Package ‘pwrAB’

Type Package
Title Power Analysis for AB Testing
Version 0.1.0
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Description Power analysis for AB testing. The calculations are based on the Welch's unequal variances t-test, which is generally preferred over the Student's t-test when sample sizes and variances of the two groups are unequal, which is frequently the case in AB testing. In such situations, the Student's t-test will give biased results due to using the pooled standard deviation, unlike the Welch's t-test.
License GPL (>= 3)
Encoding UTF-8
LazyData true
Imports stats
URL http://github.com/williamcha/pwrAB
BugReports http://github.com/williamcha/pwrAB/issues
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R topics documented:

AB_t2n ....................................................... 2
AB_t2n_prop .................................................. 3
Index 5
AB_t2n

Two-Sample t-Test Power Analysis

Description

AB_t2n performs the power analysis for AB testing. It uses the Welch’s t-test, which allows for the standard deviation to vary across groups.

Usage

AB_t2n(N = NULL, percent_B = NULL, mean_diff = NULL, sd_A, sd_B, 
sig_level = NULL, power = NULL, alternative = c("two_sided", "less", 
"greater"), max_sample = 1e+07)

Arguments

N Total number of observations (sum of observations for groups A and B)
percent_B Percentage of total observations allocated to group B (between 0 and 1 - e.g. input .5 for 50%)
mean_diff Difference in means of the two groups, with mean_B - mean_A
sd_A Standard deviation of group A
sd_B Standard deviation of group B
sig_level Significance level (Type I error probability)
power Power of test (1 minus Type II error probability)
alternative Character string specifying the alternative hypothesis, must be one of "two_sided" (default), "greater" or "less"
max_sample Maximum sample size that is searched for

Details

Exactly one of the parameters ’N’, ’percent_B’, ’mean_diff’, ’sig_level’, and ’power’ must be passed as NULL, and the omitted parameter is determined from the others. sd_A and sd_B must be specified. When ’percent_B’ is the parameter omitted, two solutions may exist, in which case the smaller value will be returned

Value

Object of class "power.htest", a list of the arguments (including the computed one).
Examples

# Search for power given other parameters
ab_t2n(N = 3000, percent_B = .3, mean_diff = .15, sd_A = 1, sd_B = 2, sig_level = .05, alternative = 'two_sided')

# Search for sample size required to satisfy other parameters
ab_t2n(percent_B = .3, mean_diff = .15, sd_A = 1, sd_B = 2, sig_level = .05, power = .8, alternative = 'two_sided')

Description

ab_t2n_prop performs the power analysis for AB testing, and when dependent variables are proportions (between 0 and 1). It uses the Welch’s t-test, which allows for the standard deviation to vary across groups.

Usage

ab_t2n_prop(prop_A = NULL, prop_B = NULL, N = NULL, percent_B = NULL, sig_level = NULL, power = NULL, alternative = c("two_sided", "less", "greater"), max_sample = 1e+07)

Arguments

- **prop_A**: Proportion of successes in group A (between 0 and 1)
- **prop_B**: Proportion of successes in group B (between 0 and 1)
- **N**: Total number of observations (sum of observations for groups A and B)
- **percent_B**: Percentage of total observations allocated to group B (between 0 and 1 - e.g. input .5 for 50%)
- **sig_level**: Significance level (Type I error probability)
- **power**: Power of test (1 minus Type II error probability)
- **alternative**: Character string specifying the alternative hypothesis, must be one of "two_sided" (default), "greater" or "less"
- **max_sample**: Maximum sample size that is searched for

Details

Exactly one of the parameters 'prop_A', 'prop_B', 'N', 'percent_B', 'sig_level', and 'power' must be passed as NULL, and the omitted parameter is determined from the others. The standard deviations for each group are calculated using the formula sqrt(prop * (1 - prop)). When 'percent_B' is the parameter omitted, two solutions may exist, in which case the smaller value will be returned. For two_sided tests, when 'prop_A' or 'prop_B' is omitted, two solutions may exist, in which case both will be reported.
Value

Object of class "power.htest", a list of the arguments (including the computed one).

Examples

# Search for power given other parameters
AB_t2n_prop(prop_A = .2, prop_B = .25,
            N = 3000, percent_B = .3,
            sig_level = .05, alternative = 'two.sided')

# Search for proportion in group B required to satisfy other parameters
AB_t2n_prop(prop_A = .2, N = 3000, percent_B = .3,
            power = .8, sig_level = .05,
            alternative = 'two.sided')
Index

AB_t2n, 2
AB_t2n_prop, 3