

Package ‘tadaatoolbox’

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Title Helpers for Data Analysis and Presentation Focused on Undergrad
Psychology

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Description Contains functions for the easy display of statistical tests as well as some convenience functions for data cleanup. It is meant to ease existing workflows with packages like 'sjPlot', 'dplyr', and 'ggplot2'. The primary components are the functions prefixed with 'tadaa_', which are built to work in an interactive environment, but also print tidy markdown tables powered by 'pixiedust' for the creation of 'RMarkdown' reports.

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Depends R (>= 3.3.0)

Suggests testthat, knitr, rmarkdown, cowplot

Imports stats, methods, broom, magrittr, pwr, pixiedust, car, ggplot2,
nortest, viridis, DescTools

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URL <https://github.com/tadaadata/tadaatoolbox>

BugReports <https://github.com/tadaadata/tadaatoolbox/issues>

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confint_t	<i>Confidence Intervals</i>
-----------	-----------------------------

Description

Confidence Intervals

Usage

```
confint_t(x, alpha = 0.05, na.rm = TRUE)
```

```
confint_norm(x, alpha = 0.05, na.rm = TRUE)
```

Arguments

x	A Numeric vector.
alpha	Alpha, default is 0.05.
na.rm	If TRUE (default), missing values are dropped.

Value

numeric of length one (size of CI in one direction).

Examples

```
set.seed(42)
df <- data.frame(x = runif(100), y = sample(c("A", "B"), 100, TRUE))
confint_t(df$x)
set.seed(42)
df <- data.frame(x = runif(100), y = sample(c("A", "B"), 100, TRUE))
confint_norm(df$x)
```

delete_na	<i>Delete cases with set amount of missing values</i>
-----------	---

Description

Delete cases with set amount of missing values

Usage

```
delete_na(df, n = ncol(df) - 1)
```

Arguments

df	A data.frame,
n	Number of NAs allowed, defaults to ncol(df) - 1.

Value

A filtered version of the input data.frame.

Note

Adapted from <http://stackoverflow.com/a/30461945/409362>.

Examples

```
## Not run:
df <- data.frame(x = sample(c(1:10, NA), 10),
                 y = sample(c(1:10, NA), 10),
                 z = sample(c(1:10, NA), 10))

df <- delete_na(df, 1)

# Or with magrittr syntax sugar
df %<>% delete_na

## End(Not run)
```

effect_size_t

Simple Effect Size Calculation for t-Tests

Description

Calculates Cohen's d for two sample comparisons.

Usage

```
effect_size_t(data, response, group, absolute = FALSE, paired = FALSE,
              na.rm = TRUE)
```

Arguments

data	A data.frame.
response	The response variable (dependent).
group	The group variable, usually a factor.
absolute	If set to TRUE, the absolute effect size is returned.
paired	Whether the effect should be calculated for a paired t-test, default is FALSE.
na.rm	If TRUE (default), missing values are dropped.

Details

The effect size here is Cohen's d as calculated by $d = \frac{m_{diff}}{S_p}$, where $m_{diff} = \bar{x}_1 - \bar{x}_2$ and

$$S_p = \sqrt{\frac{n_1 - 1 \cdot s_{x_1}^2 + n_2 - 1 \cdot s_{x_2}^2}{n_1 + n_2 - 2}}$$

For paired = TRUE, S_p is substituted by $S_D = S_{x_1 - x_2}$ via `sd(x1 - x2)`.

Value

numeric of length 1.

Examples

```
set.seed(42)
df <- data.frame(x = runif(100), group = sample(c("A", "B"), 100, TRUE))
effect_size_t(df, "x", "group")
```

etasq

Just eta².

Description

Thin wrapper for [DescTools::EtaSq](#) to retrieve η^2 for a simple use case without having to fit an aov model beforehand. Only use this for a simple one-way design, e.g. only one independent variable.

Usage

```
etasq(formula, data)
```

Arguments

formula	The model formula for stats::aov .
data	The data.frame.

Value

A single numeric value

Examples

```
etasq(stunzahl ~ jahrgang, ngo)
```

generate_recodes *Convenience functions for interval recodes*

Description

Get recode assignments for even intervals of discrete numeric values compatible with [car::recode](#).

Usage

```
generate_recodes(from, to, width = 5)
```

Arguments

from, to A numeric value for the beginning and the end of the interval.
width The width of the interval, e.g. 5 (default) for intervals 0-5.

Value

A character vector of recode assignments compatible with [car::recode](#).

Examples

```
## Not run:  
x      <- round(runif(100, 0, 100), 0)  
recodes <- generate_recodes(0, 100, 10)  
  
library(car)  
recode(x, recodes = recodes)  
  
## End(Not run)
```

interval_labels *Convenience functions for interval recodes*

Description

Get interval labels for even intervals of discrete numeric values compatible with [base::cut](#).

Usage

```
interval_labels(from, to, width = 5)
```

Arguments

from, to A numeric value for the beginning and the end of the interval.
width The width of the interval, e.g. 5 (default) for intervals 0-5.

Value

A character vector of interval labels compatible with `base::cut`.

Examples

```
## Not run:
x      <- round(runif(100, 0, 100), 0)
labels <- interval_labels(0, 100, 10)

cut(x, breaks = seq(0, 100, 10), labels = labels)

## End(Not run)
```

mean_ci_sem

Standard Error of the Mean with CI

Description

Standard Error of the Mean with CI

Usage

```
mean_ci_sem(x, conf.level = 0.95)
```

Arguments

`x` a numeric vector or R object which is coercible to one
`conf.level` the confidence level (alpha) of the Interval

Value

a `data.frame` with the mean, SEM and its Confidence Interval

Examples

```
set.seed(42)
iq <- rnorm(100, 100, 15)

mean_ci_sem(iq)
```

mean_ci_t	<i>Get mean and CI for a numeric vector</i>
-----------	---

Description

Suitable for use within ggplot's `ggplot2::stat_summary`.

Usage

```
mean_ci_t(x, alpha = 0.05, na.rm = TRUE)
```

Arguments

x	A Numeric vector.
alpha	Alpha, default is 0.05.
na.rm	If TRUE (default), missing values are dropped.

Value

A data.frame with y (mean), ymin and ymax values.

Examples

```
set.seed(42)
df <- data.frame(x = runif(100), y = sample(c("A", "B"), 100, TRUE))
mean_ci_t(df$x)
```

modus	<i>Modus</i>
-------	--------------

Description

Calculate the mode of a numeric vector. German name kept to avoid confusion.

Usage

```
modus(x, as_character = TRUE, reduce = TRUE)
```

Arguments

x	A vector with numeric data.
as_character	Always return a character. TRUE by default.
reduce	Since mode can be of length > 1, this option pastes the result into a single character value.

Value

A vector of length 1 of type numeric or character, depending on input.

Examples

```
## Not run:
x <- c(1, 2, 6, 2, 1, 5, 7, 8, 4, 3, 2, 2, 2)
modus(x)

# Or for nominal data
x <- structure(c(2L, 1L, 2L, 2L, 2L, 1L), .Label = c("Ja", "Nein"), class = "factor")
modus(x)

## End(Not run)
```

ngo

The ngo dataset

Description

Sample data for teaching purposes used by Kähler (2008)

Usage

```
ngo
```

Format

A data.frame containing numerical and factor data.

Note

ryouready: :d.ngo is the source of this data, but with some recoding done.

References

Kähler, W.-M. (2008). *Statistische Datenanalyse: Verfahren verstehen und mit SPSS gekonnt einsetzen*. Wiesbaden: Vieweg.

nom_c	<i>Contingency Coefficient C</i>
-------	----------------------------------

Description

Very simple wrapper for [DescTools::ContCoef](#).

Usage

```
nom_c(x, y = NULL)
```

Arguments

x	Dependent variable. Alternatively a table.
y	Independent variable

Value

numeric value

Examples

```
nom_c(ngo$abschalt, ngo$geschl)
```

nom_chisqu	<i>Simple Chi^2</i>
------------	---------------------

Description

This is a very simple wrapper for [stats::chisq.test](#).

Usage

```
nom_chisqu(x, y = NULL, correct = FALSE)
```

Arguments

x	Dependent variable. Alternatively a table.
y	Independent variable
correct	Apply correction, passed to <code>chisq.test</code> .

Value

A numeric value

Note

The warning message in case of low samples size and possibly incorrect approximation is suppressed silently.

Examples

```
nom_chisqu(ngo$abschalt, ngo$geschl)
```

nom_lambda	<i>Lambda</i>
------------	---------------

Description

Very simple wrapper for [DescTools::Lambda](#).

Usage

```
nom_lambda(x, y = NULL, symmetric = FALSE, reverse = FALSE)
```

Arguments

x	Dependent variable. Alternatively a table.
y	Independent variable
symmetric	If TRUE, symmetric lambda is returned. Default is FALSE.
reverse	If TRUE, row and column variable are switched.

Value

numeric value

Examples

```
nom_lambda(ngo$abschalt, ngo$geschl)
```

nom_phi	<i>Phi coefficient</i>
---------	------------------------

Description

Very simple wrapper for [DescTools::Phi](#).

Usage

```
nom_phi(x, y = NULL)
```

Arguments

x	Dependent variable. Alternatively a table.
y	Independent variable

Value

numeric value

Examples

```
nom_phi(ngo$abschalt, ngo$geschl)
```

nom_v	<i>Cramer's V</i>
-------	-------------------

Description

Very simple wrapper for [DescTools::CramerV](#).

Usage

```
nom_v(x, y = NULL)
```

Arguments

x	Dependent variable. Alternatively a table.
y	Independent variable

Value

numeric value

Examples

```
nom_v(ngo$abschalt, ngo$geschl)
```

ord_gamma	<i>Gamma</i>
-----------	--------------

Description

Simple wrapper for [DescTools::GoodmanKruskalGamma](#).

Usage

```
ord_gamma(x, y = NULL)
```

Arguments

x	A table or dependent numeric variable.
y	Empty or independent grouping variable

Value

numeric of length 1.

Examples

```
df <- data.frame(rating = round(runif(50, 1, 5)),
                group = sample(c("A", "B", "C"), 50, TRUE))
tbl <- table(df)
ord_gamma(tbl)
```

ord_pairs	<i>Retrieve all type of pairs for ordinal statistics</i>
-----------	--

Description

Retrieve all type of pairs for ordinal statistics

Usage

```
ord_pairs(x, y = NULL)
```

Arguments

x	Dependent variable. Alternatively a table.
y	Independent variable

Value

A 1x5 data.frame with numeric values.

Source

Internals for this function are copied from [this gist](#) by GitHub user Marc Schwartz.

Examples

```
ord_pairs(ngo$leistung, ngo$begabung)
```

ord_somers_d	<i>Somers' D</i>
--------------	------------------

Description

Very simple wrapper for [DescTools::SomersDelta](#).

Usage

```
ord_somers_d(x, y = NULL, symmetric = FALSE, reverse = FALSE)
```

Arguments

x	Dependent variable. Alternatively a table.
y	Independent variable
symmetric	If TRUE, symmetric D is returned. Default is FALSE.
reverse	If TRUE, row and column variable are switched. Default is FALSE, meaning the row variable is considered dependant.

Value

numeric value

Examples

```
ord_somers_d(ngo$abschalt, ngo$geschl)
```

ord_tau	<i>Various Tau Statistics</i>
---------	-------------------------------

Description

A wrapper for the appropriate functions from [DescTools](#) to calculate Tau A, B and C.

Usage

```
ord_tau(x, y = NULL, tau = "b", reverse = FALSE)
```

Arguments

x	Dependent variable. Alternatively a table.
y	Independent variable
tau	Which of the Taus to return. Default is "b".
reverse	If TRUE, row and column variable are switched.

Value

numeric value

Examples

```
ord_tau(ngo$urteil, ngo$leistung, tau = "a")
```

pval_string	<i>Easy p-value formatting</i>
-------------	--------------------------------

Description

Easy p-value formatting

Usage

```
pval_string(pv)
```

Arguments

pv	A p-value in numeric form.
----	----------------------------

Value

A formatted character representation of the input value.

Note

Simplified version of [pixiedust::pvalString](#) which considers < 0.05 .

Examples

```
pv <- c(.9, .2, .049, .009, .000003)
pval_string(pv)
```

tadaa_aov

Tadaa, ANOVA!

Description

Performs one-, two-way or factorial ANOVA with adjustable sums of squares method and optionally displays effect sizes ((partial) η^2 , Cohen's f) and power (calculated via [pwr::pwr.f2.test](#) to work with unbalanced designs).

Usage

```
tadaa_aov(formula, data = NULL, show_effect_size = TRUE,
  show_power = TRUE, factorize = TRUE, type = 3, check_contrasts = TRUE,
  print = c("df", "console", "html", "markdown"))
```

Arguments

formula	Formula for model, passed to aov.
data	Data for model.
show_effect_size	If TRUE (default), effect sizes partial η^2 and Cohen's f are appended as columns.
show_power	(Experimental) If TRUE (default), power is calculated via pwr::pwr.f2.test and appended as a column.
factorize	If TRUE (default), non-factor independent variables will automatically converted via <code>as.factor</code> , so beware of your inputs.
type	Which type of SS to use. Default is 3, can also be 1 or 2.
check_contrasts	Only applies to type = 3. If TRUE (default), the contrasts of each non-ordered factor are set to "contr.sum".
print	Print method, default df: A regular data.frame. Otherwise passed to pixiedust::sprinkle_print_method for fanciness.

Details

If a specified independent variable is not properly encoded as a factor, it is automatically converted if `factorize = TRUE` to ensure valid results.

If `type = 3` and `check_contrasts = TRUE`, the "contrasts" of each non-ordered factor will be checked and set to `contr.sum` to ensure the function yields usable results. It is highly recommended to only use `check_contrasts = FALSE` for debugging or educational purposes, or if you know what you're doing and using your own contrast matrix.

Value

A data.frame by default, otherwise dust object, depending on `print`.

See Also

Other Tadaa-functions: [tadaa_chisq](#), [tadaa_kruskal](#), [tadaa_levene](#), [tadaa_nom](#), [tadaa_normtest](#), [tadaa_one_sample](#), [tadaa_ord](#), [tadaa_pairwise_gh](#), [tadaa_pairwise_tukey](#), [tadaa_pairwise_t](#), [tadaa_t.test](#), [tadaa_wilcoxon](#)

Examples

```
tadaa_aov(stunzahl ~ jahrgang, data = ngo)
tadaa_aov(stunzahl ~ jahrgang * geschl, data = ngo)

# Other types of sums and print options
## Not run:
tadaa_aov(stunzahl ~ jahrgang * geschl, data = ngo, type = 1, print = "console")
tadaa_aov(stunzahl ~ jahrgang * geschl, data = ngo, type = 3, print = "console")
tadaa_aov(stunzahl ~ jahrgang * geschl, data = ngo,
          type = 3, check_contrasts = FALSE, print = "console")

## End(Not run)
```

tadaa_balance

Grouping design balance

Description

Easily generate heatmaps to show how well balanced groups are designed, e.g. for ANOVA.

Usage

```
tadaa_balance(data, group1, group2, palette = "D", annotate = TRUE)
```

Arguments

data	A <code>data.frame</code>
group1	The grouping variable on the x-axis
group2	The grouping variable on the y-axis
palette	The <code>viridis::viridis</code> color palette to use; <code>c("A", "B", "C", "D")</code> , defaults to "D"
annotate	Should the n of each group be displayed in each cell of the heatmap?

Value

A `ggplot2` object

See Also

Other Tadaa-plot functions: [tadaa_int](#), [tadaa_mean_ci](#), [tadaa_plot_tukey](#)

Examples

```
tadaa_balance(ngo, jahrgang, geschl)
```

tadaa_chisq

Tadaa, Chi-Square Test!

Description

A comfortable wrapper of `stats::chisq.test` with pretty output and effect sizes depending on the size of the contingency table: Phi coefficient and Odds Ratios in case of a 2x2 table, Cramer's V otherwise. The result is either returned as a `broom::tidy` `data.frame` or prettified using various `pixiedust::sprinkle` shenanigans.

Usage

```
tadaa_chisq(data, x, y, correct = TRUE, print = c("df", "console", "html", "markdown"))
```

Arguments

data	A <code>data.frame</code> .
x	A vector of categorical data (factor or character).
y	Another vector of categorical data (also factor or character).
correct	Apply Yate's continuity correction for 2x2 tables, passed to <code>stats::chisq.test</code> . Defaults to TRUE.
print	Print method, default <code>df</code> : A regular <code>data.frame</code> . Otherwise passed to <code>pixiedust::sprinkle_print_method</code> for fancyness.

Value

A data.frame by default, otherwise dust object, depending on print.

Note

The warning message in case of low samples size and possibly incorrect approximation is suppressed silently.

See Also

Other Tadaa-functions: [tadaa_aov](#), [tadaa_kruskal](#), [tadaa_levene](#), [tadaa_nom](#), [tadaa_normtest](#), [tadaa_one_sample](#), [tadaa_ord](#), [tadaa_pairwise_gh](#), [tadaa_pairwise_tukey](#), [tadaa_pairwise_t](#), [tadaa_t.test](#), [tadaa_wilcoxon](#)

Examples

```
tadaa_chisq(ngo, abschalt, geschl)
```

```
tadaa_chisq(ngo, abschalt, jahrgang)
```

tadaa_int

Interaction plots

Description

Easily generate interaction plots of two nominal grouping variables and a numeric response variable.

Usage

```
tadaa_int(data, response, group1, group2, grid = FALSE,
  brewer_palette = "Set1", labels = c("A", "B"), show_n = FALSE,
  print = TRUE)
```

Arguments

data	A data.frame.
response	Response variable.
group1	First grouping variable.
group2	Second grouping variable.
grid	If TRUE, the resulting graphs will be arranged in a grid via cowplot::plot_grid .
brewer_palette	The name of the RColorBrewer palette to use, defaults to Set1.
labels	Labels used for the plots when printed in a grid (grid = TRUE), defaults to c("A", "B").
show_n	If TRUE, displays N in plot subtitle.
print	Default is TRUE, set FALSE to suppress automatic printing. Useful if you intend to further modify the output plots.

Value

Invisible: A list with two ggplot2 objects named p1 and p2. If `print = TRUE`: Printed: The one or two ggplot2 objects, depending on grid.

See Also

Other Tadaa-plot functions: [tadaa_balance](#), [tadaa_mean_ci](#), [tadaa_plot_tukey](#)

Examples

```
tadaa_int(ngo, stunzahl, jahrgang, geschl)

# As grid, if cowplot is installed
tadaa_int(ngo, stunzahl, jahrgang, geschl, grid = TRUE)
```

tadaa_kruskal	<i>Tadaa, Kruskal-Wallis!</i>
---------------	-------------------------------

Description

Tadaa, Kruskal-Wallis!

Usage

```
tadaa_kruskal(formula, data = NULL, print = c("df", "console", "html",
"markdown"))
```

Arguments

formula	Formula for model, passed to <code>kruskal.test</code> .
data	Data for model.
print	Print method, per default a regular <code>data.frame</code> . Otherwise passed to pixiedust::sprinkle_print_method for fanciness.

Value

A `data.frame` by default, otherwise dust object, depending on `print`.

See Also

Other Tadaa-functions: [tadaa_aov](#), [tadaa_chisq](#), [tadaa_levene](#), [tadaa_nom](#), [tadaa_normtest](#), [tadaa_one_sample](#), [tadaa_ord](#), [tadaa_pairwise_gh](#), [tadaa_pairwise_tukey](#), [tadaa_pairwise_t](#), [tadaa_t.test](#), [tadaa_wilcoxon](#)

Examples

```
tadaa_kruskal(stunzahl ~ jahrgang, data = ngo)
```

tadaa_levene	<i>Levene's Test for Homoskedasticity</i>
--------------	---

Description

A thin wrapper around [car::leveneTest](#) with some formatting done.

Usage

```
tadaa_levene(data, formula, center = "median", print = c("df", "console",  
  "html", "markdown"))
```

Arguments

data	Data for the test
formula	Formula specifying groups, passed to <code>leveneTest</code> .
center	Method to use, either median (default for robustness) or mean.
print	Print method, default df: A regular data.frame. Otherwise passed to pixiedust::sprinkle_print_method for fancyness.

Value

A data.frame by default, otherwise dust object, depending on print.

Note

The case of `center = "median"` is technically called *Brown–Forsythe test*, so if that's selected the header for non-df returns will reflect that.

See Also

Other Tadaa-functions: [tadaa_aov](#), [tadaa_chisq](#), [tadaa_kruskal](#), [tadaa_nom](#), [tadaa_normtest](#), [tadaa_one_sample](#), [tadaa_ord](#), [tadaa_pairwise_gh](#), [tadaa_pairwise_tukey](#), [tadaa_pairwise_t](#), [tadaa_t.test](#), [tadaa_wilcoxon](#)

Examples

```
tadaa_levene(ngo, deutsch ~ jahrgang, print = "console")  
tadaa_levene(ngo, deutsch ~ jahrgang * geschl, print = "console")
```

tadaa_mean_ci *Plot Means with Errorbars*

Description

Plot Means with Errorbars

Usage

```
tadaa_mean_ci(data, response, group, brewer_palette = "Set1")
```

Arguments

data A data.frame
response Response variable, numeric.
group Grouping variable, ideally a factor.
brewer_palette Optional: The name of the RColorBrewer palette to use, defaults to Set1. Use NULL for no brewer palette.

Value

A ggplot2 object.

See Also

Other Tadaa-plot functions: [tadaa_balance](#), [tadaa_int](#), [tadaa_plot_tukey](#)

Examples

```
tadaa_mean_ci(ngo, deutsch, jahrgang, brewer_palette = "Set1")
```

tadaa_nom *Get all the nominal stats*

Description

Get all the nominal stats

Usage

```
tadaa_nom(x, y = NULL, round = 2, print = "console")
```

Arguments

x	Dependent variable. Alternatively a table.
y	Independent variable
round	Ho many digits should be rounded. Default is 2.
print	Print method. Passed to pixiedust::sprinkle_print_method as of now.

Value

A dust object, depending on print.

See Also

Other Tadaa-functions: [tadaa_aov](#), [tadaa_chisq](#), [tadaa_kruskal](#), [tadaa_levene](#), [tadaa_normtest](#), [tadaa_one_sample](#), [tadaa_ord](#), [tadaa_pairwise_gh](#), [tadaa_pairwise_tukey](#), [tadaa_pairwise_t](#), [tadaa_t.test](#), [tadaa_wilcoxon](#)

Examples

```
tadaa_nom(ngo$abschalt, ngo$geschl)
```

tadaa_normtest	<i>Tadaa, test for normality!</i>
----------------	-----------------------------------

Description

Tadaa, test for normality!

Usage

```
tadaa_normtest(data, method = "ad", print = c("df", "console", "html",
"markdown"), ...)
```

Arguments

data	A data.frame.
method	The type of test to perform. Either ad for Anderson Darling, shapiro for Shapiro-Wilk, pearson for Pearson's chi-square test or ks for Kolmogorov-Smirnov (not recommended).
print	Print method, default df: A regular data.frame. Otherwise passed to pixiedust::sprinkle_print_method for fancyness.
...	Further arguments passed to test functions where applicable, see nortest::pearson.test and stats::ks.test .

Value

A data.frame by default, otherwise dust object, depending on print.

See Also

Other Tadaa-functions: [tadaa_aov](#), [tadaa_chisq](#), [tadaa_kruskal](#), [tadaa_levene](#), [tadaa_nom](#), [tadaa_one_sample](#), [tadaa_ord](#), [tadaa_pairwise_gh](#), [tadaa_pairwise_tukey](#), [tadaa_pairwise_t](#), [tadaa_t.test](#), [tadaa_wilcoxon](#)

Examples

```
## Not run:
library(dplyr)
ngo %>%
select(englisch, deutsch, mathe) %>%
tadaa_normttest(method = "shapiro")

ngo %>%
select(englisch, deutsch, mathe) %>%
tadaa_normttest(method = "pearson", print = "console")

## End(Not run)
```

tadaa_one_sample	<i>Tadaa, one-sample tests!</i>
------------------	---------------------------------

Description

If sigma is omitted, the function will just perform a one-sample [stats::t.test](#), but if sigma is provided, a z-test is performed. It basically works the same way, except that we pretend we know the population sigma and use the normal distribution for comparison.

Usage

```
tadaa_one_sample(data = NULL, x, mu, sigma = NULL,
  direction = "two.sided", na.rm = FALSE, conf.level = 0.95,
  print = c("df", "console", "html", "markdown"))
```

Arguments

data	A data.frame (optional).
x	A numeric vector or bare column name of data.
mu	The true mean (μ) to test for.
sigma	Population sigma. If supplied, a z-test is performed, otherwise a one-sample stats::t.test is performed.
direction	Test direction, like alternative in t.test .
na.rm	Whether to drop NA values. Default is FALSE.
conf.level	Confidence level used for power and CI, default is 0.95.
print	Print method, default df: A regular data.frame. Otherwise passed to pixiedust::sprinkle_print_method for fancyness.

Value

A data.frame by default, otherwise dust object, depending on print.

See Also

Other Tadaa-functions: [tadaa_aov](#), [tadaa_chisq](#), [tadaa_kruskal](#), [tadaa_levene](#), [tadaa_nom](#), [tadaa_normtest](#), [tadaa_ord](#), [tadaa_pairwise_gh](#), [tadaa_pairwise_tukey](#), [tadaa_pairwise_t](#), [tadaa_t.test](#), [tadaa_wilcoxon](#)

Examples

```
set.seed(42)
df <- data.frame(x = rnorm(n = 20, mean = 100, sd = 1))

tadaa_one_sample(df, x, mu = 101, sigma = 1)

# No data.frame, just a vector
tadaa_one_sample(x = rnorm(20), mu = 0)
```

tadaa_ord	<i>Get all the ordinal stats</i>
-----------	----------------------------------

Description

Collects all ord_ statistics in neat output.

Usage

```
tadaa_ord(x, y = NULL, round = 2, print = "console")
```

Arguments

x	Dependent variable. Alternatively a table.
y	Independent variable
round	Ho many digits should be rounded. Default is 2.
print	Print method. Passed to pixiedust::sprinkle_print_method as of now.

Value

A dust object, depending on print.

See Also

Other Tadaa-functions: [tadaa_aov](#), [tadaa_chisq](#), [tadaa_kruskal](#), [tadaa_levene](#), [tadaa_nom](#), [tadaa_normtest](#), [tadaa_one_sample](#), [tadaa_pairwise_gh](#), [tadaa_pairwise_tukey](#), [tadaa_pairwise_t](#), [tadaa_t.test](#), [tadaa_wilcoxon](#)

Examples

```
tadaa_ord(ngo$leistung, ngo$begabung)
```

tadaa_pairwise_gh	<i>Games Howell Post-Hoc Test</i>
-------------------	-----------------------------------

Description

An implementation of the Games Howell procedure for pairwise comparisons. The workhorse of this function is adapted from this gist: <https://gist.github.com/aschleg/ea7942efc6108aedfa9ec98aeb6c2096>

Usage

```
tadaa_pairwise_gh(data, response, group1, group2 = NULL, print = "df")
```

Arguments

data	A data.frame containing the variables.
response	The response variable, i.e. the dependent numeric vector.
group1	The grouping variables, typically a factor.
group2	(Optional) second grouping variable.
print	Print method, defaults to df for data.frame output, otherwise passed to <code>pixiedust::sprinkle_print_method</code> .

Value

A data.frame or `pixiedust::dust` object depending on print.

Note

This function is really, really slow for large comparisons ($k > 50$). Sorry about that.

Author(s)

github.com/aschleg, Lukas Burk

Source

<https://gist.github.com/aschleg/ea7942efc6108aedfa9ec98aeb6c2096>

References

<https://rpubs.com/aaronsc32/games-howell-test>

See Also

[tadaa_pairwise_t\(\)](#), [tadaa_pairwise_tukey\(\)](#)

Other Tadaa-functions: [tadaa_aov](#), [tadaa_chisq](#), [tadaa_kruskal](#), [tadaa_levene](#), [tadaa_nom](#), [tadaa_normtest](#), [tadaa_one_sample](#), [tadaa_ord](#), [tadaa_pairwise_tukey](#), [tadaa_pairwise_t](#), [tadaa_t.test](#), [tadaa_wilcoxon](#)

Examples

```
tadaa_pairwise_gh(ngo, deutsch, jahrgang)
tadaa_pairwise_gh(ngo, deutsch, jahrgang, geschl)
```

tadaa_pairwise_t	<i>Extended Pairwise t-Tests</i>
------------------	----------------------------------

Description

This is an extension of [stats::pairwise.t.test](#) that's meant to deal with interactions out of the box, while also performing pairwise tests for the primary terms. The output of the function is modeled after [stats::TukeyHSD](#), unfortunately without confidence intervals or test statistic though.

Usage

```
tadaa_pairwise_t(data, response, group1, group2 = NULL, p.adjust = "bonf",
  paired = FALSE, pool.sd = !paired, alternative = "two.sided",
  print = "df")
```

Arguments

data	A data.frame containing the variables.
response	The response variable, i.e. the dependent numeric vector.
group1	The grouping variables, typically a factor.
group2	(Optional) second grouping variable.
p.adjust	The p-adjustment method, see stats::p.adjust.methods , passed to stats::pairwise.t.test . Additionally, <code>sidak</code> is supported as a method, which is not the case with stats::p.adjust , as is <code>sidakSD</code> for the Sidak step-down procedure.
paired	Defaults to FALSE, also passed to stats::pairwise.t.test .
pool.sd	Defaults to the inverse of <code>paired</code> , passed to stats::pairwise.t.test .
alternative	Defaults to <code>two.sided</code> , also passed to stats::pairwise.t.test .
print	Print method, defaults to <code>df</code> for data.frame output, otherwise passed to pixiedust::sprinkle_print_method .

Value

A data.frame with columns `term`, `comparison` and `adj.p.value`.

Note

The adjustment method is applied within each term, meaning that the number of pairwise t-tests counted for the adjustment is only equal to the number of rows per term of the output. The additional Sidak adjustment method uses the following method: `p_adj <- 1 - pbinom(q = 0, size = length(p_values), pr`
 And is sometimes preferred over Bonferroni. The Sidak-like (1987) step-down procedure (`sidakSD`) is an improvement over the Holm's (1979) step-down procedure.

References

<https://stats.stackexchange.com/questions/20825/sidak-or-bonferroni>

<https://rdr.io/rforge/mutoss/man/SidakSD.html>

See Also

[tadaa_pairwise_tukey\(\)](#), [tadaa_pairwise_gh\(\)](#)

Other Tadaa-functions: [tadaa_aov](#), [tadaa_chisq](#), [tadaa_kruskal](#), [tadaa_levene](#), [tadaa_nom](#), [tadaa_normtest](#), [tadaa_one_sample](#), [tadaa_ord](#), [tadaa_pairwise_gh](#), [tadaa_pairwise_tukey](#), [tadaa_t.test](#), [tadaa_wilcoxon](#)

Examples

```
tadaa_pairwise_t(ngo, deutsch, jahrgang, geschl, p.adjust = "none", print = "console")
tadaa_pairwise_t(ngo, deutsch, jahrgang, geschl, p.adjust = "bonf", print = "console")
tadaa_pairwise_t(ngo, deutsch, jahrgang, geschl, p.adjust = "sidak", print = "console")
```

`tadaa_pairwise_tukey` *Tukey HSD pairwise comparisons*

Description

This function is merely a thin wrapper around `stats::TukeyHSD` with tidying done by `broom::tidy` and optional formatting via `pixiedust::sprinkle`. Its input is not a aov model like in the original function, but instead the aov model is fit internally based on the arguments given. This is meant to enable a consistent usage between the `tadaa_pairwise`-functions.

Usage

```
tadaa_pairwise_tukey(data, response, group1, group2 = NULL, print = "df",
  ...)
```

Arguments

data	A data.frame containing the variables.
response	The response variable, i.e. the dependent numeric vector.
group1	The grouping variables, typically a factor.
group2	(Optional) second grouping variable.
print	Print method, defaults to df for data.frame output, otherwise passed to pixiedust::sprinkle_print_method .
...	Further arguments passed to stats::TukeyHSD

Value

A data.frame or [pixiedust::dust](#) object depending on print.

See Also

[tadaa_pairwise_t\(\)](#), [tadaa_pairwise_gh\(\)](#)

Other Tadaa-functions: [tadaa_aov](#), [tadaa_chisq](#), [tadaa_kruskal](#), [tadaa_levene](#), [tadaa_nom](#), [tadaa_normtest](#), [tadaa_one_sample](#), [tadaa_ord](#), [tadaa_pairwise_gh](#), [tadaa_pairwise_t](#), [tadaa_t.test](#), [tadaa_wilcoxon](#)

Examples

```
tadaa_pairwise_tukey(data = ngo, deutsch, jahrgang, geschl)
tadaa_pairwise_tukey(data = ngo, deutsch, jahrgang, print = "console")
```

tadaa_plot_tukey *Plot TukeyHSD Results as Errorbars*

Description

This is a simple plotting template that takes the [broom::tidy](#)'d output of [stats::TukeyHSD](#) or alternatively the `print = "df"` output of [tadaa_pairwise_tukey](#) and plots it nicely with error bars.

Usage

```
tadaa_plot_tukey(data, brewer_palette = "Set1")
```

Arguments

data	The broom::tidy 'd output of stats::TukeyHSD .
brewer_palette	Optional: The name of the RColorBrewer palette to use, defaults to Set1. Use NULL for no brewer palette.

Value

A [ggplot2](#) object.

Note

The alpha of the error bars is set to 0.25 if the comparison is not significant, and 1 otherwise. That's neat.

See Also

Other Tadaa-plot functions: [tadaa_balance](#), [tadaa_int](#), [tadaa_mean_ci](#)

Examples

```
tests <- tadaa_pairwise_tukey(data = ngo, deutsch, jahrgang, geschl, print = "df")
tadaa_plot_tukey(tests)
```

tadaa_t.test

Tadaa, t-Test!

Description

An extension for [stats::t.test](#) with added boni and tidy and/or pretty output. Before a t-test is performed, [car::leveneTest](#) is consulted as to whether heteroskedasticity is present (using the default center = "mean" method for a more robust test), and sets `var.equal` accordingly. Afterwards, the effect size is calculated and [pwr::pwr.t.test](#) or [pwr::pwr.t2n.test](#) are used to calculate the test's power accordingly. The result is either returned as a [broom::tidy](#) data.frame or prettified using various [pixiedust::sprinkle](#) shenanigans.

Usage

```
tadaa_t.test(data, response, group, direction = "two.sided", paired = FALSE,
  var.equal = NULL, conf.level = 0.95, print = c("df", "console", "html",
  "markdown"))
```

Arguments

<code>data</code>	A data.frame.
<code>response</code>	The response variable (dependent).
<code>group</code>	The group variable, usually a factor.
<code>direction</code>	Test direction, like <code>alternative</code> in t.test .
<code>paired</code>	If TRUE, a paired test is performed, defaults to FALSE.
<code>var.equal</code>	If set, passed to stats::t.test to decide whether to use a Welch-correction. Default is NULL to automatically determine heteroskedasticity.
<code>conf.level</code>	Confidence level used for power and CI, default is 0.95.
<code>print</code>	Print method, default <code>df</code> : A regular data.frame. Otherwise passed to pixiedust::sprinkle_print_method for fancyness.

Value

A data.frame by default, otherwise dust object, depending on print.

Note

The cutoff for the internal Levene's test to decide whether or not to perform a Welch-corrected t-test is set to 0.05 by default. To override the internal tests and decide whether to use a Welch test, set `var.equal` as you would with [stats::t.test](#).

See Also

Other Tadaa-functions: [tadaa_aov](#), [tadaa_chisq](#), [tadaa_kruskal](#), [tadaa_levene](#), [tadaa_nom](#), [tadaa_normtest](#), [tadaa_one_sample](#), [tadaa_ord](#), [tadaa_pairwise_gh](#), [tadaa_pairwise_tukey](#), [tadaa_pairwise_t](#), [tadaa_wilcoxon](#)

Examples

```
set.seed(42)
df <- data.frame(x = runif(100), y = sample(c("A", "B"), 100, TRUE))
tadaa_t.test(df, x, y)

df <- data.frame(x = runif(100), y = c(rep("A", 50), rep("B", 50)))
tadaa_t.test(df, x, y, paired = TRUE)

tadaa_t.test(ngo, deutsch, geschl, print = "console")
```

tadaa_wilcoxon	<i>Tadaa, Wilcoxon!</i>
----------------	-------------------------

Description

Tadaa, Wilcoxon!

Usage

```
tadaa_wilcoxon(data, response, group, direction = "two.sided",
  paired = FALSE, print = c("df", "console", "html", "markdown"), ...)
```

Arguments

data	A data.frame.
response	The response variable (dependent).
group	The group variable, usually a factor.
direction	Test direction, like alternative in t.test .
paired	If TRUE, a paired test is performed, defaults to FALSE.
print	Print method, default df: A regular data.frame. Otherwise passed to pixiedust::sprinkle_print_method for fancyness.
...	Further arguments passed to stats::wilcox.test , e.g. <code>correct = FALSE</code> .

Value

A data.frame by default, otherwise dust object, depending on print.

See Also

Other Tadaa-functions: `tadaa_aov`, `tadaa_chisq`, `tadaa_kruskal`, `tadaa_levene`, `tadaa_nom`, `tadaa_normtest`, `tadaa_one_sample`, `tadaa_ord`, `tadaa_pairwise_gh`, `tadaa_pairwise_tukey`, `tadaa_pairwise_t`, `tadaa_t.test`

Examples

```
set.seed(42)
df <- data.frame(x = runif(100), y = sample(c("A", "B"), 100, TRUE))
tadaa_wilcoxon(df, x, y)
```

```
df <- data.frame(x = runif(100), y = c(rep("A", 50), rep("B", 50)))
tadaa_wilcoxon(df, x, y, paired = TRUE)
```

theme_readthedown *ggplot2 theme to fit the readthedown Rmd format*

Description

A ggplot theme to fit `rmdformats::readthedown` in terms of background color and dark grid lines.

Usage

```
theme_readthedown(base_size = 12, base_family = "", bg = "#fcfcfc",
  axis_emph = "xy", ...)
```

```
theme_tadaa(base_size = 12, base_family = "", bg = "#fcfcfc",
  axis_emph = "xy", ...)
```

Arguments

<code>base_size</code>	Base text size, defaults to 12.
<code>base_family</code>	Base text family. Use "Roboto Slab" to match the readthedown headers, or "Lato" for the body style.
<code>bg</code>	Background color, defaults to <code>rmdformats::readthedown</code> 's background, #fcfcfc
<code>axis_emph</code>	Which axis to emphasize visually (black lines). One of "x", "y", "xy", NULL.
<code>...</code>	Other arguments passed to <code>ggplot2::theme()</code>

Value

A ggplot2 theme

Examples

```
## Not run:
library(ggplot2)
p <- qplot(1:10, 1:10, geom = "point")

p + theme_readthedown()
p + theme_readthedown(base_family = "Lato")
p + theme_readthedown(base_family = "Roboto Slab", axis_emph = "x")

## End(Not run)
```

z

Convert numeric vector to z-values

Description

A trivial scaling function. You might as well use [base::scale](#), which allows arbitrary centers and scales, but returns a `matrix` by default.

Usage

```
z(x)
```

Arguments

x A numeric vector.

Value

A vector of z-values of the same length as x.

Examples

```
x <- rnorm(500, mean = 10, sd = 5)
z_vals <- z(x)
round(c(mean = mean(z_vals), sd = sd(z_vals)), 2)
```

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