Package 'BayesPower'

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Title Sample Size and Power Calculation for Bayesian Testing with Bayes Factor

Version 1.0.4

Description The goal of 'BayesPower' is to provide tools for Bayesian sample size determination and power analysis across a range of common hypothesis testing scenarios using Bayes factors. The main function, BayesPower_BayesFactor(), launches an interactive 'shiny' application for performing these analyses. The application also provides command-line code for reproducibility. Details of the methods are described in the tutorial by Wong, Pawel, and Tendeiro (2025) <doi:10.31234/osf.io/pgdac_v3>.

BugReports https://github.com/tkWong3004/BayesPower/issues

License GPL (>= 3)

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Contents

`BayesPower_BayesFactor` *Launch the BayesPower Shiny Application*

Description

This function starts the interactive Shiny application for Bayesian power analysis using Bayes factors. The app provides a graphical user interface built with **shiny**.

Usage

```
BayesPower_BayesFactor()
```

Details

The application includes both the UI and server components, which are defined internally in the package. When run, a browser window or RStudio viewer pane will open to display the interface.

Value

No return value, called for its side effects.

Examples

```
if (interactive()) {
  # Launch the Shiny application
  BayesPower_BayesFactor()
}
```

`BF10.bin.test` *Bayes Factor for a Bayesian One-Proportion Test*

Description

Calculate the Bayes factor (BF10) for a single-proportion test, either against a point null or an interval null hypothesis.

Usage

```
BF10.bin.test(
  x,
  n,
  alpha,
  beta,
  h0,
  scale,
  prior_analysis,
  alternative,
  ROPE = NULL
)
```

Arguments

`x`	Numeric integer. Observed number of successes (non-negative integer scalar, must be $\leq n$).
`n`	Numeric integer. Sample size (positive integer scalar).
`alpha`	Numeric scalar. Shape parameter of the analysis beta prior under the alternative hypothesis (required if `prior_analysis = "beta"`).
`beta`	Numeric scalar. Shape parameter of the analysis beta prior under the alternative hypothesis (required if `prior_analysis = "beta"`).
`h0`	Numeric scalar. Null proportion value (numeric scalar between 0.1 and 0.9).
`scale`	Numeric scalar. Scale parameter for the analysis prior (only used if `prior_analysis = "Moment"`).
`prior_analysis`	Character. the analysis prior under the alternative hypothesis: `"beta"` (stretched beta) or `"Moment"` (normal-moment prior).
`alternative`	Character. Hypothesis being tested: two-sided (`"two.sided"`), right-sided (`"greater"`), or left-sided (`"less"`).
`ROPE`	Optional numeric vector. Specifies bounds for an interval null hypothesis. For `"two.sided"` this must be a numeric vector of length 2 with two distinct finite values; for `"greater"` a numeric scalar > 0; and for `"less"` a numeric scalar < 0.

Value

An object of class "BFvalue_bin" containing:

- bf10: Bayes factor in favor of the alternative hypothesis.
- type: Test type ("One-proportion").
- x: Number of successes.
- n: Sample size.
- h0: Null proportion value.
- analysis_h1: List describing the analysis prior, containing prior (prior distribution), alpha (alpha parameter), beta (beta parameter), and scale (scale parameter).
- alternative: the direction of the alternative hypothesis.
- ROPE: interval null bounds (if specified).
- p.value: Numeric, p-value.

Examples

```
BF10.bin.test(
 x = 42,
 n = 52,
 h0 = 0.5,
 prior_analysis = "beta",
 alternative = "greater",
 alpha = 1,
 beta = 1)
```

BF10.cor *Bayes Factor for a Bayesian Correlation Test*

Description

Calculate the Bayes factor (BF10) for a correlation coefficient, either against a point null or an interval null hypothesis. Supports default beta ("d_beta"), stretched beta ("beta"), and normal-moment ("Moment") priors for the alternative hypothesis.

Usage

```
BF10.cor(
  r,
  n,
  k,
  alpha,
  beta,
  h0,
  alternative,
```

```
  scale,
  prior_analysis,
  ROPE = NULL
)
```

Arguments

r	Numeric scalar. Observed correlation coefficient. Must be a numeric scalar between -1 and 1.
n	Numeric integer. Sample size. Must be a numeric scalar greater than 3.
k	Numeric scalar. Parameter for the analysis default beta prior ("d_beta") under the alternative hypothesis.
alpha	Numeric scalar. Parameter for the analysis beta prior ("beta") under the alternative hypothesis.
beta	Numeric scalar. Parameter for the analysis beta prior ("beta") under the alternative hypothesis.
h0	Numeric scalar. Null value of the correlation. Must be a numeric scalar between -0.8 and 0.8.
alternative	Character. The direction of the alternative hypothesis being tested: two-sided ("two.sided"), right-sided ("greater"), or left-sided ("less").
scale	Numeric scalar. Scale parameter for the analysis normal-moment prior ("Moment"). Must be > 0.
prior_analysis	Character. Analysis prior: default beta ("d_beta"), beta ("beta"), or normal-moment ("Moment").
ROPE	Optional numeric vector. Specifies bounds for an interval null hypothesis. For "two.sided" this must be a numeric vector of length 2 with two distinct finite values; for "greater" a numeric scalar > 0; and for "less" a numeric scalar < 0.

Value

A list with class "BFvalue_r" containing:

- type: "Correlation"
- bf10: Calculated Bayes factor BF10
- h0: Null value of the correlation
- r: Observed correlation coefficient
- n: Sample size
- analysis_h1: List with the analysis prior parameters: prior_analysis, k, alpha, beta, and scale.
- alternative: the direction of the alternative hypothesis
- ROPE: Interval bounds if specified
- p.value: Numeric, p-value.

Examples

```
BF10.cor(
  r = 0.3930924,
  n = 46,
  prior_analysis = "d_beta",
  k = 1,
  h0 = 0,
  alternative = "two.sided")
```

`BF10.f.test` *Bayes Factor for a Bayesian F-Test*

Description

Computes the Bayes factor (BF10) for an F-test, comparing a full model to a reduced model under either an effect-size prior or a moment prior. Optionally, an interval null hypothesis can be specified.

Usage

```
BF10.f.test(fval, df1, df2, dff, rscale, f_m, prior_analysis, ROPE = NULL)
```

Arguments

`fval`	Numeric scalar. Observed F statistic (must be at least 0).
`df1`	Numeric scalar. Numerator degrees of freedom (must be > 0).
`df2`	Numeric scalar. Denominator degrees of freedom (must be > 0).
`dff`	Numeric scalar. Degrees of freedom for the analysis prior under the alternative hypothesis. For the Moment prior, this must be ≥ 3.
`rscale`	Numeric scalar. Scale parameter for the effect-size prior (only used when `prior_analysis = "effectsize"`).
`f_m`	Numeric scalar. Cohen's f effect-size parameter for the analysis prior.
`prior_analysis`	Character. Analysis prior under the alternative hypothesis. Must be either `"effectsize"` or `"Moment"`.
`ROPE`	Numeric scaler. Optional numeric scalar specifying an upper bound for an interval null hypothesis. If provided, must be > 0.

Value

A list of class `"BFvalue_f"` containing:

- `fval`: Input F-value.
- `df1`, `df2`: Degrees of freedom.
- `ROPE`: Interval bound (if specified).
- `analysis_h1`: List containing the analysis prior specification, including the prior distribution, the scale `rscale`, `f_m`, and degrees of freedom `dff`.
- `bf10`: The computed Bayes factor.
- `p.value`: Numeric, p-value.

Examples

```
BF10.f.test(
  fval = 4.5,
  df1 = 2,
  df2 = 12,
  dff = 12,
  rscale = 0.707,
  f_m = 0.1,
  prior_analysis = "effectsize"
)
```

`BF10.props` *Bayes Factor for Comparing Two Proportions*

Description

Compute the Bayes factor (BF10) for a Bayesian test of two proportions.

Usage

```
BF10.props(a0, b0, a1, b1, a2, b2, N1, N2, x1, x2)
```

Arguments

`a0`	Numeric scalar. Alpha parameter of the Beta prior under the null hypothesis.
`b0`	Numeric scalar. Beta parameter of the Beta prior under the null hypothesis.
`a1`	Numeric scalar. Alpha parameter of the Beta prior for group 1 under the alternative hypothesis.
`b1`	Numeric scalar. Beta parameter of the Beta prior for group 1 under the alternative hypothesis.
`a2`	Numeric scalar. Alpha parameter of the Beta prior for group 2 under the alternative hypothesis.
`b2`	Numeric scalar. Beta parameter of the Beta prior for group 2 under the alternative hypothesis.
`N1`	Numeric integer. Sample size for group 1.
`N2`	Numeric integer. Sample size for group 2.
`x1`	Numeric integer. Number of successes observed in group 1.
`x2`	Numeric integer. Number of successes observed in group 2.

Value

A list of class `BFvalue_2p` containing:

- `type`: the string "Two-proportions".
- `analysis_h0`: list with `a` and `b` for the null prior.
- `analysis_h1_theta_1`: list with `a` and `b` for group 1 prior under H1.
- `analysis_h1_theta_2`: list with `a` and `b` for group 2 prior under H1.
- `bf10`: the computed Bayes factor (BF10).
- `N1`, `x1`, `N2`, `x2`: the input sample sizes and observed successes.
- `OddRatio`: observed odd ratio.
- `p.value`: Numeric, p-value.

Examples

```
BF10.props(
a0 = 1,
b0 = 1,
a1 = 1,
b1 = 1,
a2 = 1,
b2 = 1,
N1 = 493,
N2 = 488,
x1 = 155,
x2 = 150)
```

`BF10.ttest.OneSample` *Bayes Factor for a One-Sample Bayesian t-Test*

Description

Computes the Bayes factor (BF10) for a one-sample t-test, comparing an observed t-value against either a point null hypothesis or an interval null hypothesis.

Usage

```
BF10.ttest.OneSample(
  tval,
  df,
  prior_analysis,
  location,
  scale,
  dff,
  alternative,
  ROPE = NULL
)
```

Arguments

tval	Numeric scalar. Observed t-value from the one-sample t-test.
df	Numeric scalar. Degrees of freedom of the t-test (must be >= 1).
prior_analysis	Character. Analysis prior under the alternative hypothesis. Must be either "Normal" (normal distribution), "Moment" (normal-moment prior), or "t-distribution" (t-distribution).
location	Numeric scalar. Location parameter for the analysis prior under the alternative hypothesis.
scale	Numeric scalar. Scale parameter for the analysis prior under the alternative hypothesis (must be > 0).
dff	Numeric scalar. Degrees of freedom for the t-distribution prior (only required if prior_analysis = "t-distribution"; must be > 0).
alternative	Character. The direction of the alternative hypothesis two-sided ("two.sided"), right-sided ("greater"), or left-sided ("less").
ROPE	Optional numeric vector. Specifies bounds for an interval null hypothesis. For "two.sided" this must be a numeric vector of length 2 with two distinct finite values; for "greater" a numeric scalar > 0; and for "less" a numeric scalar < 0.

Value

An object of class "BFvalue_t" containing:

- type: Character indicating "One-sample t-test".
- bf10: Numeric, the Bayes factor (BF10).
- tval: Observed t-value.
- df: Degrees of freedom.
- analysis_h1: List with the analysis prior parameters: prior_analysis, location, scale, and optionally dff.
- alternative: Character, the direction of the alternative hypothesis.
- ROPE: Optional numeric vector of interval null bounds.
- d: Numeric, observed Cohen's d.
- p.value: Numeric, p-value.

Examples

```
BF10.ttest.OneSample(
tval = 2,
df = 50,
prior_analysis = "t-distribution",
location = 0,
scale = 0.707,
dff = 1,
alternative = "two.sided")
```

`BF10.ttest.TwoSample` *Bayes Factor for a Two-Sample Bayesian t-Test*

Description

Compute the Bayes factor (BF10) for a two-sample independent-samples t-test. Supports both point-null and interval-null hypotheses.

Usage

```
BF10.ttest.TwoSample(
  tval,
  N1,
  N2,
  prior_analysis,
  location,
  scale,
  dff,
  alternative,
  ROPE = NULL
)
```

Arguments

`tval`	Numeric scalar. Observed t-value from the two-sample t-test.
`N1`	Numeric integer. Sample size of group 1 (must be > 2, will be rounded to nearest integer).
`N2`	Numeric integer. Sample size of group 2 (must be > 2, will be rounded to nearest integer).
`prior_analysis`	Character. Analysis prior under the alternative hypothesis: `"Normal"`, `"Moment"` (normal-moment prior), or `"t-distribution"`.
`location`	Numeric scalar. Location parameter of the analysis prior.
`scale`	Numeric scalar > 0. Scale parameter of the analysis prior.
`dff`	Numeric scalar. Degrees of freedom for the analysis prior (required if prior_analysis = `"t-distribution"`; ignored otherwise).
`alternative`	Character. The direction of the alternative hypothesis two-sided (`"two.sided"`), right-sided (`"greater"`), or left-sided (`"less"`).
`ROPE`	Optional numeric vector. Specifies bounds for an interval null hypothesis. For `"two.sided"` this must be a numeric vector of length 2 with two distinct finite values; for `"greater"` a numeric scalar > 0; and for `"less"` a numeric scalar < 0.

Value

A list of class `BFvalue_t` containing:

- `type`: Character string describing the test type.
- `bf10`: Computed Bayes factor BF10.
- `tval`: Observed t-value.
- `df`: Degrees of freedom.
- `analysis_h1`: List with the analysis prior parameters: `prior_analysis`, `location`, `scale`, and optionally `dff`.
- `alternative`: Hypothesis tested (`"two.sided"`, `"greater"`, or `"less"`).
- `ROPE`: Interval bounds used, if any.
- `N1`: Sample size of group 1.
- `N2`: Sample size of group 2.
- `d`: Numeric, observed Cohen's d.
- `p.value`: Numeric, p-value.

Examples

```
BF10.ttest.TwoSample(
 tval = -1.148,
 N1 = 53,
 N2 = 48,
 prior_analysis = "t-distribution",
 location = 0,
 scale = 0.707,
 dff = 1,
 alternative = "two.sided",
 ROPE = c(-0.36,0.36))
```

BFpower.bin *Sample Size Determination for the Bayesian One-Proportion Test*

Description

Perform sample size determination or power calculation of compelling and misleading evidence for a Bayesian test of a single proportion. Can handle both point-null and interval-null hypothesis, and allows specifying analysis and design priors.

Usage

```
BFpower.bin(
  alternative,
  threshold,
  h0,
  true_rate,
  false_rate,
  prior_analysis,
  alpha,
  beta,
  scale,
  prior_design = NULL,
  alpha_d,
  beta_d,
  location_d,
  scale_d,
  N = NULL,
  ROPE = NULL,
  type_rate = "positive"
)
```

Arguments

`alternative`	Character. The direction of the alternative hypothesis : two-sided (`"two.sided"`), right-sided (`"greater"`), or left-sided (`"less"`).
`threshold`	Numeric scalar. Threshold for compelling evidence (must be at least 1).
`h0`	Numeric scalar. Null proportion value for the test (numeric scalar between 0.1 and 0.9).
`true_rate`	Numeric scalar. Targeted true positive rate or true negative rate .
`false_rate`	Numeric scalar. Targeted false positive rate or false negative rate .
`prior_analysis`	Character. Analysis prior under the alternative hypothesis: `"beta"` or `"Moment"` (normal-moment prior).
`alpha`	Numeric scalar. Parameter for the analysis beta prior (used when `prior_analysis = "beta"`).
`beta`	Numeric scalar. Parameter for the analysis beta prior (used when `prior_analysis = "beta"`).
`scale`	Numeric scalar. Scale parameter for the analysis moment prior (used when `prior_analysis = "Moment"`).
`prior_design`	Character. Design prior under the alternative hypothesis: `"beta"`, `"Moment"`(normal-moment prior), or `"Point"`.
`alpha_d`	Numeric scalar. Parameter for the design beta prior (used when `prior_design = "beta"`).
`beta_d`	Numeric scalar. Parameter for the design beta prior (used when `prior_design = "beta"`).

location_d	Numeric scalar. Proportion value for the design point prior (prior_design = "Point"). Represents the true proportion under the alternative hypothesis.
scale_d	Numeric scalar. Scale parameter for the design moment prior (used when prior_design = "Moment").
N	Numeric integer. Sample size. If NULL, sample size determination is performed.
ROPE	Optional numeric vector. Specifies bounds for an interval null hypothesis. For "two.sided" this must be a numeric vector of length 2 with two distinct finite values; for "greater" a numeric scalar > 0; and for "less" a numeric scalar < 0.
type_rate	Character. Either "positive" (controls true/false positive rates) or "negative" (controls true/false negative rates).

Details

1. Sample Size Determination Mode (when N = NULL):

If no sample size is provided, the function calculates the minimum sample size needed to achieve the desired configuration below. The user must provide:

- type_rate - either "positive" to control true/false positive rates or "negative" to control true/false negative rates.
- true_rate - the targeted true positive or true negative rate (between 0.6 and 0.999).
- false_rate - the acceptable false positive or false negative rate (between 0.001 and 0.1).
- threshold - the Bayes factor threshold for compelling evidence (must be at least 1).

The function iteratively finds the smallest sample size for which the probability of obtaining compelling evidence (i.e., true positive/negative rate) meets or exceeds true_rate, while the probability of misleading evidence (i.e., false positive/negative rate) does not exceed false_rate.

2. Fixed-sample Analysis Mode (when N is supplied):

If a positive numeric sample size N is provided, the function computes the probabilities of obtaining compelling or misleading evidence for that fixed sample size. In this mode, type_rate, true_rate, and false_rate are ignored; only the Bayes factor threshold threshold is used.

Direction of the Alternative Hypothesis:

The argument alternative specifies the direction of the test and can be set to "two.sided", "greater", or "less".

Interval Null Hypothesis:

The interval null hypothesis can be specified using the argument ROPE, which defines an interval around the null value of h0.

The required form of ROPE depends on the direction of alternative:

- "greater" or "less": ROPE must be a scalar. It should be positive for "greater" and negative for "less".
- "two.sided": ROPE must be a numeric vector of length 2, where the lower bound is negative and the upper bound is positive.

If ROPE = NULL, a point-null hypothesis is assumed.

Analysis Priors:

The user must specify the analysis prior under the alternative hypothesis using prior_analysis:

- beta (beta prior): alpha and beta > 0.
- Moment (normal-moment prior) : scale > 0.

Design Priors (optional):

The design prior under the alternative hypothesis can optionally be specified using prior_design:

- beta (beta prior): alpha_d and beta_d > 0.
- Moment (normal-moment prior): scale_d > 0.
- Point (point prior): location_d numeric scalar.

If prior_design is NULL, no design prior is used.

Value

A list of class "BFpower" containing:

- type: Test type ("One proportion").
- alternative: alternative hypothesis.
- h0: The proportion under the null hypothesis.
- analysis_h1: List describing the analysis prior, containing prior (prior distribution), alpha (alpha parameter), beta (beta parameter), and scale (scale parameter).
- design_h1: List describing the design prior (if provided), containing prior (prior distribution), alpha (alpha parameter), beta (beta parameter), and scale (scale parameter).
- results: Data frame of probabilities of compelling/misleading evidence and the required or supplied sample size.
- threshold: Compelling-evidence threshold.

If sample size determination fails, the function returns NaN and prints a message.

Examples

```
BFpower.bin(
  alternative = "greater",
  threshold = 3,
  true_rate = 0.8,
  false_rate = 0.05,
  h0 = 0.5,
  prior_analysis = "beta",
  alpha = 1,
  beta = 1)
```

BFpower.cor *Sample Size Determination for the Bayesian Correlation Test*

Description

Perform sample size determination or power calculation of compelling and misleading evidence for a Bayesian correlation test. Can handle both point-null and interval-null hypothesis, and allows specifying analysis and design priors.

Usage

```
BFpower.cor(
  alternative,
  h0,
  ROPE = NULL,
  threshold,
  true_rate,
  false_rate,
  prior_analysis,
  k,
  alpha,
  beta,
  scale,
  prior_design = NULL,
  alpha_d,
  beta_d,
  location_d,
  k_d,
  scale_d,
  N = NULL,
  type_rate = "positive"
)
```

Arguments

alternative	Character. The direction of the alternative hypothesis being tested: two-sided ("two.sided"), right-sided ("greater"), or left-sided ("less").
h0	Numeric scalar. Null rho correlation value. Must be between -0.8 and 0.8.
ROPE	Optional numeric vector. Specifies bounds for an interval null hypothesis. For "two.sided" this must be a numeric vector of length 2 with two distinct finite values; for "greater" a numeric scalar > 0; and for "less" a numeric scalar < 0.
threshold	Numeric scalar. Threshold for compelling evidence (must be at least 1).
true_rate	Numeric scalar. Targeted true positive rate (if positive = "positive") or true negative rate (if positive = "negative").

false_rate	Numeric scalar. Targeted false positive rate (if positive = "positive") or false negative rate (if positive = "negative").
prior_analysis	Character. Analysis prior under the alternative hypothesis: default beta ("d_beta"), beta ("beta"), or normal-moment prior ("Moment").
k	Numeric scalar. Parameter for the default beta prior ("d_beta").
alpha	Numeric scalar. Parameter for the beta prior ("beta").
beta	Numeric scalar. Parameter for the beta prior ("beta").
scale	Numeric scalar. Scale parameter for the normal-moment prior ("Moment").
prior_design	Character. Design prior under the alternative hypothesis: default beta ("d_beta"), beta ("beta"), normal-moment prior ("Moment"), or point ("Point").
alpha_d	Numeric scalar. Parameter for the design beta prior ("beta").
beta_d	Numeric scalar. Parameter for the design beta prior ("beta").
location_d	Numeric scalar. Location parameter for the design point prior ("Point").
k_d	Numeric scalar. Parameter for the design default beta prior ("d_beta").
scale_d	Numeric scalar. Scale parameter for the design normal-moment prior ("Moment").
N	Numeric integer. Sample size. Only required if the goal is not sample size determination, but rather to calculate the probability of obtaining compelling or misleading evidence for a given sample size.
type_rate	Character. Character. Either "positive" (controls true/false positive rates) or "negative" (controls true/false negative rates).

Details

1. Sample Size Determination Mode (when N = NULL):

If no sample size is provided, the function calculates the minimum sample size needed to achieve the desired configuration below. The user must provide:

- type_rate - either "positive" to control true/false positive rates, or "negative" to control true/false negative rates.
- true_rate - the targeted true positive or true negative rate (between 0.6 and 0.999).
- false_rate - the acceptable false positive or false negative rate (between 0.001 and 0.1).
- threshold - the Bayes factor threshold for compelling evidence (must be at least 1).

The function iteratively finds the smallest sample size for which the probability of obtaining compelling evidence (i.e., true positive/negative rate) meets or exceeds true_rate, while the probability of misleading evidence (i.e., false positive/negative rate) does not exceed false_rate.

2. Fixed-sample Analysis Mode (when N is supplied):

If a positive numeric sample size N is provided, the function computes the probabilities of obtaining compelling or misleading evidence for that fixed sample size. In this mode, the arguments type_rate, true_rate, and false_rate are ignored; only the Bayes factor threshold threshold is used.

Direction of the Alternative Hypothesis:

The argument alternative specifies the direction of the test and can be set to "two.sided", "greater", or "less".

Interval Null Hypothesis:

The interval null hypothesis can be specified using the argument ROPE, which defines an interval around the null value of h0.

The required form of ROPE depends on the direction of alternative:

- "greater" or "less": ROPE must be a scalar. It should be positive for "greater" and negative for "less".
- "two.sided": ROPE must be a numeric vector of length 2, where the lower bound is negative and the upper bound is positive.

If ROPE = NULL, a point-null hypothesis is assumed.

Analysis Priors:

The user must specify the analysis prior under the alternative hypothesis using prior_analysis:

- d_beta (default beta): k > 0.
- beta (stretched beta): alpha and beta > 0.
- Moment (normal-moment prior): scale > 0.

Design Priors (optional):

The design prior under the alternative hypothesis can optionally be specified using prior_design:

- d_beta (default beta): k_d > 0.
- beta (stretched beta): alpha_d and beta_d > 0.
- Moment (normal-moment prior): scale_d > 0.
- Point (point prior): location_d.

If prior_design is NULL, no design prior is used.

Value

A list of class BFpower_r containing:

- type: Test type (always "Correlation").
- alternative: the direction of the alternative hypothesis.
- h0: the value of correlation under the null hypothesis.
- ROPE: Bounds for interval null (if used).
- analysis_h1: List with the analysis prior parameters: prior_analysis, k, alpha, beta, and scale.
- design_h1: List with the design prior parameters: prior_design, k, alpha, beta, scale, and location.
- results: Data frame with the probabilities of compelling/misleading evidence, and with the required sample size.
- threshold: Threshold of compelling evidence.

Examples

```
BFpower.cor(
 alternative = "greater",
   h0 = 0,
   threshold = 3,
   true_rate = 0.8,
   false_rate = 0.05,
   prior_analysis = "d_beta",
   k = 1,
   prior_design = "Point",
   location_d = 0.3
 )
```

`BFpower.f.test` *Sample Size Determination for the Bayesian F-Test*

Description

Perform sample size determination or power calculation of compelling and misleading evidence for a Bayesian F-test comparing a full model to a nested reduced model. Can handle both point-null and interval-null hypothesis, and allows specifying analysis and design priors.

Usage

```
BFpower.f.test(
  threshold,
  true_rate,
  false_rate,
  p,
  k,
  prior_analysis,
  dff,
  rscale,
  f_m,
  prior_design = NULL,
  dff_d,
  rscale_d,
  f_m_d,
  N = NULL,
  type_rate = "positive",
  ROPE = NULL
)
```

Arguments

`threshold`	Numeric scalar. Threshold for compelling evidence (must be at least 1).

true_rate	Numeric scalar. Targeted true positive or true negative rate (used only when sample size determination is requested; N = NULL).
false_rate	Numeric scalar. Targeted false positive or false negative rate (used only when sample size determination is requested; N = NULL).
p	Numeric integer. Number of predictors in the reduced model.
k	Numeric integer. Number of predictors in the full model (must satisfy k > p).
prior_analysis	Character. Analysis prior model under the alternative hypothesis: "effectsize" or "Moment".
dff	Numeric scalar. Degrees of freedom for the analysis prior under the alternative hypothesis. Must be a positive scalar, and must be at least 3 if prior_analysis = "Moment".
rscale	Numeric scalar. Scale parameter for the analysis effect-size prior (only used when prior_analysis = "effectsize").
f_m	Numeric scalar. Cohen's f effect-size parameter for the analysis prior (must be > 0).
prior_design	Character. Design prior model under the alternative hypothesis: "effectsize", "Moment", or "Point".
dff_d	Numeric scalar. Degrees of freedom for the design prior. Must be a positive scalar, and at least 3 if prior_design = "Moment".
rscale_d	Numeric scalar. Scale parameter for the design effect-size prior (only used when prior_design = "effectsize").
f_m_d	Numeric scalar. Cohen's f value for the design prior or the effect-size of the point design prior.
N	Numeric integer. Sample size. If NULL, sample size determination is performed.
type_rate	Character. Either "positive" (control true/false positive rates) or "negative" (control true/false negative rates).
ROPE	Numeric vector. Numeric bounds for the interval null (only used when interval Bayes factors are required).

Details

1. Sample Size Determination Mode (when N = NULL):

If no sample size is provided, the function calculates the minimum sample size needed to achieve the desired configuration below. The user must provide:

- type_rate - either "positive" to control true/false positive rates, or "negative" to control true/false negative rates.
- true_rate - the targeted true positive or true negative rate (between 0.6 and 0.999).
- false_rate - the acceptable false positive or false negative rate (between 0.001 and 0.1).
- threshold - the Bayes factor threshold for compelling evidence (must be > 1).

The function iteratively finds the smallest sample size for which the probability of obtaining compelling evidence (i.e., true positive/negative rate) meets or exceeds true_rate, while the probability of misleading evidence (i.e., false positive/negative rate) does not exceed false_rate.

2. Fixed-sample Analysis Mode (when `N` is supplied):

If a positive numeric sample size `N` is provided, the function computes the probabilities of obtaining compelling or misleading evidence for that fixed sample size. In this mode, `type_rate`, `true_rate`, and `false_rate` are ignored; only the Bayes factor threshold `threshold` is used.

Interval Null Hypothesis:

The interval null hypothesis can be specified using the argument `ROPE`, which defines an interval around the null value of 0. The specified value of `ROPE` should be a positive numeric scaler. If `ROPE = NULL`, a point-null hypothesis is assumed.

Analysis Priors:

The user must specify the analysis prior under the alternative hypothesis using `prior_analysis`:

- `effectsize` (effect size prior): `rscale` > 0, `f_m` , and `dff`.
- `Moment` (normal-moment prior): `f_m` and `dff` ≥ 3.

Design Priors (optional):

The design prior under the alternative hypothesis can optionally be specified using `prior_design`:

- `effectsize` (effect size prior): `rscale_d` > 0, `f_m_d`, and `dff_d` .
- `Moment` (normal-moment prior): `f_m_d` and `dff_d` ≥ 3.
- `Point` (point prior): `f_m_d`.

If `prior_design` is `NULL`, no design prior is used.

Value

A list of class `BFpower` containing:

- `type`: Test type (always "Regression/ANOVA").
- `k`, `p`: Number of predictors in the full and reduced models.
- `ROPE`: Bounds for interval null (if used).
- `analysis_h1`: List containing the analysis prior specification, including the prior distribution, the scale `rscale`, `f_m`, and degrees of freedom `dff`.
- `design_h1`: List containing the design prior specification, including the prior distribution, the scale `rscale`, `f_m`, and degrees of freedom `dff` (or `NULL` if not specified).
- `results`: Data frame of probabilities of compelling/misleading evidence and the required or supplied sample size.
- `threshold`: Threshold of compelling evidence.

If sample size determination fails, the function returns `NaN` and prints a message.

Examples

```
BFpower.f.test(
 threshold = 3,
 true_rate = 0.8,
 false_rate = 0.05,
 p = 3,
 k = 4,
 prior_analysis = "effectsize",
 dff = 3,
 rscale = 0.18,
 f_m = 0.1,
 prior_design = "Point",
 f_m_d = 0.1)
```

BFpower.props *Sample Size Determination for the Bayesian Test of Two Proportions*

Description

Perform sample size determination or power calculation of compelling and misleading evidence for a Bayesian test of two proportions. Under the null hypothesis, $\theta_1 = \theta_2$ and it is assigned a shared analysis beta prior. Under the alternative hypothesis, θ_1 and θ_2 are treated as distinct parameters and are assigned independent beta analysis priors. The function supports the specification of point design prior.

Usage

```
BFpower.props(
  threshold,
  true_rate,
  a0,
  b0,
  a1,
  b1,
  a2,
  b2,
  prior_design_1 = "same",
  a1d,
  b1d,
  dp1,
  prior_design_2 = "same",
  a2d,
  b2d,
  dp2,
  N1 = NULL,
  N2 = NULL,
  type_rate = "positive"
)
```

Arguments

threshold	Numeric scalar. Threshold of compelling evidence.
true_rate	Numeric scalar. Targeted true positive rate (if positive = "positive") or true negative rate (if positive = "negative").
a0	Numeric scalar. Alpha parameter of the Beta prior under the null hypothesis.
b0	Numeric scalar. Beta parameter of the Beta prior under the null hypothesis.
a1	Numeric scalar. Alpha parameter of the Beta analysis prior for group 1 under the alternative hypothesis.
b1	Numeric scalar. Beta parameter of the Beta analysis prior for group 1 under the alternative hypothesis.
a2	Numeric scalar. Alpha parameter of the Beta analysis prior for group 2 under the alternative hypothesis.
b2	Numeric scalar. Beta parameter of the Beta analysis prior for group 2 under the alternative hypothesis.
prior_design_1	Character. The design prior of group 1: "beta", "Point", or "same" (if "same", the design prior is identical to the analysis prior).
a1d	Numeric scalar. Alpha parameter of the design prior for group 1 (used if prior_design_1 = "beta").
b1d	Numeric scalar. Beta parameter of the design prior for group 1 (used if prior_design_1 = "beta").
dp1	Numeric scalar. True proportion for group 1 in the design prior (used if prior_design_1 = "Point").
prior_design_2	Character. The design prior of group 2: "beta", "Point", or "same" (if "same", the design prior is identical to the analysis prior).
a2d	Numeric scalar. Alpha parameter of the design prior for group 2 (used if prior_design_2 = "beta").
b2d	Numeric scalar. Beta parameter of the design prior for group 2 (used if prior_design_2 = "beta").
dp2	Numeric scalar. True proportion for group 2 in the design prior (used if prior_design_2 = "Point").
N1	Numeric integer. Sample size for group 1.
N2	Numeric integer. Sample size for group 2.
type_rate	Character. Choose "positive" to control true positive rate or "negative" to control true negative rate.

Details

1. Sample Size Determination Mode (when N1 = NULL and N2 = NULL):

If no sample sizes are provided for the two groups, the function calculates the minimum sample sizes needed to achieve the desired configuration. The user must provide:

- type_rate - either "positive" to control true/false positive rates or "negative" to control true/false negative rates.

- `true_rate` - the targeted true positive or true negative rate (between 0.6 and 0.999).
- `threshold` - the Bayes factor threshold for compelling evidence (must be > 1).

The function iteratively finds the smallest sample sizes for which the probability of obtaining compelling evidence (i.e., true positive/negative rate) meets or exceeds `true_rate`.

2. Fixed-sample Analysis Mode (when `N1` and `N2` are supplied):

If positive numeric sample sizes `N1` and `N2` are provided, the function computes the probabilities of obtaining compelling or misleading evidence for these fixed sample sizes. In this mode, `type_rate` and `true_rate` are ignored; only the Bayes factor threshold `threshold` is used.

Analysis Priors:

The user must specify the analysis priors under the null and alternative hypotheses:

- Null hypothesis: Beta prior with parameters `a0` and `b0`.
- Alternative hypothesis:
  - Group 1: Beta prior with hyperparameters `a1` and `b1`.
  - Group 2: Beta prior with hyperparameters `a2` and `b2`.

Design Priors (optional):

Design priors for the alternative hypothesis can optionally be specified:

- Group 1 design prior (`prior_design_1`):
  - `"same"`: uses the corresponding analysis prior (`a1`, `b1`).
  - `"beta"` (beta prior): requires hyperparameters `a1d` and `b1d`.
  - `"Point"` (point prior): requires fixed proportion `dp1`.
- Group 2 design prior (`prior_design_2`):
  - `"same"`: uses the corresponding analysis prior (`a2`, `b2`).
  - `"beta"` (beta prior): requires hyperparameters `a2d` and `b2d`.
  - `"Point"` (point prior): requires fixed proportion `dp2`.

Value

An object of class `BFpower` (a list) containing:

- `type`: Character, always `"Two-proportions"`.
- `analysis_h0`: List of analysis prior parameters under the null, containing `a` and `b`.
- `analysis_h1_theta_1`: List of analysis prior parameters for group 1 under the alternative, containing `a` and `b`.
- `analysis_h1_theta_2`: List of analysis prior parameters for group 2 under the alternative, containing `a` and `b`.
- `design_h1_theta_1`: List of design prior parameters for group 1 under the alternative, containing `prior`, `a`, `b`, and `p`.
- `design_h1_theta_2`: List of design prior parameters for group 2 under the alternative, containing `prior`, `a`, `b`, and `p`.
- `results`: Data frame of probabilities of compelling and misleading evidence.

- `grid`: Grid used for computation.
- `threshold`: Threshold of compelling evidence.
- `mode_bf`: Character string specifying the mode (sample size determination or power calculation).

Examples

```
BFpower.props(
threshold = 3,
true_rate = 0.8,
a0 = 1,
b0 = 1,
a1 = 156,
b1 = 339,
a2 = 151,
b2 = 339)
```

BFpower.ttest.OneSample

Sample Size Determination for the One-Sample Bayesian t-Test

Description

Perform sample size determination or power calculation of compelling and misleading evidence for a one-sample Bayesian t-test. Can handle both point-null and interval-null hypothesis, and allows specifying analysis and design priors.

Usage

```
BFpower.ttest.OneSample(
  alternative,
  ROPE = NULL,
  prior_analysis,
  location,
  scale,
  dff,
  prior_design = NULL,
  location_d,
  scale_d,
  dff_d,
  N = NULL,
  type_rate = "positive",
  true_rate,
  false_rate,
  threshold
)
```

Arguments

alternative	Character. The direction of the alternative hypothesis : two-sided ("two.sided"), right-sided ("greater"), or left-sided ("less").
ROPE	Optional numeric vector. Specifies bounds for an interval null hypothesis. For "two.sided" this must be a numeric vector of length 2 with two distinct finite values; for "greater" a numeric scalar > 0; and for "less" a numeric scalar < 0.
prior_analysis	Character. The analysis prior under the alternative hypothesis: "Normal", "Moment" (normal-moment prior), or "t-distribution".
location	Numeric scaler. Location parameter for the analysis prior under the alternative hypothesis.
scale	Numeric scaler. Scale parameter for the analysis prior under the alternative hypothesis (must be > 0).
dff	Numeric scaler. Degrees of freedom for the analysis prior under the alternative hypothesis (required if prior_analysis = "t-distribution").
prior_design	Optional Character. The design prior under the alternative hypothesis: "Normal", "Moment" (normal-moment prior), "t-distribution", or "Point".
location_d	Numeric scaler. Location parameter for the design prior under the alternative hypothesis.
scale_d	Numeric scaler. Scale parameter for the design prior under the alternative hypothesis.
dff_d	Numeric scaler. Degrees of freedom for the design prior under the alternative hypothesis (required if prior_design = "t-distribution").
N	Numeric integer. Sample size.
type_rate	Character. Either "positive" (controls true/false positive rates) or "negative" (controls true/false negative rates).
true_rate	Numeric scaler. Target true positive or negative rate (between 0.6 and 0.999).
false_rate	Numeric scaler. Target false positive or false negative rate (between 0.001 and 0.1).
threshold	Numeric scaler. Threshold of compelling evidence (must be at least 1).

Details

1. Sample Size Determination Mode (when N = NULL):

If no sample size is provided, the function calculates the minimum sample size needed to achieve the desired configuration below. The user must provide:

- type_rate - either "positive" to control true/false positive rates, or "negative" to control true/false negative rates.
- true_rate - the targeted true positive or true negative rate (between 0.6 and 0.999).
- false_rate - the acceptable false positive or false negative rate (between 0.001 and 0.1).
- threshold - the Bayes factor threshold for compelling evidence (must be at least 1).

The function iteratively finds the smallest sample size for which the probability of obtaining compelling evidence (i.e., true positive/negative rate) meets or exceeds `true_rate`, while the probability of misleading evidence (i.e., false positive/negative rate) does not exceed `false_rate`.

2. Fixed-sample Analysis Mode (when `N` is supplied):

If a positive numeric sample size `N` is provided, the function computes the probabilities of obtaining compelling or misleading evidence for that fixed sample size. In this mode, the arguments `type_rate`, `true_rate`, and `false_rate` are ignored; only the Bayes factor threshold `threshold` is used.

Direction of the Alternative Hypothesis:

The argument `alternative` specifies the direction of the test and can be set to `"two.sided"`, `"greater"`, or `"less"`.

Interval Null Hypothesis:

The interval null hypothesis can be specified using the argument `ROPE`, which defines an interval around the null value of 0.

The required form of `ROPE` depends on the direction of `alternative`:

- `"greater"` or `"less"`: `ROPE` must be a scalar. It should be positive for `"greater"` and negative for `"less"`.
- `"two.sided"`: `ROPE` must be a numeric vector of length 2, where the lower bound is negative and the upper bound is positive.

If `ROPE = NULL`, a point-null hypothesis is assumed.

Analysis Priors:

The user must specify the analysis prior under the alternative hypothesis using `prior_analysis`:

- `Normal` (normal prior): `location` and `scale` > 0.
- `Moment` (normal-moment prior): `scale` > 0.
- `t-distribution` (scaled t prior): `location`, `scale` > 0, and `dff` > 0.

Design Priors (optional):

The design prior under the alternative hypothesis can optionally be specified using `prior_design`:

- `Normal` (normal prior): `location_d` and `scale_d` > 0.
- `Moment` (normal-moment prior): `scale_d` > 0.
- `t-distribution` (scaled t prior): `location_d`, `scale_d` > 0, and `dff_d` > 0.
- `Point` (point prior): `location_d`.

If `prior_design` is `NULL`, no design prior is used.

Value

An object of class `BFpower_t` containing:

- `type`: Character, always "One-sample t-test".
- `alternative`: Character, the direction of the alternative hypothesis.

- ROPE: Optional numeric vector for interval null bounds.
- analysis_h1: List with the analysis prior parameters: prior_analysis, location, scale, and optionally dff.
- design_h1: List with the design prior parameters: prior_design, location, scale, and optionally dff (or NULL if not provided).
- results: Data frame of probabilities: compelling/misleading evidence, or NaN if calculation fails.
- threshold: Numeric, threshold of compelling evidence.

Examples

```
BFpower.ttest.OneSample(
 alternative = "two.sided",
 threshold = 3,
 true_rate = 0.8,
 false_rate = 0.05,
 prior_analysis = "t-distribution",
 location = 0,
 scale = 0.707,
 dff = 1
)
```

BFpower.ttest.TwoSample

Sample Size Determination for the Two-Sample Bayesian t-Test

Description

Perform sample size determination or power calculation of compelling and misleading evidence for a two-sample Bayesian t-test. Can handle both point-null and interval-null hypothesis, and allows specifying analysis and design priors.

Usage

```
BFpower.ttest.TwoSample(
  alternative,
  ROPE = NULL,
  threshold,
  true_rate,
  false_rate,
  prior_analysis,
  location,
  scale,
  dff,
  prior_design = NULL,
  location_d,
  scale_d,
```

```
  dff_d,
  N1 = NULL,
  N2 = NULL,
  r = NULL,
  type_rate = "positive"
)
```

Arguments

alternative	Character. The direction of the alternative hypothesis: two-sided ("two.sided"), right-sided ("greater"), or left-sided ("less").
ROPE	Optional numeric vector. Specifies bounds for an interval null hypothesis. For "two.sided" this must be a numeric vector of length 2 with two distinct finite values; for "greater" a numeric scalar > 0; and for "less" a numeric scalar < 0.
threshold	Numeric scalar. Threshold for compelling evidence (must be at least 1).
true_rate	Numeric scalar. Target true positive or negative rate .
false_rate	Numeric scalar. Target false positive or negative rate .
prior_analysis	Character. Analysis prior under the alternative hypothesis: "Normal", "Moment" (normal-moment prior), or "t-distribution".
location	Numeric scalar. Location parameter for the analysis prior.
scale	Numeric scalar > 0. Scale parameter for the analysis prior.
dff	Numeric scalar. Degrees of freedom for the analysis prior (required if prior_analysis = "t-distribution"; ignored otherwise).
prior_design	Optional Character. Design prior under the alternative: "Normal", "Moment"(normal-moment prior), "t-distribution", or "Point".
location_d	Numeric scalar. Location parameter for the design prior.
scale_d	Numeric scalar > 0. Scale parameter for the design prior.
dff_d	Numeric scalar. Degrees of freedom for the design prior (required if prior_design = "t-distribution"; ignored otherwise).
N1	Numeric integer. Sample size for group 1 (used if r = NULL).
N2	Numeric integer. Sample size for group 2 (used if r = NULL).
r	Optional numeric scalar. Ratio of sample size N2 / N1 (used if N1 and N2 are NULL).
type_rate	Character, either "positive" or "negative"; determines whether to control true/false positive or true/false negative rates .

Details

1. Sample size determination mode (when N1 = NULL and N2 = NULL, but r is provided):

If no sample size is provided, the function calculates the minimum sample size needed to achieve the desired configuration below. The user must provide:

- type_rate - either "positive" to control true/false positive rates, or "negative" to control true/false negative rates.

- `true_rate` - the targeted true positive or true negative rate (between 0.6 and 0.999).
- `false_rate` - the acceptable false positive or false negative rate (between 0.001 and 0.1).
- `threshold` - the Bayes factor threshold for compelling evidence (must be > 1).
- `r` - the allocation ratio of group 2 to group 1 sample sizes (`N2/N1`).

The function iteratively finds the smallest sample size `N1` and `N2 = r * N1` for which the probability of obtaining compelling evidence (i.e., true positive/negative rate) meets or exceeds `true_rate`, while the probability of misleading evidence (i.e., false positive/negative rate) does not exceed `false_rate`.

2. Fixed-sample analysis mode (when `N1` and `N2` are supplied):

If a positive numeric sample size `N1` and `N2` are provided, the function computes the probabilities of obtaining compelling or misleading evidence for that fixed sample size. In this mode, the arguments `type_rate`, `r`, `true_rate`, and `false_rate` are ignored; only the Bayes factor threshold `threshold` is used.

Direction of the Alternative Hypothesis:

The argument `alternative` specifies the direction of the test and can be set to `"two.sided"`, `"greater"`, or `"less"`.

Interval Null Hypothesis:

The interval null hypothesis can be specified using the argument `ROPE`, which defines an interval around the null value of 0.

The required form of `ROPE` depends on the direction of `alternative`:

- `"greater"` or `"less"`: `ROPE` must be a scalar. It should be positive for `"greater"` and negative for `"less"`.
- `"two.sided"`: `ROPE` must be a numeric vector of length 2, where the lower bound is negative and the upper bound is positive.

If `ROPE = NULL`, a point-null hypothesis is assumed.

Analysis Priors:

The user must specify the analysis prior under the alternative hypothesis using `prior_analysis`:

- `Normal` (normal prior): `location` and `scale` > 0.
- `Moment` (normal-moment prior): `scale` > 0.
- `t-distribution` (scaled t prior): `location`, `scale` > 0, and `dff` > 0.

Design Priors (optional):

The design prior under the alternative hypothesis can optionally be specified using `prior_design`:

- `Normal` (normal prior): `location_d` and `scale_d` > 0.
- `Moment` (normal-moment prior): `scale_d` > 0.
- `t-distribution` (scaled t prior): `location_d`, `scale_d` > 0, and `dff_d` > 0.
- `Point` (point prior): `location_d`.

If `prior_design` is `NULL`, no design prior is used.

Value

An object of class BFpower_t containing:

- type: Character string describing the test type.
- alternative: Alternative hypothesis ("two.sided", "greater", or "less").
- ROPE: Interval bounds under the null used, if any.
- analysis_h1: List with the analysis prior parameters: prior_analysis, location, scale, and optionally dff.
- design_h1: List with the design prior parameters: prior_design, location, scale, and optionally dff (or NULL if not provided).
- results: Data frame with probabilities of compelling/misleading evidence.
- threshold: Threshold of compelling evidence.

Examples

```
BFpower.ttest.TwoSample(
 alternative = "two.sided",
 ROPE = c(-0.36, 0.36),
 threshold = 3,
 true_rate = 0.8,
 false_rate = 0.05,
 prior_analysis = "Normal",
 location = -0.23,
 scale = 0.2,
 dff = 1,
 type_rate = "negative",
 r = 1)
```

---

plot.BFpower *Plot Method for BFpower Objects*

Description

Visualizes a "BFpower" object.

Usage

```
## S3 method for class 'BFpower'
plot(x, plot_power = FALSE, plot_rel = FALSE, ...)
```

Arguments

x	A "BFpower" object returned by one of the BFpower functions listed in the section Details.
plot_power	Logical. If TRUE, the power-related plots are returned.
plot_rel	Logical. If TRUE, the plot showing the relationship between the data and the Bayes factors is returned.
...	Additional arguments (currently unused; included for method consistency).

Details

This plot method can return up to three plots (or five plots for testing two-proportions) based on the information from the "BFpower" object:

- The first plot displays the analysis prior and the design prior. However, for BFpower.props, three plots are returned, corresponding to the three thetas.
- The second plot contains two panels where the left panel shows the true and false positive rates as a function of sample size, and the right panel shows the true and false negative rates.
- The third plot illustrates the relationship between the data and the Bayes factors.

The object can be generated by any of the following functions: BF10.ttest.OneSample, BF10.ttest.TwoSample, BF10.cor, BFpower.f.test BF10.bin.test, or BF10.props.

Value

A list of up to three ggplot objects.

Examples

```
results <- BFpower.cor(
  alternative = "greater",
  h0 = 0,
  threshold = 3,
  true_rate = 0.8,
  false_rate = 0.05,
  prior_analysis = "beta",
  alpha = 1,
  beta = 1,
  prior_design = "Point",
  location_d = 0.3
)
print(results)
plot(results, plot_power = TRUE, plot_rel = TRUE)
```

---

print.BFpower *Print Method for BFpower Objects*

Description

Displays the results of a "BFpower" object.

Usage

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

Arguments

x	A "BFpower" object returned by one of the BFpower functions listed in the section Details.
...	Additional arguments (currently unused; included for method consistency).

Details

This method prints key information from the "BFpower" object, including the type of hypothesis specification, priors, true and false rates, and required sample. The object can be generated by any of the following functions: BFpower.ttest.OneSample, BFpower.ttest.TwoSample, BFpower.cor, BFpower.f.test, BFpower.bin, or BFpower.props.

Value

Invisibly returns the input "BFpower" object.

Examples

```
results <- BFpower.ttest.OneSample(
  alternative = "two.sided",
  threshold = 3,
  true_rate = 0.8,
  false_rate = 0.05,
  prior_analysis = "t-distribution",
  location = 0,
  scale = 0.707,
  dff = 1
)
print(results)
```

---

print.BFvalue *Print Method for BFvalue Objects*

Description

Displays the results of a "BFvalue" object.

Usage

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

Arguments

x	A "BFvalue" object returned by one of the BF10 testing functions listed in Details.
...	Additional arguments (currently unused; included for method consistency).

Details

This method prints key results from a Bayesian test, including the Bayes factor and relevant test statistics with frequentist test result. The object can be generated by any of the following functions: BF10.ttest.OneSample, BF10.ttest.TwoSample, BF10.cor, BFpower.f.test BF10.bin.test, or BF10.props.

Value

Invisibly returns the input "BFvalue" object.

Examples

```
result <- BF10.ttest.OneSample(
 tval = 2,
 df = 50,
 prior_analysis = "t-distribution",
 location = 0,
 scale = 0.707,
 dff = 1,
 alternative = "two.sided")
print(result)
```

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