Package 'R2ROC'

June 23, 2023

Title AUC Statistics

Version 0.0.0.9000

Description AUC statistic for significance test. Variance and covariance of AUC values used to assess the 95% CI and p-value of the AUC difference for both nested and non-nested model.

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R topics documented:

`auc_diff` *auc_diff function*

Description

This function estimates var(AUC(y~x[,v1]) - AUC(y~x[,v2])) where AUC is the Area Under ROC curve of the model, y is N by 1 matrix having the dependent variable, and x is N by M matrix having M explanatory variables. v1 or v2 indicates the ith column in the x matrix (v1 or v2 can be multiple values between 1 - M, see Arguments below)

Usage

```
auc_diff(dat, v1, v2, nv, kv)
```

Arguments

dat	N by (M+1) matrix having variables in the order of cbind(y,x)
v1	This can be set as v1=c(1) or v1=c(1,2)
v2	This can be set as v2=c(2), v2=c(3), v2=c(1,3) or v2=c(3,4)
nv	Sample size
kv	Population prevalence

Value

This function will estimate significant difference between two PRS (either dependent or independent and joint or single). To get the test statistics for the difference between AUC(y~x[,v1]) and AUC(y~x[,v2]). (here we define AUC1=AUC(y~x[,v1])) and AUC2=AUC(y~x[,v2]))). The outputs are listed as follows.

mean_diff	AUC differences between AUC1 and AUC2
var	Variances of AUC differences
upper_diff	Upper value of the differences
lower_diff	Upper value of the differences
p	two tailed P-value for significant difference between AUC1 and AUC2
p_one_tail	tailed P-value for significant difference
heller_p	P-value based on Heller's test for significant difference
heller_upper_diff	Upper limit of 95% CI for the difference basedon Heller's test
heller_lower_diff	Lower limit of 95% CI for the difference basedon Heller's test

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auc_var *auc_var function*

Description

This function estimates var(AUC(y~x[,v1])) where AUC is the Area Under ROC curve of the model, y is N by 1 matrix having the dependent variable, and x is N by M matrix having M explanatory variables. v1 indicates the ith column in the x matrix (v1 can be multiple values between 1 - M, see Arguments below)

Usage

```
auc_var(dat, v1, nv, kv)
```

Arguments

dat	N by (M+1) matrix having variables in the order of cbind(y,x)
v1	This can be set as v1=c(1), v1=c(1,2) or possibly with more values
nv	Sample size
kv	Population prevalence

Value

This function will test the null hypothesis for AUC. To get the test statistics for AUC(y~x[,v1]). The outputs are listed as follows.

auc	AUC
var	Variance of AUC
upper_auc	Upper limit of 95% CI for AUC
lower_auc	Lower limit of 95% CI for AUC

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olkin_auc1 *olkin_auc1 function*

Description

olkin_auc1 function

Usage

```
olkin_auc1(omat, nv, kv)
```

Arguments

omat	3 by 3 matrix having the correlation coefficients between y, x1 and x2, i.e. omat=cor(dat) where dat is N by 3 matrix having variables in the order of cbind (y,x1,x2)
nv	Sample size

Value

This function will be used as source code

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olkin_auc12 *olkin_auc12 function*

Description

olkin_auc12 function

Usage

```
olkin_auc12(omat, nv, kv)
```

Arguments

omat	3 by 3 matrix having the correlation coefficients between y, x1 and x2, i.e. omat=cor(dat) where dat is N by 3 matrix having variables in the order of cbind (y,x1,x2)
nv	Sample size

Value

This function will be used as source code

`olkin_auc12_1` *olkin_auc12_1 function*

Description

olkin_auc12_1 function

Usage

```
olkin_auc12_1(omat, nv, kv)
```

Arguments

`omat`	3 by 3 matrix having the correlation coefficients between y, x1 and x2, i.e. omat=cor(dat) where dat is N by 3 matrix having variables in the order of cbind (y,x1,x2)
`nv`	Sample size

Value

This function will be used as source code

`olkin_auc12_13` *olkin_auc12_13 function*

Description

olkin_auc12_13 function

Usage

```
olkin_auc12_13(omat, nv, kv)
```

Arguments

`omat`	3 by 3 matrix having the correlation coefficients between y, x1 and x2, i.e. omat=cor(dat) where dat is N by 3 matrix having variables in the order of cbind (y,x1,x2)
`nv`	Sample size

Value

This function will be used as source code

`olkin_auc12_3` *olkin_auc12_3 function*

Description

olkin_auc12_3 function

Usage

```
olkin_auc12_3(omat, nv, kv)
```

Arguments

`omat`	3 by 3 matrix having the correlation coefficients between y, x1 and x2, i.e. omat=cor(dat) where dat is N by 3 matrix having variables in the order of cbind (y,x1,x2)
`nv`	Sample size

Value

This function will be used as source code

`olkin_auc12_34` *olkin_auc12_34 function*

Description

olkin_auc12_34 function

Usage

```
olkin_auc12_34(omat, nv, kv)
```

Arguments

`omat`	3 by 3 matrix having the correlation coefficients between y, x1 and x2, i.e. omat=cor(dat) where dat is N by 3 matrix having variables in the order of cbind (y,x1,x2)
`nv`	Sample size

Value

This function will be used as source code

`olkin_auc1_2` *olkin_auc1_2 function*

Description

olkin_auc1_2 function

Usage

```
olkin_auc1_2(omat, nv, kv)
```

Arguments

`omat`	3 by 3 matrix having the correlation coefficients between y, x1 and x2, i.e. omat=cor(dat) where dat is N by 3 matrix having variables in the order of cbind (y,x1,x2)
`nv`	Sample size

Value

This function will be used as source code

Index