

Package ‘idarps’

April 21, 2023

Type Package

Title Datasets and Functions for the Class “Modelling and Data Analysis for Pharmaceutical Sciences”

Version 0.0.3

Description Provides datasets and functions for the class “Modelling and Data Analysis for Pharmaceutical Sciences”.

The datasets can be used to present various methods of data analysis and statistical modeling. Functions for data visualization are also implemented.

License AGPL-3

Encoding UTF-8

LazyData true

RoxygenNote 7.2.3

NeedsCompilation no

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Depends R (>= 3.5.0)

Repository CRAN

Date/Publication 2023-04-21 17:12:32 UTC

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boxplot_w_points	<i>boxplot_w_points</i>
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Description

boxplot_w_points

Usage

```

boxplot_w_points(
  ...,
  col_points = "#9033FF3F",
  col_boxplot = "#d2d2d2",
  horizontal = FALSE,
  main = "",
  names = NULL,
  las = 0,
  xlab = "",
  ylab = "",
  seed = 123,
  jitter_param = 0.25
)

```

Arguments

...	data vectors to be visualized.
col_points	color of the points to be added to the boxplot.
col_boxplot	color of the boxplot.
horizontal	logical indicating if the boxplots should be horizontal; default FALSE means vertical boxes.
main	string indicating the title of the plot.
names	vector of string indicating the group labels which will be printed under each boxplot.

<code>las</code>	a numeric value indicating the orientation of the tick mark labels and any other text added to a plot after its initialization. The options are as follows: always parallel to the axis (the default, 0), always horizontal (1), always perpendicular to the axis (2), and always vertical (3).
<code>xlab</code>	a string indicating the x label.
<code>ylab</code>	a string indicating the y label.
<code>seed</code>	an integer specifying a seed for the random jitter of the boxplot points.
<code>jitter_param</code>	a double specifying the amount of jittering applied on points.

Value

No return value. Plot a boxplot.

Examples

```
x <- rnorm(20, mean = 5)
y <- rnorm(20, mean = 10)
z <- rnorm(20, mean = 15)
boxplot_w_points(x, main = "test")
boxplot_w_points(x, y, names = c("x", "y"), las = 1, main = "Data")
boxplot_w_points(x, y, z, names = c("x", "y", "z"), horizontal = TRUE, las = 1, main = "Data")
boxplot_w_points(x, y, z, names = c("x", "y", "z"), horizontal = FALSE, las = 1, main = "Data")
```

BreastCancer

Breast Cancer

Description

This dataset consists of several clinical features observed or measured for 116 participants in a study of breast cancer.

Usage

```
BreastCancer
```

Format

Age Age in years

BMI Body mass index in kg/m^2

Glucose Glucose in mg/dL

Insulin Insulin in $\mu\text{U}/\text{mL}$

HOMA Homeostasis model assessment

Classification Presence of breast cancer (0 if no cancer, 1 if with cancer)

Source

<https://bmccancer.biomedcentral.com/articles/10.1186/s12885-017-3877-1>

References

Patricio, Miguel, et al. "Using Resistin, glucose, age and BMI to predict the presence of breast cancer", *BMC Cancer*, (2018).

bronchitis	<i>Bronchitis</i>
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Description

Data collected in a study to assess the effects of smoking and pollution on being diagnosed with bronchitis. This dataset is based on 212 subjects.

Usage

bronchitis

Format

bron Presence of bronchitis (0 for no and 1 for yes)

cigs Average daily number of smoked cigarettes

poll Pollution index

codex	<i>codex</i>
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Description

This dataset is based on an observational study conducted at Geneva University Hospitals to assess the impact of weight on the pharmacokinetics of dexamethasone in normal-weight versus obese patients hospitalized for COVID-19.

Usage

codex

Format

id ID of the patient

gender Gender (0 for men and 1 for women)

age Age

bmi Body mass index

weight Weight in kg

number_doses Number of doses of the dexamethasone (DEX) drug

- tmax** The time it takes for the drug to reach the maximum concentration (i.e. Cmax) after its administration in hours (h)
- cmax** The maximum concentration that achieves in the blood after the drug has been administered (ng/m)
- t1_2** t1_2 is the time required to decrease the drug concentration within the body by one-half during elimination in hours (h)
- auc** The integral (from 0 to 8 hours) of a curve that describes the variation of a drug concentration in the blood as a function of time it takes for a drug to reach the maximum concentration (Cmax) after administration of a drug (ng.h/m)
- length_hospital** Number of days the patient were hospitalized
- length_intermed** Number of days the patient were hospitalized at the intermediate and intensive care unit
- crp** crp
- comor_e** Presence of comorbidity type e
- comor_p** Presence of comorbidity type p
- comor_v** Presence of comorbidity type v
- comor_c** Presence of comorbidity type c
- comor_r** Presence of comorbidity type r
- obese** Indicator variable based on whether the subject is obese (i.e. with BMI > 30), 0 for no and 1 for yes.

cortisol

Biomarkers in pigs fed with various diets

Description

This dataset contains measured biomarkers in pigs fed with various diets.

Usage

```
cortisol
```

Format

A data frame with 61 rows and 9 variables:

- id** the id of the pig
- group** the diet fed to the pig (chipped diet or non-chipped diet)
- gender** the gender of the pig
- cortisol** urine cortisol in pg/ml
- acth** serum acth in pg/ml
- crh** serum crh in pg/ml
- testosterone** testosterone in ng/ml
- lh** LH in ng/ml
- caloric** daily caloric intake in kcal

covid

Intensive care admission of COVID-19 patients in Belgium

Description

Data from Parisi, et al., (2021) which studies the applicability of predictive models for intensive care admission of COVID-19 patients in a secondary care hospital in Belgium. This study is based on data of patients admitted to an emergency department with a positive RT-PCR SARS-CoV-2 test.

Usage

covid

Format

A data frame with 64 rows and 5 variables:

icu admission to an Intensive Care Unit (0 for no, 1 for yes)

sex sex (men, women)

age age in years

ldh lactate dehydrogenase in U/L

spo2 oxygen saturation in percentage

Source

<https://jeccm.amegroups.com/article/view/6927/html>

References

Parisi, Nicolas, et al. "Non applicability of validated predictive models for intensive care admission and death of COVID-19 patients in a secondary care hospital in Belgium.", *Journal of Emergency and Critical Care Medicine*, (2021).

data_covid_switzerland_spatial

COVID-19 Spatial

Description

Data from the COVID-19 Data Hub joined with spatial features for Switzerland.

Usage

data_covid_switzerland_spatial

Format

admin Country
iso_alpha_3 3-letter code of the country according to the standard ISO 3166-1 Alpha-3
date Date
confirmed Cumulative number of confirmed cases
population Total population
tests Cumulative number of tests
diff_confirmed Daily number of confirmed cases
diff_test Daily number of tests
confirmed_per_pop Number of daily confirmed cases divided per the country population
confirmed_per_pop_ma Moving Average applied to confirmed_per_pop with a window of 7 days
geometry 'sf' geometry list of country

Source

<https://covid19datahub.io/>

diet

Diet

Description

Diet

Usage

diet

Format

id ID
gender Gender (male or female)
age Age in years
height Height in m
diet.type Type of diet (A, B or C)
initial.weight Initial weight in kg
final.weight Final weight in kg

fev	<i>Forced Expiratory Volume</i>
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Description

This dataset is based on a study conducted in suburban Boston in the late 1970s to investigate the relationship between forced expiratory volume and smoking behavior in 654 youths between the ages of 3 and 19.

Usage

fev

Format

fev forced expiratory volume or FEV, which measures the amount of air a person can exhale during a forced breath.

age age in years

sex gender of the person (0 for males and 1 for females)

height height in cm

smoke smoking behavior (0 for non-smokers and 1 for smokers)

hist_compare_to_normal	<i>hist_compare_to_normal</i>
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Description

hist_compare_to_normal

Usage

```
hist_compare_to_normal(
  x,
  col = "lightgray",
  main = "",
  xlab = "",
  ylab = "",
  lwd_line = 1.5,
  col_line1 = "#ff160e",
  col_line2 = "#335bff",
  add_legend = TRUE,
  legend_position = "topleft",
  delta = 0.2,
  ...
)
```


Arguments

<code>x</code>	data vector to be visualized.
<code>col</code>	color of the histogram.
<code>main</code>	string indicating the title of the plot.
<code>xlab</code>	a string indicating the x label.
<code>ylab</code>	a string indicating the y label.
<code>lwd_line</code>	width of density lines.
<code>col_line1</code>	color of density line classic mle estimation.
<code>col_line2</code>	color of density line classic robust estimation.
<code>add_legend</code>	a Boolean if the estimated parameters of the Normal distribution should be plotted.
<code>legend_position</code>	a string specifying the position of the legend.
<code>delta</code>	graphic parameter to determine the shrinkage of the axis.
<code>...</code>	Extra graphical arguments.

Value

No return value. Plot a histogram.

Examples

```
n <- 1000
x <- rnorm(n = n)
hist_compare_to_normal(x)
x2 <- rexp(n, rate = 25)
hist_compare_to_normal(x2, legend_position = "topright")
```

HP13Cbicarbonate

HP13Cbicarbonate

Description

Data from an experiment made on rats which compares the HP13C bicarbonate signal intensities normalized to the total sum of metabolites and corresponding initial reaction rate as a function of the injected dose of HP1-13C pyruvate. Two groups of rats were compared (i.e. fed and overnight-fasted). Dataset from Can et al. 2022.

Usage

HP13Cbicarbonate

Format

signal HP13C bicarbonate signal intensities normalized to the total sum of metabolites

dose initial reaction rate as a function of the injected dose of HP13C pyruvate

group fed and overnight-fasted

Source

<https://www.nature.com/articles/s42003-021-02978-2>

PeruvianBP

Peruvian Blood Pressure

Description

This dataset consists of variables possibly relating to blood pressures of 39 Peruvians who have moved from rural high-altitude areas to urban lower-altitude areas.

Usage

PeruvianBP

Format

Age Age in years

Years Years in urban area

Weight Weight in kg

Height Height in mm

Chin Chin skinfold

Forearm Forearm skinfold

Calf Calf skinfold

Pulse Resting pulse rate

Systol Systolic blood pressure

pharmacy	<i>Customer attendance of a pharmacy in Geneva</i>
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Description

This dataset contains the number of clients in a pharmacy for each hour over two years.

Usage

pharmacy

Format

A data frame with 17520 rows and 4 variables:

date the date

hours the hour of the day

weekday the week day

attendance the recorded number of clients

reading	<i>Reading</i>
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Description

This dataset is based on the effectiveness of directed reading activities for elementary school students (6-12 years old).

Usage

reading

Format

id Student id

score Degree of Reading Power (DRP) test score

age Age of the students

group Binary variable indicating whether a student participated to the directed reading activities (Treatment if the student participated, Control otherwise)

snoring	<i>Snoring</i>
---------	----------------

Description

This dataset is based on a study on the physical and behavioral characteristics of snorers.

Usage

snoring

Format

sex gender of the person (0 for males and 1 for females)

age age in years

height height in cm

weight weight in kg

smoke smoking behavior (0 for non-smokers and 1 for smokers)

alcohol number of glasses drunk per day (in red wine equivalent)

snore snoring diagnosis (0 for not snoring, 1 for snoring)

students	<i>Students</i>
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Description

Students

Usage

students

Format

day day

case case

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