant ID

age.group A factor with 4 levels: 21 and younger; 22 to 26; 27 to 37; 38 and older

bmi a factor with 3 levels: Normal; Overweight/Obese; Underweight. These categories reflect older WHO coding and do not apply to all populations.

chronic.disease a factor with two levels: No, no other chronic disease; Yes, other chronic diseases present in the participant

hiv.test Outcome of HIV test, a factor with 3 levels: Negative; Positive; Test not Done
 marital.status a factor with 4 levels: Divorced/separated; Married/cohabitating; Single; Widowed
 poverty socioeconomic status, a factor with two levels: No, not living in extreme poverty; Yes, living in extreme poverty
 prison.history a factor with 2 levels: No, no history of having been incarcerated; Yes, participant has been incarcerated
 education a factor with 2 levels: No, participant does not have at least a secondary school education; Yes, participant does have a secondary school education
 tobacco.use a factor with 3 levels: Currently smokes; Never smoked; Used to Smoke
 alcohol.use a factor with 2 levels: No, participant does not use alcohol at least weekly; Yes, participant does use alcohol at least weekly
 drug.use a factor with 2 levels: No, history of illicit drug use; Yes, a history of illicit drug use
 rehab.history a factor with 2 levels: No, no history of residence in a rehabilitation facility; Yes, prior residence in a rehabilitation facility
 mdr.tb a factor with two levels: No, participant has not been treated for multi-drug resistant TB; Yes, participant has been treated for MDR TB
 diabetes a factor with 2 levels: No, participant does not have type 2 diabetes; Yes, participant does have diabetes
 trt.outcome a factor with 4 levels denoting treatment outcome: Cured; Default (treatment was interrupted before 2 months); Died; Still in treatment; Transferred out

Source

doi:10.5061/dryad.fp94d

References

Lackey, Brian, et al. "Patient characteristics associated with tuberculosis treatment default: a cohort study in a high-incidence area of Lima, Peru." PLoS One 10.6 (2015): e0128541. doi:10.1371/journal.pone.0128541

teacher

Teacher Salaries in St. Louis, Michigan

Description

This dataset contains teacher salaries from 2009-2010 for 71 teachers employed by the St. Louis Public School in Michigan, as well as several covariates.

Usage

teacher

Format

A data frame with 71 observations on the following 8 variables.

id Identification code for each teacher, assigned randomly.

degree Highest educational degree attained: BA (bachelor's degree) or MA (master's degree).

fte Full-time enrollment status: full-time 1 or part-time 0.5.

years Number of years employed by the school district.

base Base annual salary, in dollars.

fica Amount paid into Social Security and Medicare per year through the Federal Insurance Contribution Act (FICA), in dollars.

retirement Amount paid into the retirement fund of the teacher per year, in dollars.

total Total annual salary of the teacher, resulting from the sum of base salary + fica + retirement, in dollars.

Source

Originally posted on SODA Developers (dev.socrata.com/data), removed in 2020.

Examples

```
library(ggplot2)

# Salary and education level
ggplot(teacher, aes(x = degree, y = base)) +
  geom_boxplot() +
  labs(
    x = "Highest educational degree attained",
    y = "Base annual salary, in $",
    color = "Degree",
    title = "Salary and education level"
  )

# Salary and years of employment
ggplot(teacher, aes(x = years, y = base, color = degree)) +
  geom_point() +
  labs(
    x = "Number of years employed by the school district",
    y = "Base annual salary, in $",
    color = "Degree",
    title = "Salary and years of employment"
  )
```

textbooks*Textbook data for UCLA Bookstore and Amazon*

Description

A random sample was taken of nearly 10\ textbook for each course was identified, and its new price at the UCLA Bookstore and on Amazon.com were recorded.

Usage

textbooks

Format

A data frame with 73 observations on the following 7 variables.

dept_abbr Course department (abbreviated).

course Course number.

isbn Book ISBN.

ucla_new New price at the UCLA Bookstore.

amaz_new New price on Amazon.com.

more Whether additional books were required for the course (Y means "yes, additional books were required").

diff The UCLA Bookstore price minus the Amazon.com price for each book.

Details

The sample represents only courses where textbooks were listed online through UCLA Bookstore's website. The most expensive textbook was selected based on the UCLA Bookstore price, which may insert bias into the data; for this reason, it may be beneficial to analyze only the data where more is "N".

Source

Collected by David Diez.

Examples

```
library(ggplot2)

ggplot(textbooks, aes(x = diff)) +
  geom_histogram(binwidth = 5)

t.test(textbooks$diff)
```

thanksgiving_spend	<i>Thanksgiving spending, simulated based on Gallup poll.</i>
--------------------	---

Description

This entry gives simulated spending data for Americans during Thanksgiving in 2009 based on findings of a Gallup poll.

Usage

```
thanksgiving_spend
```

Format

A data frame with 436 observations on the following 1 variable.

spending Amount of spending, in US dollars.

Examples

```
library(ggplot2)

ggplot(thanksgiving_spend, aes(x = spending)) +
  geom_histogram(binwidth = 20)
```

thermometry	<i>A dataframe of 130 rows and 3 on body temperature.</i>
-------------	---

Description

Data derived from a study examining whether population mean body temperature is 98.6 degrees Fahrenheit. Participant level data was constructed from histograms in the cited reference

Usage

```
thermometry
```

Format

A tibble with 130 rows and 3 variables:

body.temp Numeric, body temperature in degrees Fahrenheit

gender Factor, recorded gender of participant, with levels female, male

heart.rate Numeric, heart rate, in beats per minute

Source

<https://jse.amstat.org/v4n2/datasets.shoemaker.html>

References

Mackowiak, P. A., Wasserman, S. S., and Levine, M. M. (1992), A Critical Appraisal of 98.6 Degrees F, the Upper Limit of the Normal Body Temperature, and Other Legacies of Carl Reinhold August Wunderlich, *Journal of the American Medical Association*, 268, 1578-1580. Shoemaker, A.L., College, C. (1996) What's Normal? – Temperature, Gender, and Heart Rate *Journal of Statistics Education*, 4 (2)

tips

Tip data

Description

A simulated dataset of tips over a few weeks on a couple days per week. Each tip is associated with a single group, which may include several bills and tables (i.e. groups paid in one lump sum in simulations).

Usage

tips

Format

A data frame with 95 observations on the following 5 variables.

week Week number.

day Day, either Friday or Tuesday.

n_peop Number of people associated with the group.

bill Total bill for the group.

tip Total tip from the group.

Details

This dataset was built using simulations of tables, then bills, then tips based on the bills. Large groups were assumed to only pay the gratuity, which is evident in the data. Tips were set to be plausible round values; they were often (but not always) rounded to dollars, quarters, etc.

Source

Simulated dataset.

Examples

```
library(ggplot2)

ggplot(tips, aes(x = day, y = tip)) +
  geom_boxplot()

ggplot(tips, aes(x = tip, fill = factor(week))) +
  geom_density(alpha = 0.5) +
  labs(x = "Tip", y = "Density", fill = "Week")

ggplot(tips, aes(x = tip)) +
  geom_dotplot()

ggplot(tips, aes(x = tip, fill = factor(day))) +
  geom_density(alpha = 0.5) +
  labs(x = "Tip", y = "Density", fill = "Day")
```

toohey

Simulated polling dataset

Description

Simulated data for a fake political candidate.

Usage

toohey

Format

A data frame with 500 observations on the following variable.

vote_for a factor with levels no yes

Examples

toohey

tourism	<i>Turkey tourism</i>
---------	-----------------------

Description

Summary of tourism in Turkey.

Usage

```
tourism
```

Format

A data frame with 47 observations on the following 3 variables.

year a numeric vector

visitor_count_tho a numeric vector

tourist_spending a numeric vector

Source

Association of Turkish Travel Agencies, Foreign Visitors Figure & Tourist Spendings By Years.

https://www.tursab.org.tr/en/statistics/foreign-visitors-figure-tourist-spendings-by-years_1083.html

Examples

```
tourism
```

toy_anova	<i>Simulated dataset for ANOVA</i>
-----------	------------------------------------

Description

Simulated dataset for getting a better understanding of intuition that ANOVA is based off of.

Usage

```
toy_anova
```

Format

A data frame with 70 observations on the following 3 variables.

group a factor with levels I II III

outcome a numeric vector

Examples

```
toy_anova
```

transplant	<i>Transplant consultant success rate (fake data)</i>
------------	---

Description

Summarizing whether there was or was not a complication for 62 patients who used a particular medical consultant.

Usage

```
transplant
```

Format

A data frame with 62 observations on the following variable.

outcome a factor with levels complications okay

Examples

```
transplant
```

treeDiag	<i>Construct tree diagrams</i>
----------	--------------------------------

Description

Construct beautiful tree diagrams

Usage

```
treeDiag(  
  main,  
  p1,  
  p2,  
  out1 = c("Yes", "No"),  
  out2 = c("Yes", "No"),  
  textwd = 0.15,  
  solwd = 0.2,  
  SBS = c(TRUE, TRUE),  
  showSol = TRUE,  
  solSub = NULL,  
  digits = 4,
```

```

    textadj = 0.015,
    cex.main = 1.3,
    col.main = "#999999",
    showWork = FALSE
  )

```

Arguments

main	Character vector with two variable names, descriptions, or questions
p1	Vector of probabilities for the primary branches
p2	List for the secondary branches, where each list item should be a numerical vector of probabilities corresponding to the primary branches of p1
out1	Character vector of the outcomes corresponding to the primary branches
out2	Character vector of the outcomes corresponding to the secondary branches
textwd	The width provided for text with a default of 0.15
solwd	The width provided for the solution with a default of 0.2
SBS	A boolean vector indicating whether to place text and probability side-by-side for the primary and secondary branches
showSol	Boolean indicating whether to show the solution in the tree diagram
solSub	An optional list of vectors corresponding to p2 to list alternative text or solutions
digits	The number of digits to show in the solution
textadj	Vertical adjustment of text
cex.main	Size of main in the plot
col.main	Color of main in the plot
showWork	Whether work should be shown for the solutions

Author(s)

David Diez, Christopher Barr

Examples

```

treeDiag(
  c("Flight on time?", "Luggage on time?"),
  c(0.8, 0.2), list(c(0.97, 0.03), c(0.15, 0.85))
)
treeDiag(c("Breakfast?", "Go to class"), c(.4, .6),
  list(c(0.4, 0.36, 0.34), c(0.6, 0.3, 0.1)), c("Yes", "No"),
  c("Statistics", "English", "Sociology"),
  showWork = TRUE
)
treeDiag(
  c("Breakfast?", "Go to class"), c(0.4, 0.11, 0.49),
  list(c(0.4, 0.36, 0.24), c(0.6, 0.3, 0.1), c(0.1, 0.4, 0.5)),
  c("one", "two", "three"), c("Statistics", "English", "Sociology")
)

```

```
treeDiag(c("Dow Jones rise?", "NASDAQ rise?"),
  c(0.53, 0.47), list(c(0.75, 0.25), c(0.72, 0.28)),
  solSub = list(c("(a)", "(b)"), c("(c)", "(d)")), solwd = 0.08
)
```

twins

twins

Description

A data frame containing data collected in the mid 20th century by Cyril Burt from a study tracked down identical twins who were separated at birth: one child was raised in the home of their biological parents and the other in a foster home. In an attempt to answer the question of whether intelligence is the result of nature or nurture, both children were given IQ tests.

Usage

```
twins
```

Format

A data frame with 27 observations on the following 2 variables.

foster IQ score of the twin raised by Foster parents.

biological IQ score of the twin raised by Biological parents.

Examples

```
library(ggplot2)
library(dplyr)
library(tidyr)

plot_data <- twins |>
  pivot_longer(cols = c(foster, biological), names_to = "twin", values_to = "iq")

ggplot(plot_data, aes(iq, fill = twin)) +
  geom_histogram(color = "white", binwidth = 5) +
  facet_wrap(~twin) +
  theme_minimal() +
  labs(
    title = "IQ of identical twins",
    subtitle = "Separated at birth",
    x = "IQ",
    y = "Count",
    fill = ""
  )
```

ucla_f18

UCLA courses in Fall 2018

Description

List of all courses at UCLA during Fall 2018.

Usage

```
ucla_f18
```

Format

A data frame with 3950 observations on the following 14 variables.

year Year the course was offered

term Term the course was offered

subject Subject

subject_abbrev Subject abbreviation, if any

course Course name

course_num Course number, complete

course_numeric Course number, numeric only

seminar Boolean for if this is a seminar course

ind_study Boolean for if this is some form of independent study

apprenticeship Boolean for if this is an apprenticeship

internship Boolean for if this is an internship

honors_contracts Boolean for if this is an honors contracts course

laboratory Boolean for if this is a lab

special_topic Boolean for if this is any of the special types of courses listed

Source

<https://sa.ucla.edu/ro/public/soc>, retrieved 2018-11-22.

Examples

```
nrow(ucla_f18)
table(ucla_f18$special_topic)
subset(ucla_f18, is.na(course_numeric))
table(subset(ucla_f18, !special_topic)$course_numeric < 100)
elig_courses <-
  subset(ucla_f18, !special_topic & course_numeric < 100)
set.seed(1)
ucla_textbooks_f18 <-
```



```

    elig_courses[sample(nrow(elig_courses), 100), ]
tmp <- order(
  ucla_textbooks_f18$subject,
  ucla_textbooks_f18$course_numeric
)
ucla_textbooks_f18 <- ucla_textbooks_f18[tmp, ]
rownames(ucla_textbooks_f18) <- NULL
head(ucla_textbooks_f18)

```

ucla_textbooks_f18	<i>Sample of UCLA course textbooks for Fall 2018</i>
--------------------	--

Description

A sample of courses were collected from UCLA from Fall 2018, and the corresponding textbook prices were collected from the UCLA bookstore and also from Amazon.

Usage

```
ucla_textbooks_f18
```

Format

A data frame with 201 observations on the following 20 variables.

year Year the course was offered
term Term the course was offered
subject Subject
subject_abbr Subject abbreviation, if any
course Course name
course_num Course number, complete
course_numeric Course number, numeric only
seminar Boolean for if this is a seminar course.
ind_study Boolean for if this is some form of independent study
apprenticeship Boolean for if this is an apprenticeship
internship Boolean for if this is an internship
honors_contracts Boolean for if this is an honors contracts course
laboratory Boolean for if this is a lab
special_topic Boolean for if this is any of the special types of courses listed
textbook_isbn Textbook ISBN
bookstore_new New price at the UCLA bookstore
bookstore_used Used price at the UCLA bookstore
amazon_new New price sold by Amazon
amazon_used Used price sold by Amazon
notes Any relevant notes

Details

A past dataset was collected from UCLA courses in Spring 2010, and Amazon at that time was found to be almost uniformly lower than those of the UCLA bookstore's. Now in 2018, the UCLA bookstore is about even with Amazon on the vast majority of titles, and there is no statistical difference in the sample data.

The most expensive book required for the course was generally used.

The reason why we advocate for using raw amount differences instead of percent differences is that a 20\ to a 20\ price difference on low-priced books would balance numerically (but not in a practical sense) a moderate but important price difference on more expensive books. So while this tends to result in a bit less sensitivity in detecting *some* effect, we believe the absolute difference compares prices in a more meaningful way.

Used prices contain the shipping cost but do not contain tax. The used prices are a more nuanced comparison, since these are all 3rd party sellers. Amazon is often more a marketplace than a retail site at this point, and many people buy from 3rd party sellers on Amazon now without realizing it. The relationship Amazon has with 3rd party sellers is also challenging. Given the frequently changing dynamics in this space, we don't think any analysis here will be very reliable for long term insights since products from these sellers changes frequently in quantity and price. For this reason, we focus only on new books sold directly by Amazon in our comparison. In a future round of data collection, it may be interesting to explore whether the dynamics have changed in the used market.

Source

<https://sa.ucla.edu/ro/public/soc>

<https://ucla.verbacompare.com>

Amazon.com

See Also

[textbooks](#), [ucla_f18](#)

Examples

```
library(ggplot2)
library(dplyr)

ggplot(ucla_textbooks_f18, aes(x = bookstore_new, y = amazon_new)) +
  geom_point() +
  geom_abline(slope = 1, intercept = 0, color = "orange") +
  labs(
    x = "UCLA Bookstore price", y = "Amazon price",
    title = "Amazon vs. UCLA Bookstore prices of new textbooks",
    subtitle = "Orange line represents y = x"
  )

# The following outliers were double checked for accuracy
ucla_textbooks_f18_with_diff <- ucla_textbooks_f18 |>
  mutate(diff = bookstore_new - amazon_new)
```

```
ucla_textbooks_f18_with_diff |>
  filter(diff > 20 | diff < -20)

# Distribution of price differences
ggplot(ucla_textbooks_f18_with_diff, aes(x = diff)) +
  geom_histogram(binwidth = 5)

# t-test of price differences
t.test(ucla_textbooks_f18_with_diff$diff)
```

ukdemo

United Kingdom Demographic Data

Description

This dataset comes from the Guardian's Data Blog and includes five financial demographic variables.

Usage

ukdemo

Format

A data frame with 12 observations on the following 6 variables.

region Region in the United Kingdom

debt Average regional debt, not including mortgages, in pounds

unemployment Percent unemployment

house Average house price, in pounds

pay Average hourly pay, in pounds

rpi Retail price index, which is standardized to 100 for the entire UK, and lower index scores correspond to lower prices

Source

The data was described in the Guardian Data Blog: <https://www.theguardian.com/news/datablog/interactive/2011/oct/27/debt-money-expert-facts>, retrieved 2011-11-01.

References

Guardian Data Blog

Examples

```
library(ggplot2)

ggplot(ukdemo, aes(x = pay, y = rpi)) +
  geom_point() +
  labs(x = "Average hourly pay", y = "Retail price index")
```

unempl	<i>Annual unemployment since 1890</i>
--------	---------------------------------------

Description

A compilation of two datasets that provides an estimate of unemployment from 1890 to 2010.

Usage

```
unempl
```

Format

A data frame with 121 observations on the following 3 variables.

year Year

unemp Unemployment rate, in percent

us_data 1 if from the Bureau of Labor Statistics, 0 otherwise

Source

The data are from Wikipedia at the following URL accessed on November 1st, 2010:

https://en.wikipedia.org/wiki/File:US_Unemployment_1890-2009.gif

Below is a direct quote from Wikipedia describing the sources of the data:

Own work by Peace01234 Complete raw data are on Peace01234. 1930-2009 data are from Bureau of Labor Statistics (BLS), Employment status of the civilian noninstitutional population, 1940 to date retrieved on March 6, 2009 and February 12, 2010 from the BLS' FTP server. Data prior to 1948 are for persons age 14 and over. Data beginning in 1948 are for persons age 16 and over. See also "Historical Comparability" under the Household Data section of the Explanatory Notes at https://www.bls.gov/cps/eetech_methods.pdf. 1890-1930 data are from Christina Romer (1986). "Spurious Volatility in Historical Unemployment Data", The Journal of Political Economy, 94(1): 1-37. 1930-1940 data are from Robert M. Coen (1973). "Labor Force and Unemployment in the 1920's and 1930's: A Re-Examination Based on Postwar Experience", The Review of Economics and Statistics, 55(1): 46-55. Unemployment data was only surveyed once each decade until 1940 when yearly surveys were begun. The yearly data estimates before 1940 are based on the decade surveys combined with other relevant surveys that were collected during those years. The methods are described in detail by Coen and Romer.

Examples

```
# =====> Time Series Plot of Data <=====#
COL <- c("#DDEEBB", "#EEDDBB", "#BBDDEE", "#FFD5DD", "#FFC5CC")
plot(unempl$year, unempl$unemp, type = "n")
rect(0, -50, 3000, 100, col = "#E2E2E2")
rect(1914.5, -1000, 1918.9, 1000, col = COL[1], border = "#E2E2E2")
rect(1929, -1000, 1939, 1000, col = COL[2], border = "#E2E2E2")
rect(1939.7, -1000, 1945.6, 1000, col = COL[3], border = "#E2E2E2")
rect(1955.8, -1000, 1965.3, 1000, col = COL[4], border = "#E2E2E2")
rect(1965.3, -1000, 1975.4, 1000, col = COL[5], border = "#E2E2E2")
abline(h = seq(0, 50, 5), col = "#F8F8F8", lwd = 2)
abline(v = seq(1900, 2000, 20), col = "#FFFFFF", lwd = 1.3)
lines(unempl$year, unempl$unemp)
points(unempl$year, unempl$unemp, pch = 20)
legend("topright",
      fill = COL,
      c(
        "World War I", "Great Depression", "World War II",
        "Vietnam War Start", "Vietnam War Escalated"
      ),
      bg = "#FFFFFF", border = "#FFFFFF"
    )
```

unemploy_pres

President's party performance and unemployment rate

Description

Covers midterm elections.

Usage

```
unemploy_pres
```

Format

A data frame with 29 observations on the following 5 variables.

year Year.

potus The president in office.

party President's party.

unemp Unemployment rate.

change Change in House seats for the president's party.

Source

Wikipedia.

Examples

```
unemploy_pres
```

```
usb_admit
```

```
ucb_admit
```

Description

Data from a study carried out by the graduate Division of the University of California, Berkeley in the early 1970's to evaluate whether there was a sex bias in graduate admissions.

Usage

```
ucb_admit
```

Format

A data frame with 4526 observations on the following 3 variables.

admit Was the applicant admitted to the university?

gender Whether the applicant identified as male or female.

department What department did the applicant apply to, noted as A through F for confidentiality.

Examples

```
library(ggplot2)
library(dplyr)

plot_data <- ucb_admit |>
  count(dept, gender, admit)

ggplot(plot_data, aes(dept, n, fill = gender)) +
  geom_col(position = "dodge") +
  facet_wrap(~admit) +
  theme_minimal() +
  labs(
    title = "Does gender discrimination play a role in college admittance?",
    x = "Department",
    y = "Number of Students",
    fill = "Gender",
    caption = "Source: UC Berkeley, 1970's"
  )
```

us_temperature*US temperatures in 1950 and 2022*

Description

A representative set of monitoring locations were taken from NOAA data in 1950 and 2022 such that the locations are sampled roughly geographically across the continental US (the observations do not represent a random sample of geographical locations).

Usage

```
us_temperature
```

Format

A data frame with 18759 observations on the following 9 variables.

location Location of the NOAA weather station.

station Formal ID of the NOAA weather station.

latitude Latitude of the NOAA weather station.

longitude Longitude of the NOAA weather station.

elevation Elevation of the NOAA weather station.

date Date the measurement was taken (Y-m-d).

tmax Maximum daily temperature (Fahrenheit).

tmin Minimum daily temperature (Fahrenheit).

year Year of the measurement.

Details

Please keep in mind that the data represent two annual snapshots, and a complete analysis would consider more than two years of data and a random or more complete sampling of weather stations across the US.

Source

[NOAA Climate Data Online](#). Retrieved 23 September, 2023.

Examples

```
library(dplyr)
library(ggplot2)
library(maps)

summarized_temp <- us_temperature |>
  group_by(station, year, latitude, longitude) |>
  summarize(tmax_med = median(tmax, na.rm = TRUE)) |>
```

```

mutate(plot_shift = ifelse(year == "1950", 0, 1)) |>
mutate(year = as.factor(year))

usa <- map_data("state")

ggplot(data = usa, aes(x = long, y = lat)) +
  geom_polygon(aes(group = group), color = "black", fill = "white") +
  geom_point(
    data = summarized_temp,
    aes(
      x = longitude + plot_shift, y = latitude,
      color = tmax_med, shape = year
    )
  ) +
  scale_color_gradient(high = IMSCOL["red", 1], low = IMSCOL["yellow", 1]) +
  ggtitle("Median of the daily high temp, 1950 & 2022") +
  labs(
    x = "longitude",
    color = "median high temp"
  ) +
  guides(shape = guide_legend(override.aes = list(color = "black")))

```

wdi_2022

World Development Indicators, 2022.

Description

A data frame with 217 rows and 11 variables from the World Development Indicators (WDI) available from the World Bank. The rows contain only country level data. Regional groupings such as the European Union (EU) and financial groupings such as low income countries have been eliminated. World Bank Country codes (iso2c, iso3c) have been dropped. The data were downloaded from the World Bank on 17 July 2024 using the R package WDI, version 2.8.8, Arel-Bundock V (2022). *WDI: World Development Indicators and Other World Bank Data*. R package version 2.7.8, <https://CRAN.R-project.org/package=WDI>. These data update the dataset wdi.2011 in the previous version of the package, which is outdated and has been removed. Some variable names have been changed for readability and some constructed variables (e.g., log(gdp)) have not been included. Missing values have been retained.

Usage

wdi_2022

Format

A data frame with 217 rows and 11 columns

country Character variable with country name

gni_percap Numeric, gross national income (GNI) per capita, based on purchasing power parity (PPP) in international \$

gdp_percap Numeric, gross domestic product (GDP) per capita, based on PPP in international \$

life_expect Numeric, life expectancy at birth, in years

adolesc_fert_rate Numeric, adolescent fertility rate, births per 1,000 women age 15 - 19

total_fert_rate Numeric, total fertility rate, births per woman

infant_mortality_rate Numeric, infant deaths per 1,000 live births

perc_basic_sanit Numeric, percent of the population with access to basic sanitation

adult_lit_rate Numeric, adult literacy rate, percent of population above the age of 15 considered literate

govt_expend_edu Numeric, government expenditures on education as a percent of GDP

female_prim_edu Numeric, primary school completion rate among the relevant population of women

Source

<https://data.worldbank.org/indicator>

winery_cars

Time Between Gondola Cars at Sterling Winery

Description

These times represent times between gondolas at Sterling Winery. The main take-away: there are 7 cars, as evidenced by the somewhat regular increases in splits between every 7 cars. The reason the times are slightly non-constant is that the gondolas come off the tracks, so times will change a little between each period.

Usage

winery_cars

Format

A data frame with 52 observations on the following 2 variables.

obs_number The observation number, e.g. observation 3 was immediately preceded by observation 2.

time_until_next Time until this gondola car arrived since the last car had left.

Details

Important context: there was a sufficient line that people were leaving the winery.

So why is this data valuable? It indicates that the winery should add one more car since it has a lot of time wasted every 7th car. By adding another car, fewer visitors are likely to be turned away, resulting in increased revenue.

Source

In-person data collection by David Diez (OpenIntro) on 2013-07-04.

Examples

```
winery_cars$car_number <- rep(1:7, 10)[1:nrow(winery_cars)]
col <- COL[ifelse(winery_cars$car_number == 3, 4, 1)]
plot(winery_cars[, c("obs_number", "time_until_next")],
     col = col, pch = 19
)
plot(winery_cars$car_number, winery_cars$time_until_next,
     col = fadeColor(col, "88"), pch = 19
)
```

world_pop

World Population Data.

Description

From World Bank, population 1960-2020

Usage

world_pop

Format

A data frame with 216 rows and 62 variables.

country Name of country.
year_1960 population in 1960.
year_1961 population in 1961.
year_1962 population in 1962.
year_1963 population in 1963.
year_1964 population in 1964.
year_1965 population in 1965.
year_1966 population in 1966.
year_1967 population in 1967.
year_1968 population in 1968.
year_1969 population in 1969.
year_1970 population in 1970.
year_1971 population in 1971.
year_1972 population in 1972.
year_1973 population in 1973.

year_1974 population in 1974.
year_1975 population in 1975.
year_1976 population in 1976.
year_1977 population in 1977.
year_1978 population in 1978.
year_1979 population in 1979.
year_1980 population in 1980.
year_1981 population in 1981.
year_1982 population in 1982.
year_1983 population in 1983.
year_1984 population in 1984.
year_1985 population in 1985.
year_1986 population in 1986.
year_1987 population in 1987.
year_1988 population in 1988.
year_1989 population in 1989.
year_1990 population in 1990.
year_1991 population in 1991.
year_1992 population in 1992.
year_1993 population in 1993.
year_1994 population in 1994.
year_1995 population in 1995.
year_1996 population in 1996.
year_1997 population in 1997.
year_1998 population in 1998.
year_1999 population in 1999.
year_2000 population in 2000.
year_2001 population in 2001.
year_2002 population in 2002.
year_2003 population in 2003.
year_2004 population in 2004.
year_2005 population in 2005.
year_2006 population in 2006.
year_2007 population in 2007.
year_2008 population in 2008.
year_2009 population in 2009.
year_2010 population in 2010.

year_2011 population in 2011.
year_2012 population in 2012.
year_2013 population in 2013.
year_2014 population in 2014.
year_2015 population in 2015.
year_2016 population in 2016.
year_2017 population in 2017.
year_2018 population in 2018.
year_2019 population in 2019.
year_2020 population in 2020.

Source

World Bank

Examples

```

library(dplyr)
library(ggplot2)
library(tidyr)

# List percentage of population change from 1960 to 2020
world_pop |>
  mutate(percent_change = round((year_2020 - year_1960) / year_2020 * 100, 2)) |>
  mutate(rank_pop_change = round(rank(-percent_change)), 0) |>
  select(rank_pop_change, country, percent_change) |>
  arrange(rank_pop_change)

# Graph population in millions by decade for specified countries
world_pop |>
  select(
    country, year_1960, year_1970, year_1980, year_1990,
    year_2000, year_2010, year_2020
  ) |>
  filter(country %in% c("China", "India", "United States")) |>
  pivot_longer(
    cols = c(year_1960, year_1970, year_1980, year_1990, year_2000, year_2010, year_2020),
    names_to = "year",
    values_to = "population"
  ) |>
  mutate(year = as.numeric(gsub("year_", "", year))) |>
  ggplot(aes(year, population, color = country)) +
  geom_point() +
  geom_smooth(method = "loess", formula = "y ~ x") +
  labs(
    title = "Population",
    subtitle = "by Decade",
    x = "Year",
    y = "Population (in millions)",
  )

```

```
    color = "Country"  
  )
```

write_pkg_data	Create a CSV variant of .rda files
----------------	------------------------------------

Description

The function should be run with a path to a package directory. It will then look through the data directory of the package, and for all datasets that are data frames, create CSV variants in a data-csv directory.

Usage

```
write_pkg_data(  
  pkg,  
  dir = paste0("data-", out_type),  
  overwrite = FALSE,  
  out_type = c("csv", "tab", "R")  
)
```

Arguments

pkg	The R package where we'd like to generate CSVs of any data frames.
dir	A character string representing the path to the folder. where the CSV files should be written. If no such directory exists, one will be created (recursively).
overwrite	Boolean to indicate if to overwrite any existing files that have conflicting names in the directory specified.
out_type	Format for the type of output as a CSV ("csv"), tab-delimited text file ("tab"), or the R code to generate the object ("R").

Examples

```
## Not run:  
write_pkg_data("openintro")  
list.files("data-csv")  
  
## End(Not run)
```

xom	<i>Exxon Mobile stock data</i>
-----	--------------------------------

Description

Monthly data covering 2006 through early 2014.

Usage

```
xom
```

Format

A data frame with 98 observations on the following 7 variables.

date Date.

open a numeric vector

high a numeric vector

low a numeric vector

close a numeric vector

volume a numeric vector

adj_close a numeric vector

Source

Yahoo! Finance.

Examples

```
xom
```

yawn	<i>Contagiousness of yawning</i>
------	----------------------------------

Description

An experiment conducted by the MythBusters, a science entertainment TV program on the Discovery Channel, tested if a person can be subconsciously influenced into yawning if another person near them yawns. 50 people were randomly assigned to two groups: 34 to a group where a person near them yawned (treatment) and 16 to a group where there wasn't a person yawning near them (control).

Usage

```
yawn
```

Format

A data frame with 50 observations on the following 2 variables.

result a factor with levels not yawn yawn

group a factor with levels ctrl1 trmt

Source

MythBusters, Season 3, Episode 28.

Examples

yawn

yrbss

Youth Risk Behavior Surveillance System (YRBSS)

Description

Select variables from YRBSS.

Usage

yrbss

Format

A data frame with 13583 observations on the following 13 variables.

age Age, in years.

gender Gender.

grade School grade.

hispanic Hispanic or not.

race Race / ethnicity.

height Height, in meters (3.28 feet per meter).

weight Weight, in kilograms (2.2 pounds per kilogram).

helmet_12m How often did you wear a helmet when biking in the last 12 months?

text_while_driving_30d How many days did you text while driving in the last 30 days?

physically_active_7d How many days were you physically active for 60+ minutes in the last 7 days?

hours_tv_per_school_day How many hours of TV do you typically watch on a school night?

strength_training_7d How many days did you do strength training (e.g. lift weights) in the last 7 days?

school_night_hours_sleep How many hours of sleep do you typically get on a school night?

Source

CDC's Youth Risk Behavior Surveillance System (YRBSS)

Examples

```
table(yrbss$physically_active_7d)
```

yrbss_samp

Sample of Youth Risk Behavior Surveillance System (YRBSS)

Description

A sample of the [yrbss](#) dataset.

Usage

```
yrbss_samp
```

Format

A data frame with 100 observations on the following 13 variables.

age Age, in years.

gender Gender.

grade School grade.

hispanic Hispanic or not.

race Race / ethnicity.

height Height, in meters (3.28 feet per meter).

weight Weight, in kilograms (2.2 pounds per kilogram).

helmet_12m How often did you wear a helmet when biking in the last 12 months?

text_while_driving_30d How many days did you text while driving in the last 30 days?

physically_active_7d How many days were you physically active for 60+ minutes in the last 7 days?

hours_tv_per_school_day How many hours of TV do you typically watch on a school night?

strength_training_7d How many days did you do strength training (e.g. lift weights) in the last 7 days?

school_night_hours_sleep How many hours of sleep do you typically get on a school night?

Source

CDC's Youth Risk Behavior Surveillance System (YRBSS)

Examples

```
table(yrbss_samp$physically_active_7d)
```


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