Package ‘samplesize’

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Type Package
Title Sample Size Calculation for Various t-Tests and Wilcoxon-Test
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Description Computes sample size for Student's t-test and for the Wilcoxon-Mann-Whitney test for categorical data. The t-test function allows paired and unpaired (balanced / unbalanced) designs as well as homogeneous and heterogeneous variances. The Wilcoxon function allows for ties.
License GPL (>= 2)
URL https://github.com/shearer/samplesize
BugReports https://github.com/shearer/samplesize/issues
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samplesize-package

Computes sample size for several two-sample tests

Description
Computes sample size for independent and paired Student’s t-test, Student’s t-test with Welch-approximation, Wilcoxon-Mann-Whitney test with and without ties on ordinal data

Details

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n.ttest(): sample size for Student’s t-test and t-test with Welch approximation
n.wilcox.ord(): sample size for Wilcoxon-Mann-Whitney test with and without ties

Author(s)
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References
Zhao YD, Rahardja D, Qu Yongming. Sample size calculation for the Wilcoxon-Mann-Whitney test adjusting for ties. Statistics in Medicine 2008; 27:462-468

n.ttest

n.ttest computes sample size for paired and unpaired t-tests.

Description
n.ttest computes sample size for paired and unpaired t-tests. Design may be balanced or unbalanced. Homogeneous and heterogeneous variances are allowed.

Usage
n.ttest(power = 0.8, alpha = 0.05, mean.diff = 0.8, sd1 = 0.83, sd2 = sd1, k = 1, design = "unpaired", fraction = "balanced", variance = "equal")
**Arguments**

- `power`: Power (1 - Type-II-error)
- `alpha`: Two-sided Type-I-error
- `mean.diff`: Expected mean difference
- `sd1`: Standard deviation in group 1
- `sd2`: Standard deviation in group 2
- `k`: Sample fraction k
- `design`: Type of design. May be paired or unpaired
- `fraction`: Type of fraction. May be balanced or unbalanced
- `variance`: Type of variance. May be homo- or heterogeneous

**Value**

- Total sample size
  - Sample size for both groups together
- Sample size group 1
  - Sample size in group 1
- Sample size group 2
  - Sample size in group 2

**Author(s)**

Ralph Scherer

**References**


**Examples**

```r
n.ttest(power = 0.8, alpha = 0.05, mean.diff = 0.80, sd1 = 0.83, k = 1, design = "unpaired", fraction = "balanced", variance = "equal")
```

```r
n.ttest(power = 0.8, alpha = 0.05, mean.diff = 0.80, sd1 = 0.83, sd2 = 2.65, k = 0.7, design = "unpaired", fraction = "unbalanced", variance = "unequal")
```
Sample size for Wilcoxon-Mann-Whitney for ordinal data

**Description**

Function computes sample size for the two-sided Wilcoxon test when applied to two independent samples with ordered categorical responses.

**Usage**

\[
n_{\text{wilcox.ord}}(\text{power} = 0.8, \text{alpha} = 0.05, t, p, q)
\]

**Arguments**

- `power`: required Power
- `alpha`: required two-sided Type-I-error level
- `t`: sample size fraction \(n/N\), where \(n\) is sample size of group B and \(N\) is the total sample size
- `p`: vector of expected proportions of the categories in group A, should sum to 1
- `q`: vector of expected proportions of the categories in group B, should be of equal length as `p` and should sum to 1

**Details**

This function approximates the total sample size, \(N\), needed for the two-sided Wilcoxon test when comparing two independent samples, A and B, when data are ordered categorical according to Equation 12 in Zhao et al. (2008). Assuming that the response consists of \(D\) ordered categories \(C_1, \ldots, C_D\). The expected proportions of these categories in two treatments A and B must be specified as numeric vectors \(p_1, \ldots, p_D\) and \(q_1, \ldots, q_D\), respectively. The argument `t` allows to compute power for an unbalanced design, where \(t = n_B/N\) is the proportion of sample size in treatment B.

**Value**

- total sample size
  - Total sample size
  - Sample size group 1
  - Sample size group 2

**Author(s)**

Ralph Scherer

**References**

Zhao YD, Rahardja D, Qu Yongming. Sample size calculation for the Wilcoxon-Mann-Whitney test adjusting for ties. Statistics in Medicine 2008; 27:462-468
Examples

```r
n.wilcox.ord
```

```
## example out of:
## Zhao YD, Rahardja D, Qu Yongming.
## Sample size calculation for the Wilcoxon-Mann-Whitney test adjusting for ties.
## Statistics in Medicine 2008; 27:462-468
n.wilcox.ord(power = 0.8, alpha = 0.05, t = 0.53, p = c(0.66, 0.15, 0.19), q = c(0.61, 0.23, 0.16))
```
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