Package ‘LDtests’

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Type Package

Title Exact tests for Linkage Disequilibrium and Hardy-Weinberg Equilibrium

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Description Exact tests for Linkage Disequilibrium (LD) and Hardy-Weinberg Equilibrium (HWE). - 2-sided LD tests based on different measures of LD (Kulinskaya and Lewin 2008) - 1-sided Fisher's exact test for LD - 2-sided Haldane test for HWE (Wiggington 2005) - 1-sided test for inbreeding - conditional p-values proposed in Kulinskaya (2008) to overcome the problems of asymmetric distributions (for both LD and HWE)

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Exact tests for Linkage Disequilibrium and Hardy-Weinberg Equilibrium

Description

Exact tests for Linkage Disequilibrium (LD) and Hardy-Weinberg Equilibrium (HWE). - 2-sided LD tests based on different measures of LD (Kulinskaya and Lewin 2008) - 1-sided Fisher’s exact test for LD - 2-sided Haldane test for HWE (Wiggington 2005) - 1-sided test for inbreeding - conditional p-values proposed in Kulinskaya (2008) to overcome the problems of asymmetric distributions (for both LD and HWE)

Details

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Version: 1.0
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License: GPL

ld2sided.pvals calculates LD p-values for the input table Fisher1sided calculates Fisher’s 1-sided p-values for LD for the input table HWE2sided calculates HWE p-values for the input table LD2sided.tables calculates LD p-values for an entire null distribution. HWE2sided.tables calculates HWE p-values for an entire null distribution

Author(s)

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References

Kulinskaya and Lewin 2008

Examples

catable <- c(4,5,1,20)
LD2sided.tables(ctable)
LD2sided.pvals(ctable)$pval.Fish
Fisher1sided(ctable)$pval.Fish
HWE2sided.table(maf=0.17,n=100)
geno <- c(20,73,7)
HWE2sided(geno)
Description

1-sided Fisher’s test of linkage disequilibrium

Usage

Fisher1sided(ctable, side = "great")

Arguments

c-table Vector of the 4 entries in the 2x2 contingency table
side "great" or "less" according to which tail you are interested in

Value

pval.Fish P-value
Prob Probability of the contingency under the null
yobs The observed n11 (first cell in the table)
n1 Row margin
n2 Column margin
nn Sample size

Author(s)

Alex Lewin

References

Kulinskaya and Lewin 2008

Examples

c-table <- c(4,5,1,20)
Fisher1sided(ctable)
HWE2sided  

P-values for three different tests of HWE

Description

Calculates conditional p-values proposed in Kulinskaya (2008) to overcome the problems of asymmetric distributions, the Haldane 2-sided test as implemented by Wiggington et al (2005) and the 1-sided test for inbreeding.

Usage

HWE2sided(geno, qplot = F, title = NULL)

Arguments

- geno: Vector of genotype counts: no. heterozygotes followed by the nos. homozygotes
- qplot: If qplot is true the distribution of the null hypothesis is plotted
- title: Title for the plot

Value

- pval.cond: Conditional p-value
- pval.H: 2-sided Haldane p-value
- pval.inbreed: 1-sided test for inbreeding

Author(s)

Alex Lewin

References

Kulinskaya and Lewin 2008

See Also

HWE2sided.table

Examples

geno <- c(20,73,7)
HWE2sided(geno)
Table and plot of Hardy-Weinberg p-values for all 2x2 tables possible under the null distribution.

**Description**

Table and plot of HWE p-values for all possible contingency tables consistent with the margins of the input observed contingency table. See `HWE2sided` for details of the p-values calculated.

**Usage**

```r
HWE2sided.table(maf, n, ylim = c(0, 1), xlim = NULL)
```

**Arguments**

- **maf**: Minor allele frequency
- **n**: Total genotype count
- **ylim**: Y-axis range for plot
- **xlim**: X-axis range for plot

**Value**

Outputs the table of HWE p-values for all the contingency tables consistent with the margins of the input table.

**Author(s)**

Alex Lewin

**References**

Kulinskaya and Lewin 2008

**See Also**

- `HWE2sided`

**Examples**

```r
HWE2sided.table(0.17, 100)
geno <- c(20, 73, 7)
HWE2sided(geno)
```
LD2sided.pvals

P-values and Linkage Disequilibrium measures for several tests of Linkage Disequilibrium

Description
Calculates 2-sided LD tests based on different measures of LD (Kulinskaya and Lewin 2008), 1-sided Fisher’s exact test for LD and the conditional p-values proposed in Kulinskaya (2008) to overcome the problems of asymmetric distributions.

Usage
LD2sided.pvals(htable)

Arguments
ctable Vector of the 4 entries in the 2x2 contingency table

Value
pval.cond Conditional p-value
pval.Fish Fisher’s p-value (sum of tables less probable than observed)
pval.LR P-value based on the likelihood ratio statistic
pval.r P-value based on the correlation coefficient
pval.Dprime P-value based on D prime
pval.delta P-value based on delta (Devlin and Risch)
pval.Q P-value based on Yule’s Q
Prob Probability under the null hypothesis of the observed table
LR Likelihood ratio statistic
r Correlation coefficient
Dprime D prime
delta delta (Devlin and Risch)
Q Yule’s Q
yobs The observed n11 (first cell in the table)
n1 Row margin
n2 Column margin
nn Sample size

Author(s)
Alex Lewin
LD2sided.tables

References

Kulinskaya and Lewin 2008

See Also

LD2sided.tables

Examples

ctable <- c(0,9,5,16)
LD2sided.pvals(ctable)

LD2sided.tables          Tables of p-values and Linkage Disequilibrium measures for all 2x2 tables possible under the null distribution.

Description

This function calculates p-values and Linkage Disequilibrium measures for all possible 2x2 contingency tables consistent with the margins of the input observed contingency table. See LD2sided.pvals for details of the Linkage Disequilibrium measures and tests used.

Usage

LD2sided.tables(ctable)

Arguments

ctable            Vector of the 4 entries in the 2x2 contingency table

Details

This function prints out three tables. First lists all contingency tables consistent with the margins of the input table. Second lists the orderings of the contingency tables according to the different LD measures. Third gives the different LD p-values for all the contingency tables.

Value

Outputs the table of LD p-values for all the contingency tables consistent with the margins of the input table.

Author(s)

Alex Lewin

References

Kulinskaya and Lewin 2008
See Also

LD2sided.pvals

Examples

ctable <- c(0,9,5,16)
LD2sided.tables(ctable)
LD2sided.pvals(ctable)$pval.Fish
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