Package ‘CsChange’

December 11, 2018

Type Package
Title Testing for Change in C-Statistic
Version 0.1.5
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Maintainer Zhicheng Du<dgdzc@hotmail.com>
Description Calculate the confidence interval and p value for change in C-statistic. The adjusted C-statistic is calculated by using formula as "Somers’ Dxy rank correlation"/2+0.5. The confidence interval was calculated by using the bootstrap method. The p value was calculated by using the Z testing method. Please refer to the article of Peter Ganz et al. (2016) <doi:10.1001/jama.2016.5951>.
License GPL-3
Encoding UTF-8
LazyData true
Imports rms, survival, boot, stats, Hmisc
NeedsCompilation no
Repository CRAN
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R topics documented:

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Description

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Usage

CsChange(fit1, fit2, form1, form2, data, nb, signif, seed)

Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>fit1</td>
<td>an object from 'cph', 'coxph' or 'lrm' model</td>
</tr>
<tr>
<td>fit2</td>
<td>another object from 'cph', 'coxph' or 'lrm' model</td>
</tr>
<tr>
<td>form1</td>
<td>unnecessary, the formula used in fit1, i.e., 'y~x1'</td>
</tr>
<tr>
<td>form2</td>
<td>unnecessary, the formula used in fit2, i.e., 'y~x1+x2'</td>
</tr>
<tr>
<td>data</td>
<td>a data frame used in the fit1 or fit2</td>
</tr>
<tr>
<td>nb</td>
<td>the number of bootstrap replicate, with a default of 200</td>
</tr>
<tr>
<td>signif</td>
<td>the significant level of confidence interval, with a default of 0.05 and a two-sided test</td>
</tr>
<tr>
<td>seed</td>
<td>an integer used to set for random seed, with a default of 123</td>
</tr>
</tbody>
</table>

Value

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>change</td>
<td>in list 1, the change of C-statistic from fit1 to fit2</td>
</tr>
<tr>
<td>low, up</td>
<td>in list 1, the confidence interval of change</td>
</tr>
<tr>
<td>p</td>
<td>in list 1, the p value of testing for change</td>
</tr>
<tr>
<td>c</td>
<td>in list 2, the C-statistic of fit1 and fit2</td>
</tr>
<tr>
<td>low, up</td>
<td>in list 2, the confidence interval of change</td>
</tr>
</tbody>
</table>

Note

Please feel free to contact us, if you have any advice and find any bug!

Update description:

Version 0.1.1: Fix the error of "variables not found" for the 'coxph' model.
Version 0.1.2: Fix the error of data with missing value.
Version 0.1.3: a) Add the c statistic of fit1 and fit2 to the output. b) Fix the error of model with multiple variables. c) Fix the error of independent variable with functions, i.e., rcc(), ploy().
Version 0.1.4: a) Fix the error with the arguments of 'time=' and 'event=' in the coxph model. b) 'lrm' model was supported. c) Different dependent variables could be set.
Version 0.1.5: a) Apply 'boot.ci' function to compute the confidence interval. b) 'lrm' model was supported. c) Different dependent variables could be set.

more functions will be included in 'CsChange' package!

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References


Examples

```r
require("rms")
set.seed(123)
n=50
age=50+12*rnorm(n)
sex=factor(sample(c('Male','Female'), n, rep=TRUE, prob=c(.6, .4))
cens=15*runif(n)
h=.02*exp(.04*(age-50)+.8*(sex=='Female'))
dt=-log(runif(n))/h
e=ifelse(dt <= cens,1,0)
dt=pmin(dt, cens)
units(dt)="Year"
data=data.frame(dt,e,dt1=dt,dt2=dt,e1=e,e2=e,age,sex)
dd=datadist(age, sex)
options(datadist="dd")
#
# for 'cph' model
fit1=cph(Surv(dt,e)-age,data)
fit2=cph(Surv(dt,e)-age+sex,data)
CsChange(fit1,fit2,data=data,nb=20)

# for 'coxph' model
fit1=coxph(Surv(dt,e)-age,data)
fit2=coxph(Surv(dt,e)-age+sex,data)
CsChange(fit1,fit2,data=data,nb=20)

# for 'coxph' model
#fit1=coxph(Surv(dt1,e1)-age,data)
#fit2=coxph(Surv(dt2,e2)-age+sex,data)
#CsChange(fit1,fit2,data=data,nb=20)

# for 'coxph' model
#fit1=coxph(Surv(dt,e)-age+sex,data)
#fit2=coxph(Surv(dt,e)-rcs(age)+sex,data)
#CsChange(fit1,fit2,data=data,nb=20)#ignore the warnings messages
```
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