# Package ‘tidydice’

January 9, 2020

**Type**  Package  

**Title**  Simulates Dice Rolls and Coin Flips  

**Version**  0.0.6  

**Author**  Roland Krasser  

**Maintainer**  Roland Krasser  

<roland.krasser@gmail.com>  

**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  

**LazyData**  true  

**URL**  http://github.com/rolkra/tidydice  

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

**RoxygenNote**  6.1.1  

**Suggests**  explore, knitr, testthat  

**VignetteBuilder**  knitr  

**NeedsCompilation**  no  

**Repository**  CRAN  

**Date/Publication**  2020-01-09 19:10:06 UTC  

## R topics documented:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>binom</td>
<td>2</td>
</tr>
<tr>
<td>binom_coin</td>
<td>2</td>
</tr>
<tr>
<td>binom_dice</td>
<td>3</td>
</tr>
<tr>
<td>circle_points</td>
<td>4</td>
</tr>
<tr>
<td>flip_coin</td>
<td>4</td>
</tr>
</tbody>
</table>
binomCoin

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

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

### Arguments
- `times` number of trials
- `sides` number of sides on the coin
- `success` number of heads (number between 0 and 1)

### Value
Binomial distribution as a tibble

### Examples
```r
binom_coin(times = 10, sides = 2, success = 2)
```
**binom_dice**

**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**

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

---

**binom_dice**

Binomial distribution of rolling a dice.

**Description**

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

**Usage**

```r
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**

```r
binom_dice(times = 10)
```
circle_points

**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

**Description**

Simulating flipping a coin.

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
**Example**

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

---

**force_dice**

*Force a dice rolling result.*

**Description**

The forced result is returned as a tibble.

**Usage**

```r
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

**Example**

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

---

**plot_binom**

*Plot a binomial distribution.*

**Description**

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

**Usage**

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

- **data**: data containing values for binomial distribution
- **title**: title of the plot
- **color**: color of bars
- **color_highlight**: color of highlighted bars
- **label**: add labels to plot?
- **label_size**: size of label
- **min_pct**: supress values < min_pct
- **highlight**: vector of values to be highlighted

### Value

A ggplot object

### Examples

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

### Description

Plot result of `roll_dice()`

### Usage

```r
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
plot_single_dice

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

binom, 2
binom_coin, 2
binom_dice, 3

circle_points, 4

flip_coin, 4
force_coin, 5
force_dice, 6

plot_binom, 6
plot_dice, 7
plot_single_dice, 8

roll_dice, 9