Package ‘BBcor’

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Type Package
Title Bayesian Bootstrapping Correlations
Version 1.0.3
Description Efficiently draw samples from the posterior distribution of various correlation coefficients with the Bayesian bootstrap described in Rubin (1981) <doi:10.1214/aos/1176345338>. There are six correlation coefficients, including Pearson, Kendall, Spearman, Gaussian Rank, Blomqvist, and polychoric.
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Description

Efficiently draws samples from the posterior distribution of various correlation coefficients.

Usage

`bbcor(x, method = "pearson", iter = 5000, cores = 2)`

Arguments

- `x`: A matrix of dimensions `n` by `p`.
- `method`: Character string. Which correlation coefficient should be computed. One of "pearson" (default), "kendall", "spearman", "polychoric", "gaussian_rank", or "blomqvist" (i.e., median correlation).
- `iter`: Numeric. How many posterior samples (defaults to 5000)?
- `cores`: Numeric. How many cores for parallel computing (defaults to 2)?

Value

- `cor_mean`: A matrix including the posterior mean
- `samps`: An array of dimensions `p` by `b` by `iter` that includes the sampled correlation matrices.

Note

NAs are removed.

Examples

```r
Y <- mtcars[,1:2]
bb_samps <- bbcor(Y, method = "spearman")
```
**compare**  
*Compare Bayesian bootstrapped correlations*

---

**Description**
See `lin_comb`

**Usage**
```r
compare(lin_comb, obj, cred = 0.9, rope = NULL, contrast = NULL)
```

**Arguments**
- `lin_comb`: A string specifying a linear combination of variables, or a list of variable names if using `contrast`.
- `obj`: An object of class `BGGM`, `bbcor`, or a `data.frame` of posterior samples.
- `cred`: The level for which a credible interval should be computed.
- `rope`: Specify a ROPE. Optional.
- `contrast`: A contrast matrix specifying which combinations to test. Optional.

**Value**
An object of class `bayeslincom`

**Examples**
```r
Y <- mtcars[, 1:3]
b <- bbcor(Y)
b_compare <- compare("mpg--cyl > mpg--disp", obj = bb,
                        cred = 0.9,
                        rope = c(-0.1, 0.1))
b_compare
```

---

**cor_2_pcor**  
*Correlation to Partial Correlation*

---

**Description**
Convert correlations into the corresponding partial correlations.

**Usage**
```r
cor_2_pcor(x, ...)
```
Arguments

x An object of class bbcor

... Currently ignored

- pcor_mean: A matrix including the posterior mean.
- samps: An array of dimensions p by b by iter that includes the sampled partial correlation matrices.

Examples

Y <- mtcars[,1:3]

fit <- bbcor(Y, method = "spearman")

cor_2_pcor(fit)

plot.bayeslincom

Plot comparisons from compare

Description

See plot.bayeslincom

Usage

## S3 method for class 'bayeslincom'
plot(
  x,
  point_col = "black",
  hist_col = "black",
  hist_fill = "gray",
  bar_col = "steelblue",
  bins = 30,
  display_comb_strings = TRUE,
  ...
)

Arguments

x An object of class bayeslincom

point_col Color for point indicating mean of posterior

hist_col Color for histogram edges

hist_fill Color for histogram bars

bar_col Color of bar for credible interval

bins Number of bins
plot.bbcor

```
    display_comb_strings
    If TRUE, displays full strings for combinations in ggplot facets when there is
    more than one combination in x

    ... Currently ignored
```

Value
An object of class ggplot

Examples
```
Y <- mtcars[, 1:3]
b <- bbcor(Y)
bb_compare <- compare("mpg--cyl > mpg--disp",
    obj = bb,
    cred = 0.90,
    rope = c(-0.1, 0.1))
plot(bb_compare)
```

plot.bbcor

Plot bbcor point estimates and intervals

Description
Plot bbcor point estimates and intervals

Usage
```
## S3 method for class 'bbcor'
plot(x, ci = 0.9, point_col = "red", bar_col = "black", ...)
```

Arguments
```
x An object of class bbcor

ci Width of credible interval. Defaults to 0.9.

point_col Color for point indicating mean of posterior

bar_col Color of bar for credible interval

... Currently ignored
```

Value
An object of class ggplot

Examples
```
Y <- mtcars[, 1:5]
b <- bbcor(Y)
plot(bb)
```
posterior_samples  

Extract Posterior Samples

**Description**

Extract Posterior Samples

**Usage**

```r
posterior_samples(object, ...)
```

**Arguments**

- `object` An object of class `bbcor`
- `...` Currently ignored

**Value**

A data frame including the posterior samples

**Examples**

```r
Y <- mtcars[,1:5]
bb_samps <- bbcor(Y, method = "spearman")
# correlations
posterior_samples(bb_samps)

# partial correlations
posterior_samples(cor_2_pcor(bb_samps))
```

---

print.bayeslincom  

Print formatted summary of a bayeslincom object

**Description**

Print formatted summary of a bayeslincom object

**Usage**

```r
## S3 method for class 'bayeslincom'
print(x, decimals = 2, ...)
```
Arguments

x        An object of class bayeslincom
decimals The number of decimals points to which estimates should be rounded
...      Other arguments to be passed to print

Value

A formatted summary of posterior samples

Description

Print the correlation or partial correlation matrix

Usage

```r
## S3 method for class 'bbcor'
print(x, ...)
```

Arguments

x        An object of class bbcor
...      Currently ignored

Description

Data on the social consequences of COVID-19 conspiracy beliefs

Usage

data("srol2021")
Format

A data frame with 501 rows and 24 variables

- id: participant id
- gender: participants' indicated gender (1 = "male", 2 = "female")
- age: participants' indicated age
- education: participants' indicated highest attained education level (1 = "elementary education", 2 = "high school without diploma", 3 = "high school with diploma", 4 = "undergraduate college degree", 5 = "graduate college degree", 6 = "doctoral degree")
- combined_covid_conspiracy: average rating on 12 items of both generic and China-specific COVID-19 conspiracy beliefs
- china_covid_conspiracy: average rating on 4 items of China-specific COVID-19 conspiracy beliefs
- generic_covid_conspiracy: average rating on 8 items of generic COVID-19 conspiracy beliefs
- generic_covid_conspiracy_wo_hoax: average rating on 7 items of generic COVID-19 conspiracy beliefs (without the hoax theory item)
- combined_covid_conspiracy_wo_hoax: average rating on 11 items of both generic and China-specific COVID-19 conspiracy beliefs (without the hoax theory item)
- neg_feelings_italy: score on a feeling thermometer (higher score = more negative feelings) toward Italian people/ 0-100
- neg_feelings_china: score on a feeling thermometer (higher score = more negative feelings) toward Chinese people/ 0-100
- neg_feelings_roma: score on a feeling thermometer (higher score = more negative feelings) toward Roma people/ 0-100
- social_distance_italy: average rating on three items of social distance toward Italian people
- social_distance_china: average rating on three items of social distance toward Chinese people
- social_distance_roma: average rating on three items of social distance toward Roma people
- discrimination_italy: rating on one discrimination item for Italian people
- discrimination_china: rating on one discrimination item for Chinese people
- discrimination_roma: rating on one discrimination item for Roma people
- italy_composite: composite average of 5 z-scores (feeling thermometer, 3 social distance items, and discrimination) for Italian people
- china_composite: composite average of 5 z-scores (feeling thermometer, 3 social distance items, and discrimination) for Chinese people
- roma_composite: composite average of 5 z-scores (feeling thermometer, 3 social distance items, and discrimination) for Roma people
- information_exposure: average rating on the 3 items of exposure to information about COVID-19 pandemic
- anxiety: average rating on the 4 items related to feelings of anxiety
- lack_of_control: average rating on the 4 items related to the feeling of lack of control
**Details**

Further details can be found at https://osf.io/jkab7/

**References**


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**summary.bbcor**

**Summarize posterior samples from bbcor object**

**Description**

Summarize posterior samples from bbcor object

**Usage**

```r
## S3 method for class 'bbcor'
summary(object, ci = 0.9, decimals = 2, ...)
```

**Arguments**

- `object`: An object of class `bbcor`
- `ci`: The desired credible interval
- `decimals`: The number of decimals points to which estimates should be rounded
- `...`: Currently ignored

**Value**

A `data.frame` summarizing the relations

**Examples**

```r
Y <- mtcars[, 1:5]
b <- bbcor(Y, method = "spearman")

summary(b)
```
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