Package ‘r2spss’

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Type Package

Title Format R Output to Look Like SPSS

Version 0.2.0

Date 2021-11-24

Description Create plots and LaTeX tables that look like SPSS output for use in teaching materials. Rather than copying-and-pasting SPSS output into documents, R code that mocks up SPSS output can be integrated directly into dynamic LaTeX documents with tools such as knitr. Functionality includes methods that are typically covered in introductory statistics classes: descriptive statistics, common hypothesis tests, ANOVA, and linear regression, as well as boxplots, histograms, scatterplots, and line plots (including profile plots).

License GPL (>= 3)

URL https://github.com/aalfons/r2spss

BugReports https://github.com/aalfons/r2spss/issues

Depends R (>= 3.5.0)

Imports graphics, grDevices, stats, car

Suggests knitr

LazyLoad yes

VignetteBuilder knitr

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r2spss-package

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r2spss-package Format R Output to Look Like SPSS

Description

Create plots and LaTeX tables that look like SPSS output for use in teaching materials. Rather than copying-and-pasting SPSS output into documents, R code that mocks up SPSS output can be integrated directly into dynamic LaTeX documents with tools such as knitr. Functionality includes methods that are typically covered in introductory statistics classes: descriptive statistics, common hypothesis tests, ANOVA, and linear regression, as well as boxplots, histograms, scatterplots, and line plots (including profile plots).

Details

The DESCRIPTION file:

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URL: https://github.com/aalfons/r2spss
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Depends: R (>= 3.5.0)
ANOVA

Index of help topics:

- ANOVA: One-way and Two-way ANOVA
- Eredivisie: Football players of the Dutch Eredivisie season 2013-14
- Exams: Exam results of an applied statistics course
- boxplotSPSS: Boxplots
- chisqTest: Chi-squared Tests
- descriptives: Descriptive Statistics
- formatSPSS: Format Objects
- histSPSS: Histogram
- kruskalTest: Kruskal-Wallis Test
- linesSPSS: Line Plots
- paletteSPSS: SPSS Color Palette
- plotSPSS: Scatterplot and Scatterplot Matrix
- r2spss-package: Format R Output to Look Like SPSS
- regression: Linear Regression
- signTest: Sign Test
- tTest: t Tests
- wilcoxonTest: Wilcoxon Signed Rank and Rank Sum Tests

Further information is available in the following vignettes:

r2spss-intro  r2spss: Format R Output to Look Like SPSS (source)

Author(s)

Andreas Alfons [aut, cre] (<https://orcid.org/0000-0002-2513-3788>)
Maintainer: Andreas Alfons <alfons@ese.eur.nl>
**Description**

Perform one-way or two-way ANOVA on variables of a data set. The output is printed as a LaTeX table that mimics the look of SPSS output (version <24), and a plot of the results mimics the look of SPSS graphs.

**Usage**

```r
ANOVA(data, variable, group, conf.level = 0.95)
```

```r
## S3 method for class 'ANOVASPSS'
print(x, digits = 3, statistics = c("descriptives", "variance", "test"), ...)
```

```r
## S3 method for class 'ANOVASPSS'
plot(x, y, which = 1, type = "o", main = NULL, xlab = NULL, ylab = NULL, ...)
```

**Arguments**

- `data`: a data frame containing the variables.
- `variable`: a character string specifying the numeric variable of interest.
- `group`: a character vector specifying one or two grouping variables.
- `conf.level`: a number between 0 and 1 giving the confidence level of the confidence interval.
- `x`: an object of class "ANOVASPSS" as returned by function `ANOVA`.
- `digits`: an integer giving the number of digits after the comma to be printed in the LaTeX tables.
- `statistics`: a character vector specifying which LaTeX tables should be printed. Available options are "descriptives" for descriptive statistics, "variance" for Levene's test on homogeneity of the variances, and "test" for ANOVA results. The default is to print all tables.
- `...`: For the `plot` method, additional arguments to be passed down, in particular graphical parameters (see also `linesSPSS`). For the `print` method, additional arguments are currently ignored.
- `y`: ignored (only included because it is defined for the generic function `plot`.
- `which`: for two-way ANOVA, an integer with possible values 1 or 2 indicating whether the first or the second factor should be used on the x-axis. The other factor will then be used for drawing separate lines. For one-way ANOVA, this is not meaningful and ignored.
- `type`: a character string specifying the type of lines. Possible values are "o" (the default) for overplotted points and lines, and "l" for lines only.
- `main`, `xlab`, `ylab`: the plot title and axis labels.

**Value**

An object of class "ANOVASPSS" with the following components:

- `descriptives`: a data frame containing per-group descriptive statistics.
levene  an object as returned by leveneTest.
test  a data frame containing the ANOVA table.
variable  a character string containing the name of the numeric variable of interest.
group  a character vector containing the name(s) of the grouping variable(s).
i  an integer giving the number of groups in the (first) grouping variable.
j  an integer giving the number of groups in the second grouping variable (only two-way ANOVA).
conf.level  numeric; the confidence level used.
type  a character string giving the type of ANOVA performed ("one-way" or "two-way").

The print method produces a LaTeX table that mimics the look of SPSS output (version <24).
The plot method does not return anything, but produces a profile plot of the ANOVA results.

Author(s)
Andreas Alfons

Examples

# load data
data("Eredivisie")
# log-transform market values
Eredivisie$logMarketValue <- log(Eredivisie$MarketValue)

# one-way ANOVA
oneway <- ANOVA(Eredivisie, "logMarketValue",
                 group = "Position")
oneway  # print LaTeX table
plot(oneway)  # create profile plot

# two-way ANOVA
twoway <- ANOVA(Eredivisie, "logMarketValue",
                 group = c("Position", "Foreign"))
twoway  # print LaTeX table
plot(twoway)  # create profile plot

---

Description

Boxplots

Draw boxplots of variables in a data frame, including boxplots for groups of observations and boxplots for separate variables. The plots thereby mimic the look of SPSS graphs.
Usage

boxplotSPSS(
  data,
  variables,
  group = NULL,
  xlab = NULL,
  ylab = NULL,
  cut.names = NULL,
  ...
)

Arguments

data: a data frame containing the variables to be plotted.
variables: a character vector specifying separate variables to be plotted. If `group` is not `NULL`, only the first variable is used and boxplots of groups of observations are drawn instead.
group: an character string specifying a grouping variable, or `NULL` for no grouping.
xlab, ylab: the axis labels.
cut.names: a logical indicating whether to cut long variable names or group labels to 8 characters. The default is `TRUE` for boxplots of separate variables, but `FALSE` for boxplots of groups of observations (which mimics SPSS behavior).
...
additional arguments to be passed down, in particular graphical parameters (see `boxplot` and `par`).

Value

A list containing summary statistics is returned invisibly (see `boxplot`).

Author(s)

Andreas Alfons

Examples

## paired sample
# load data
data("Exams")

# plot grades on regular and resit exams
boxplotSPSS(Exams, c("Regular", "Resit"))

## independent samples

# load data
data("Eredivisie")
# log-transform market values
Eredivisie$logMarketValue <- log(Eredivisie$MarketValue)

# plot log market values of Dutch and Foreign players
boxplotSPSS(Eredivisie, "logMarketValue", group = "Foreign")

---

### chisqTest

| **chisqTest** | **χ² Tests** |

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perform a χ² goodness-of-fit test or a χ² test on independence on variables of a data set. The output is printed as a LaTeX table that mimics the look of SPSS output (version &lt;24).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>chisqTest(data, variables, p = NULL)</td>
</tr>
</tbody>
</table>

## S3 method for class 'chisqTestSPSS'

print(x, digits = c(1, 3), statistics = c("frequencies", "test"), ...)

<table>
<thead>
<tr>
<th>Arguments</th>
</tr>
</thead>
<tbody>
<tr>
<td>data</td>
</tr>
<tr>
<td>variables</td>
</tr>
<tr>
<td>p</td>
</tr>
<tr>
<td>x</td>
</tr>
<tr>
<td>digits</td>
</tr>
<tr>
<td>statistics</td>
</tr>
<tr>
<td>...</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>An object of class &quot;chisqTestSPSS&quot; with the following components:</td>
</tr>
<tr>
<td>chisq</td>
</tr>
<tr>
<td>lr</td>
</tr>
<tr>
<td>observed</td>
</tr>
</tbody>
</table>
expected a vector or matrix containing the expected frequencies.
n an integer giving the number of observations.
k an integer giving the number of groups (only goodness-of-fit test).
r an integer giving the number of groups in the first variable corresponding to the rows (only test on independence).
c an integer giving the number of groups in the second variable corresponding to the columns (only test on independence).
variables a character vector containing the name(s) of the categorical variable(s) of interest.
type a character string giving the type of $\chi^2$ test performed ("goodness-of-fit" or "independence").

The print method produces a LaTeX table that mimics the look of SPSS output (version <24).

Note

The test on independence also reports the results of a likelihood ratio test.

Author(s)

Andreas Alfons

Examples

```r
# load data
data(Eredivisie)

# test whether playing position and dummy variable for foreign players are independent
chisqTest(Eredivisie, c("Position", "Foreign"))

# test whether the traditional Dutch 4-3-3 (total football) is still reflected in player composition
chisqTest(Eredivisie, "Position", p = c(1, 4, 3, 3)/11)
```

---

### descriptives

**Descriptive Statistics**

Compute descriptive statistics of numeric variables of a data set (number of observations, minimum, maximum, mean, standard deviation). The output is printed as a LaTeX table that mimics the look of SPSS output (version <24).

**Usage**

```r
descriptives(data, variables)
```

---

## S3 method for class 'descriptivesSPSS'

```r
print(x, digits = 2, ...)
```
Arguments

data a data frame containing the variables.
variables a character vector specifying numeric variables for which to compute descriptive statistics.
x an object of class "descriptivesSPSS" as returned by function descriptives.
digits an integer giving the number of digits after the comma to be printed in the LaTeX table.
... currently ignored.

Value

An object of class "descriptivesSPSS" with the following components:

classes a character vector giving the (first) class of the variables of interest.
descriptives a data frame containing the descriptive statistics.
n an integer giving the number of observations.

The print method produces a LaTeX table that mimics the look of SPSS output (version <24).

Author(s)

Andreas Alfons

Examples

# load data
data("Eredivisie")

# compute descriptive statistics for market value and age
descriptives(Eredivisie, c("MarketValue", "Age"))

---

Eredivisie

*Football players of the Dutch Eredivisie season 2013-14*

Description

Data on all football players in the Dutch Eredivisie, the highest men’s football league in the Netherlands, who played at least one match in the 2013-14 season.

Usage

data("Eredivisie")
**Format**

A data frame with 417 observations on the following 20 variables.

- **Player**  the player’s name.
- **Team**  the team with which the player was under contract at the end of the 2013-14 season.
- **MarketValue**  the player’s market value after the 2013-14 season.
- **Age**  the player’s age in years.
- **Height**  the player’s height in centimeters.
- **Foreign**  a dummy variable with value 0 for Dutch players and value 1 for players without a Dutch nationality.
- **Position**  the primary position of the player (**"Goalkeeper"**, **"Defender"**, **"Midfielder"**, or **"Forward"**).
- **BothFeet**  a dummy variable with value 0 if the player has one stronger foot and value 1 if the player is equally strong with both feet.
- **AtClub**  the number of years the player is with the current team.
- **Contract**  the number of years remaining on the player’s current contract.
- **Matches**  the number of matches played in the 2013-14 season.
- **Goals**  the number of goals scored in the 2013-14 season.
- **OwnGoals**  the number of own goals scored in the 2013-14 season.
- **Assists**  the number of assists given in the 2013-14 season.
- **Yellow**  the number of yellow cards received in the 2013-14 season.
- **YellowRed**  the number of yellow-red cards received in the 2013-14 season.
- **Red**  the number of red cards received in the 2013-14 season.
- **SubOn**  the number of times the player was substituted on the field in the 2013-14 season.
- **SubOff**  the number of times the player was substituted off the field in the 2013-14 season.
- **Minutes**  the number of minutes played in the 2013-14 season.

**Source**

[https://www.transfermarkt.de/](https://www.transfermarkt.de/)

**Examples**

```r
data("Eredivisie")
summary(Eredivisie)
```
Exam results of an applied statistics course

Description
Data on grades for an applied statistics course at Erasmus University Rotterdam for students who took both the regular exam and the resit. Grades in the Netherlands are on a scale from 1 to 10, with a higher grade being better, and a minimum of 5.5 is required to pass.

Usage
```r
data("Exams")
```

Format
A data frame with 45 observations on the following 2 variables.
- `Regular`: the student’s grade based on the regular exam at the end of the course.
- `Resit`: the student’s grade based on the resit exam at the end of the academic year.

Examples
```r
data("Exams")
summary(Exams)
```

formatSPSS

Format Objects

Description
Format an object for printing, mostly used to print numeric data in the same way SPSS. This is mainly for internal use in `print` methods.

Usage
```r
formatSPSS(x, ...)
```

## Default S3 method:
```r
formatSPSS(x, ...)
```

## S3 method for class 'integer'
```r
formatSPSS(x, ...)
```

## S3 method for class 'numeric'
```r
formatSPSS(x, digits = 3, ...)
```
## S3 method for class 'matrix'
formatSPSS(x, ...)

## S3 method for class 'data.frame'
formatSPSS(x, ...)

### Arguments

- **x**: an R object, typically numeric. Currently methods are implemented for vectors, matrices and data frames. The default method calls `as.character`.
- **...**: additional arguments passed down to methods.
- **digits**: an integer giving the number of digits after the comma to display.

### Value

A character vector or matrix containing the formatted object.

### Author(s)

Andreas Alfons

### Examples

```r
# note how numbers in the interval (-1, 1) are printed
# without the zero in front of the comma
formatSPSS(c(-1.5, -2/3, 2/3, 1.5))
```

### histSPSS

#### Description

Draw a histogram of a variable in a data frame. The plot thereby mimics the look of SPSS graphs.

#### Usage

```r
histSPSS(data, variable, normal = FALSE, xlab = NULL, ylab = NULL, ...)
```

#### Arguments

- **data**: a data frame containing the variable to be plotted.
- **variable**: a character string specifying the variable to be plotted.
- **normal**: a logical indicating whether to add a normal density with the estimated mean and standard deviation (the default is `FALSE`).
- **xlab, ylab**: the axis labels (the default is to use the variable name for the x-axis label and "Frequency" as the y-axis label).
- **...**: additional arguments to be passed down, in particular graphical parameters (see `hist` and `par`).
**kruskalTest**

**Value**

An object of class "histogram" is returned invisibly (see `hist`).

**Author(s)**

Andreas Alfons

**Examples**

```r
# load data
data("Eredivisie")
# log-transform market values
Eredivisie$logMarketValue <- log(Eredivisie$MarketValue)

# plot histogram of log market values
histSPSS(Eredivisie, "logMarketValue")
```

**kruskalTest**  

*Kruskal-Wallis Test*

**Description**

Perform a Kruskal-Wallis test on variables of a data set. The output is printed as a LaTeX table that mimics the look of SPSS output (version <24).

**Usage**

```r
kruskalTest(data, variable, group)
```

```r
## S3 method for class 'kruskalTestSPSS'
print(x, digits = 2:3, statistics = c("ranks", "test"), ...)
```

**Arguments**

- `data`: a data frame containing the variables.
- `variable`: a character string specifying the numeric variable of interest.
- `group`: a character string specifying a grouping variable.
- `x`: an object of class "kruskalTestSPSS" as returned by function `kruskalTest`.
- `digits`: an integer vector giving the number of digits after the comma to be printed in the LaTeX tables. The first element corresponds to the number of digits in table with the summary of the ranks, and the second element corresponds to the number of digits in the table for the test.
- `statistics`: a character vector specifying which LaTeX tables should be printed. Available options are "ranks" for a summary of the ranks and "test" for test results. The default is to print both tables.
- `...`: currently ignored.
Value
An object of class "kruskalTestSPSS" with the following components:

- statistics a data frame containing information on the per-group mean ranks.
- test a list containing the results of the Kruskal-Wallis test.
- variable a character string containing the name of the numeric variable of interest.
- group a character string containing the name of the grouping variable.

The print method produces a LaTeX table that mimics the look of SPSS output (version <24).

Author(s)
Andreas Alfons

Examples

# load data
data("Eredivisie")

# test whether market values differ by playing position
kruskalTest(Eredivisie, "MarketValue", group = "Position")

linesSPSS  Line Plots

Description
Draw connected lines for variables in a data frame. The plot thereby mimics the look of SPSS graphs.

Usage

linesSPSS(data, variables, index = NULL, xlab = NULL, ylab = NULL, ...)

Arguments

data a data frame containing the variables to be plotted.
variables a character vector specifying at least one variable to be plotted on the y-axis. In case of multiple variables, separate lines are drawn for each variable and a legend is shown.
index a character string specifying a variable to be plotted on the x-axis, or NULL to plot the observations against their index.
xlab, ylab the axis labels.
... additional arguments to be passed down, in particular graphical parameters (see par).
paletteSPSS

Value

Nothing is returned, but a plot is produced.

Author(s)

Andreas Alfons

Examples

```r
# load data
data("Eredivisie")

# log-transform market values
Eredivisie$logMarketValue <- log(Eredivisie$MarketValue)

# aggregate log market values by position
means <- aggregate(Eredivisie[, "logMarketValue", drop = FALSE],
                    Eredivisie[, "Position", drop = FALSE],
                    FUN = mean)

# create profile plot
linesSPSS(means, "logMarketValue", "Position")

# easier and fancier as the plot method of ANOVA results
oneway <- ANOVA(Eredivisie, "logMarketValue",
                 group = "Position")
plot(oneway)
```

paletteSPSS  

### SPSS Color Palette

**Description**

Color palette used by SPSS (e.g., for multiple lines in a plot).

**Usage**

```r
paletteSPSS()
```

**Value**

A character vector specifying 30 colors as used by SPSS.

**Author(s)**

Andreas Alfons
Examples

```r
df <- data.frame(x = 1:30, y = 0)
colors <- paletteSPSS()
plotSPSS(df, c("x", "y"), col = colors, pch = 16)
```

---

**plotSPSS**  
*Scatterplot and Scatterplot Matrix*

Description

Draw a scatterplot or a scatterplot matrix of variables in a data frame. The plots thereby mimic the look of SPSS graphs.

Usage

```r
plotSPSS(data, variables, xlab = NULL, ylab = NULL, ...)
```

Arguments

- **data**: a data frame containing the variables to be plotted.
- **variables**: a character vector specifying at least two variables to be plotted. In case of two variables, a simple scatterplot is produced with the first variable on the \textit{x}-axis and the second variable on the \textit{y}-axis. In case of more than two variables, a scatterplot matrix is produced.
- **xlab, ylab**: the axis labels for a simple scatterplot (the default is to use the variable names). This is ignored for a scatterplot matrix.
- **...**: additional arguments to be passed down, in particular graphical parameters (see \texttt{par}).

Value

Nothing is returned, but a plot is produced.

Author(s)

Andreas Alfons

Examples

```r
# load data
data("Eredivisie")
# log-transform market values
Eredivisie$LogMarketValue <- log(Eredivisie$MarketValue)

# plot log market values against age
plotSPSS(Eredivisie, c("Age", "LogMarketValue"))
```
# scatterplot matrix of age, number of minutes played, and 
# log market values
plotSPSS(Eredivisie, c("Age", "Minutes", "logMarketValue"))

---

**regression**

**Linear Regression**

**Description**

Perform linear regression on variables of a data set. The output is printed as a LaTeX table that mimics the look of SPSS output (version <24), and plots of the results mimic the look of SPSS graphs.

**Usage**

regression(..., data, labels = NULL, change = FALSE)

## S3 method for class 'regressionSPSS'
print(x, digits = 3, statistics = c("summary", "anova", "estimates"), ...)

## S3 method for class 'regressionSPSS'
coef(object, ...)

## S3 method for class 'regressionSPSS'
df.residual(object, ...)

## S3 method for class 'regressionSPSS'
fitted(object, standardized = FALSE, ...)

## S3 method for class 'regressionSPSS'
residuals(object, standardized = FALSE, ...)

## S3 method for class 'regressionSPSS'
plot(
  x, 
  y, 
  which = c("histogram", "scatter"), 
  main = NULL, 
  xlab = NULL, 
  ylab = NULL, 
  ... 
)
Arguments

... for regression, at least one formula specifying a regression model. Different models can be compared by supplying multiple formulas. For the plot method, additional arguments to be passed down, in particular graphical parameters (see also histSPSS and plotSPSS). For other methods, this is currently ignored.

data a data frame containing the variables.
labels a character or numeric vector giving labels for the regression models in the output tables.
change a logical indicating whether tests on the $R^2$ change should be included in model summaries.
x, object an object of class "regressionSPSS" as returned by function regression.
digits an integer giving the number of digits after the comma to be printed in the LaTeX tables.
statistics a character vector specifying which LaTeX tables should be printed. Available options are "summary" for model summaries, "anova" for ANOVA results, and "estimates" for estimated coefficients. The default is to print all tables.
standardized a logical indicating whether to return standardized residuals and fitted values (TRUE), or residuals and fitted values on their original scale (FALSE).
y ignored (only included because it is defined for the generic function plot).
which a character string specifying which plot to produce. Possible values are "histogram" for a histogram of the residuals, or "scatter" for a scatterplot of the standardized residuals against the standardized fitted values.
main, xlab, ylab the plot title and axis labels.

Value

An object of class "regressionSPSS" with the following components:

models a list in which each component is an object of class "lm" as returned by function lm.
response a character string containing the name of the response variable.
method a character string specifying whether the nested models are increasing in dimension by entering additional variables ("enter") or decreasing in dimension by removing variables ("remove").
change a logical indicating whether tests on the $R^2$ change are included in model summaries.

The print method produces a LaTeX table that mimics the look of SPSS output (version <24). The coef, df.residual, fitted and residuals methods return the coefficients, residual degrees of freedom, fitted values and residuals, respectively, of the last model (to mimic SPSS functionality).

Similarly, the plot method creates the specified plot for the last model.

Author(s)

Andreas Alfons
Examples

# load data
data("Eredivisie")
# log-transform market values
Eredivisie$logMarketValue <- log(Eredivisie$MarketValue)
# squared values of age
Eredivisie$AgeSq <- Eredivisie$Age^2

# simple regression model of log market value on age
fit1 <- regression(logMarketValue ~ Age, data = Eredivisie)
fit1 # print LaTeX table
plot(fit1, which = "scatter")  # diagnostic plot

# add a squared effect for age
fit2 <- regression(logMarketValue ~ Age + AgeSq, 
data = Eredivisie, labels = 2)
fit2 # print LaTeX table
plot(fit2, which = "scatter")  # diagnostic plot

# more complex models with model comparison
fit3 <- regression(logMarketValue ~ Age + AgeSq, 
                  logMarketValue ~ Age + AgeSq + Contract + 
                  Foreign, 
                  logMarketValue ~ Age + AgeSq + Contract + 
                  Foreign + Position, 
data = Eredivisie, labels = 2:4, 
                  change = TRUE)
fit3 # print LaTeX table
plot(fit3, which = "histogram")  # diagnostic plot

signTest  

Description

Perform a sign test for a paired sample on variables of a data set. The output is printed as a LaTeX table that mimics the look of SPSS output (version <24).

Usage

signTest(data, variables, exact = FALSE)

## S3 method for class 'signTestSPSS'
print(x, digits = 3, statistics = c("frequencies", "test"), ...)
Arguments

- **data**: a data frame containing the variables.
- **variables**: a character vector specifying two numeric variables containing the paired observations.
- **exact**: a logical indicating whether or not to include the exact p-value using the binomial distribution. Note that the p-value using the normal approximation is always reported.
- **x**: an object of class "signTestSPSS" as returned by function `signTest`.
- **digits**: an integer giving the number of digits after the comma to be printed in the LaTeX tables.
- **statistics**: a character vector specifying which LaTeX tables should be printed. Available options are "frequencies" for a summary of the frequencies and "test" for test results. The default is to print both tables.
- **...**: currently ignored.

Value

An object of class "signTestSPSS" with the following components:

- **statistics**: a data frame containing information on the number of observations with negative and positive differences.
- **asymptotic**: a list containing the results of the test using the normal approximation.
- **exact**: if requested, a numeric vector containing the exact two-sided p-value, one-sided p-value, and point probability using the binomial distribution.
- **variables**: a character vector containing the names of the two numeric variables with the paired observations.
- **n**: an integer giving the number of observations.

The `print` method produces a LaTeX table that mimics the look of SPSS output (version <24).

Author(s)

Andreas Alfons

Examples

```r
# load data
data("Exams")

# test whether grades differ between the regular exam and the resit
signTest(Exams, c("Regular", "Resit"))
```
**tTest**

### Description

Perform a one-sample t test, a paired-sample t test or an independent-samples t test on variables of a data set. The output is printed as a LaTeX table that mimics the look of SPSS output (version <24).

### Usage

```r
  tTest(data, variables, group = NULL, mu = 0, conf.level = 0.95)
```

```r
  # S3 method for class 'tTestSPSS'
  print(x, digits = 3, statistics = c("statistics", "test"), ...)
```

### Arguments

- `data` a data frame containing the variables.
- `variables` a character vector specifying numeric variable(s) to be used for testing the mean(s). If `group` is `NULL`, a one-sample t test is performed if only one variable is specified, and a paired-sample t test is performed if two variables are specified. If a grouping variable is specified in `group`, an independent-samples t-test is performed and this should be a character string specifying the numeric variable of interest.
- `group` a character string specifying a grouping variable for an independent-samples t-test, or `NULL`.
- `mu` a number indicating the true value of the mean for a one-sample t test.
- `conf.level` a number between 0 and 1 giving the confidence level of the confidence interval.
- `x` an object of class "tTestSPSS" as returned by function `tTest`.
- `digits` an integer giving the number of digits after the comma to be printed in the LaTeX tables.
- `statistics` a character vector specifying which LaTeX tables should be printed. Available options are "statistics" for descriptive statistics and "test" for test results. The default is to print both tables.
- `...` currently ignored.

### Value

An object of class "tTestSPSS" with the following components:

- `statistics` a data frame containing the relevant descriptive statistics.
- `test` an object of class "htest" as returned by `t.test` (only one-sample and paired-sample tests).
- `variables` a character vector containing the name(s) of the relevant numeric variable(s).
- `n` an integer giving the number of observations (only paired-sample test).
levene an object as returned by `leveneTest` (only independent-samples test).
pooled an object of class "htest" as returned by `t.test` assuming equal variances (only independent-samples test).
satterthwaite an object of class "htest" as returned by `t.test` not assuming equal variance (only independent-samples test).
group a character string containing the name of the grouping variable (only independent-samples test).
type a character string giving the type of t test performed ("one-sample", "paired", or "independent").

The print method produces a LaTeX table that mimics the look of SPSS output (version <24).

Author(s)
Andreas Alfons

Examples

```r
## one-sample and paired-sample t test

# load data
data("Exams")

# test whether the average grade on the resit
# differs from 5.5 (minimum passing grade)
tTest(Exams, "Resit", mu = 5.5)

# test whether average grades differ between the
# regular exam and the resit
tTest(Exams, c("Resit", "Regular"))

## independent-samples t test

# load data
data("Eredivisie")

# log-transform market values
Eredivisie$logMarketValue <- log(Eredivisie$MarketValue)

# test whether average log market values differ between
# Dutch and foreign players
tTest(Eredivisie, "logMarketValue", group = "Foreign")
```

---

wilcoxonTest Wilcoxon Signed Rank and Rank Sum Tests
wilcoxonTest

Description

Perform a Wilcoxon signed rank test for a paired sample or a Wilcoxon rank sum test for independent samples on variables of a data set. The output is printed as a LaTeX table that mimics the look of SPSS output (version <24).

Usage

wilcoxonTest(data, variables, group = NULL, exact = FALSE)

## S3 method for class 'wilcoxonTestSPSS'
print(x, digits = 2:3, statistics = c("ranks", "test"), ...)

Arguments

data a data frame containing the variables.
variables a character vector specifying numeric variable(s) to be used. If group is NULL, the Wilcoxon signed rank test is performed and this should be a character vector specifying two numeric variables which contain the paired observations. If a grouping variable is specified in group, the Wilcoxon rank sum test is performed and this should be a character string specifying the numeric variable of interest.
group a character string specifying a grouping variable for the Wilcoxon rank sum test, or NULL.
exact a logical indicating whether the Wilcoxon rank sum test should also return the p-value of the exact test. The default is FALSE. Note that the p-value of the asymptotic test is always returned.
x an object of class "wilcoxonTestSPSS" as returned by function wilcoxonTest.
digits an integer vector giving the number of digits after the comma to be printed in the LaTeX tables. The first element corresponds to the number of digits in table with the summary of the ranks, and the second element corresponds to the number of digits in the table for the test.
statistics a character vector specifying which LaTeX tables should be printed. Available options are "ranks" for a summary of the ranks and "test" for test results. The default is to print both tables.
... currently ignored.

Value

An object of class "wilcoxonTestSPSS" with the following components:

statistics a data frame containing the relevant information on the ranks.
test a list containing the results of the Wilcoxon signed rank test (only paired-sample test).
variables a character vector containing the name(s) of the relevant numeric variable(s).
n an integer giving the number of observations (only paired-sample test).
w numeric; the Wilcoxon rank sum test statistic (only independent-samples test).
asymptotic a list containing the results of the Wilcoxon rank sum test using the normal approximation (only independent-samples test).
exact a list containing the test statistic of the exact Wilcoxon rank sum test test, and if requested the corresponding p-value (only independent-samples test).
group a character string containing the name of the grouping variable (only independent-samples test).
type a character string giving the type of Wilcoxon test performed "paired" or "independent").
The print method produces a LaTeX table that mimics the look of SPSS output (version <24).

Note
The Wilcoxon rank sum test also reports the value of the equivalent Mann-Whitney U test statistic.

Author(s)
Andreas Alfons

Examples

```r
## paired sample

# load data
data("Exams")

# test whether grades differ between the regular exam and the resit
wilcoxonTest(Exams, c("Regular", "Resit"))

## independent samples

# load data
data("Eredivisie")

# test whether market values differ between Dutch and foreign players
wilcoxonTest(Eredivisie, "MarketValue", group = "Foreign")
```
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