Package 'corx'

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Type Package

Title Create and Format Correlation Matrices

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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

LazyData true

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

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

RoxygenNote 7.1.1

Suggests testthat

NeedsCompilation no

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R topics documented:

`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

`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?

corx *corx*

Description

Creates an object of class 'corx'. This function calculates correlation matrices. It stores effect sizes, p-values, the number of pairwise observations, and a formatted correlation matrix in a list. The argument 'z' allows for control variables to be assigned. If z does not equal NULL, partial correlations are performed. Methods are exported for the generic functions 'print', 'plot', 'summary', 'data.frame' and, 'coef'.

Usage

```
corx(
  data,
  x = NULL,
  y = NULL,
  z = NULL,
  method = c("pearson", "spearman", "kendall"),
  stars = c(0.05),
  round = 2,
  remove_lead = TRUE,
  triangle = NULL,
  caption = NULL,
  note = NULL,
  describe = FALSE,
  grey_nonsig = TRUE,
  call_only = FALSE
)
```

Arguments

data	A 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 colnames. Control variables to be used in partial correlations - defaults to NULL
method	a string. One of "pearson", "spearman", or "kendall"
stars	a numeric vector. This argument defines cut-offs for p-value stars.
round	a scalar. Number of digits in printing
remove_lead	a logical. if TRUE (the default), leading zeros are removed in summaries
triangle	one of "lower", "upper" or NULL (the default)
caption	table caption. Passed to plots
note	table note

describe	a list of 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	a logical. Should non-significant values be grey in output? This argument does nothing if describe is not set to FALSE
call_only	For debugging, if TRUE only the call is returned

Details

'corx' constructs intercorrelation matrices using 'psych::corr.test'. P-values attained are not adjusted for multiple comparisons. The argument z can be used to specify control variables. If control variables are specified, partial correlations are calculated using 'ppcor::ppcor.test'. Asymmetrical correlation matrices can be constructed using the arguments 'x' and 'y'. The arguments 'x', 'y', and 'z' are powered by 'tidyselect::vars_select'.

Value

A list of class 'corx' which includes:

- "call" The call
- "apa" An 'APA' formatted correlation matrix with significance stars
- "r" Raw correlation coefficients
- "p" Raw 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
```

digits *digits*

Description

Consistent rounding for strings

Usage

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

Arguments

x	number to round
n	number of digits

get_cor *get_cor*

Description

A flexible correlation function

Usage

```
get_cor(data, x, y, method, partial)
```

Arguments

data	data
x	variable 1
y	variable 2
method	correlation method
partial	control for anything?

partial_matrix *partial_matrix*

Description

Creates matrices of partial correlations including r, n, and p

Usage

```
partial_matrix(data, x, y, method, partial)
```

Arguments

data	the data object
x	rownames
y	colnames
method	the method
partial	variables to partial out

par_matrix *par_matrix*

Description

This function is used to construct final matrices

Usage

```
par_matrix(results, x, y)
```

Arguments

results	results dataset
x	one set of variables
y	another set of variables

`plot.corx` *S3 class corx*

Description

S3 class corx

Usage

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

Arguments

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

`plot_mds` *plot_mds*

Description

plot the Classical multidimensional scaling of a corx object

Usage

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

Arguments

`corx`	the corx object, or a matrix of correlation coefficients
`k`	a 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`	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:

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

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 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

`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

`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'

Index