

# Package: AUtests (via r-universe)

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**Title** Approximate Unconditional and Permutation Tests

**Version** 0.99

**Author** Arjun Sondhi, Ken Rice

**Maintainer** Arjun Sondhi <asondhi@uw.edu>

**Description** Performs approximate unconditional and permutation testing for 2x2 contingency tables. Motivated by testing for disease association with rare genetic variants in case-control studies. When variants are extremely rare, these tests give better control of Type I error than standard tests.

**Depends** R (>= 3.1.2)

**License** GPL-2

**Imports** logistf

**LazyLoad** yes

**Suggests** knitr, markdown

**VignetteBuilder** knitr

**RoxygenNote** 5.0.1

**NeedsCompilation** no

**Repository** CRAN

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au.firth	<i>Firth AU testing</i>
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**Description**

Calculates approximate unconditional Firth test p-value for testing independence in 2x2 case-control tables. The Firth test requires significantly more computational time than the tests computed in the au.tests function.

**Usage**

```
au.firth(m0, m1, r0, r1, lowthresh = 1e-12)
```

**Arguments**

m0	Number of control subjects
m1	Number of case subjects
r0	Number of control subjects exposed
r1	Number of case subjects exposed
lowthresh	A threshold for probabilities below to be considered as zero. Defaults to 1e-12.

**Value**

A single AU p-value, computed under the Firth test.

**Examples**

```
au.firth(15000, 5000, 1, 0)
```

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au.test.strat	<i>Stratified AU testing</i>
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**Description**

Calculates AU p-values for testing independence in 2x2 case-control tables, while adjusting for categorical covariates. Inputs are given as a vector of counts in each strata defined by the covariate(s). Note that computational time can be extremely high.

**Usage**

```
au.test.strat(m0list, m1list, r0list, r1list, lowthresh = 1e-12)
```

**Arguments**

<code>m0list</code>	Number of control subjects in each strata
<code>m1list</code>	Number of case subjects in each strata
<code>r0list</code>	Number of control subjects exposed in each strata
<code>r1list</code>	Number of case subjects exposed in each strata
<code>lowthresh</code>	A threshold for probabilities below to be considered as zero. Defaults to 1e-12.

**Value**

An AU p-value, computed under the likelihood ratio test.

**Examples**

```
au.test.strat(c(500, 1250), c(150, 100), c(0, 0), c(10, 5))
```

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<code>au.tests</code>	<i>AU testing</i>
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**Description**

Calculates approximate unconditional p-values for testing independence in 2x2 case-control tables.

**Usage**

```
au.tests(m0, m1, r0, r1, lowthresh = 1e-12)
```

**Arguments**

<code>m0</code>	Number of control subjects
<code>m1</code>	Number of case subjects
<code>r0</code>	Number of control subjects exposed
<code>r1</code>	Number of case subjects exposed
<code>lowthresh</code>	A threshold for probabilities below to be considered as zero. Defaults to 1e-12.

**Value**

A vector of AU p-values, computed under score, likelihood ratio, and Wald tests.

**Examples**

```
au.tests(15000, 5000, 30, 25)
au.tests(10000, 10000, 30, 25)
```

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 basic.tests

*Basic testing*


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### Description

Calculates standard p-values for testing independence in 2x2 case-control tables.

### Usage

```
basic.tests(m0, m1, r0, r1)
```

### Arguments

m0	Number of control subjects
m1	Number of case subjects
r0	Number of control subjects exposed
r1	Number of case subjects exposed

### Value

A vector of p-values, computed under score, likelihood ratio, Wald, Firth, and Fisher's exact tests.

### Examples

```
basic.tests(15000, 5000, 30, 25)
```

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 perm.test.strat

*Stratified permutation testing*


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### Description

Calculates permutation p-values for testing independence in 2x2 case-control tables, while adjusting for categorical covariates. Inputs are given as a vector of counts in each strata defined by the covariate(s). Note that computational time can be extremely high.

### Usage

```
perm.test.strat(m0list, m1list, r0list, r1list)
```

### Arguments

m0list	Number of control subjects in each strata
m1list	Number of case subjects in each strata
r0list	Number of control subjects exposed in each strata
r1list	Number of case subjects exposed in each strata

**Value**

A permutation p-value, computed under the likelihood ratio test.

**Examples**

```
perm.test.strat(c(7000, 1000), c(11000, 1000), c(50, 30), c(70, 40))
```

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perm.tests

*Permutation testing*

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**Description**

Calculates permutation p-values for testing independence in 2x2 case-control tables.

**Usage**

```
perm.tests(m0, m1, r0, r1, lowthresh = 1e-12)
```

**Arguments**

m0	Number of control subjects
m1	Number of case subjects
r0	Number of control subjects exposed
r1	Number of case subjects exposed
lowthresh	A threshold for probabilities below to be considered as zero. Defaults to 1e-12.

**Value**

A vector of permutation p-values, computed under score, likelihood ratio, Wald, and Firth tests.

**Examples**

```
perm.tests(15000, 5000, 30, 25)
```

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