

Package ‘TidyDensity’

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Title Functions for Tidy Analysis and Generation of Random Data

Version 1.2.2

Description To make it easy to generate random numbers based upon the underlying stats distribution functions. All data is returned in a tidy and structured format making working with the data simple and straight forward. Given that the data is returned in a tidy 'tibble' it lends itself to working with the rest of the 'tidyverse'.

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Encoding UTF-8

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URL <https://github.com/spsanderson/TidyDensity>

BugReports <https://github.com/spsanderson/TidyDensity/issues>

Imports magrittr, rlang ($\geq 0.4.11$), dplyr, ggplot2, plotly, tidyr, purrr, stringr, actuar, methods, stats, patchwork, survival, nloptr, broom

Suggests rmarkdown, knitr, roxygen2, EnvStats

VignetteBuilder knitr

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bootstrap_unnest_tbl *Unnest Tidy Bootstrap Tibble*

Description

Unnest the data output from tidy_bootstrap().

Usage

```
bootstrap_unnest_tbl(.data)
```

Arguments

`.data` The data that is passed from the `tidy_bootstrap()` function.

Details

This function takes as input the output of the `tidy_bootstrap()` function and returns a two column tibble. The columns are `sim_number` and `y`

It looks for an attribute that comes from using `tidy_bootstrap()` so it will not work unless the data comes from that function.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Bootstrap: [tidy_bootstrap\(\)](#)

Examples

```
tb <- tidy_bootstrap(.x = mtcars$mpg)
bootstrap_unnest_tbl(tb)

bootstrap_unnest_tbl(tb) %>%
  tidy_distribution_summary_tbl(sim_number)
```

ci_hi

Confidence Interval Generic

Description

Gets the upper 97.5% quantile of a numeric vector.

Usage

```
ci_hi(.x, .na_rm = FALSE)
```

Arguments

`.x` A vector of numeric values
`.na_rm` A Boolean, defaults to FALSE. Passed to the quantile function.

Details

Gets the upper 97.5% quantile of a numeric vector.

Value

A numeric value.

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Statistic: [ci_lo\(\)](#), [tidy_kurtosis_vec\(\)](#), [tidy_range_statistic\(\)](#), [tidy_skewness_vec\(\)](#)

Examples

```
x <- mtcars$mpg
ci_hi(x)
```

ci_lo	<i>Confidence Interval Generic</i>
-------	------------------------------------

Description

Gets the lower 2.5% quantile of a numeric vector.

Usage

```
ci_lo(.x, .na_rm = FALSE)
```

Arguments

`.x` A vector of numeric values
`.na_rm` A Boolean, defaults to FALSE. Passed to the quantile function.

Details

Gets the lower 2.5% quantile of a numeric vector.

Value

A numeric value.

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Statistic: [ci_hi\(\)](#), [tidy_kurtosis_vec\(\)](#), [tidy_range_statistic\(\)](#), [tidy_skewness_vec\(\)](#)

Examples

```
x <- mtcars$mpg
ci_lo(x)
```

color_blind

Provide Colorblind Compliant Colors

Description

8 Hex RGB color definitions suitable for charts for colorblind people.

Usage

```
color_blind()
```

td_scale_color_colorblind

Provide Colorblind Compliant Colors

Description

Provide Colorblind Compliant Colors

Usage

```
td_scale_color_colorblind(..., theme = "td")
```

Arguments

...	Data passed to the function
theme	This defaults to td and that is the only allowed value

Provide Colorblind Compliant Colors

Description

Provide Colorblind Compliant Colors

Usage

```
td_scale_fill_colorblind(..., theme = "td")
```

Arguments

...	Data passed to the function
theme	This defaults to td and that is the only allowed value

Automatic Plot of Density Data

Description

This is an auto plotting function that will take in a tidy_ distribution function and a few arguments, one being the plot type, which is a quoted string of one of the following:

- density
- quantile
- probablity
- qq
- mcmc

If the number of simulations exceeds 9 then the legend will not print. The plot subtitle is put together by the attributes of the table passed to the function.

Usage

```
tidy_autoplot(
  .data,
  .plot_type = "density",
  .line_size = 0.5,
  .geom_point = FALSE,
  .point_size = 1,
  .geom_rug = FALSE,
  .geom_smooth = FALSE,
  .geom_jitter = FALSE,
  .interactive = FALSE
)
```

Arguments

<code>.data</code>	The data passed in from a tidy_distribution function like tidy_normal()
<code>.plot_type</code>	This is a quoted string like 'density'
<code>.line_size</code>	The size param ggplot
<code>.geom_point</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return a plot with ggplot2::geom_point()
<code>.point_size</code>	The point size param for ggplot
<code>.geom_rug</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return the use of ggplot2::geom_rug()
<code>.geom_smooth</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return the use of ggplot2::geom_smooth() The aes parameter of group is set to FALSE. This ensures a single smoothing band returned with SE also set to FALSE. Color is set to 'black' and linetype is 'dashed'.
<code>.geom_jitter</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return the use of ggplot2::geom_jitter()
<code>.interactive</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return an interactive plotly plot.

Details

This function will spit out one of the following plots:

- density
- quantile
- probability
- qq
- mcmc

Value

A ggplot or a plotly plot.

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Autoplot: [tidy_combined_autoplot\(\)](#), [tidy_four_autoplot\(\)](#), [tidy_multi_dist_autoplot\(\)](#), [tidy_random_walk_autoplot\(\)](#)

Examples

```
tidy_normal(.num_sims = 5) %>%
  tidyautoplot()

tidy_normal(.num_sims = 20) %>%
  tidyautoplot(.plot_type = "qq")
```

`tidy_beta`*Tidy Randomly Generated Beta Distribution Tibble*

Description

This function will generate `n` random points from a beta distribution with a user provided, `.shape1`, `.shape2`, `.ncp` or non-centrality parameter, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the `n` randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of `n` for the current simulation.
- `y` The randomly generated data point.
- `dx` The `x` value from the `stats::density()` function.
- `dy` The `y` value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_beta(.n = 50, .shape1 = 1, .shape2 = 1, .ncp = 0, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.shape1</code>	A non-negative parameter of the Beta distribution.
<code>.shape2</code>	A non-negative parameter of the Beta distribution.
<code>.ncp</code>	The non-centrality parameter of the Beta distribution.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `stats::rbeta()`, and its underlying `p`, `d`, and `q` functions. For more information please see [stats::rbeta\(\)](#)

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://statisticsglobe.com/beta-distribution-in-r-dbeta-pbeta-qbeta-rbeta>

https://en.wikipedia.org/wiki/Beta_distribution

Other Continuous Distribution: `tidy_burr()`, `tidy_cauchy()`, `tidy_chisquare()`, `tidy_exponential()`, `tidy_f()`, `tidy_gamma()`, `tidy_generalized_beta()`, `tidy_generalized_pareto()`, `tidy_geometric()`, `tidy_inverse_burr()`, `tidy_inverse_exponential()`, `tidy_inverse_gamma()`, `tidy_inverse_normal()`, `tidy_inverse_pareto()`, `tidy_inverse_weibull()`, `tidy_logistic()`, `tidy_lognormal()`, `tidy_normal()`, `tidy_paralogistic()`, `tidy_pareto1()`, `tidy_pareto()`, `tidy_t()`, `tidy_uniform()`, `tidy_weibull()`, `tidy_zero_truncated_geometric()`

Other Beta: `tidy_generalized_beta()`, `util_beta_param_estimate()`, `util_beta_stats_tbl()`

Examples

```
tidy_beta()
```

```
tidy_binomial
```

```
Tidy Randomly Generated Binomial Distribution Tibble
```

Description

This function will generate `n` random points from a binomial distribution with a user provided, `.size`, `.prob`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the `n` randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of `n` for the current simulation.
- `y` The randomly generated data point.
- `dx` The `x` value from the `stats::density()` function.
- `dy` The `y` value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_binomial(.n = 50, .size = 0, .prob = 1, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.size</code>	Number of trials, zero or more.
<code>.prob</code>	Probability of success on each trial.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `stats::rbinom()`, and its underlying `p`, `d`, and `q` functions. For more information please see [stats::rbinom\(\)](#)

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://www.itl.nist.gov/div898/handbook/eda/section3/eda366i.htm>

Other Discrete Distribution: [tidy_hypergeometric\(\)](#), [tidy_negative_binomial\(\)](#), [tidy_poisson\(\)](#), [tidy_zero_truncated_binomial\(\)](#), [tidy_zero_truncated_negative_binomial\(\)](#), [tidy_zero_truncated_poisson\(\)](#)

Other Binomial: [tidy_negative_binomial\(\)](#), [tidy_zero_truncated_binomial\(\)](#), [tidy_zero_truncated_negative_binomial\(\)](#), [util_binomial_param_estimate\(\)](#), [util_binomial_stats_tbl\(\)](#), [util_negative_binomial_param_estimate\(\)](#)

Examples

```
tidy_binomial()
```

tidy_bootstrap

Bootstrap Empirical Data

Description

Takes an input vector of numeric data and produces a bootstrapped nested tibble by simulation number.

Usage

```
tidy_bootstrap(  
  .x,  
  .num_sims = 2000,  
  .proportion = 0.8,  
  .distribution_type = "continuous"  
)
```

Arguments

<code>.x</code>	The vector of data being passed to the function. Must be a numeric vector.
<code>.num_sims</code>	The default is 2000, can be set to anything desired. A warning will pass to the console if the value is less than 2000.
<code>.proportion</code>	How much of the original data do you want to pass through to the sampling function. The default is 0.80 (80%)
<code>.distribution_type</code>	This can either be 'continuous' or 'discrete'

Details

This function will take in a numeric input vector and produce a tibble of bootstrapped values in a list. The table that is output will have two columns: `sim_number` and `bootstrap_samples`

The `sim_number` corresponds to how many times you want the data to be resampled, and the `bootstrap_samples` column contains a list of the bootstrapped resampled data.

Value

A nested tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Bootstrap: [bootstrap_unnest_tbl\(\)](#)

Examples

```
x <- mtcars$mpg
tidy_bootstrap(x)
```

tidy_burr

Tidy Randomly Generated Burr Distribution Tibble

Description

This function will generate `n` random points from a Burr distribution with a user provided, `.shape1`, `.shape2`, `.scale`, `.rate`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the `n` randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of `n` for the current simulation.
- `y` The randomly generated data point.
- `dx` The `x` value from the `stats::density()` function.
- `dy` The `y` value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_burr(  
  .n = 50,  
  .shape1 = 1,  
  .shape2 = 1,  
  .rate = 1,  
  .scale = 1/.rate,  
  .num_sims = 1  
)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.shape1</code>	Must be strictly positive.
<code>.shape2</code>	Must be strictly positive.
<code>.rate</code>	An alternative way to specify the <code>.scale</code> .
<code>.scale</code>	Must be strictly positive.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `actuar::rburr()`, and its underlying `p`, `d`, and `q` functions. For more information please see [actuar::rburr\(\)](#)

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://openacttexts.github.io/Loss-Data-Analytics/ChapSummaryDistributions.html>

Other Continuous Distribution: `tidy_beta()`, `tidy_cauchy()`, `tidy_chisquare()`, `tidy_exponential()`, `tidy_f()`, `tidy_gamma()`, `tidy_generalized_beta()`, `tidy_generalized_pareto()`, `tidy_geometric()`, `tidy_inverse_burr()`, `tidy_inverse_exponential()`, `tidy_inverse_gamma()`, `tidy_inverse_normal()`, `tidy_inverse_pareto()`, `tidy_inverse_weibull()`, `tidy_logistic()`, `tidy_lognormal()`, `tidy_normal()`, `tidy_paralogistic()`, `tidy_pareto1()`, `tidy_pareto()`, `tidy_t()`, `tidy_uniform()`, `tidy_weibull()`, `tidy_zero_truncated_geometric()`

Other Burr: `tidy_inverse_burr()`

Examples

```
tidy_burr()
```

```
tidy_cauchy
```

```
Tidy Randomly Generated Cauchy Distribution Tibble
```

Description

This function will generate `n` random points from a cauchy distribution with a user provided, `.location`, `.scale`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the `n` randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of `n` for the current simulation.
- `y` The randomly generated data point.
- `dx` The `x` value from the `stats::density()` function.
- `dy` The `y` value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_cauchy(.n = 50, .location = 0, .scale = 1, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.location</code>	The location parameter.
<code>.scale</code>	The scale parameter, must be greater than or equal to 0.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `stats::rcauchy()`, and its underlying `p`, `d`, and `q` functions. For more information please see `stats::rcauchy()`

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://www.itl.nist.gov/div898/handbook/eda/section3/eda3663.htm>

Other Continuous Distribution: `tidy_beta()`, `tidy_burr()`, `tidy_chisquare()`, `tidy_exponential()`, `tidy_f()`, `tidy_gamma()`, `tidy_generalized_beta()`, `tidy_generalized_pareto()`, `tidy_geometric()`, `tidy_inverse_burr()`, `tidy_inverse_exponential()`, `tidy_inverse_gamma()`, `tidy_inverse_normal()`, `tidy_inverse_pareto()`, `tidy_inverse_weibull()`, `tidy_logistic()`, `tidy_lognormal()`, `tidy_normal()`, `tidy_paralogistic()`, `tidy_pareto1()`, `tidy_pareto()`, `tidy_t()`, `tidy_uniform()`, `tidy_weibull()`, `tidy_zero_truncated_geometric()`

Other Cauchy: `util_cauchy_param_estimate()`, `util_cauchy_stats_tbl()`

Examples

```
tidy_cauchy()
```

<code>tidy_chisquare</code>	<i>Tidy Randomly Generated Chisquare (Non-Central) Distribution Tibble</i>
-----------------------------	--

Description

This function will generate `n` random points from a chisquare distribution with a user provided, `.df`, `.ncp`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the `n` randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of `n` for the current simulation.
- `y` The randomly generated data point.
- `dx` The `x` value from the `stats::density()` function.
- `dy` The `y` value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_chisquare(.n = 50, .df = 1, .ncp = 1, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.df</code>	Degrees of freedom (non-negative but can be non-integer)
<code>.ncp</code>	Non-centrality parameter, must be non-negative.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `stats::rchisq()`, and its underlying p, d, and q functions. For more information please see [stats::rchisq\(\)](#)

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://www.itl.nist.gov/div898/handbook/eda/section3/eda3666.htm>

Other Continuous Distribution: [tidy_beta\(\)](#), [tidy_burr\(\)](#), [tidy_cauchy\(\)](#), [tidy_exponential\(\)](#), [tidy_f\(\)](#), [tidy_gamma\(\)](#), [tidy_generalized_beta\(\)](#), [tidy_generalized_pareto\(\)](#), [tidy_geometric\(\)](#), [tidy_inverse_burr\(\)](#), [tidy_inverse_exponential\(\)](#), [tidy_inverse_gamma\(\)](#), [tidy_inverse_normal\(\)](#), [tidy_inverse_pareto\(\)](#), [tidy_inverse_weibull\(\)](#), [tidy_logistic\(\)](#), [tidy_lognormal\(\)](#), [tidy_normal\(\)](#), [tidy_paralogistic\(\)](#), [tidy_pareto1\(\)](#), [tidy_pareto\(\)](#), [tidy_t\(\)](#), [tidy_uniform\(\)](#), [tidy_weibull\(\)](#), [tidy_zero_truncated_geometric\(\)](#)

Other Chisquare: [util_chisquare_stats_tbl\(\)](#)

Examples

```
tidy_chisquare()
```

tidy_combinedautoplot

Automatic Plot of Combined Multi Dist Data

Description

This is an auto plotting function that will take in a tidy_ distribution function and a few arguments, one being the plot type, which is a quoted string of one of the following:

- density
- quantile
- probability
- qq

If the number of simulations exceeds 9 then the legend will not print. The plot subtitle is put together by the attributes of the table passed to the function.

Usage

```
tidy_combinedautoplot(
  .data,
  .plot_type = "density",
  .line_size = 0.5,
  .geom_point = FALSE,
  .point_size = 1,
  .geom_rug = FALSE,
  .geom_smooth = FALSE,
  .geom_jitter = FALSE,
  .interactive = FALSE
)
```

Arguments

.data	The data passed in from a the function tidy_multi_dist()
.plot_type	This is a quoted string like 'density'
.line_size	The size param ggplot
.geom_point	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return a plot with ggplot2::ggeom_point()
.point_size	The point size param for ggplot
.geom_rug	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return the use of ggplot2::geom_rug()
.geom_smooth	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return the use of ggplot2::geom_smooth() The aes parameter of group is set to FALSE. This ensures a single smoothing band returned with SE also set to FALSE. Color is set to 'black' and linetype is 'dashed'.

<code>.geom_jitter</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return the use of <code>ggplot2::geom_jitter()</code>
<code>.interactive</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return an interactive plotly plot.

Details

This function will spit out one of the following plots:

- density
- quantile
- probability
- qq

Value

A ggplot or a plotly plot.

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Autoplot: [tidy_autoplot\(\)](#), [tidy_four_autoplot\(\)](#), [tidy_multi_dist_autoplot\(\)](#), [tidy_random_walk_autoplot\(\)](#)

Examples

```
combined_tbl <- tidy_combine_distributions(  
  tidy_normal(),  
  tidy_gamma(),  
  tidy_beta()  
)  
  
combined_tbl  
  
combined_tbl %>%  
  tidy_combined_autoplot()  
  
combined_tbl %>%  
  tidy_combined_autoplot(.plot_type = "qq")
```

`tidy_combine_distributions`*Combine Multiple Tidy Distributions of Different Types*

Description

This allows a user to specify any n number of tidy_ distributions that can be combined into a single tibble. This is the preferred method for combining multiple distributions of different types, for example a Gaussian distribution and a Beta distribution.

This generates a single tibble with an added column of dist_type that will give the distribution family name and its associated parameters.

Usage

```
tidy_combine_distributions(...)
```

Arguments

... The ... is where you can place your different distributions

Details

Allows a user to generate a tibble of different tidy_ distributions

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Multiple Distribution: [tidy_multi_single_dist\(\)](#)

Examples

```
tn <- tidy_normal()
tb <- tidy_beta()
tc <- tidy_cauchy()

tidy_combine_distributions(tn, tb, tc)

## OR

tidy_combine_distributions(
```

```
tidy_normal(),  
tidy_beta(),  
tidy_cauchy(),  
tidy_logistic()  
)
```

tidy_distribution_comparison

Compare Empirical Data to Distributions

Description

Compare some empirical data set against different distributions to help find the distribution that could be the best fit.

Usage

```
tidy_distribution_comparison(.x, .distribution_type = "continuous")
```

Arguments

`.x` The data set being passed to the function
`.distribution_type` What kind of data is it, can be one of continuous or discrete

Details

The purpose of this function is to take some data set provided and to try to find a distribution that may fit the best. A parameter of `.distribution_type` must be set to either continuous or discrete in order for this the function to try the appropriate types of distributions.

The following distributions are used:

Continuous:

- tidy_beta
- tidy_cauchy
- tidy_exponential
- tidy_gamma
- tidy_logistic
- tidy_lognormal
- tidy_normal
- tidy_pareto
- tidy_uniform
- tidy_weibull

Discrete:

- tidy_binomial
- tidy_geometric
- tidy_hypergeometric
- tidy_poisson

The function itself returns a list output of tibbles. Here are the tibbles that are returned:

- comparison_tbl
- deviance_tbl
- total_deviance_tbl
- aic_tbl
- kolmogorov_smirnov_tbl
- multi_metric_tbl

The comparison_tbl is a long tibble that lists the values of the density function against the given data.

The deviance_tbl and the total_deviance_tbl just give the simple difference from the actual density to the estimated density for the given estimated distribution.

The aic_tbl will provide the AIC for a lm model of the estimated density against the empirical density.

The kolmogorov_smirnov_tbl for now provides a two.sided estimate of the ks.test of the estimated density against the empirical.

The multi_metric_tbl will summarise all of these metrics into a single tibble.

Value

An invisible list object. A tibble is printed.

Author(s)

Steven P. Sanderson II, MPH

Examples

```
xc <- mtcars$mpg
output_c <- tidy_distribution_comparison(xc, "continuous")

xd <- trunc(xc)
output_d <- tidy_distribution_comparison(xd, "discrete")

output_c
```

`tidy_distribution_summary_tbl`*Tidy Distribution Summary Statistics Tibble*

Description

This function returns a summary statistics tibble. It will use the `y` column from the `tidy_distribution` function.

Usage

```
tidy_distribution_summary_tbl(.data, ...)
```

Arguments

`.data` The data that is going to be passed from a `tidy_distribution` function.
`...` This is the grouping variable that gets passed to `dplyr::group_by()` and `dplyr::select()`.

Details

This function takes in a `tidy_distribution` table and will return a tibble of the following information:

- `sim_number`
- `mean_val`
- `median_val`
- `std_val`
- `min_val`
- `max_val`
- `skewness`
- `kurtosis`
- `range`
- `iqr`
- `variance`
- `ci_hi`
- `ci_lo`

The kurtosis and skewness come from the package `healthyR.ai`

Value

A summary stats tibble

Author(s)

Steven P. Sanderson II, MPH

Examples

```
library(dplyr)

tn <- tidy_normal(.num_sims = 5)
tb <- tidy_beta(.num_sims = 5)

tidy_distribution_summary_tbl(tn)
tidy_distribution_summary_tbl(tn, sim_number)

data_tbl <- tidy_combine_distributions(tn, tb)

tidy_distribution_summary_tbl(data_tbl)
tidy_distribution_summary_tbl(data_tbl, dist_type)
```

tidy_empirical	<i>Tidy Empirical</i>
----------------	-----------------------

Description

This function takes in a single argument of `.x` a vector and will return a tibble of information similar to the `tidy_` distribution functions. The `y` column is set equal to `dy` from the density function.

Usage

```
tidy_empirical(.x, .num_sims = 1, .distribution_type = "continuous")
```

Arguments

<code>.x</code>	A vector of numbers
<code>.num_sims</code>	How many simulations should be run, defaults to 1.
<code>.distribution_type</code>	A string of either "continuous" or "discrete". The function will default to "continuous"

Details

This function takes in a single argument of `.x` a vector

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

Examples

```
x <- mtcars$mpg
tidy_empirical(.x = x, .distribution_type = "continuous")
tidy_empirical(.x = x, .num_sims = 10, .distribution_type = "continuous")
```

tidy_exponential	<i>Tidy Randomly Generated Exponential Distribution Tibble</i>
------------------	--

Description

This function will generate n random points from a exponential distribution with a user provided, `.rate`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the n randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the `stats::density()` function.
- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_exponential(.n = 50, .rate = 1, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.rate</code>	A vector of rates
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `stats::rexp()`, and its underlying `p`, `d`, and `q` functions. For more information please see `stats::rexp()`

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://www.itl.nist.gov/div898/handbook/eda/section3/eda3667.htm>

Other Continuous Distribution: [tidy_beta\(\)](#), [tidy_burr\(\)](#), [tidy_cauchy\(\)](#), [tidy_chisquare\(\)](#), [tidy_f\(\)](#), [tidy_gamma\(\)](#), [tidy_generalized_beta\(\)](#), [tidy_generalized_pareto\(\)](#), [tidy_geometric\(\)](#), [tidy_inverse_burr\(\)](#), [tidy_inverse_exponential\(\)](#), [tidy_inverse_gamma\(\)](#), [tidy_inverse_normal\(\)](#), [tidy_inverse_pareto\(\)](#), [tidy_inverse_weibull\(\)](#), [tidy_logistic\(\)](#), [tidy_lognormal\(\)](#), [tidy_normal\(\)](#), [tidy_paralogistic\(\)](#), [tidy_pareto1\(\)](#), [tidy_pareto\(\)](#), [tidy_t\(\)](#), [tidy_uniform\(\)](#), [tidy_weibull\(\)](#), [tidy_zero_truncated_geometric\(\)](#)

Other Exponential: [tidy_inverse_exponential\(\)](#), [util_exponential_param_estimate\(\)](#), [util_exponential_stats\(\)](#)

Examples

```
tidy_exponential()
```

tidy_f

Tidy Randomly Generated F Distribution Tibble

Description

This function will generate n random points from a rf distribution with a user provided, $df1$, $df2$, and ncp , and number of random simulations to be produced. The function returns a tibble with the simulation number column the x column which corresponds to the n randomly generated points, the $d_$, $p_$ and $q_$ data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the `stats::density()` function.
- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting $p_$ function of the distribution family.
- `q` The values from the resulting $q_$ function of the distribution family.

Usage

```
tidy_f(.n = 50, .df1 = 1, .df2 = 1, .ncp = 0, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.df1</code>	Degrees of freedom, Inf is allowed.
<code>.df2</code>	Degrees of freedom, Inf is allowed.
<code>.ncp</code>	Non-centrality parameter.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `stats::rf()`, and its underlying `p`, `d`, and `q` functions. For more information please see [stats::rf\(\)](#)

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://www.itl.nist.gov/div898/handbook/eda/section3/eda3665.htm>

Other Continuous Distribution: [tidy_beta\(\)](#), [tidy_burr\(\)](#), [tidy_cauchy\(\)](#), [tidy_chisquare\(\)](#), [tidy_exponential\(\)](#), [tidy_gamma\(\)](#), [tidy_generalized_beta\(\)](#), [tidy_generalized_pareto\(\)](#), [tidy_geometric\(\)](#), [tidy_inverse_burr\(\)](#), [tidy_inverse_exponential\(\)](#), [tidy_inverse_gamma\(\)](#), [tidy_inverse_normal\(\)](#), [tidy_inverse_pareto\(\)](#), [tidy_inverse_weibull\(\)](#), [tidy_logistic\(\)](#), [tidy_lognormal\(\)](#), [tidy_normal\(\)](#), [tidy_paralogistic\(\)](#), [tidy_pareto1\(\)](#), [tidy_pareto\(\)](#), [tidy_t\(\)](#), [tidy_uniform\(\)](#), [tidy_weibull\(\)](#), [tidy_zero_truncated_geometric\(\)](#)

Other F Distribution: [util_f_stats_tbl\(\)](#)

Examples

```
tidy_f()
```

Description

This is an auto plotting function that will take in a `tidy_` distribution function and a few arguments, one being the plot type, which is a quoted string of one of the following:

- density
- quantile
- probability
- qq

If the number of simulations exceeds 9 then the legend will not print. The plot subtitle is put together by the attributes of the table passed to the function.

Usage

```
tidy_fourautoplot(
  .data,
  .line_size = 0.5,
  .geom_point = FALSE,
  .point_size = 1,
  .geom_rug = FALSE,
  .geom_smooth = FALSE,
  .geom_jitter = FALSE,
  .interactive = FALSE
)
```

Arguments

<code>.data</code>	The data passed in from a <code>tidy_distribution</code> function like <code>tidy_normal()</code>
<code>.line_size</code>	The size param <code>ggplot</code>
<code>.geom_point</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return a plot with <code>ggplot2::geom_point()</code>
<code>.point_size</code>	The point size param for <code>ggplot</code>
<code>.geom_rug</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return the use of <code>ggplot2::geom_rug()</code>
<code>.geom_smooth</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return the use of <code>ggplot2::geom_smooth()</code> The <code>aes</code> parameter of <code>group</code> is set to FALSE. This ensures a single smoothing band returned with <code>SE</code> also set to FALSE. Color is set to 'black' and <code>linetype</code> is 'dashed'.
<code>.geom_jitter</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return the use of <code>ggplot2::geom_jitter()</code>
<code>.interactive</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return an interactive <code>plotly</code> plot.

Details

This function will spit out one of the following plots:

- density
- quantile
- probability
- qq

Value

A ggplot or a plotly plot.

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Autoplot: [tidy_autoplot\(\)](#), [tidy_combined_autoplot\(\)](#), [tidy_multi_dist_autoplot\(\)](#), [tidy_random_walk_autoplot\(\)](#)

Examples

```
tidy_normal(.num_sims = 5) %>%
  tidy_four_autoplot()
```

tidy_gamma

Tidy Randomly Generated Gamma Distribution Tibble

Description

This function will generate n random points from a gamma distribution with a user provided, `.shape`, `.scale`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the x column which corresponds to the n randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the `stats::density()` function.
- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_gamma(.n = 50, .shape = 1, .scale = 0.3, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.shape</code>	This is strictly 0 to infinity.
<code>.scale</code>	The standard deviation of the randomly generated data. This is strictly from 0 to infinity.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `stats::rgamma()`, and its underlying `p`, `d`, and `q` functions. For more information please see [stats::rgamma\(\)](#)

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://www.statology.org/fit-gamma-distribution-to-dataset-in-r/>

https://en.wikipedia.org/wiki/Gamma_distribution

Other Continuous Distribution: [tidy_beta\(\)](#), [tidy_burr\(\)](#), [tidy_cauchy\(\)](#), [tidy_chisquare\(\)](#), [tidy_exponential\(\)](#), [tidy_f\(\)](#), [tidy_generalized_beta\(\)](#), [tidy_generalized_pareto\(\)](#), [tidy_geometric\(\)](#), [tidy_inverse_burr\(\)](#), [tidy_inverse_exponential\(\)](#), [tidy_inverse_gamma\(\)](#), [tidy_inverse_normal\(\)](#), [tidy_inverse_pareto\(\)](#), [tidy_inverse_weibull\(\)](#), [tidy_logistic\(\)](#), [tidy_lognormal\(\)](#), [tidy_normal\(\)](#), [tidy_paralogistic\(\)](#), [tidy_pareto1\(\)](#), [tidy_pareto\(\)](#), [tidy_t\(\)](#), [tidy_uniform\(\)](#), [tidy_weibull\(\)](#), [tidy_zero_truncated_geometric\(\)](#)

Other Gamma: [tidy_inverse_gamma\(\)](#), [util_gamma_param_estimate\(\)](#), [util_gamma_stats_tbl\(\)](#)

Examples

```
tidy_gamma()
```

tidy_generalized_beta *Tidy Randomly Generated Generalized Beta Distribution Tibble*

Description

This function will generate n random points from a generalized beta distribution with a user provided, `.shape1`, `.shape2`, `.shape3`, `.rate`, and/or `.scale`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the n randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the `stats::density()` function.
- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_generalized_beta(
  .n = 50,
  .shape1 = 1,
  .shape2 = 1,
  .shape3 = 1,
  .rate = 1,
  .scale = 1/.rate,
  .num_sims = 1
)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.shape1</code>	A non-negative parameter of the Beta distribution.
<code>.shape2</code>	A non-negative parameter of the Beta distribution.
<code>.shape3</code>	A non-negative parameter of the Beta distribution.
<code>.rate</code>	An alternative way to specify the <code>.scale</code> parameter.
<code>.scale</code>	Must be strictly positive.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `stats::rbeta()`, and its underlying `p`, `d`, and `q` functions. For more information please see [stats::rbeta\(\)](#)

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://statisticsglobe.com/beta-distribution-in-r-dbeta-pbeta-qbeta-rbeta>

https://en.wikipedia.org/wiki/Beta_distribution

<https://openacttexts.github.io/Loss-Data-Analytics/ChapSummaryDistributions.html>

Other Continuous Distribution: [tidy_beta\(\)](#), [tidy_burr\(\)](#), [tidy_cauchy\(\)](#), [tidy_chisquare\(\)](#), [tidy_exponential\(\)](#), [tidy_f\(\)](#), [tidy_gamma\(\)](#), [tidy_generalized_pareto\(\)](#), [tidy_geometric\(\)](#), [tidy_inverse_burr\(\)](#), [tidy_inverse_exponential\(\)](#), [tidy_inverse_gamma\(\)](#), [tidy_inverse_normal\(\)](#), [tidy_inverse_pareto\(\)](#), [tidy_inverse_weibull\(\)](#), [tidy_logistic\(\)](#), [tidy_lognormal\(\)](#), [tidy_normal\(\)](#), [tidy_paralogistic\(\)](#), [tidy_pareto1\(\)](#), [tidy_pareto\(\)](#), [tidy_t\(\)](#), [tidy_uniform\(\)](#), [tidy_weibull\(\)](#), [tidy_zero_truncated_geometric\(\)](#)

Other Beta: [tidy_beta\(\)](#), [util_beta_param_estimate\(\)](#), [util_beta_stats_tbl\(\)](#)

Examples

```
tidy_generalized_beta()
```

```
tidy_generalized_pareto
```

Tidy Randomly Generated Generalized Pareto Distribution Tibble

Description

This function will generate `n` random points from a generalized Pareto distribution with a user provided, `.shape1`, `.shape2`, `.rate` or `.scale` and number of #' random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the `n` randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of `n` for the current simulation.
- `y` The randomly generated data point.

- dx The x value from the `stats::density()` function.
- dy The y value from the `stats::density()` function.
- p The values from the resulting `p_` function of the distribution family.
- q The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_generalized_pareto(
  .n = 50,
  .shape1 = 1,
  .shape2 = 1,
  .rate = 1,
  .scale = 1/.rate,
  .num_sims = 1
)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.shape1</code>	Must be positive.
<code>.shape2</code>	Must be positive.
<code>.rate</code>	An alternative way to specify the <code>.scale</code> argument
<code>.scale</code>	Must be positive.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `actuar::rgenpareto()`, and its underlying `p`, `d`, and `q` functions. For more information please see [actuar::rgenpareto\(\)](#)

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://openacttexts.github.io/Loss-Data-Analytics/ChapSummaryDistributions.html>

Other Continuous Distribution: [tidy_beta\(\)](#), [tidy_burr\(\)](#), [tidy_cauchy\(\)](#), [tidy_chisquare\(\)](#), [tidy_exponential\(\)](#), [tidy_f\(\)](#), [tidy_gamma\(\)](#), [tidy_generalized_beta\(\)](#), [tidy_geometric\(\)](#), [tidy_inverse_burr\(\)](#), [tidy_inverse_exponential\(\)](#), [tidy_inverse_gamma\(\)](#), [tidy_inverse_normal\(\)](#), [tidy_inverse_pareto\(\)](#), [tidy_inverse_weibull\(\)](#), [tidy_logistic\(\)](#), [tidy_lognormal\(\)](#), [tidy_normal\(\)](#), [tidy_paralogistic\(\)](#), [tidy_pareto1\(\)](#), [tidy_pareto\(\)](#), [tidy_t\(\)](#), [tidy_uniform\(\)](#), [tidy_weibull\(\)](#), [tidy_zero_truncated_geometric\(\)](#)

Other Pareto: [tidy_inverse_pareto\(\)](#), [tidy_pareto1\(\)](#), [tidy_pareto\(\)](#), [util_pareto_param_estimate\(\)](#), [util_pareto_stats_tbl\(\)](#)

Examples

```
tidy_generalized_pareto()
```

tidy_geometric

Tidy Randomly Generated Geometric Distribution Tibble

Description

This function will generate n random points from a geometric distribution with a user provided, `.prob`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the n randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the `stats::density()` function.
- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_geometric(.n = 50, .prob = 1, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.prob</code>	A probability of success in each trial $0 < \text{prob} \leq 1$.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `stats::rgeom()`, and its underlying `p`, `d`, and `q` functions. For more information please see [stats::rgeom\(\)](#)

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

https://en.wikipedia.org/wiki/Geometric_distribution

Other Continuous Distribution: `tidy_beta()`, `tidy_burr()`, `tidy_cauchy()`, `tidy_chisquare()`, `tidy_exponential()`, `tidy_f()`, `tidy_gamma()`, `tidy_generalized_beta()`, `tidy_generalized_pareto()`, `tidy_inverse_burr()`, `tidy_inverse_exponential()`, `tidy_inverse_gamma()`, `tidy_inverse_normal()`, `tidy_inverse_pareto()`, `tidy_inverse_weibull()`, `tidy_logistic()`, `tidy_lognormal()`, `tidy_normal()`, `tidy_paralogistic()`, `tidy_pareto1()`, `tidy_pareto()`, `tidy_t()`, `tidy_uniform()`, `tidy_weibull()`, `tidy_zero_truncated_geometric()`

Other Geometric: `tidy_zero_truncated_geometric()`, `util_geometric_param_estimate()`, `util_geometric_stats_tbl()`

Examples

```
tidy_geometric()
```

tidy_hypergeometric *Tidy Randomly Generated Hypergeometric Distribution Tibble*

Description

This function will generate n random points from a hypergeometric distribution with a user provided, m , nn , and k , and number of random simulations to be produced. The function returns a tibble with the simulation number column the x column which corresponds to the n randomly generated points, the d_* , p_* and q_* data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the `stats::density()` function.
- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting p_* function of the distribution family.
- `q` The values from the resulting q_* function of the distribution family.

Usage

```
tidy_hypergeometric(.n = 50, .m = 0, .nn = 0, .k = 0, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.m</code>	The number of white balls in the urn
<code>.nn</code>	The number of black balls in the urn
<code>.k</code>	The number of balls drawn fro the urn.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `stats::rhyper()`, and its underlying `p`, `d`, and `q` functions. For more information please see [stats::rhyper\(\)](#)

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

https://en.wikipedia.org/wiki/Hypergeometric_distribution

Other Discrete Distribution: [tidy_binomial\(\)](#), [tidy_negative_binomial\(\)](#), [tidy_poisson\(\)](#), [tidy_zero_truncated_binomial\(\)](#), [tidy_zero_truncated_negative_binomial\(\)](#), [tidy_zero_truncated_poisson\(\)](#)

Other Hypergeometric: [util_hypergeometric_param_estimate\(\)](#), [util_hypergeometric_stats_tbl\(\)](#)

Examples

```
tidy_hypergeometric()
```

<code>tidy_inverse_burr</code>	<i>Tidy Randomly Generated Inverse Burr Distribution Tibble</i>
--------------------------------	---

Description

This function will generate `n` random points from an Inverse Burr distribution with a user provided, `.shape1`, `.shape2`, `.scale`, `.rate`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the `n` randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of `n` for the current simulation.

- y The randomly generated data point.
- dx The x value from the `stats::density()` function.
- dy The y value from the `stats::density()` function.
- p The values from the resulting p_ function of the distribution family.
- q The values from the resulting q_ function of the distribution family.

Usage

```
tidy_inverse_burr(
  .n = 50,
  .shape1 = 1,
  .shape2 = 1,
  .rate = 1,
  .scale = 1/.rate,
  .num_sims = 1
)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.shape1</code>	Must be strictly positive.
<code>.shape2</code>	Must be strictly positive.
<code>.rate</code>	An alternative way to specify the <code>.scale</code> .
<code>.scale</code>	Must be strictly positive.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `actuar::rinvburr()`, and its underlying p, d, and q functions. For more information please see `actuar::rinvburr()`

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://openacttexts.github.io/Loss-Data-Analytics/ChapSummaryDistributions.html>

Other Continuous Distribution: `tidy_beta()`, `tidy_burr()`, `tidy_cauchy()`, `tidy_chisquare()`, `tidy_exponential()`, `tidy_f()`, `tidy_gamma()`, `tidy_generalized_beta()`, `tidy_generalized_pareto()`, `tidy_geometric()`, `tidy_inverse_exponential()`, `tidy_inverse_gamma()`, `tidy_inverse_normal()`, `tidy_inverse_pareto()`, `tidy_inverse_weibull()`, `tidy_logistic()`, `tidy_lognormal()`, `tidy_normal()`,

`tidy_paralogistic()`, `tidy_pareto1()`, `tidy_pareto()`, `tidy_t()`, `tidy_uniform()`, `tidy_weibull()`,
`tidy_zero_truncated_geometric()`

Other Burr: `tidy_burr()`

Other Inverse Distribution: `tidy_inverse_exponential()`, `tidy_inverse_gamma()`, `tidy_inverse_normal()`,
`tidy_inverse_pareto()`, `tidy_inverse_weibull()`

Examples

```
tidy_inverse_burr()
```

```
tidy_inverse_exponential
```

Tidy Randomly Generated Inverse Exponential Distribution Tibble

Description

This function will generate n random points from an inverse exponential distribution with a user provided, `.rate` or `.scale` and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the n randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the `stats::density()` function.
- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_inverse_exponential(.n = 50, .rate = 1, .scale = 1/.rate, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.rate</code>	An alternative way to specify the <code>.scale</code>
<code>.scale</code>	Must be strictly positive.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `actuar::rinexp()`, and its underlying `p`, `d`, and `q` functions. For more information please see `actuar::rinexp()`

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://openacttexts.github.io/Loss-Data-Analytics/ChapSummaryDistributions.html>

Other Continuous Distribution: `tidy_beta()`, `tidy_burr()`, `tidy_cauchy()`, `tidy_chisquare()`, `tidy_exponential()`, `tidy_f()`, `tidy_gamma()`, `tidy_generalized_beta()`, `tidy_generalized_pareto()`, `tidy_geometric()`, `tidy_inverse_burr()`, `tidy_inverse_gamma()`, `tidy_inverse_normal()`, `tidy_inverse_pareto()`, `tidy_inverse_weibull()`, `tidy_logistic()`, `tidy_lognormal()`, `tidy_normal()`, `tidy_paralogistic()`, `tidy_pareto1()`, `tidy_pareto()`, `tidy_t()`, `tidy_uniform()`, `tidy_weibull()`, `tidy_zero_truncated_geometric()`

Other Exponential: `tidy_exponential()`, `util_exponential_param_estimate()`, `util_exponential_stats_tbl()`

Other Inverse Distribution: `tidy_inverse_burr()`, `tidy_inverse_gamma()`, `tidy_inverse_normal()`, `tidy_inverse_pareto()`, `tidy_inverse_weibull()`

Examples

```
tidy_inverse_exponential()
```

<code>tidy_inverse_gamma</code>	<i>Tidy Randomly Generated Inverse Gamma Distribution Tibble</i>
---------------------------------	--

Description

This function will generate `n` random points from an inverse gamma distribution with a user provided, `.shape`, `.rate`, `.scale`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the `n` randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of `n` for the current simulation.
- `y` The randomly generated data point.

- dx The x value from the `stats::density()` function.
- dy The y value from the `stats::density()` function.
- p The values from the resulting `p_` function of the distribution family.
- q The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_inverse_gamma(
  .n = 50,
  .shape = 1,
  .rate = 1,
  .scale = 1/.rate,
  .num_sims = 1
)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.shape</code>	Must be strictly positive.
<code>.rate</code>	An alternative way to specify the <code>.scale</code>
<code>.scale</code>	Must be strictly positive.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `actuar::rinvgamma()`, and its underlying `p`, `d`, and `q` functions. For more information please see `actuar::rinvgamma()`

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://openacttexts.github.io/Loss-Data-Analytics/ChapSummaryDistributions.html>

Other Continuous Distribution: `tidy_beta()`, `tidy_burr()`, `tidy_cauchy()`, `tidy_chisquare()`, `tidy_exponential()`, `tidy_f()`, `tidy_gamma()`, `tidy_generalized_beta()`, `tidy_generalized_pareto()`, `tidy_geometric()`, `tidy_inverse_burr()`, `tidy_inverse_exponential()`, `tidy_inverse_normal()`, `tidy_inverse_pareto()`, `tidy_inverse_weibull()`, `tidy_logistic()`, `tidy_lognormal()`, `tidy_normal()`, `tidy_paralogistic()`, `tidy_pareto1()`, `tidy_pareto()`, `tidy_t()`, `tidy_uniform()`, `tidy_weibull()`, `tidy_zero_truncated_geometric()`

Other Gamma: `tidy_gamma()`, `util_gamma_param_estimate()`, `util_gamma_stats_tbl()`

Other Inverse Distribution: `tidy_inverse_burr()`, `tidy_inverse_exponential()`, `tidy_inverse_normal()`, `tidy_inverse_pareto()`, `tidy_inverse_weibull()`

Examples

```
tidy_inverse_gamma()
```

```
tidy_inverse_normal
```

Tidy Randomly Generated Inverse Gaussian Distribution Tibble

Description

This function will generate n random points from an Inverse Gaussian distribution with a user provided, `.mean`, `.shape`, `.dispersion`. The function returns a tibble with the simulation number column the `x` column which corresponds to the n randomly generated points.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the `stats::density()` function.
- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_inverse_normal(
  .n = 50,
  .mean = 1,
  .shape = 1,
  .dispersion = 1/.shape,
  .num_sims = 1
)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.mean</code>	Must be strictly positive.
<code>.shape</code>	Must be strictly positive.
<code>.dispersion</code>	An alternative way to specify the <code>.shape</code> .
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `actuar::rinvgauss()`. For more information please see [rinvgauss\(\)](#)

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Continuous Distribution: [tidy_beta\(\)](#), [tidy_burr\(\)](#), [tidy_cauchy\(\)](#), [tidy_chisquare\(\)](#), [tidy_exponential\(\)](#), [tidy_f\(\)](#), [tidy_gamma\(\)](#), [tidy_generalized_beta\(\)](#), [tidy_generalized_pareto\(\)](#), [tidy_geometric\(\)](#), [tidy_inverse_burr\(\)](#), [tidy_inverse_exponential\(\)](#), [tidy_inverse_gamma\(\)](#), [tidy_inverse_pareto\(\)](#), [tidy_inverse_weibull\(\)](#), [tidy_logistic\(\)](#), [tidy_lognormal\(\)](#), [tidy_normal\(\)](#), [tidy_paralogistic\(\)](#), [tidy_pareto1\(\)](#), [tidy_pareto\(\)](#), [tidy_t\(\)](#), [tidy_uniform\(\)](#), [tidy_weibull\(\)](#), [tidy_zero_truncated_geometric\(\)](#)

Other Gaussian: [tidy_normal\(\)](#), [util_normal_param_estimate\(\)](#), [util_normal_stats_tbl\(\)](#)

Other Inverse Distribution: [tidy_inverse_burr\(\)](#), [tidy_inverse_exponential\(\)](#), [tidy_inverse_gamma\(\)](#), [tidy_inverse_pareto\(\)](#), [tidy_inverse_weibull\(\)](#)

Examples

```
tidy_inverse_normal()
```

`tidy_inverse_pareto` *Tidy Randomly Generated Inverse Pareto Distribution Tibble*

Description

This function will generate n random points from an inverse pareto distribution with a user provided, `.shape`, `.scale`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the n randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the [stats::density\(\)](#) function.
- `dy` The y value from the [stats::density\(\)](#) function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_inverse_pareto(.n = 50, .shape = 1, .scale = 1, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.shape</code>	Must be positive.
<code>.scale</code>	Must be positive.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `actuar::rinvpareto()`, and its underlying p, d, and q functions. For more information please see [actuar::rinvpareto\(\)](#)

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://openacttexts.github.io/Loss-Data-Analytics/ChapSummaryDistributions.html>

Other Continuous Distribution: [tidy_beta\(\)](#), [tidy_burr\(\)](#), [tidy_cauchy\(\)](#), [tidy_chisquare\(\)](#), [tidy_exponential\(\)](#), [tidy_f\(\)](#), [tidy_gamma\(\)](#), [tidy_generalized_beta\(\)](#), [tidy_generalized_pareto\(\)](#), [tidy_geometric\(\)](#), [tidy_inverse_burr\(\)](#), [tidy_inverse_exponential\(\)](#), [tidy_inverse_gamma\(\)](#), [tidy_inverse_normal\(\)](#), [tidy_inverse_weibull\(\)](#), [tidy_logistic\(\)](#), [tidy_lognormal\(\)](#), [tidy_normal\(\)](#), [tidy_paralogistic\(\)](#), [tidy_pareto1\(\)](#), [tidy_pareto\(\)](#), [tidy_t\(\)](#), [tidy_uniform\(\)](#), [tidy_weibull\(\)](#), [tidy_zero_truncated_geometric\(\)](#)

Other Pareto: [tidy_generalized_pareto\(\)](#), [tidy_pareto1\(\)](#), [tidy_pareto\(\)](#), [util_pareto_param_estimate\(\)](#), [util_pareto_stats_tbl\(\)](#)

Other Inverse Distribution: [tidy_inverse_burr\(\)](#), [tidy_inverse_exponential\(\)](#), [tidy_inverse_gamma\(\)](#), [tidy_inverse_normal\(\)](#), [tidy_inverse_weibull\(\)](#)

Examples

```
tidy_inverse_pareto()
```

tidy_inverse_weibull *Tidy Randomly Generated Inverse Weibull Distribution Tibble*

Description

This function will generate n random points from a weibull distribution with a user provided, `.shape`, `.scale`, `.rate`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the n randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the `stats::density()` function.
- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_inverse_weibull(  
  .n = 50,  
  .shape = 1,  
  .rate = 1,  
  .scale = 1/.rate,  
  .num_sims = 1  
)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.shape</code>	Must be strictly positive.
<code>.rate</code>	An alternative way to specify the <code>.scale</code> .
<code>.scale</code>	Must be strictly positive.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `actuar::rinweibull()`, and its underlying `p`, `d`, and `q` functions. For more information please see `actuar::rinweibull()`

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://openacttexts.github.io/Loss-Data-Analytics/ChapSummaryDistributions.html>

Other Continuous Distribution: `tidy_beta()`, `tidy_burr()`, `tidy_cauchy()`, `tidy_chisquare()`, `tidy_exponential()`, `tidy_f()`, `tidy_gamma()`, `tidy_generalized_beta()`, `tidy_generalized_pareto()`, `tidy_geometric()`, `tidy_inverse_burr()`, `tidy_inverse_exponential()`, `tidy_inverse_gamma()`, `tidy_inverse_normal()`, `tidy_inverse_pareto()`, `tidy_logistic()`, `tidy_lognormal()`, `tidy_normal()`, `tidy_paralogistic()`, `tidy_pareto1()`, `tidy_pareto()`, `tidy_t()`, `tidy_uniform()`, `tidy_weibull()`, `tidy_zero_truncated_geometric()`

Other Weibull: `tidy_weibull()`, `util_weibull_param_estimate()`, `util_weibull_stats_tbl()`

Other Inverse Distribution: `tidy_inverse_burr()`, `tidy_inverse_exponential()`, `tidy_inverse_gamma()`, `tidy_inverse_normal()`, `tidy_inverse_pareto()`

Examples

```
tidy_inverse_weibull()
```

<code>tidy_kurtosis_vec</code>	<i>Compute Kurtosis of a Vector</i>
--------------------------------	-------------------------------------

Description

This function takes in a vector as its input and will return the kurtosis of that vector. The length of this vector must be at least four numbers. The kurtosis explains the sharpness of the peak of a distribution of data.

$$\left(\frac{1}{n} * \sum(x - \mu)^4\right) / \left(\left(\frac{1}{n} * \sum(x - \mu)^2\right)^2\right)$$
Usage

```
tidy_kurtosis_vec(.x)
```

Arguments

`.x` A numeric vector of length four or more.

Details

A function to return the kurtosis of a vector.

Value

The kurtosis of a vector

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://en.wikipedia.org/wiki/Kurtosis>

Other Vector Function: `tidy_scale_zero_one_vec()`, `tidy_skewness_vec()`

Other Statistic: `ci_hi()`, `ci_lo()`, `tidy_range_statistic()`, `tidy_skewness_vec()`

Other Vector Function: `tidy_scale_zero_one_vec()`, `tidy_skewness_vec()`

Examples

```
tidy_kurtosis_vec(rnorm(100, 3, 2))
```

tidy_logistic

Tidy Randomly Generated Logistic Distribution Tibble

Description

This function will generate `n` random points from a logistic distribution with a user provided, `.location`, `.scale`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the `n` randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of `n` for the current simulation.
- `y` The randomly generated data point.
- `dx` The `x` value from the `stats::density()` function.
- `dy` The `y` value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_logistic(.n = 50, .location = 0, .scale = 1, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.location</code>	The location parameter
<code>.scale</code>	The scale parameter
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `stats::rlogis()`, and its underlying `p`, `d`, and `q` functions. For more information please see [stats::rlogis\(\)](#)

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

https://en.wikipedia.org/wiki/Logistic_distribution

Other Continuous Distribution: `tidy_beta()`, `tidy_burr()`, `tidy_cauchy()`, `tidy_chisquare()`, `tidy_exponential()`, `tidy_f()`, `tidy_gamma()`, `tidy_generalized_beta()`, `tidy_generalized_pareto()`, `tidy_geometric()`, `tidy_inverse_burr()`, `tidy_inverse_exponential()`, `tidy_inverse_gamma()`, `tidy_inverse_normal()`, `tidy_inverse_pareto()`, `tidy_inverse_weibull()`, `tidy_lognormal()`, `tidy_normal()`, `tidy_paralogistic()`, `tidy_pareto1()`, `tidy_pareto()`, `tidy_t()`, `tidy_uniform()`, `tidy_weibull()`, `tidy_zero_truncated_geometric()`

Other Logistic: `tidy_paralogistic()`, `util_logistic_param_estimate()`, `util_logistic_stats_tbl()`

Examples

```
tidy_logistic()
```

<code>tidy_lognormal</code>	<i>Tidy Randomly Generated Lognormal Distribution Tibble</i>
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Description

This function will generate `n` random points from a lognormal distribution with a user provided, `.meanlog`, `.sdlog`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the `n` randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of `n` for the current simulation.
- `y` The randomly generated data point.
- `dx` The `x` value from the `stats::density()` function.
- `dy` The `y` value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_lognormal(.n = 50, .meanlog = 0, .sdlog = 1, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.meanlog</code>	Mean of the distribution on the log scale with default 0
<code>.sdlog</code>	Standard deviation of the distribution on the log scale with default 1
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `stats::rlnorm()`, and its underlying `p`, `d`, and `q` functions. For more information please see `stats::rlnorm()`

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://www.itl.nist.gov/div898/handbook/eda/section3/eda3669.htm>

Other Continuous Distribution: `tidy_beta()`, `tidy_burr()`, `tidy_cauchy()`, `tidy_chisquare()`, `tidy_exponential()`, `tidy_f()`, `tidy_gamma()`, `tidy_generalized_beta()`, `tidy_generalized_pareto()`, `tidy_geometric()`, `tidy_inverse_burr()`, `tidy_inverse_exponential()`, `tidy_inverse_gamma()`, `tidy_inverse_normal()`, `tidy_inverse_pareto()`, `tidy_inverse_weibull()`, `tidy_logistic()`, `tidy_normal()`, `tidy_paralogistic()`, `tidy_pareto1()`, `tidy_pareto()`, `tidy_t()`, `tidy_uniform()`, `tidy_weibull()`, `tidy_zero_truncated_geometric()`

Other Lognormal: `util_lognormal_param_estimate()`, `util_lognormal_stats_tbl()`

Examples

```
tidy_lognormal()
```

tidy_mixture_density *Tidy Mixture Data*

Description

Create mixture model data and resulting density and line plots.

Usage

```
tidy_mixture_density(...)
```

Arguments

... The random data you want to pass. Example `rnorm(50,0,1)` or something like `tidy_normal(.mean = 5, .sd = 1)`

Details

This function allows you to make mixture model data. It allows you to produce density data and plots for data that is not strictly of one family or of one single type of distribution with a given set of parameters.

For example this function will allow you to mix say `tidy_normal(.mean = 0, .sd = 1)` and `tidy_normal(.mean = 5, .sd = 1)` or you can mix and match distributions.

The output is a list object with three components.

1. Data

- `input_data` (The random data passed)
- `dist_tbl` (A tibble of the passed random data)
- `density_tbl` (A tibble of the x and y data from `stats::density()`)

1. Plots

- `line_plot` - Plots the `dist_tbl`
- `dens_plot` - Plots the `density_tbl`

1. Input Functions

- `input_fns` - A list of the functions and their parameters passed to the function itself

Value

A list object

Author(s)

Steven P. Sanderson II, MPH

Examples

```
output <- tidy_mixture_density(rnorm(100, 0, 1), tidy_normal(.mean = 5, .sd = 1))

output$data

output$plots

output$input_fns
```

```
tidy_multi_dist_autoplot
```

Automatic Plot of Multi Dist Data

Description

This is an auto plotting function that will take in a tidy_ distribution function and a few arguments, one being the plot type, which is a quoted string of one of the following:

- density
- quantile
- probability
- qq

If the number of simulations exceeds 9 then the legend will not print. The plot subtitle is put together by the attributes of the table passed to the function.

Usage

```
tidy_multi_dist_autoplot(
  .data,
  .plot_type = "density",
  .line_size = 0.5,
  .geom_point = FALSE,
  .point_size = 1,
  .geom_rug = FALSE,
  .geom_smooth = FALSE,
  .geom_jitter = FALSE,
  .interactive = FALSE
)
```

Arguments

.data	The data passed in from a the function tidy_multi_dist()
.plot_type	This is a quoted string like 'density'
.line_size	The size param ggplot

<code>.geom_point</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return a plot with <code>ggplot2::geom_point()</code>
<code>.point_size</code>	The point size param for <code>ggplot</code>
<code>.geom_rug</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return the use of <code>ggplot2::geom_rug()</code>
<code>.geom_smooth</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return the use of <code>ggplot2::geom_smooth()</code> The <code>aes</code> parameter of <code>group</code> is set to FALSE. This ensures a single smoothing band returned with <code>SE</code> also set to FALSE. Color is set to 'black' and <code>linetype</code> is 'dashed'.
<code>.geom_jitter</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return the use of <code>ggplot2::geom_jitter()</code>
<code>.interactive</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return an interactive plotly plot.

Details

This function will spit out one of the following plots:

- density
- quantile
- probability
- qq

Value

A `ggplot` or a `plotly` plot.

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Autoplot: [tidy_autoplot\(\)](#), [tidy_combined_autoplot\(\)](#), [tidy_four_autoplot\(\)](#), [tidy_random_walk_autoplot\(\)](#)

Examples

```
tn <- tidy_multi_single_dist(
  .tidy_dist = "tidy_normal",
  .param_list = list(
    .n = 500,
    .mean = c(-2, 0, 2),
    .sd = 1,
    .num_sims = 5
  )
)

tn %>%
```

```
tidy_multi_dist_autoplot()  
  
tn %>%  
  tidy_multi_dist_autoplot(.plot_type = "qq")
```

tidy_multi_single_dist

Generate Multiple Tidy Distributions of a single type

Description

Generate multiple distributions of data from the same tidy_ distribution function.

Usage

```
tidy_multi_single_dist(.tidy_dist = NULL, .param_list = list())
```

Arguments

`.tidy_dist` The type of tidy_ distribution that you want to run. You can only choose one.

`.param_list` This must be a `list()` object of the parameters that you want to pass through to the TidyDensity tidy_ distribution function.

Details

Generate multiple distributions of data from the same tidy_ distribution function. This allows you to simulate multiple distributions of the same family in order to view how shapes change with parameter changes. You can then visualize the differences however you choose.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Multiple Distribution: [tidy_combine_distributions\(\)](#)

Examples

```
tidy_multi_single_dist(
  .tidy_dist = "tidy_normal",
  .param_list = list(
    .n = 50,
    .mean = c(-1, 0, 1),
    .sd = 1,
    .num_sims = 3
  )
)
```

tidy_negative_binomial

Tidy Randomly Generated Negative Binomial Distribution Tibble

Description

This function will generate n random points from a negative binomial distribution with a user provided, `.size`, `.prob`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the n randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the `stats::density()` function.
- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_negative_binomial(.n = 50, .size = 1, .prob = 0.1, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.size</code>	target for number of successful trials, or dispersion parameter (the shape parameter of the gamma mixing distribution). Must be strictly positive, need not be integer.
<code>.prob</code>	Probability of success on each trial where $0 < .prob \leq 1$.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `stats::rbinom()`, and its underlying `p`, `d`, and `q` functions. For more information please see `stats::rbinom()`

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://openacttexts.github.io/Loss-Data-Analytics/ChapSummaryDistributions.html>

Other Discrete Distribution: `tidy_binomial()`, `tidy_hypergeometric()`, `tidy_poisson()`, `tidy_zero_truncated_binomial()`, `tidy_zero_truncated_negative_binomial()`, `tidy_zero_truncated_poisson()`

Other Binomial: `tidy_binomial()`, `tidy_zero_truncated_binomial()`, `tidy_zero_truncated_negative_binomial()`, `util_binomial_param_estimate()`, `util_binomial_stats_tbl()`, `util_negative_binomial_param_estimate()`

Examples

```
tidy_negative_binomial()
```

tidy_normal

Tidy Randomly Generated Gaussian Distribution Tibble

Description

This function will generate `n` random points from a Gaussian distribution with a user provided, `.mean`, `.sd` - standard deviation and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the `n` randomly generated points, the `dnorm`, `pnorm` and `qnorm` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of `n` for the current simulation.
- `y` The randomly generated data point.
- `dx` The `x` value from the `stats::density()` function.
- `dy` The `y` value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_normal(.n = 50, .mean = 0, .sd = 1, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.mean</code>	The mean of the randomly generated data.
<code>.sd</code>	The standard deviation of the randomly generated data.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `stats::rnorm()`, `stats::pnorm()`, and `stats::qnorm()` functions to generate data from the given parameters. For more information please see [stats::rnorm\(\)](#)

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Continuous Distribution: [tidy_beta\(\)](#), [tidy_burr\(\)](#), [tidy_cauchy\(\)](#), [tidy_chisquare\(\)](#), [tidy_exponential\(\)](#), [tidy_f\(\)](#), [tidy_gamma\(\)](#), [tidy_generalized_beta\(\)](#), [tidy_generalized_pareto\(\)](#), [tidy_geometric\(\)](#), [tidy_inverse_burr\(\)](#), [tidy_inverse_exponential\(\)](#), [tidy_inverse_gamma\(\)](#), [tidy_inverse_normal\(\)](#), [tidy_inverse_pareto\(\)](#), [tidy_inverse_weibull\(\)](#), [tidy_logistic\(\)](#), [tidy_lognormal\(\)](#), [tidy_paralogistic\(\)](#), [tidy_pareto1\(\)](#), [tidy_pareto\(\)](#), [tidy_t\(\)](#), [tidy_uniform\(\)](#), [tidy_weibull\(\)](#), [tidy_zero_truncated_geometric\(\)](#)

Other Gaussian: [tidy_inverse_normal\(\)](#), [util_normal_param_estimate\(\)](#), [util_normal_stats_tbl\(\)](#)

Examples

```
tidy_normal()
```

tidy_paralogistic *Tidy Randomly Generated Paralogistic Distribution Tibble*

Description

This function will generate n random points from a paralogistic distribution with a user provided, `.shape`, `.rate`, `.scale` and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the n randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the `stats::density()` function.
- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_paralogistic(
  .n = 50,
  .shape = 1,
  .rate = 1,
  .scale = 1/.rate,
  .num_sims = 1
)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.shape</code>	Must be strictly positive.
<code>.rate</code>	An alternative way to specify the <code>.scale</code>
<code>.scale</code>	Must be strictly positive.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `actuar::rparalogis()`, and its underlying `p`, `d`, and `q` functions. For more information please see `actuar::rparalogis()`

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

https://en.wikipedia.org/wiki/Logistic_distribution

Other Continuous Distribution: `tidy_beta()`, `tidy_burr()`, `tidy_cauchy()`, `tidy_chisquare()`, `tidy_exponential()`, `tidy_f()`, `tidy_gamma()`, `tidy_generalized_beta()`, `tidy_generalized_pareto()`, `tidy_geometric()`, `tidy_inverse_burr()`, `tidy_inverse_exponential()`, `tidy_inverse_gamma()`, `tidy_inverse_normal()`, `tidy_inverse_pareto()`, `tidy_inverse_weibull()`, `tidy_logistic()`, `tidy_lognormal()`, `tidy_normal()`, `tidy_pareto1()`, `tidy_pareto()`, `tidy_t()`, `tidy_uniform()`, `tidy_weibull()`, `tidy_zero_truncated_geometric()`

Other Logistic: `tidy_logistic()`, `util_logistic_param_estimate()`, `util_logistic_stats_tbl()`

Examples

```
tidy_paralogistic()
```

tidy_pareto

Tidy Randomly Generated Pareto Distribution Tibble

Description

This function will generate n random points from a pareto distribution with a user provided, `.shape`, `.scale`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the n randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the `stats::density()` function.
- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_pareto(.n = 50, .shape = 10, .scale = 0.1, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.shape</code>	Must be positive.
<code>.scale</code>	Must be positive.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `actuar::rpareto()`, and its underlying `p`, `d`, and `q` functions. For more information please see [actuar::rpareto\(\)](#)

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://openacttexts.github.io/Loss-Data-Analytics/ChapSummaryDistributions.html>

Other Continuous Distribution: `tidy_beta()`, `tidy_burr()`, `tidy_cauchy()`, `tidy_chisquare()`, `tidy_exponential()`, `tidy_f()`, `tidy_gamma()`, `tidy_generalized_beta()`, `tidy_generalized_pareto()`, `tidy_geometric()`, `tidy_inverse_burr()`, `tidy_inverse_exponential()`, `tidy_inverse_gamma()`, `tidy_inverse_normal()`, `tidy_inverse_pareto()`, `tidy_inverse_weibull()`, `tidy_logistic()`, `tidy_lognormal()`, `tidy_normal()`, `tidy_paralogistic()`, `tidy_pareto1()`, `tidy_t()`, `tidy_uniform()`, `tidy_weibull()`, `tidy_zero_truncated_geometric()`

Other Pareto: `tidy_generalized_pareto()`, `tidy_inverse_pareto()`, `tidy_pareto1()`, `util_pareto_param_estimat`, `util_pareto_stats_tbl()`

Examples

```
tidy_pareto()
```

`tidy_pareto1`*Tidy Randomly Generated Pareto Single Parameter Distribution Tibble*

Description

This function will generate `n` random points from a single parameter pareto distribution with a user provided, `.shape`, `.min`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the `n` randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of `n` for the current simulation.
- `y` The randomly generated data point.
- `dx` The `x` value from the `stats::density()` function.
- `dy` The `y` value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_pareto1(.n = 50, .shape = 1, .min = 1, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.shape</code>	Must be positive.
<code>.min</code>	The lower bound of the support of the distribution.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `actuar::rpareto1()`, and its underlying `p`, `d`, and `q` functions. For more information please see [actuar::rpareto1\(\)](#)

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://openacttexts.github.io/Loss-Data-Analytics/ChapSummaryDistributions.html>

Other Continuous Distribution: `tidy_beta()`, `tidy_burr()`, `tidy_cauchy()`, `tidy_chisquare()`, `tidy_exponential()`, `tidy_f()`, `tidy_gamma()`, `tidy_generalized_beta()`, `tidy_generalized_pareto()`, `tidy_geometric()`, `tidy_inverse_burr()`, `tidy_inverse_exponential()`, `tidy_inverse_gamma()`, `tidy_inverse_normal()`, `tidy_inverse_pareto()`, `tidy_inverse_weibull()`, `tidy_logistic()`, `tidy_lognormal()`, `tidy_normal()`, `tidy_paralogistic()`, `tidy_pareto()`, `tidy_t()`, `tidy_uniform()`, `tidy_weibull()`, `tidy_zero_truncated_geometric()`

Other Pareto: `tidy_generalized_pareto()`, `tidy_inverse_pareto()`, `tidy_pareto()`, `util_pareto_param_estimate`, `util_pareto_stats_tbl()`

Examples

```
tidy_pareto1()
```

tidy_poisson	<i>Tidy Randomly Generated Poisson Distribution Tibble</i>
--------------	--

Description

This function will generate n random points from a Poisson distribution with a user provided, `.lambda`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the n randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the `stats::density()` function.
- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_poisson(.n = 50, .lambda = 1, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.lambda</code>	A vector of non-negative means.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `stats::rpois()`, and its underlying `p`, `d`, and `q` functions. For more information please see `stats::rpois()`

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://r-coder.com/poisson-distribution-r/>

https://en.wikipedia.org/wiki/Poisson_distribution

Other Poisson: `tidy_zero_truncated_poisson()`, `util_poisson_param_estimate()`, `util_poisson_stats_tbl()`

Other Discrete Distribution: `tidy_binomial()`, `tidy_hypergeometric()`, `tidy_negative_binomial()`, `tidy_zero_truncated_binomial()`, `tidy_zero_truncated_negative_binomial()`, `tidy_zero_truncated_poisson()`

Examples

```
tidy_poisson()
```

tidy_random_walk	<i>Tidy Random Walk</i>
------------------	-------------------------

Description

Takes in the data from a `tidy_` distribution function and applies a random walk calculation of either `cum_prod` or `cum_sum` to `y`.

Usage

```
tidy_random_walk(  
  .data,  
  .initial_value = 0,  
  .sample = FALSE,  
  .replace = FALSE,  
  .value_type = "cum_prod"  
)
```

Arguments

<code>.data</code>	The data that is being passed from a <code>tidy_</code> distribution function.
<code>.initial_value</code>	The default is 0, this can be set to whatever you want.
<code>.sample</code>	This is a boolean value TRUE/FALSE. The default is FALSE. If set to TRUE then the y value from the <code>tidy_</code> distribution function is sampled.
<code>.replace</code>	This is a boolean value TRUE/FALSE. The default is FALSE. If set to TRUE AND <code>.sample</code> is set to TRUE then the replace parameter of the sample function will be set to TRUE.
<code>.value_type</code>	This can take one of three different values for now. These are the following: <ul style="list-style-type: none">• "cum_prod" - This will take the cumprod of y• "cum_sum" - This will take the cumsum of y

Details

Monte Carlo simulations were first formally designed in the 1940's while developing nuclear weapons, and since have been heavily used in various fields to use randomness solve problems that are potentially deterministic in nature. In finance, Monte Carlo simulations can be a useful tool to give a sense of how assets with certain characteristics might behave in the future. While there are more complex and sophisticated financial forecasting methods such as ARIMA (Auto-Regressive Integrated Moving Average) and GARCH (Generalised Auto-Regressive Conditional Heteroskedasticity) which attempt to model not only the randomness but underlying macro factors such as seasonality and volatility clustering, Monte Carlo random walks work surprisingly well in illustrating market volatility as long as the results are not taken too seriously.

Value

An ungrouped tibble.

Author(s)

Steven P. Sanderson II, MPH

Examples

```
tidy_normal(.sd = .1, .num_sims = 25) %>%
  tidy_random_walk()
```

tidy_random_walk_autoplot

Automatic Plot of Random Walk Data

Description

This is an auto-plotting function that will take in a tidy_ distribution function and a few arguments with regard to the output of the visualization.

If the number of simulations exceeds 9 then the legend will not print. The plot subtitle is put together by the attributes of the table passed to the function.

Usage

```
tidy_random_walk_autoplot(
  .data,
  .line_size = 1,
  .geom_rug = FALSE,
  .geom_smooth = FALSE,
  .interactive = FALSE
)
```

Arguments

<code>.data</code>	The data passed in from a tidy_distribution function like tidy_normal()
<code>.line_size</code>	The size param ggplot
<code>.geom_rug</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return the use of ggplot2::geom_rug()
<code>.geom_smooth</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return the use of ggplot2::geom_smooth() The aes parameter of group is set to FALSE. This ensures a single smoothing band returned with SE also set to FALSE. Color is set to 'black' and linetype is 'dashed'.
<code>.interactive</code>	A Boolean value of TRUE/FALSE, FALSE is the default. TRUE will return an interactive plotly plot.

Details

This function will produce a simple random walk plot from a tidy_ distribution function.

Value

A ggplot or a plotly plot.

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Autoplot: [tidy_autoplot\(\)](#), [tidy_combined_autoplot\(\)](#), [tidy_four_autoplot\(\)](#), [tidy_multi_dist_autoplot](#)

Examples

```
tidy_normal(.sd = .1, .num_sims = 5) %>%
  tidy_random_walk(.value_type = "cum_sum") %>%
  tidy_random_walk_autoplot()

tidy_normal(.sd = .1, .num_sims = 20) %>%
  tidy_random_walk(.value_type = "cum_sum", .sample = TRUE, .replace = TRUE) %>%
  tidy_random_walk_autoplot()
```

tidy_range_statistic *Get the range statistic*

Description

Takes in a numeric vector and returns back the range of that vector

Usage

```
tidy_range_statistic(.x)
```

Arguments

.x A numeric vector

Details

Takes in a numeric vector and returns the range of that vector using the diff and range functions.

Value

A single number, the range statistic

Author(s)

Steven P. Sandeson II, MPH

See Also

Other Statistic: [ci_hi\(\)](#), [ci_lo\(\)](#), [tidy_kurtosis_vec\(\)](#), [tidy_skewness_vec\(\)](#)

Examples

```
tidy_range_statistic(seq(1:10))
```

`tidy_scale_zero_one_vec`*Vector Function Scale to Zero and One*

Description

Takes a numeric vector and will return a vector that has been scaled from $[0, 1]$

Usage

```
tidy_scale_zero_one_vec(.x)
```

Arguments

`.x` A numeric vector to be scaled from $[0, 1]$ inclusive.

Details

Takes a numeric vector and will return a vector that has been scaled from $[0, 1]$ The input vector must be numeric. The computation is fairly straightforward. This may be helpful when trying to compare the distributions of data where a distribution like beta which requires data to be between 0 and 1

$$y[h] = (x - \min(x)) / (\max(x) - \min(x))$$

Value

A numeric vector

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Vector Function: [tidy_kurtosis_vec\(\)](#), [tidy_skewness_vec\(\)](#)

Examples

```
vec_1 <- rnorm(100, 2, 1)
vec_2 <- tidy_scale_zero_one_vec(vec_1)

dens_1 <- density(vec_1)
dens_2 <- density(vec_2)
max_x <- max(dens_1$x, dens_2$x)
max_y <- max(dens_1$y, dens_2$y)
plot(dens_1, asp = max_y/max_x, main = "Density vec_1 (Red) and vec_2 (Blue)",
     col = "red", xlab = "", ylab = "Density of Vec 1 and Vec 2")
lines(dens_2, col = "blue")
```

tidy_skewness_vec *Compute Skewness of a Vector*

Description

This function takes in a vector as it's input and will return the skewness of that vector. The length of this vector must be at least four numbers. The skewness explains the 'tailedness' of the distribution of data.

$$\frac{((1/n) * \sum(x - \mu)^3)}{(((1/n) * \sum(x - \mu)^2)^{3/2})}$$

Usage

```
tidy_skewness_vec(.x)
```

Arguments

.x A numeric vector of length four or more.

Details

A function to return the skewness of a vector.

Value

The skewness of a vector

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://en.wikipedia.org/wiki/Skewness>

Other Statistic: [ci_hi\(\)](#), [ci_lo\(\)](#), [tidy_kurtosis_vec\(\)](#), [tidy_range_statistic\(\)](#)

Other Vector Function: [tidy_kurtosis_vec\(\)](#), [tidy_scale_zero_one_vec\(\)](#)

Examples

```
tidy_skewness_vec(rnorm(100, 3, 2))
```

`tidy_t`*Tidy Randomly Generated T Distribution Tibble*

Description

This function will generate n random points from a rt distribution with a user provided, df , ncp , and number of random simulations to be produced. The function returns a tibble with the simulation number column the x column which corresponds to the n randomly generated points, the $d_$, $p_$ and $q_$ data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the `stats::density()` function.
- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting $p_$ function of the distribution family.
- `q` The values from the resulting $q_$ function of the distribution family.

Usage

```
tidy_t(.n = 50, .df = 1, .ncp = 0, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.df</code>	Degrees of freedom, Inf is allowed.
<code>.ncp</code>	Non-centrality parameter.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `stats::rt()`, and its underlying p , d , and q functions. For more information please see `stats::rt()`

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://www.itl.nist.gov/div898/handbook/eda/section3/eda3664.htm>

Other Continuous Distribution: `tidy_beta()`, `tidy_burr()`, `tidy_cauchy()`, `tidy_chisquare()`, `tidy_exponential()`, `tidy_f()`, `tidy_gamma()`, `tidy_generalized_beta()`, `tidy_generalized_pareto()`, `tidy_geometric()`, `tidy_inverse_burr()`, `tidy_inverse_exponential()`, `tidy_inverse_gamma()`, `tidy_inverse_normal()`, `tidy_inverse_pareto()`, `tidy_inverse_weibull()`, `tidy_logistic()`, `tidy_lognormal()`, `tidy_normal()`, `tidy_paralogistic()`, `tidy_pareto1()`, `tidy_pareto()`, `tidy_uniform()`, `tidy_weibull()`, `tidy_zero_truncated_geometric()`

Other T Distribution: `util_t_stats_tbl()`

Examples

```
tidy_t()
```

```
tidy_uniform
```

```
Tidy Randomly Generated Uniform Distribution Tibble
```

Description

This function will generate n random points from a uniform distribution with a user provided, `.min` and `.max` values, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the n randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the `stats::density()` function.
- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_uniform(.n = 50, .min = 0, .max = 1, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.min</code>	A lower limit of the distribution.
<code>.max</code>	An upper limit of the distribution
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `stats::runif()`, and its underlying p, d, and q functions. For more information please see [stats::runif\(\)](#)

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://www.itl.nist.gov/div898/handbook/eda/section3/eda3662.htm>

Other Continuous Distribution: `tidy_beta()`, `tidy_burr()`, `tidy_cauchy()`, `tidy_chisquare()`, `tidy_exponential()`, `tidy_f()`, `tidy_gamma()`, `tidy_generalized_beta()`, `tidy_generalized_pareto()`, `tidy_geometric()`, `tidy_inverse_burr()`, `tidy_inverse_exponential()`, `tidy_inverse_gamma()`, `tidy_inverse_normal()`, `tidy_inverse_pareto()`, `tidy_inverse_weibull()`, `tidy_logistic()`, `tidy_lognormal()`, `tidy_normal()`, `tidy_paralogistic()`, `tidy_pareto1()`, `tidy_pareto()`, `tidy_t()`, `tidy_weibull()`, `tidy_zero_truncated_geometric()`

Other Uniform: `util_uniform_param_estimate()`, `util_uniform_stats_tbl()`

Examples

```
tidy_uniform()
```

tidy_weibull

Tidy Randomly Generated Weibull Distribution Tibble

Description

This function will generate n random points from a weibull distribution with a user provided, `.shape`, `.scale`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the x column which corresponds to the n randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the `stats::density()` function.
- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_weibull(.n = 50, .shape = 1, .scale = 1, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.shape</code>	Shape parameter defaults to 0.
<code>.scale</code>	Scale parameter defaults to 1.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `stats::rweibull()`, and its underlying p, d, and q functions. For more information please see [stats::rweibull\(\)](#)

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://www.itl.nist.gov/div898/handbook/eda/section3/eda3669.htm>

Other Continuous Distribution: [tidy_beta\(\)](#), [tidy_burr\(\)](#), [tidy_cauchy\(\)](#), [tidy_chisquare\(\)](#), [tidy_exponential\(\)](#), [tidy_f\(\)](#), [tidy_gamma\(\)](#), [tidy_generalized_beta\(\)](#), [tidy_generalized_pareto\(\)](#), [tidy_geometric\(\)](#), [tidy_inverse_burr\(\)](#), [tidy_inverse_exponential\(\)](#), [tidy_inverse_gamma\(\)](#), [tidy_inverse_normal\(\)](#), [tidy_inverse_pareto\(\)](#), [tidy_inverse_weibull\(\)](#), [tidy_logistic\(\)](#), [tidy_lognormal\(\)](#), [tidy_normal\(\)](#), [tidy_paralogistic\(\)](#), [tidy_pareto1\(\)](#), [tidy_pareto\(\)](#), [tidy_t\(\)](#), [tidy_uniform\(\)](#), [tidy_zero_truncated_geometric\(\)](#)

Other Weibull: [tidy_inverse_weibull\(\)](#), [util_weibull_param_estimate\(\)](#), [util_weibull_stats_tbl\(\)](#)

Examples

```
tidy_weibull()
```

`tidy_zero_truncated_binomial`*Tidy Randomly Generated Binomial Distribution Tibble*

Description

This function will generate n random points from a zero truncated binomial distribution with a user provided, `.size`, `.prob`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the n randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the `stats::density()` function.
- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_zero_truncated_binomial(.n = 50, .size = 0, .prob = 1, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.size</code>	Number of trials, zero or more.
<code>.prob</code>	Probability of success on each trial $0 \leq \text{prob} \leq 1$.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `actuar::rztbinom()`, and its underlying `p`, `d`, and `q` functions. For more information please see `actuar::rztbinom()`

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://openacttexts.github.io/Loss-Data-Analytics/ChapSummaryDistributions.html>

Other Discrete Distribution: `tidy_binomial()`, `tidy_hypergeometric()`, `tidy_negative_binomial()`, `tidy_poisson()`, `tidy_zero_truncated_negative_binomial()`, `tidy_zero_truncated_poisson()`

Other Binomial: `tidy_binomial()`, `tidy_negative_binomial()`, `tidy_zero_truncated_negative_binomial()`, `util_binomial_param_estimate()`, `util_binomial_stats_tbl()`, `util_negative_binomial_param_estimate()`

Other Zero Truncated Distribution: `tidy_zero_truncated_geometric()`, `tidy_zero_truncated_poisson()`

Examples

```
tidy_zero_truncated_binomial()
```

```
tidy_zero_truncated_geometric
```

Tidy Randomly Generated Zero Truncated Geometric Distribution Tibble

Description

This function will generate n random points from a zero truncated Geometric distribution with a user provided, `.prob`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the n randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the `stats::density()` function.
- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_zero_truncated_geometric(.n = 50, .prob = 1, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.prob</code>	A probability of success in each trial $0 < \text{prob} \leq 1$.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `actuar::rztgeom()`, and its underlying `p`, `d`, and `q` functions. For more information please see `actuar::rztgeom()`

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://openacttexts.github.io/Loss-Data-Analytics/ChapSummaryDistributions.html>

Other Geometric: `tidy_geometric()`, `util_geometric_param_estimate()`, `util_geometric_stats_tbl()`

Other Continuous Distribution: `tidy_beta()`, `tidy_burr()`, `tidy_cauchy()`, `tidy_chisquare()`, `tidy_exponential()`, `tidy_f()`, `tidy_gamma()`, `tidy_generalized_beta()`, `tidy_generalized_pareto()`, `tidy_geometric()`, `tidy_inverse_burr()`, `tidy_inverse_exponential()`, `tidy_inverse_gamma()`, `tidy_inverse_normal()`, `tidy_inverse_pareto()`, `tidy_inverse_weibull()`, `tidy_logistic()`, `tidy_lognormal()`, `tidy_normal()`, `tidy_paralogistic()`, `tidy_pareto1()`, `tidy_pareto()`, `tidy_t()`, `tidy_uniform()`, `tidy_weibull()`

Other Zero Truncated Distribution: `tidy_zero_truncated_binomial()`, `tidy_zero_truncated_poisson()`

Examples

```
tidy_zero_truncated_geometric()
```

```
tidy_zero_truncated_negative_binomial
```

Tidy Randomly Generated Binomial Distribution Tibble

Description

This function will generate `n` random points from a zero truncated binomial distribution with a user provided, `.size`, `.prob`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the `n` randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of `n` for the current simulation.
- `y` The randomly generated data point.
- `dx` The `x` value from the `stats::density()` function.

- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_zero_truncated_negative_binomial(
  .n = 50,
  .size = 0,
  .prob = 1,
  .num_sims = 1
)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.size</code>	Number of trials, zero or more.
<code>.prob</code>	Probability of success on each trial $0 \leq \text{prob} \leq 1$.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `actuar::rztbinom()`, and its underlying `p`, `d`, and `q` functions. For more information please see `actuar::rztbinom()`

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://openacttexts.github.io/Loss-Data-Analytics/ChapSummaryDistributions.html>

Other Discrete Distribution: `tidy_binomial()`, `tidy_hypergeometric()`, `tidy_negative_binomial()`, `tidy_poisson()`, `tidy_zero_truncated_binomial()`, `tidy_zero_truncated_poisson()`

Other Binomial: `tidy_binomial()`, `tidy_negative_binomial()`, `tidy_zero_truncated_binomial()`, `util_binomial_param_estimate()`, `util_binomial_stats_tbl()`, `util_negative_binomial_param_estimate()`

Examples

```
tidy_zero_truncated_binomial()
```

`tidy_zero_truncated_poisson`*Tidy Randomly Generated Zero Truncated Poisson Distribution Tibble*

Description

This function will generate n random points from a Zero Truncated Poisson distribution with a user provided, `.lambda`, and number of random simulations to be produced. The function returns a tibble with the simulation number column the `x` column which corresponds to the n randomly generated points, the `d_`, `p_` and `q_` data points as well.

The data is returned un-grouped.

The columns that are output are:

- `sim_number` The current simulation number.
- `x` The current value of n for the current simulation.
- `y` The randomly generated data point.
- `dx` The x value from the `stats::density()` function.
- `dy` The y value from the `stats::density()` function.
- `p` The values from the resulting `p_` function of the distribution family.
- `q` The values from the resulting `q_` function of the distribution family.

Usage

```
tidy_zero_truncated_poisson(.n = 50, .lambda = 1, .num_sims = 1)
```

Arguments

<code>.n</code>	The number of randomly generated points you want.
<code>.lambda</code>	A vector of non-negative means.
<code>.num_sims</code>	The number of randomly generated simulations you want.

Details

This function uses the underlying `actuar::rztpois()`, and its underlying `p`, `d`, and `q` functions. For more information please see `actuar::rztpois()`

Value

A tibble of randomly generated data.

Author(s)

Steven P. Sanderson II, MPH

See Also

<https://openacttexts.github.io/Loss-Data-Analytics/ChapSummaryDistributions.html>

Other Poisson: `tidy_poisson()`, `util_poisson_param_estimate()`, `util_poisson_stats_tbl()`

Other Zero Truncated Distribution: `tidy_zero_truncated_binomial()`, `tidy_zero_truncated_geometric()`

Other Discrete Distribution: `tidy_binomial()`, `tidy_hypergeometric()`, `tidy_negative_binomial()`, `tidy_poisson()`, `tidy_zero_truncated_binomial()`, `tidy_zero_truncated_negative_binomial()`

Examples

```
tidy_zero_truncated_poisson()
```

```
util_beta_param_estimate
```

Estimate Beta Parameters

Description

This function will automatically scale the data from 0 to 1 if it is not already. This means you can pass a vector like `mtcars$mpg` and not worry about it.

The function will return a list output by default, and if the parameter `.auto_gen_empirical` is set to `TRUE` then the empirical data given to the parameter `.x` will be run through the `tidy_empirical()` function and combined with the estimated beta data.

Three different methods of shape parameters are supplied:

- Bayes
- NIST mme
- EnvStats mme, see [EnvStats::ebeta\(\)](#)

Usage

```
util_beta_param_estimate(.x, .auto_gen_empirical = TRUE)
```

Arguments

`.x` The vector of data to be passed to the function. Must be numeric, and all values must be $0 \leq x \leq 1$

`.auto_gen_empirical` This is a boolean value of `TRUE/FALSE` with default set to `TRUE`. This will automatically create the `tidy_empirical()` output for the `.x` parameter and use the `tidy_combine_distributions()`. The user can then plot out the data using `$combined_data_tbl` from the function output.

Details

This function will attempt to estimate the beta `shape1` and `shape2` parameters given some vector of values.

Value

A tibble/list

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Parameter Estimation: [util_binomial_param_estimate\(\)](#), [util_cauchy_param_estimate\(\)](#), [util_exponential_param_estimate\(\)](#), [util_gamma_param_estimate\(\)](#), [util_geometric_param_estimate\(\)](#), [util_hypergeometric_param_estimate\(\)](#), [util_logistic_param_estimate\(\)](#), [util_lognormal_param_estimate\(\)](#), [util_negative_binomial_param_estimate\(\)](#), [util_normal_param_estimate\(\)](#), [util_pareto_param_estimate\(\)](#), [util_poisson_param_estimate\(\)](#), [util_uniform_param_estimate\(\)](#), [util_weibull_param_estimate\(\)](#)

Other Beta: [tidy_beta\(\)](#), [tidy_generalized_beta\(\)](#), [util_beta_stats_tbl\(\)](#)

Examples

```
library(dplyr)
library(ggplot2)

x <- mtcars$mpg
output <- util_beta_param_estimate(x)

output$parameter_tbl

output$combined_data_tbl %>%
  tidy_combinedautoplot()

tb <- rbeta(50, 2.5, 1.4)
util_beta_param_estimate(tb)$parameter_tbl
```

util_beta_stats_tbl *Distribution Statistics*

Description

Returns distribution statistics in a tibble.

Usage

```
util_beta_stats_tbl(.data)
```

Arguments

`.data` The data being passed from a `tidy_` distribution function.

Details

This function will take in a tibble and returns the statistics of the given type of tidy_ distribution. It is required that data be passed from a tidy_ distribution function.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Beta: [tidy_beta\(\)](#), [tidy_generalized_beta\(\)](#), [util_beta_param_estimate\(\)](#)

Other Distribution Statistics: [util_binomial_stats_tbl\(\)](#), [util_cauchy_stats_tbl\(\)](#), [util_chisquare_stats_tbl\(\)](#), [util_exponential_stats_tbl\(\)](#), [util_f_stats_tbl\(\)](#), [util_gamma_stats_tbl\(\)](#), [util_geometric_stats_tbl\(\)](#), [util_hypergeometric_stats_tbl\(\)](#), [util_logistic_stats_tbl\(\)](#), [util_lognormal_stats_tbl\(\)](#), [util_negative_binomial_stats_tbl\(\)](#), [util_normal_stats_tbl\(\)](#), [util_pareto_stats_tbl\(\)](#), [util_poisson_stats_tbl\(\)](#), [util_t_stats_tbl\(\)](#), [util_uniform_stats_tbl\(\)](#), [util_weibull_stats_tbl\(\)](#)

Examples

```
library(dplyr)

tidy_beta() %>%
  util_beta_stats_tbl() %>%
  glimpse()
```

util_binomial_param_estimate

Estimate Binomial Parameters

Description

This function will check to see if some given vector `.x` is either a numeric vector or a factor vector with at least two levels then it will cause an error and the function will abort. The function will return a list output by default, and if the parameter `.auto_gen_empirical` is set to `TRUE` then the empirical data given to the parameter `.x` will be run through the `tidy_empirical()` function and combined with the estimated binomial data.

Usage

```
util_binomial_param_estimate(.x, .size = NULL, .auto_gen_empirical = TRUE)
```

Arguments

- `.x` The vector of data to be passed to the function. Must be numeric, and all values must be $0 \leq x \leq 1$
- `.size` Number of trials, zero or more.
- `.auto_gen_empirical`
This is a boolean value of TRUE/FALSE with default set to TRUE. This will automatically create the `tidy_empirical()` output for the `.x` parameter and use the `tidy_combine_distributions()`. The user can then plot out the data using `$combined_data_tbl` from the function output.

Details

This function will attempt to estimate the binomial p_{hat} and size parameters given some vector of values.

Value

A tibble/list

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Parameter Estimation: [util_beta_param_estimate\(\)](#), [util_cauchy_param_estimate\(\)](#), [util_exponential_param_estimate\(\)](#), [util_gamma_param_estimate\(\)](#), [util_geometric_param_estimate\(\)](#), [util_hypergeometric_param_estimate\(\)](#), [util_logistic_param_estimate\(\)](#), [util_lognormal_param_estimate\(\)](#), [util_negative_binomial_param_estimate\(\)](#), [util_normal_param_estimate\(\)](#), [util_pareto_param_estimate\(\)](#), [util_poisson_param_estimate\(\)](#), [util_uniform_param_estimate\(\)](#), [util_weibull_param_estimate\(\)](#)

Other Binomial: [tidy_binomial\(\)](#), [tidy_negative_binomial\(\)](#), [tidy_zero_truncated_binomial\(\)](#), [tidy_zero_truncated_negative_binomial\(\)](#), [util_binomial_stats_tbl\(\)](#), [util_negative_binomial_param_estim](#)

Examples

```
library(dplyr)
library(ggplot2)

tb <- rbinom(50, 1, .1)
output <- util_binomial_param_estimate(tb)

output$parameter_tbl

output$combined_data_tbl %>%
  tidy_combined_autoplot()
```

`util_binomial_stats_tbl`*Distribution Statistics*

Description

Returns distribution statistics in a tibble.

Usage

```
util_binomial_stats_tbl(.data)
```

Arguments

`.data` The data being passed from a tidy_ distribution function.

Details

This function will take in a tibble and returns the statistics of the given type of tidy_ distribution. It is required that data be passed from a tidy_ distribution function.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Binomial: [tidy_binomial\(\)](#), [tidy_negative_binomial\(\)](#), [tidy_zero_truncated_binomial\(\)](#), [tidy_zero_truncated_negative_binomial\(\)](#), [util_binomial_param_estimate\(\)](#), [util_negative_binomial_param](#)

Other Distribution Statistics: [util_beta_stats_tbl\(\)](#), [util_cauchy_stats_tbl\(\)](#), [util_chisquare_stats_tbl\(\)](#), [util_exponential_stats_tbl\(\)](#), [util_f_stats_tbl\(\)](#), [util_gamma_stats_tbl\(\)](#), [util_geometric_stats_tbl\(\)](#), [util_hypergeometric_stats_tbl\(\)](#), [util_logistic_stats_tbl\(\)](#), [util_lognormal_stats_tbl\(\)](#), [util_negative_binomial_stats_tbl\(\)](#), [util_normal_stats_tbl\(\)](#), [util_pareto_stats_tbl\(\)](#), [util_poisson_stats_tbl\(\)](#), [util_t_stats_tbl\(\)](#), [util_uniform_stats_tbl\(\)](#), [util_weibull_stats_tbl\(\)](#)

Examples

```
library(dplyr)

tidy_binomial() %>%
  util_binomial_stats_tbl() %>%
  glimpse()
```

`util_cauchy_param_estimate`*Estimate Cauchy Parameters*

Description

The function will return a list output by default, and if the parameter `.auto_gen_empirical` is set to `TRUE` then the empirical data given to the parameter `.x` will be run through the `tidy_empirical()` function and combined with the estimated cauchy data.

Usage

```
util_cauchy_param_estimate(.x, .auto_gen_empirical = TRUE)
```

Arguments

`.x` The vector of data to be passed to the function.

`.auto_gen_empirical` This is a boolean value of `TRUE/FALSE` with default set to `TRUE`. This will automatically create the `tidy_empirical()` output for the `.x` parameter and use the `tidy_combine_distributions()`. The user can then plot out the data using `$combined_data_tbl` from the function output.

Details

This function will attempt to estimate the cauchy location and scale parameters given some vector of values.

Value

A tibble/list

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Parameter Estimation: [util_beta_param_estimate\(\)](#), [util_binomial_param_estimate\(\)](#), [util_exponential_param_estimate\(\)](#), [util_gamma_param_estimate\(\)](#), [util_geometric_param_estimate\(\)](#), [util_hypergeometric_param_estimate\(\)](#), [util_logistic_param_estimate\(\)](#), [util_lognormal_param_estimate\(\)](#), [util_negative_binomial_param_estimate\(\)](#), [util_normal_param_estimate\(\)](#), [util_pareto_param_estimate\(\)](#), [util_poisson_param_estimate\(\)](#), [util_uniform_param_estimate\(\)](#), [util_weibull_param_estimate\(\)](#)

Other Cauchy: [tidy_cauchy\(\)](#), [util_cauchy_stats_tbl\(\)](#)

Examples

```
library(dplyr)
library(ggplot2)

x <- tidy_cauchy(.location = 0, .scale = 1)$y
output <- util_cauchy_param_estimate(x)

output$parameter_tbl

output$combined_data_tbl %>%
  tidy_combinedautoplot()
```

util_cauchy_stats_tbl *Distribution Statistics*

Description

Returns distribution statistics in a tibble.

Usage

```
util_cauchy_stats_tbl(.data)
```

Arguments

`.data` The data being passed from a `tidy_` distribution function.

Details

This function will take in a tibble and returns the statistics of the given type of `tidy_` distribution. It is required that data be passed from a `tidy_` distribution function.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Cauchy: [tidy_cauchy\(\)](#), [util_cauchy_param_estimate\(\)](#)

Other Distribution Statistics: [util_beta_stats_tbl\(\)](#), [util_binomial_stats_tbl\(\)](#), [util_chisquare_stats_tbl\(\)](#), [util_exponential_stats_tbl\(\)](#), [util_f_stats_tbl\(\)](#), [util_gamma_stats_tbl\(\)](#), [util_geometric_stats_tbl\(\)](#), [util_hypergeometric_stats_tbl\(\)](#), [util_logistic_stats_tbl\(\)](#), [util_lognormal_stats_tbl\(\)](#), [util_negative_binomial_stats_tbl\(\)](#), [util_normal_stats_tbl\(\)](#), [util_pareto_stats_tbl\(\)](#), [util_poisson_stats_tbl\(\)](#), [util_t_stats_tbl\(\)](#), [util_uniform_stats_tbl\(\)](#), [util_weibull_stats_tbl\(\)](#)

Examples

```
library(dplyr)

tidy_cauchy() %>%
  util_cauchy_stats_tbl() %>%
  glimpse()
```

util_chisquare_stats_tbl

Distribution Statistics

Description

Returns distribution statistics in a tibble.

Usage

```
util_chisquare_stats_tbl(.data)
```

Arguments

`.data` The data being passed from a `tidy_` distribution function.

Details

This function will take in a tibble and returns the statistics of the given type of `tidy_` distribution. It is required that data be passed from a `tidy_` distribution function.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Chisquare: [tidy_chisquare\(\)](#)

Other Distribution Statistics: [util_beta_stats_tbl\(\)](#), [util_binomial_stats_tbl\(\)](#), [util_cauchy_stats_tbl\(\)](#), [util_exponential_stats_tbl\(\)](#), [util_f_stats_tbl\(\)](#), [util_gamma_stats_tbl\(\)](#), [util_geometric_stats_tbl\(\)](#), [util_hypergeometric_stats_tbl\(\)](#), [util_logistic_stats_tbl\(\)](#), [util_lognormal_stats_tbl\(\)](#), [util_negative_binomial_stats_tbl\(\)](#), [util_normal_stats_tbl\(\)](#), [util_pareto_stats_tbl\(\)](#), [util_poisson_stats_tbl\(\)](#), [util_t_stats_tbl\(\)](#), [util_uniform_stats_tbl\(\)](#), [util_weibull_stats_tbl\(\)](#)

Examples

```
library(dplyr)

tidy_chisquare() %>%
  util_chisquare_stats_tbl() %>%
  glimpse()
```

util_exponential_param_estimate

Estimate Exponential Parameters

Description

This function will attempt to estimate the exponential rate parameter given some vector of values. The function will return a list output by default, and if the parameter `.auto_gen_empirical` is set to `TRUE` then the empirical data given to the parameter `.x` will be run through the `tidy_empirical()` function and combined with the estimated exponential data.

Usage

```
util_exponential_param_estimate(.x, .auto_gen_empirical = TRUE)
```

Arguments

`.x` The vector of data to be passed to the function. Must be numeric.

`.auto_gen_empirical` This is a boolean value of `TRUE/FALSE` with default set to `TRUE`. This will automatically create the `tidy_empirical()` output for the `.x` parameter and use the `tidy_combine_distributions()`. The user can then plot out the data using `$combined_data_tbl` from the function output.

Details

This function will see if the given vector `.x` is a numeric vector.

Value

A tibble/list

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Parameter Estimation: `util_beta_param_estimate()`, `util_binomial_param_estimate()`, `util_cauchy_param_estimate()`, `util_gamma_param_estimate()`, `util_geometric_param_estimate()`, `util_hypergeometric_param_estimate()`, `util_logistic_param_estimate()`, `util_lognormal_param_estimate()`, `util_negative_binomial_param_estimate()`, `util_normal_param_estimate()`, `util_pareto_param_estimate()`, `util_poisson_param_estimate()`, `util_uniform_param_estimate()`, `util_weibull_param_estimate()`

Other Exponential: `tidy_exponential()`, `tidy_inverse_exponential()`, `util_exponential_stats_tbl()`

Examples

```
library(dplyr)
library(ggplot2)

te <- tidy_exponential(.rate = .1) %>% pull(y)
output <- util_exponential_param_estimate(te)

output$parameter_tbl

output$combined_data_tbl %>%
  tidy_combined_autoplot()
```

util_exponential_stats_tbl

Distribution Statistics

Description

Returns distribution statistics in a tibble.

Usage

```
util_exponential_stats_tbl(.data)
```

Arguments

`.data` The data being passed from a `tidy_` distribution function.

Details

This function will take in a tibble and returns the statistics of the given type of `tidy_` distribution. It is required that data be passed from a `tidy_` distribution function.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Exponential: [tidy_exponential\(\)](#), [tidy_inverse_exponential\(\)](#), [util_exponential_param_estimate\(\)](#)
Other Distribution Statistics: [util_beta_stats_tbl\(\)](#), [util_binomial_stats_tbl\(\)](#), [util_cauchy_stats_tbl\(\)](#),
[util_chisquare_stats_tbl\(\)](#), [util_f_stats_tbl\(\)](#), [util_gamma_stats_tbl\(\)](#), [util_geometric_stats_tbl\(\)](#),
[util_hypergeometric_stats_tbl\(\)](#), [util_logistic_stats_tbl\(\)](#), [util_lognormal_stats_tbl\(\)](#),
[util_negative_binomial_stats_tbl\(\)](#), [util_normal_stats_tbl\(\)](#), [util_pareto_stats_tbl\(\)](#),
[util_poisson_stats_tbl\(\)](#), [util_t_stats_tbl\(\)](#), [util_uniform_stats_tbl\(\)](#), [util_weibull_stats_tbl\(\)](#)

Examples

```
library(dplyr)

tidy_exponential() %>%
  util_exponential_stats_tbl() %>%
  glimpse()
```

util_f_stats_tbl	<i>Distribution Statistics</i>
------------------	--------------------------------

Description

Returns distribution statistics in a tibble.

Usage

```
util_f_stats_tbl(.data)
```

Arguments

`.data` The data being passed from a `tidy_` distribution function.

Details

This function will take in a tibble and returns the statistics of the given type of `tidy_` distribution. It is required that data be passed from a `tidy_` distribution function.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other F Distribution: `tidy_f()`

Other Distribution Statistics: `util_beta_stats_tbl()`, `util_binomial_stats_tbl()`, `util_cauchy_stats_tbl()`, `util_chisquare_stats_tbl()`, `util_exponential_stats_tbl()`, `util_gamma_stats_tbl()`, `util_geometric_stats_tbl()`, `util_hypergeometric_stats_tbl()`, `util_logistic_stats_tbl()`, `util_lognormal_stats_tbl()`, `util_negative_binomial_stats_tbl()`, `util_normal_stats_tbl()`, `util_pareto_stats_tbl()`, `util_poisson_stats_tbl()`, `util_t_stats_tbl()`, `util_uniform_stats_tbl()`, `util_weibull_stats_tbl()`

Examples

```
library(dplyr)

tidy_f() %>%
  util_f_stats_tbl() %>%
  glimpse()
```

```
util_gamma_param_estimate
```

Estimate Gamma Parameters

Description

This function will attempt to estimate the gamma shape and scale parameters given some vector of values. The function will return a list output by default, and if the parameter `.auto_gen_empirical` is set to TRUE then the empirical data given to the parameter `.x` will be run through the `tidy_empirical()` function and combined with the estimated gamma data.

Usage

```
util_gamma_param_estimate(.x, .auto_gen_empirical = TRUE)
```

Arguments

`.x` The vector of data to be passed to the function. Must be numeric.

`.auto_gen_empirical` This is a boolean value of TRUE/FALSE with default set to TRUE. This will automatically create the `tidy_empirical()` output for the `.x` parameter and use the `tidy_combine_distributions()`. The user can then plot out the data using `$combined_data_tbl` from the function output.

Details

This function will see if the given vector `.x` is a numeric vector.

Value

A tibble/list

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Parameter Estimation: [util_beta_param_estimate\(\)](#), [util_binomial_param_estimate\(\)](#), [util_cauchy_param_estimate\(\)](#), [util_exponential_param_estimate\(\)](#), [util_geometric_param_estimate\(\)](#), [util_hypergeometric_param_estimate\(\)](#), [util_logistic_param_estimate\(\)](#), [util_lognormal_param_estimate\(\)](#), [util_negative_binomial_param_estimate\(\)](#), [util_normal_param_estimate\(\)](#), [util_pareto_param_estimate\(\)](#), [util_poisson_param_estimate\(\)](#), [util_uniform_param_estimate\(\)](#), [util_weibull_param_estimate\(\)](#)

Other Gamma: [tidy_gamma\(\)](#), [tidy_inverse_gamma\(\)](#), [util_gamma_stats_tbl\(\)](#)

Examples

```
library(dplyr)
library(ggplot2)

tg <- tidy_gamma(.shape = 1, .scale = .3) %>% pull(y)
output <- util_gamma_param_estimate(tg)

output$parameter_tbl

output$combined_data_tbl %>%
  tidy_combinedautoplot()
```

util_gamma_stats_tbl *Distribution Statistics*

Description

Returns distribution statistics in a tibble.

Usage

```
util_gamma_stats_tbl(.data)
```

Arguments

`.data` The data being passed from a `tidy_` distribution function.

Details

This function will take in a tibble and returns the statistics of the given type of `tidy_` distribution. It is required that data be passed from a `tidy_` distribution function.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Gamma: `tidy_gamma()`, `tidy_inverse_gamma()`, `util_gamma_param_estimate()`

Other Distribution Statistics: `util_beta_stats_tbl()`, `util_binomial_stats_tbl()`, `util_cauchy_stats_tbl()`, `util_chisquare_stats_tbl()`, `util_exponential_stats_tbl()`, `util_f_stats_tbl()`, `util_geometric_stats_tbl()`, `util_hypergeometric_stats_tbl()`, `util_logistic_stats_tbl()`, `util_lognormal_stats_tbl()`, `util_negative_binomial_stats_tbl()`, `util_normal_stats_tbl()`, `util_pareto_stats_tbl()`, `util_poisson_stats_tbl()`, `util_t_stats_tbl()`, `util_uniform_stats_tbl()`, `util_weibull_stats_tbl()`

Examples

```
library(dplyr)

tidy_gamma() %>%
  util_gamma_stats_tbl() %>%
  glimpse()
```

util_geometric_param_estimate

Estimate Geometric Parameters

Description

This function will attempt to estimate the geometric prob parameter given some vector of values `.x`. The function will return a list output by default, and if the parameter `.auto_gen_empirical` is set to TRUE then the empirical data given to the parameter `.x` will be run through the `tidy_empirical()` function and combined with the estimated geometric data.

Usage

```
util_geometric_param_estimate(.x, .auto_gen_empirical = TRUE)
```

Arguments

`.x` The vector of data to be passed to the function. Must be non-negative integers.

`.auto_gen_empirical`

This is a boolean value of TRUE/FALSE with default set to TRUE. This will automatically create the `tidy_empirical()` output for the `.x` parameter and use the `tidy_combine_distributions()`. The user can then plot out the data using `$combined_data_tbl` from the function output.

Details

This function will see if the given vector `.x` is a numeric vector. It will attempt to estimate the prob parameter of a geometric distribution.

Value

A tibble/list

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Parameter Estimation: [util_beta_param_estimate\(\)](#), [util_binomial_param_estimate\(\)](#), [util_cauchy_param_estimate\(\)](#), [util_exponential_param_estimate\(\)](#), [util_gamma_param_estimate\(\)](#), [util_hypergeometric_param_estimate\(\)](#), [util_logistic_param_estimate\(\)](#), [util_lognormal_param_estimate\(\)](#), [util_negative_binomial_param_estimate\(\)](#), [util_normal_param_estimate\(\)](#), [util_pareto_param_estimate\(\)](#), [util_poisson_param_estimate\(\)](#), [util_uniform_param_estimate\(\)](#), [util_weibull_param_estimate\(\)](#)

Other Geometric: [tidy_geometric\(\)](#), [tidy_zero_truncated_geometric\(\)](#), [util_geometric_stats_tbl\(\)](#)

Examples

```
library(dplyr)
library(ggplot2)

tg <- tidy_geometric(.prob = .1) %>% pull(y)
output <- util_geometric_param_estimate(tg)

output$parameter_tbl

output$combined_data_tbl %>%
  tidy_combined_autoplot()
```

util_geometric_stats_tbl

Distribution Statistics

Description

Returns distribution statistics in a tibble.

Usage

```
util_geometric_stats_tbl(.data)
```

Arguments

`.data` The data being passed from a `tidy_` distribution function.

Details

This function will take in a tibble and returns the statistics of the given type of `tidy_` distribution. It is required that data be passed from a `tidy_` distribution function.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Geometric: `tidy_geometric()`, `tidy_zero_truncated_geometric()`, `util_geometric_param_estimate()`

Other Distribution Statistics: `util_beta_stats_tbl()`, `util_binomial_stats_tbl()`, `util_cauchy_stats_tbl()`, `util_chisquare_stats_tbl()`, `util_exponential_stats_tbl()`, `util_f_stats_tbl()`, `util_gamma_stats_tbl()`, `util_hypergeometric_stats_tbl()`, `util_logistic_stats_tbl()`, `util_lognormal_stats_tbl()`, `util_negative_binomial_stats_tbl()`, `util_normal_stats_tbl()`, `util_pareto_stats_tbl()`, `util_poisson_stats_tbl()`, `util_t_stats_tbl()`, `util_uniform_stats_tbl()`, `util_weibull_stats_tbl()`

Examples

```
library(dplyr)

tidy_geometric() %>%
  util_geometric_stats_tbl() %>%
  glimpse()
```

util_hypergeometric_param_estimate

Estimate Hypergeometric Parameters

Description

This function will attempt to estimate the geometric prob parameter given some vector of values `.x`. Estimate `m`, the number of white balls in the urn, or `m+n`, the total number of balls in the urn, for a hypergeometric distribution.

Usage

```
util_hypergeometric_param_estimate(
  .x,
  .m = NULL,
  .total = NULL,
  .k,
  .auto_gen_empirical = TRUE
)
```

Arguments

- `.x` A non-negative integer indicating the number of white balls out of a sample of size `.k` drawn without replacement from the urn. You cannot have missing, undefined or infinite values.
- `.m` Non-negative integer indicating the number of white balls in the urn. You must supply `.m` or `.total`, but not both. You cannot have missing values.
- `.total` A positive integer indicating the total number of balls in the urn (i.e., $m+n$). You must supply `.m` or `.total`, but not both. You cannot have missing values.
- `.k` A positive integer indicating the number of balls drawn without replacement from the urn. You cannot have missing values.
- `.auto_gen_empirical`
This is a boolean value of TRUE/FALSE with default set to TRUE. This will automatically create the `tidy_empirical()` output for the `.x` parameter and use the `tidy_combine_distributions()`. The user can then plot out the data using `$combined_data_tbl` from the function output.

Details

This function will see if the given vector `.x` is a numeric integer. It will attempt to estimate the prob parameter of a geometric distribution. Missing (NA), undefined (NaN), and infinite (Inf, -Inf) values are not allowed. Let `.x` be an observation from a hypergeometric distribution with parameters `.m = M`, `.n = N`, and `.k = K`. In R nomenclature, `.x` represents the number of white balls drawn out of a sample of `.k` balls drawn without replacement from an urn containing `.m` white balls and `.n` black balls. The total number of balls in the urn is thus `.m + .n`. Denote the total number of balls by $T = .m + .n$

Value

A tibble/list

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Parameter Estimation: [util_beta_param_estimate\(\)](#), [util_binomial_param_estimate\(\)](#), [util_cauchy_param_estimate\(\)](#), [util_exponential_param_estimate\(\)](#), [util_gamma_param_estimate\(\)](#),

```
util_geometric_param_estimate(), util_logistic_param_estimate(), util_lognormal_param_estimate(),  
util_negative_binomial_param_estimate(), util_normal_param_estimate(), util_pareto_param_estimate(),  
util_poisson_param_estimate(), util_uniform_param_estimate(), util_weibull_param_estimate()
```

Other Hypergeometric: `tidy_hypergeometric()`, `util_hypergeometric_stats_tbl()`

Examples

```
library(dplyr)  
library(ggplot2)  
  
th <- rhyper(10, 20, 30, 5)  
output <- util_hypergeometric_param_estimate(th, .total = 50, .k = 5)  
  
output$parameter_tbl  
  
output$combined_data_tbl %>%  
  tidy_combinedautoplot()
```

util_hypergeometric_stats_tbl
Distribution Statistics

Description

Returns distribution statistics in a tibble.

Usage

```
util_hypergeometric_stats_tbl(.data)
```

Arguments

`.data` The data being passed from a `tidy_` distribution function.

Details

This function will take in a tibble and returns the statistics of the given type of `tidy_` distribution. It is required that data be passed from a `tidy_` distribution function.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Hypergeometric: `tidy_hypergeometric()`, `util_hypergeometric_param_estimate()`

Other Distribution Statistics: `util_beta_stats_tbl()`, `util_binomial_stats_tbl()`, `util_cauchy_stats_tbl()`, `util_chisquare_stats_tbl()`, `util_exponential_stats_tbl()`, `util_f_stats_tbl()`, `util_gamma_stats_tbl()`, `util_geometric_stats_tbl()`, `util_logistic_stats_tbl()`, `util_lognormal_stats_tbl()`, `util_negative_binomial_stats_tbl()`, `util_normal_stats_tbl()`, `util_pareto_stats_tbl()`, `util_poisson_stats_tbl()`, `util_t_stats_tbl()`, `util_uniform_stats_tbl()`, `util_weibull_stats_tbl()`

Examples

```
library(dplyr)

tidy_hypergeometric() %>%
  util_hypergeometric_stats_tbl() %>%
  glimpse()
```

util_logistic_param_estimate

Estimate Logistic Parameters

Description

The function will return a list output by default, and if the parameter `.auto_gen_empirical` is set to TRUE then the empirical data given to the parameter `.x` will be run through the `tidy_empirical()` function and combined with the estimated logistic data.

Three different methods of shape parameters are supplied:

- MLE
- MME
- MMUE

Usage

```
util_logistic_param_estimate(.x, .auto_gen_empirical = TRUE)
```

Arguments

`.x` The vector of data to be passed to the function.

`.auto_gen_empirical`

This is a boolean value of TRUE/FALSE with default set to TRUE. This will automatically create the `tidy_empirical()` output for the `.x` parameter and use the `tidy_combine_distributions()`. The user can then plot out the data using `$combined_data_tbl` from the function output.

Details

This function will attempt to estimate the logistic location and scale parameters given some vector of values.

Value

A tibble/list

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Parameter Estimation: [util_beta_param_estimate\(\)](#), [util_binomial_param_estimate\(\)](#), [util_cauchy_param_estimate\(\)](#), [util_exponential_param_estimate\(\)](#), [util_gamma_param_estimate\(\)](#), [util_geometric_param_estimate\(\)](#), [util_hypergeometric_param_estimate\(\)](#), [util_lognormal_param_estimate\(\)](#), [util_negative_binomial_param_estimate\(\)](#), [util_normal_param_estimate\(\)](#), [util_pareto_param_estimate\(\)](#), [util_poisson_param_estimate\(\)](#), [util_uniform_param_estimate\(\)](#), [util_weibull_param_estimate\(\)](#)

Other Logistic: [tidy_logistic\(\)](#), [tidy_paralogistic\(\)](#), [util_logistic_stats_tbl\(\)](#)

Examples

```
library(dplyr)
library(ggplot2)

x <- mtcars$mpg
output <- util_logistic_param_estimate(x)

output$parameter_tbl

output$combined_data_tbl %>%
  tidy_combinedautoplot()

t <- rlogis(50, 2.5, 1.4)
util_logistic_param_estimate(t)$parameter_tbl
```

util_logistic_stats_tbl

Distribution Statistics

Description

Returns distribution statistics in a tibble.

Usage

```
util_logistic_stats_tbl(.data)
```

Arguments

`.data` The data being passed from a `tidy_` distribution function.

Details

This function will take in a tibble and returns the statistics of the given type of `tidy_` distribution. It is required that data be passed from a `tidy_` distribution function.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Logistic: [tidy_logistic\(\)](#), [tidy_paralogistic\(\)](#), [util_logistic_param_estimate\(\)](#)

Other Distribution Statistics: [util_beta_stats_tbl\(\)](#), [util_binomial_stats_tbl\(\)](#), [util_cauchy_stats_tbl\(\)](#), [util_chisquare_stats_tbl\(\)](#), [util_exponential_stats_tbl\(\)](#), [util_f_stats_tbl\(\)](#), [util_gamma_stats_tbl\(\)](#), [util_geometric_stats_tbl\(\)](#), [util_hypergeometric_stats_tbl\(\)](#), [util_lognormal_stats_tbl\(\)](#), [util_negative_binomial_stats_tbl\(\)](#), [util_normal_stats_tbl\(\)](#), [util_pareto_stats_tbl\(\)](#), [util_poisson_stats_tbl\(\)](#), [util_t_stats_tbl\(\)](#), [util_uniform_stats_tbl\(\)](#), [util_weibull_stats_tbl\(\)](#)

Examples

```
library(dplyr)

tidy_logistic() %>%
  util_logistic_stats_tbl() %>%
  glimpse()
```

`util_lognormal_param_estimate`

Estimate Lognormal Parameters

Description

The function will return a list output by default, and if the parameter `.auto_gen_empirical` is set to `TRUE` then the empirical data given to the parameter `.x` will be run through the `tidy_empirical()` function and combined with the estimated lognormal data.

Three different methods of shape parameters are supplied:

- `mme`, see [EnvStats::elnorm\(\)](#)
- `mle`, see [EnvStats::elnorm\(\)](#)

Usage

```
util_lognormal_param_estimate(.x, .auto_gen_empirical = TRUE)
```

Arguments

`.x` The vector of data to be passed to the function.

`.auto_gen_empirical` This is a boolean value of TRUE/FALSE with default set to TRUE. This will automatically create the `tidy_empirical()` output for the `.x` parameter and use the `tidy_combine_distributions()`. The user can then plot out the data using `$combined_data_tbl` from the function output.

Details

This function will attempt to estimate the lognormal meanlog and log sd parameters given some vector of values.

Value

A tibble/list

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Parameter Estimation: [util_beta_param_estimate\(\)](#), [util_binomial_param_estimate\(\)](#), [util_cauchy_param_estimate\(\)](#), [util_exponential_param_estimate\(\)](#), [util_gamma_param_estimate\(\)](#), [util_geometric_param_estimate\(\)](#), [util_hypergeometric_param_estimate\(\)](#), [util_logistic_param_estimate\(\)](#), [util_negative_binomial_param_estimate\(\)](#), [util_normal_param_estimate\(\)](#), [util_pareto_param_estimate\(\)](#), [util_poisson_param_estimate\(\)](#), [util_uniform_param_estimate\(\)](#), [util_weibull_param_estimate\(\)](#)

Other Lognormal: [tidy_lognormal\(\)](#), [util_lognormal_stats_tbl\(\)](#)

Examples

```
library(dplyr)
library(ggplot2)

x <- mtcars$mpg
output <- util_lognormal_param_estimate(x)

output$parameter_tbl

output$combined_data_tbl %>%
  tidy_combinedautoplot()

tb <- tidy_lognormal(.meanlog = 2, .sdlog = 1) %>% pull(y)
util_lognormal_param_estimate(tb)$parameter_tbl
```

`util_lognormal_stats_tbl`*Distribution Statistics*

Description

Returns distribution statistics in a tibble.

Usage

```
util_lognormal_stats_tbl(.data)
```

Arguments

`.data` The data being passed from a `tidy_` distribution function.

Details

This function will take in a tibble and returns the statistics of the given type of `tidy_` distribution. It is required that data be passed from a `tidy_` distribution function.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Lognormal: [tidy_lognormal\(\)](#), [util_lognormal_param_estimate\(\)](#)

Other Distribution Statistics: [util_beta_stats_tbl\(\)](#), [util_binomial_stats_tbl\(\)](#), [util_cauchy_stats_tbl\(\)](#), [util_chisquare_stats_tbl\(\)](#), [util_exponential_stats_tbl\(\)](#), [util_f_stats_tbl\(\)](#), [util_gamma_stats_tbl\(\)](#), [util_geometric_stats_tbl\(\)](#), [util_hypergeometric_stats_tbl\(\)](#), [util_logistic_stats_tbl\(\)](#), [util_negative_binomial_stats_tbl\(\)](#), [util_normal_stats_tbl\(\)](#), [util_pareto_stats_tbl\(\)](#), [util_poisson_stats_tbl\(\)](#), [util_t_stats_tbl\(\)](#), [util_uniform_stats_tbl\(\)](#), [util_weibull_stats_tbl\(\)](#)

Examples

```
library(dplyr)

tidy_lognormal() %>%
  util_lognormal_stats_tbl() %>%
  glimpse()
```

`util_negative_binomial_param_estimate`*Estimate Negative Binomial Parameters*

Description

The function will return a list output by default, and if the parameter `.auto_gen_empirical` is set to `TRUE` then the empirical data given to the parameter `.x` will be run through the `tidy_empirical()` function and combined with the estimated negative binomial data.

Two different methods of shape parameters are supplied:

- MLE/MME
- MMUE

Usage

```
util_negative_binomial_param_estimate(.x, .size, .auto_gen_empirical = TRUE)
```

Arguments

`.x` The vector of data to be passed to the function.

`.size` The size parameter.

`.auto_gen_empirical`

This is a boolean value of `TRUE/FALSE` with default set to `TRUE`. This will automatically create the `tidy_empirical()` output for the `.x` parameter and use the `tidy_combine_distributions()`. The user can then plot out the data using `$combined_data_tbl` from the function output.

Details

This function will attempt to estimate the negative binomial size and prob parameters given some vector of values.

Value

A tibble/list

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Parameter Estimation: `util_beta_param_estimate()`, `util_binomial_param_estimate()`, `util_cauchy_param_estimate()`, `util_exponential_param_estimate()`, `util_gamma_param_estimate()`, `util_geometric_param_estimate()`, `util_hypergeometric_param_estimate()`, `util_logistic_param_estimate()`, `util_lognormal_param_estimate()`, `util_normal_param_estimate()`, `util_pareto_param_estimate()`, `util_poisson_param_estimate()`, `util_uniform_param_estimate()`, `util_weibull_param_estimate()`

Other Binomial: `tidy_binomial()`, `tidy_negative_binomial()`, `tidy_zero_truncated_binomial()`, `tidy_zero_truncated_negative_binomial()`, `util_binomial_param_estimate()`, `util_binomial_stats_tbl()`

Examples

```
library(dplyr)
library(ggplot2)

x <- as.integer(mtcars$mpg)
output <- util_negative_binomial_param_estimate(x, .size = 1)

output$parameter_tbl

output$combined_data_tbl %>%
  tidy_combinedautoplot()

t <- rnbinom(50, 1, .1)
util_negative_binomial_param_estimate(t, .size = 1)$parameter_tbl
```

```
util_negative_binomial_stats_tbl
```

Distribution Statistics

Description

Returns distribution statistics in a tibble.

Usage

```
util_negative_binomial_stats_tbl(.data)
```

Arguments

`.data` The data being passed from a `tidy_` distribution function.

Details

This function will take in a tibble and returns the statistics of the given type of `tidy_` distribution. It is required that data be passed from a `tidy_` distribution function.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Distribution Statistics: [util_beta_stats_tbl\(\)](#), [util_binomial_stats_tbl\(\)](#), [util_cauchy_stats_tbl\(\)](#), [util_chisquare_stats_tbl\(\)](#), [util_exponential_stats_tbl\(\)](#), [util_f_stats_tbl\(\)](#), [util_gamma_stats_tbl\(\)](#), [util_geometric_stats_tbl\(\)](#), [util_hypergeometric_stats_tbl\(\)](#), [util_logistic_stats_tbl\(\)](#), [util_lognormal_stats_tbl\(\)](#), [util_normal_stats_tbl\(\)](#), [util_pareto_stats_tbl\(\)](#), [util_poisson_stats_tbl\(\)](#), [util_t_stats_tbl\(\)](#), [util_uniform_stats_tbl\(\)](#), [util_weibull_stats_tbl\(\)](#)

Examples

```
library(dplyr)

tidy_negative_binomial() %>%
  util_negative_binomial_stats_tbl() %>%
  glimpse()
```

util_normal_param_estimate

Estimate Normal Gaussian Parameters

Description

The function will return a list output by default, and if the parameter `.auto_gen_empirical` is set to `TRUE` then the empirical data given to the parameter `.x` will be run through the `tidy_empirical()` function and combined with the estimated normal data.

Three different methods of shape parameters are supplied:

- MLE/MME
- MVUE

Usage

```
util_normal_param_estimate(.x, .auto_gen_empirical = TRUE)
```

Arguments

- `.x` The vector of data to be passed to the function.
- `.auto_gen_empirical` This is a boolean value of TRUE/FALSE with default set to TRUE. This will automatically create the `tidy_empirical()` output for the `.x` parameter and use the `tidy_combine_distributions()`. The user can then plot out the data using `$combined_data_tbl` from the function output.

Details

This function will attempt to estimate the normal gaussian mean and standard deviation parameters given some vector of values.

Value

A tibble/list

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Parameter Estimation: [util_beta_param_estimate\(\)](#), [util_binomial_param_estimate\(\)](#), [util_cauchy_param_estimate\(\)](#), [util_exponential_param_estimate\(\)](#), [util_gamma_param_estimate\(\)](#), [util_geometric_param_estimate\(\)](#), [util_hypergeometric_param_estimate\(\)](#), [util_logistic_param_estimate\(\)](#), [util_lognormal_param_estimate\(\)](#), [util_negative_binomial_param_estimate\(\)](#), [util_pareto_param_estimate\(\)](#), [util_poisson_param_estimate\(\)](#), [util_uniform_param_estimate\(\)](#), [util_weibull_param_estimate\(\)](#)

Other Gaussian: [tidy_inverse_normal\(\)](#), [tidy_normal\(\)](#), [util_normal_stats_tbl\(\)](#)

Examples

```
library(dplyr)
library(ggplot2)

x <- mtcars$mpg
output <- util_normal_param_estimate(x)

output$parameter_tbl

output$combined_data_tbl %>%
  tidy_combined_autoplot()

t <- rnorm(50, 0, 1)
util_normal_param_estimate(t)$parameter_tbl
```

util_normal_stats_tbl *Distribution Statistics*

Description

Returns distribution statistics in a tibble.

Usage

```
util_normal_stats_tbl(.data)
```

Arguments

`.data` The data being passed from a tidy_ distribution function.

Details

This function will take in a tibble and returns the statistics of the given type of tidy_ distribution. It is required that data be passed from a tidy_ distribution function.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Gaussian: [tidy_inverse_normal\(\)](#), [tidy_normal\(\)](#), [util_normal_param_estimate\(\)](#)

Other Distribution Statistics: [util_beta_stats_tbl\(\)](#), [util_binomial_stats_tbl\(\)](#), [util_cauchy_stats_tbl\(\)](#), [util_chisquare_stats_tbl\(\)](#), [util_exponential_stats_tbl\(\)](#), [util_f_stats_tbl\(\)](#), [util_gamma_stats_tbl\(\)](#), [util_geometric_stats_tbl\(\)](#), [util_hypergeometric_stats_tbl\(\)](#), [util_logistic_stats_tbl\(\)](#), [util_lognormal_stats_tbl\(\)](#), [util_negative_binomial_stats_tbl\(\)](#), [util_pareto_stats_tbl\(\)](#), [util_poisson_stats_tbl\(\)](#), [util_t_stats_tbl\(\)](#), [util_uniform_stats_tbl\(\)](#), [util_weibull_stats_tbl\(\)](#)

Examples

```
library(dplyr)

tidy_normal() %>%
  util_normal_stats_tbl() %>%
  glimpse()
```

`util_pareto_param_estimate`*Estimate Pareto Parameters*

Description

The function will return a list output by default, and if the parameter `.auto_gen_empirical` is set to `TRUE` then the empirical data given to the parameter `.x` will be run through the `tidy_empirical()` function and combined with the estimated pareto data.

Two different methods of shape parameters are supplied:

- LSE
- MLE

Usage

```
util_pareto_param_estimate(.x, .auto_gen_empirical = TRUE)
```

Arguments

`.x` The vector of data to be passed to the function.

`.auto_gen_empirical`

This is a boolean value of `TRUE/FALSE` with default set to `TRUE`. This will automatically create the `tidy_empirical()` output for the `.x` parameter and use the `tidy_combine_distributions()`. The user can then plot out the data using `$combined_data_tbl` from the function output.

Details

This function will attempt to estimate the pareto shape and scale parameters given some vector of values.

Value

A tibble/list

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Parameter Estimation: [util_beta_param_estimate\(\)](#), [util_binomial_param_estimate\(\)](#), [util_cauchy_param_estimate\(\)](#), [util_exponential_param_estimate\(\)](#), [util_gamma_param_estimate\(\)](#), [util_geometric_param_estimate\(\)](#), [util_hypergeometric_param_estimate\(\)](#), [util_logistic_param_estimate\(\)](#), [util_lognormal_param_estimate\(\)](#), [util_negative_binomial_param_estimate\(\)](#), [util_normal_param_estimate\(\)](#), [util_poisson_param_estimate\(\)](#), [util_uniform_param_estimate\(\)](#), [util_weibull_param_estimate\(\)](#)

Other Pareto: [tidy_generalized_pareto\(\)](#), [tidy_inverse_pareto\(\)](#), [tidy_pareto1\(\)](#), [tidy_pareto\(\)](#), [util_pareto_stats_tbl\(\)](#)

Examples

```
library(dplyr)
library(ggplot2)

x <- mtcars$mpg
output <- util_pareto_param_estimate(x)

output$parameter_tbl

output$combined_data_tbl %>%
  tidy_combined_autoplot()

t <- tidy_pareto(50, 1, 1) %>% pull(y)
util_pareto_param_estimate(t)$parameter_tbl
```

util_pareto_stats_tbl *Distribution Statistics*

Description

Returns distribution statistics in a tibble.

Usage

```
util_pareto_stats_tbl(.data)
```

Arguments

`.data` The data being passed from a `tidy_` distribution function.

Details

This function will take in a tibble and returns the statistics of the given type of `tidy_` distribution. It is required that data be passed from a `tidy_` distribution function.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Pareto: `tidy_generalized_pareto()`, `tidy_inverse_pareto()`, `tidy_pareto1()`, `tidy_pareto()`, `util_pareto_param_estimate()`

Other Distribution Statistics: `util_beta_stats_tbl()`, `util_binomial_stats_tbl()`, `util_cauchy_stats_tbl()`, `util_chisquare_stats_tbl()`, `util_exponential_stats_tbl()`, `util_f_stats_tbl()`, `util_gamma_stats_tbl()`, `util_geometric_stats_tbl()`, `util_hypergeometric_stats_tbl()`, `util_logistic_stats_tbl()`, `util_lognormal_stats_tbl()`, `util_negative_binomial_stats_tbl()`, `util_normal_stats_tbl()`, `util_poisson_stats_tbl()`, `util_t_stats_tbl()`, `util_uniform_stats_tbl()`, `util_weibull_stats_tbl()`

Examples

```
library(dplyr)

tidy_pareto() %>%
  util_pareto_stats_tbl() %>%
  glimpse()
```

```
util_poisson_param_estimate
```

Estimate Poisson Parameters

Description

The function will return a list output by default, and if the parameter `.auto_gen_empirical` is set to `TRUE` then the empirical data given to the parameter `.x` will be run through the `tidy_empirical()` function and combined with the estimated poisson data.

Usage

```
util_poisson_param_estimate(.x, .auto_gen_empirical = TRUE)
```

Arguments

`.x` The vector of data to be passed to the function.

`.auto_gen_empirical` This is a boolean value of `TRUE/FALSE` with default set to `TRUE`. This will automatically create the `tidy_empirical()` output for the `.x` parameter and use the `tidy_combine_distributions()`. The user can then plot out the data using `$combined_data_tbl` from the function output.

Details

This function will attempt to estimate the pareto lambda parameter given some vector of values.

Value

A tibble/list

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Parameter Estimation: `util_beta_param_estimate()`, `util_binomial_param_estimate()`, `util_cauchy_param_estimate()`, `util_exponential_param_estimate()`, `util_gamma_param_estimate()`, `util_geometric_param_estimate()`, `util_hypergeometric_param_estimate()`, `util_logistic_param_estimate()`, `util_lognormal_param_estimate()`, `util_negative_binomial_param_estimate()`, `util_normal_param_estimate()`, `util_pareto_param_estimate()`, `util_uniform_param_estimate()`, `util_weibull_param_estimate()`

Other Poisson: `tidy_poisson()`, `tidy_zero_truncated_poisson()`, `util_poisson_stats_tbl()`

Examples

```
library(dplyr)
library(ggplot2)

x <- as.integer(mtcars$mpg)
output <- util_poisson_param_estimate(x)

output$parameter_tbl

output$combined_data_tbl %>%
  tidy_combinedautoplot()

t <- rpois(50, 5)
util_poisson_param_estimate(t)$parameter_tbl
```

util_poisson_stats_tbl

Distribution Statistics

Description

Returns distribution statistics in a tibble.

Usage

```
util_poisson_stats_tbl(.data)
```

Arguments

`.data` The data being passed from a `tidy_` distribution function.

Details

This function will take in a tibble and returns the statistics of the given type of `tidy_` distribution. It is required that data be passed from a `tidy_` distribution function.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Poisson: [tidy_poisson\(\)](#), [tidy_zero_truncated_poisson\(\)](#), [util_poisson_param_estimate\(\)](#)

Other Distribution Statistics: [util_beta_stats_tbl\(\)](#), [util_binomial_stats_tbl\(\)](#), [util_cauchy_stats_tbl\(\)](#), [util_chisquare_stats_tbl\(\)](#), [util_exponential_stats_tbl\(\)](#), [util_f_stats_tbl\(\)](#), [util_gamma_stats_tbl\(\)](#), [util_geometric_stats_tbl\(\)](#), [util_hypergeometric_stats_tbl\(\)](#), [util_logistic_stats_tbl\(\)](#), [util_lognormal_stats_tbl\(\)](#), [util_negative_binomial_stats_tbl\(\)](#), [util_normal_stats_tbl\(\)](#), [util_pareto_stats_tbl\(\)](#), [util_t_stats_tbl\(\)](#), [util_uniform_stats_tbl\(\)](#), [util_weibull_stats_tbl\(\)](#)

Examples

```
library(dplyr)

tidy_poisson() %>%
  util_poisson_stats_tbl() %>%
  glimpse()
```

util_t_stats_tbl	<i>Distribution Statistics</i>
------------------	--------------------------------

Description

Returns distribution statistics in a tibble.

Usage

```
util_t_stats_tbl(.data)
```

Arguments

`.data` The data being passed from a `tidy_` distribution function.

Details

This function will take in a tibble and returns the statistics of the given type of `tidy_` distribution. It is required that data be passed from a `tidy_` distribution function.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other T Distribution: [tidy_t\(\)](#)

Other Distribution Statistics: [util_beta_stats_tbl\(\)](#), [util_binomial_stats_tbl\(\)](#), [util_cauchy_stats_tbl\(\)](#), [util_chisquare_stats_tbl\(\)](#), [util_exponential_stats_tbl\(\)](#), [util_f_stats_tbl\(\)](#), [util_gamma_stats_tbl\(\)](#), [util_geometric_stats_tbl\(\)](#), [util_hypergeometric_stats_tbl\(\)](#), [util_logistic_stats_tbl\(\)](#), [util_lognormal_stats_tbl\(\)](#), [util_negative_binomial_stats_tbl\(\)](#), [util_normal_stats_tbl\(\)](#), [util_pareto_stats_tbl\(\)](#), [util_poisson_stats_tbl\(\)](#), [util_uniform_stats_tbl\(\)](#), [util_weibull_stats_tbl\(\)](#)

Examples

```
library(dplyr)

tidy_t() %>%
  util_t_stats_tbl() %>%
  glimpse()
```

util_uniform_param_estimate

Estimate Uniform Parameters

Description

The function will return a list output by default, and if the parameter `.auto_gen_empirical` is set to `TRUE` then the empirical data given to the parameter `.x` will be run through the `tidy_empirical()` function and combined with the estimated uniform data.

Usage

```
util_uniform_param_estimate(.x, .auto_gen_empirical = TRUE)
```

Arguments

`.x` The vector of data to be passed to the function.

`.auto_gen_empirical`

This is a boolean value of `TRUE/FALSE` with default set to `TRUE`. This will automatically create the `tidy_empirical()` output for the `.x` parameter and use the `tidy_combine_distributions()`. The user can then plot out the data using `$combined_data_tbl` from the function output.

Details

This function will attempt to estimate the uniform min and max parameters given some vector of values.

Value

A tibble/list

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Parameter Estimation: [util_beta_param_estimate\(\)](#), [util_binomial_param_estimate\(\)](#), [util_cauchy_param_estimate\(\)](#), [util_exponential_param_estimate\(\)](#), [util_gamma_param_estimate\(\)](#), [util_geometric_param_estimate\(\)](#), [util_hypergeometric_param_estimate\(\)](#), [util_logistic_param_estimate\(\)](#), [util_lognormal_param_estimate\(\)](#), [util_negative_binomial_param_estimate\(\)](#), [util_normal_param_estimate\(\)](#), [util_pareto_param_estimate\(\)](#), [util_poisson_param_estimate\(\)](#), [util_weibull_param_estimate\(\)](#)

Other Uniform: [tidy_uniform\(\)](#), [util_uniform_stats_tbl\(\)](#)

Examples

```
library(dplyr)
library(ggplot2)

x <- tidy_uniform(.min = 1, .max = 3)$y
output <- util_uniform_param_estimate(x)

output$parameter_tbl

output$combined_data_tbl %>%
  tidy_combinedautoplot()
```

util_uniform_stats_tbl

Distribution Statistics

Description

Returns distribution statistics in a tibble.

Usage

```
util_uniform_stats_tbl(.data)
```

Arguments

`.data` The data being passed from a `tidy_` distribution function.

Details

This function will take in a tibble and returns the statistics of the given type of tidy_ distribution. It is required that data be passed from a tidy_ distribution function.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Uniform: [tidy_uniform\(\)](#), [util_uniform_param_estimate\(\)](#)

Other Distribution Statistics: [util_beta_stats_tbl\(\)](#), [util_binomial_stats_tbl\(\)](#), [util_cauchy_stats_tbl\(\)](#), [util_chisquare_stats_tbl\(\)](#), [util_exponential_stats_tbl\(\)](#), [util_f_stats_tbl\(\)](#), [util_gamma_stats_tbl\(\)](#), [util_geometric_stats_tbl\(\)](#), [util_hypergeometric_stats_tbl\(\)](#), [util_logistic_stats_tbl\(\)](#), [util_lognormal_stats_tbl\(\)](#), [util_negative_binomial_stats_tbl\(\)](#), [util_normal_stats_tbl\(\)](#), [util_pareto_stats_tbl\(\)](#), [util_poisson_stats_tbl\(\)](#), [util_t_stats_tbl\(\)](#), [util_weibull_stats_tbl\(\)](#)

Examples

```
library(dplyr)

tidy_uniform() %>%
  util_uniform_stats_tbl() %>%
  glimpse()
```

util_weibull_param_estimate

Estimate Weibull Parameters

Description

The function will return a list output by default, and if the parameter `.auto_gen_empirical` is set to `TRUE` then the empirical data given to the parameter `.x` will be run through the `tidy_empirical()` function and combined with the estimated weibull data.

Usage

```
util_weibull_param_estimate(.x, .auto_gen_empirical = TRUE)
```

Arguments

- `.x` The vector of data to be passed to the function.
- `.auto_gen_empirical` This is a boolean value of TRUE/FALSE with default set to TRUE. This will automatically create the `tidy_empirical()` output for the `.x` parameter and use the `tidy_combine_distributions()`. The user can then plot out the data using `$combined_data_tbl` from the function output.

Details

This function will attempt to estimate the weibull shape and scale parameters given some vector of values.

Value

A tibble/list

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Parameter Estimation: [util_beta_param_estimate\(\)](#), [util_binomial_param_estimate\(\)](#), [util_cauchy_param_estimate\(\)](#), [util_exponential_param_estimate\(\)](#), [util_gamma_param_estimate\(\)](#), [util_geometric_param_estimate\(\)](#), [util_hypergeometric_param_estimate\(\)](#), [util_logistic_param_estimate\(\)](#), [util_lognormal_param_estimate\(\)](#), [util_negative_binomial_param_estimate\(\)](#), [util_normal_param_estimate\(\)](#), [util_pareto_param_estimate\(\)](#), [util_poisson_param_estimate\(\)](#), [util_uniform_param_estimate\(\)](#)

Other Weibull: [tidy_inverse_weibull\(\)](#), [tidy_weibull\(\)](#), [util_weibull_stats_tbl\(\)](#)

Examples

```
library(dplyr)
library(ggplot2)

x <- tidy_weibull(.shape = 1, .scale = 2)$y
output <- util_weibull_param_estimate(x)

output$parameter_tbl

output$combined_data_tbl %>%
  tidy_combined_autoplot()
```

`util_weibull_stats_tbl`*Distribution Statistics*

Description

Returns distribution statistics in a tibble.

Usage

```
util_weibull_stats_tbl(.data)
```

Arguments

`.data` The data being passed from a `tidy_` distribution function.

Details

This function will take in a tibble and returns the statistics of the given type of `tidy_` distribution. It is required that data be passed from a `tidy_` distribution function.

Value

A tibble

Author(s)

Steven P. Sanderson II, MPH

See Also

Other Weibull: [tidy_inverse_weibull\(\)](#), [tidy_weibull\(\)](#), [util_weibull_param_estimate\(\)](#)

Other Distribution Statistics: [util_beta_stats_tbl\(\)](#), [util_binomial_stats_tbl\(\)](#), [util_cauchy_stats_tbl\(\)](#), [util_chisquare_stats_tbl\(\)](#), [util_exponential_stats_tbl\(\)](#), [util_f_stats_tbl\(\)](#), [util_gamma_stats_tbl\(\)](#), [util_geometric_stats_tbl\(\)](#), [util_hypergeometric_stats_tbl\(\)](#), [util_logistic_stats_tbl\(\)](#), [util_lognormal_stats_tbl\(\)](#), [util_negative_binomial_stats_tbl\(\)](#), [util_normal_stats_tbl\(\)](#), [util_pareto_stats_tbl\(\)](#), [util_poisson_stats_tbl\(\)](#), [util_t_stats_tbl\(\)](#), [util_uniform_stats_tbl\(\)](#)

Examples

```
library(dplyr)

tidy_weibull() %>%
  util_weibull_stats_tbl() %>%
  glimpse()
```


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