Package 'corx'

June 16, 2023

Type Package

Title Create and Format Correlation Matrices

Version 1.0.7.2

Date 2023-06-15

Description Create correlation (or partial correlation) matrices. Correlation matrices are formatted with significance stars based on user preferences. Matrices of coefficients, p-values, and number of pairwise observations are returned. Send resultant formatted matrices to the clipboard to be pasted into excel and other programs. A plot method allows users to visualize correlation matrices created with 'corx'.

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Encoding UTF-8

URL https://github.com/conig/corx

Depends R (>= 3.6)

Imports crayon, ggcorrplot, glue, clipr, tidyselect, moments, ggpubr, ggplot2, stats, methods, ppcor

RoxygenNote 7.2.3

Suggests covr, papaja, psych, testthat

NeedsCompilation no

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Repository CRAN

Date/Publication 2023-06-16 04:10:02 UTC

R topics documented:

`adjust_pmat` *adjust_p*

Description

adjust_p

Usage

```
adjust_pmat(pmat, p_adjust)
```

Arguments

`pmat`	matrix of p-values to adjust
`p_adjust`	character describing adjustment to make. See stats::p.adjust

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`apa_matrix` *apa matrix*

Description

Creates an apa matrix

Usage

```
apa_matrix(r_matrix, p_matrix, stars, round, remove_lead, triangle)
```

Arguments

`r_matrix`	correlation coefficient matrix
`p_matrix`	p-value matrix
`stars`	a vector of pvalue stars
`round`	How many digits to round to?
`remove_lead`	a logical. Should leading zeros be removed?
`triangle`	can select lower upper or NULL

apa_table.corx *apa_table.corx*

Description

method for papaja::apa_table for corx objects

Usage

```
apa_table.corx(corx, ...)
```

Arguments

corx	corx object
...	Other arguments to papaja::apa_table

check_classes *check_classes*

Description

check all classes are as expected

Usage

```
check_classes(data, ok_classes, stop_message, stop = TRUE)
```

Arguments

data	the data object
ok_classes	a vector of allowed classes
stop_message	a character string provided to users if error triggers.
stop	should the variable stop, or create a warning?

cormat_list *cormat_list*

Description

cormat_list

Usage

```
cormat_list(data, x, y, z, method, p_adjust)
```

Arguments

data	data.frame
x	character vector, row names
y	character vector, column names
z	character vector, partial variable names
method	string, passed to cor.test
p_adjust	string, passed to p.adjust

corx *corx*

Description

Calculates correlations matrices. Relevant values are stored in a list with methods for easy retrieval and formatting in publication ready tables.

Usage

```
corx(
  data,
  x = NULL,
  y = NULL,
  z = NULL,
  method = c("pearson", "spearman", "kendall"),
  stars = c(0.05, 0.01, 0.001),
 p_adjust = c("none", "holm", "hochberg", "hommel", "bonferroni", "BH", "BY", "fdr"),
  round = 2,
  remove_lead = TRUE,
  triangle = NULL,
  caption = NULL,
  note = NULL,
  describe = FALSE,
  grey_nonsig = TRUE,
  call_only = FALSE
)
```

Arguments

data	data.frame or matrix
x	a vector of rownames. Defaults to all
y	a vector of colnames. If not supplied, y is set to x.
z	a vector of variable names. Control variables to be used in partial correlations - defaults to NULL
method	character. One of "pearson", "spearman", or "kendall"
stars	a numeric vector. This argument defines cut-offs for p-value stars.
p_adjust	character. What adjustment for multiple tests should be used? One of "none" (default), "holm", "hochberg", "hommel", "bonferroni", "BH", "BY", or "fdr"
round	numeric. Number of digits in printing
remove_lead	logical. if TRUE (the default), leading zeros are removed in summaries
triangle	character. one of "lower", "upper" or NULL (the default)
caption	character. table caption. Passed to plots
note	character. Text for a table note
describe	list of named functions. If functions are supplied to describe, new columns will be bound to the 'APA matrix' for each function in the list. Describe also accepts a variety of shortcuts. If describe is set to TRUE, mean and standard deviation are returned for all row variables. Describe can accept a character vector to call the following descriptive functions: c('mean','sd','var','median','iqr','skewness','kurtosis'). These shortcuts are powered by 'tidyselect'. Skewness and kurtosis are calculated using the 'moments' package. All functions retrieved with shortcuts remove missing values.
grey_nonsig	logical. Should non-significant values be grey in output? This argument does nothing if describe is not set to FALSE
call_only	logical. For debugging, if TRUE only the call is returned

Details

Constructs correlation matrices using 'stats::cor.test' unless z is specified. When z is specified ppcor::ppcor.test is used instead. Character and factor variables are not accepted. To prevent errors, users must first convert all variables to numeric.

Partial correlations:

Supplying the argument z will call ppcor::pcor.test the correlation pair are supplied to arguments x and y. The vector of z given to corx is passed to argument z in pcor.test.

Missing data:

Observations containing missing data required to complete a correlation or partial correlation are automatically removed.

P-adjust:

P-values attained can be adjusted for multiple comparisons by using the 'p_adjust' argument. This calls the function stats::p.adjust. When a matrix is symmetrical, p-values are only adjusted for unique comparisons. When a correlation matrix is not symmetrical, all comparisons are assumed to be unique.

Value

A list of class 'corx' which includes: * "call" The call which if evaluated reproduces the object * "apa" An 'APA' formatted correlation matrix with significance stars * "r" Raw correlation coefficients * "p" p-values * "n" Pairwise observations * "caption" Object caption * "note" Object note

Examples

```
cor_mat <- corx(mtcars, x = c(mpg,cyl,disp), y = c(wt,drat,disp,qsec),
           z = wt, round = 2, stars = c(0.05),
           caption = "Controlling for weight" ,
           describe = list("mean" = function(x) mean(x,na.rm=TRUE)))
cor_mat
coef(cor_mat)
cor_mat$p
plot(cor_mat)
cor_2 <- corx(iris[,-5], describe = c(median, IQR = iqr, kurt = kurtosis),
         note = "Using shortcuts to select describe functions", triangle = "lower")
cor_2
```

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digits *digits*

Description

Consistent rounding for strings

Usage

```
digits(x, n = 2)
```

Arguments

x	number to round
n	number of digits

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partial_n_matrix *partial_n_matrix*

Description

Calculate complete observations for a crosstab + a third variable

Usage

```
partial_n_matrix(data, x, y, z)
```

Arguments

data	data.frame or matrix
x	rownames
y	colnames
z	partial variable vector

`plot.corx` *plot.corx*

Description

plot.corx

Usage

```
## S3 method for class 'corx'
plot(x, ...)
```

Arguments

x	a corx object
...	other arguments to ggcorrplot::ggcorrplot

`plot_mds` *plot_mds*

Description

Perform multidimensional scaling of a corx object and plot results

Usage

```
plot_mds(corx, k = NULL, abs = TRUE, ...)
```

Arguments

corx	corx object
k	numeric. The number of clusters. If set to "auto" will be equal to the number of principal components that explain more than 5% of total variance.
abs	logical. If TRUE (the default) negative correlations will be turned positive. This means items with high negative correlations will be treated as highly similar.
...	additional arguments passed to ggpubr::ggscatter

Details

plot_mds performs classic multidimensional scaling on a correlation matrix. The correlation matrix is first converted to a distance matrix using psych::cor2dist. This function employs the following formula:

$$d = \sqrt{(2 * (1 - r))}$$

These distances are then passed to stats::cmdscale where k = 2. To compute $latex$, distances are predict from the cmdscale output and correlated with input distances. This correlation is squared. If the value of R^2 is less than 70%, a warning will inform users that two-dimensions may not be sufficient to represent item relationships. The position of variables is then plotted with ggplot2. Clusters of items are identified using stats::kmeans. The number of clusters is determined using principal component analysis unless specified.

References

Carlson, D.L., 2017. Quantitative methods in archaeology using R. Cambridge University Press.

`print.corx` *print.corx*

Description

print.corx

Usage

```
## S3 method for class 'corx'
print(x, ...)
```

Arguments

`x`	object
`...`	extra arguments

`rename_if_needed` *rename if needed*

Description

Renames columns

Usage

```
rename_if_needed(data, x)
```

Arguments

data	data object
x	a character vector. If named, columns will be renamed

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star_matrix *star_matrix*

Description

Replaces p-values with stars

Usage

```
star_matrix(m, stars)
```

Arguments

m	matrix of p-values
stars	a vector of p-value thresholds to replace with stars

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to_clipboard *to_clipboard*

Description

Sends a formatted corx table to the clipboard so that it can be pasted into excel.

Usage

```
to_clipboard(x, ...)
```

Arguments

x	a corx object, matrix, or data.frame
...	additional arguments passed to 'clipr::write_clip'

to_table *to_table*

Description

Tabulate correlation matrices

Usage

```
to_table(corx, include_p = FALSE)
```

Arguments

corx	a corx object
include_p	logical. should p-values be included?

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