

Package ‘tidydice’

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Type Package

Title Simulates Dice Rolls and Coin Flips

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Description Utils for basic statistical experiments, that can be used for teaching introductory statistics. Each experiment generates a tibble.

Dice rolls and coin flips are simulated using `sample()`.

The properties of the dice can be changed, like the number of sides.

A coin flip is simulated using a two sided dice.

Experiments can be combined with the pipe-operator.

License GPL-3

Encoding UTF-8

URL <https://github.com/rolkra/tidydice/>

Imports assertthat, dplyr, ggplot2, magrittr, purrr, stats, tibble

RoxygenNote 7.1.1

Suggests explore, knitr, rmarkdown, testthat

VignetteBuilder knitr

NeedsCompilation no

Repository CRAN

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binom	<i>Binomial distribution as table.</i>
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Description

Generates a tibble containing the binomial distribution using `dbinom()`.

Usage

```
binom(times, prob_success)
```

Arguments

times	number of trials
prob_success	probability of success (number between 0 and 1)

Value

Binomial distribution as a tibble

Examples

```
binom(times = 10, prob_success = 1/10)
```

binom_coin	<i>Binomial distribution of flipping a coin.</i>
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Description

Generates a tibble containing the binomial distribution of flipping a coin using `dbinom()`.

Usage

```
binom_coin(times, sides = 2, success = 2)
```

Arguments

times	how many times a coin is flipped (or how many coins are flipped at the same time)
sides	number of sides of the coin (default = 2)
success	which result is a success (default = 2)

Value

binomial distribution as a tibble

Examples

```
binom_coin(times = 10)
```

binom_dice	<i>Binomial distribution of rolling a dice.</i>
------------	---

Description

Generates a tibble containing the binomial distribution of rolling the dice using `dbinom()`.

Usage

```
binom_dice(times, sides = 6, success = 6)
```

Arguments

times	How many times a dice is rolled (or how many dice are rolled at the same time)
sides	Number of sides of the dice (default = 6)
success	Which result is a success (default = 6)

Value

Binomial distribution as a tibble

Examples

```
binom_dice(times = 10)
```

circle_points	<i>Helper function to draw a circle</i>
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Description

Helper function to draw a circle

Usage

```
circle_points(center = c(0, 0), diameter = 1, npoints = 61)
```

Arguments

center	Vector with x and y coordinate of center
diameter	Diameter of circle
npoints	Number of points used for drawing a circle

Value

Dataframe with x and y coordinates to draw a circle

flip_coin	<i>Simulating flipping a coin.</i>
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Description

Flipping a coin is simulated using `sample()`. The default coin has 2 sides and is fair. The properties of the coin can be changed. The result is returned as a tibble.

Usage

```
flip_coin(  
  data = NULL,  
  times = 1,  
  rounds = 1,  
  success = c(2),  
  agg = FALSE,  
  sides = 2,  
  prob = NULL,  
  seed = NULL  
)
```

Arguments

data	Data from a previous experiment
times	How many times coin is flipped (or how many coins are flipped at the same time)
rounds	Number of rounds
success	Which result is a success (default = 2)
agg	If TRUE, the result is aggregated (by experiment, rounds)
sides	Number of sides of the coin (default = 2)
prob	Vector of probabilities for each side of the coin
seed	Seed to produce reproducible results

Value

Result of experiment as a tibble

Examples

```
# flipping a coin
flip_coin()

# flipping a coin 10 times
flip_coin(times = 10)

# aggregate result
flip_coin(times = 10, agg = TRUE)

# rounds
flip_coin(times = 10, rounds = 3, agg = TRUE)

# experiments
library(dplyr)
flip_coin(times = 10, rounds = 3, agg = TRUE) %>%
  flip_coin(times = 12, rounds = 3, agg = TRUE)
```

force_coin

Force a coin flipping result.

Description

The forced result is returned as a tibble.

Usage

```
force_coin(data = NULL, result = 6, round = 1, experiment = 1, success = 2)
```

Arguments

data	Data from a previous experiment
result	Vector of flipping coin results
round	Round of flipping coin
experiment	Experiment Number
success	Which result is a success (default = 6)

Value

Result of experiment as a tibble

Examples

```
force_coin(6)
force_coin(1:6)
```

force_dice	<i>Force a dice rolling result.</i>
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Description

The forced result is returned as a tibble.

Usage

```
force_dice(data = NULL, result = 6, round = 1, experiment = 1, success = 6)
```

Arguments

data	Data from a previous experiment
result	Vector of rolling dice results
round	Round of rolling dice
experiment	Experiment Number
success	Which result is a success (default = 6)

Value

Result of experiment as a tibble

Examples

```
force_dice(6)
force_dice(1:6)
```

plot_binom	<i>Plot a binomial distribution.</i>
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Description

Plot a binomial distribution generated with `dice_binom()` or `coin_binom()`

Usage

```
plot_binom(  
  data,  
  title = "Binomial distribution",  
  color = "darkgrey",  
  color_highlight = "red",  
  label = NULL,  
  label_size = 3,  
  min_pct = 0.05,  
  highlight = NULL  
)
```

Arguments

<code>data</code>	data containing values for binomial distribution
<code>title</code>	title of the plot
<code>color</code>	color of bars
<code>color_highlight</code>	color of highlighted bars
<code>label</code>	add labels to plot?
<code>label_size</code>	size of label
<code>min_pct</code>	surpress values < min_pct
<code>highlight</code>	vector of values to be highlighted

Value

ggplot object

Examples

```
plot_binom(data = binom_dice(times = 10))
```

plot_dice *Plot result of roll_dice()*

Description

Plot result of roll_dice()

Usage

```
plot_dice(  
  data,  
  detailed = FALSE,  
  fill = "white",  
  fill_success = fill,  
  point_color = "black",  
  line_color = "black",  
  line_size = 0.8  
)
```

Arguments

data	result of roll_dice()
detailed	If TRUE, the dice is plotted with more details
fill	Fill color
fill_success	Fill color if result is a success
point_color	Color of Points
line_color	Color of Lines
line_size	Size of Lines

Value

ggplot-Object

Examples

```
library(magrittr)  
plot_dice()  
roll_dice(times = 3, rounds = 3) %>% plot_dice()  
roll_dice(times = 3, rounds = 3) %>% plot_dice(fill_success = "red")
```

plot_single_dice *Draw a single dice*

Description

Draw a single dice

Usage

```
plot_single_dice(  
  ggplot = NULL,  
  result = 6,  
  x = 0,  
  y = 0,  
  width = 0.9,  
  fill = "white",  
  detailed = FALSE,  
  rounding = dice_width/5,  
  line_size = 0.8,  
  line_color = "black",  
  point_size = width/6,  
  point_color = "black"  
)
```

Arguments

ggplot	ggplot-Object. If passed, the dice will be added to plot
result	Result of dice rolling (0..6)
x	X-coordinate of dice (center)
y	y-coordinate of dice (center)
width	Width of dice
fill	Fill color
detailed	If TRUE, the dice is plotted with more details
rounding	Rounding of dice (only used if detailed == TRUE)
line_size	Size of Lines
line_color	Color of Lines
point_size	Size of Points
point_color	Color of Points

Value

ggplot-Object

roll_dice *Simulating rolling a dice.*

Description

Rolling a dice is simulated using `sample()`. The default dice has 6 sides and is fair. The properties of the dice can be changed. The result is returned as a tibble.

Usage

```
roll_dice(  
  data = NULL,  
  times = 1,  
  rounds = 1,  
  success = c(6),  
  agg = FALSE,  
  sides = 6,  
  prob = NULL,  
  seed = NULL  
)
```

Arguments

<code>data</code>	Data from a previous experiment
<code>times</code>	How many times a dice is rolled (or how many dice are rolled at the same time)
<code>rounds</code>	Number of rounds
<code>success</code>	Which result is a success (default = 6)
<code>agg</code>	If TRUE, the result is aggregated (by experiment, rounds)
<code>sides</code>	Number of sides of the dice (default = 6)
<code>prob</code>	Vector of probabilities for each side of the dice
<code>seed</code>	Seed to produce reproducible results

Value

Result of experiment as a tibble

Examples

```
# rolling a dice once  
roll_dice()  
  
# rolling a dice 10 times  
roll_dice(times = 10)  
  
# aggregate result  
roll_dice(times = 10, agg = TRUE)
```

```
# rounds
roll_dice(times = 10, rounds = 3, agg = TRUE)

# experiments
library(dplyr)
roll_dice(times = 10, rounds = 3, agg = TRUE) %>%
  roll_dice(times = 12, rounds = 3, agg = TRUE)
```

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