Package 'linearModel'

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Type Package

Title Linear Model Functions

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Imports stats, utils

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Description Functions to access and test results from a linear model.

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Contents

anovaTable *ANOVA Table*

Description

Produces the overall ANOVA table where the model sum of squares are not partioned into their parts.

Usage

```
anovaTable(object, ...)
```

Arguments

object	lm or aov model object
...	currently ignored

Value

Object of class anova and data.frame

Examples

```
data(depression)

## MLR model
modMLR <- lm(depress~trauma+control,data=depression)
anovaTable(modMLR)

## ANOVA model
depression$gender <- factor(depression$gender)
depression$history <- factor(depression$history)
modAOV  <- lm(depress~-1+gender+history+gender:history,data=depression)
anovaTable(modAOV)
```

contrastTest *Test Contrasts*

Description

Contrast testing function. Designed to test contrasts of parameter estimates from a linear model.

Usage

```
contrastTest(
  estVec,
  n,
  dfModel,
  dfError,
  mse,
  C = NULL,
  test = c("scheffe", "bonferroni", "hsd", "lsd"),
  ...
)
```

Arguments

estVec	numeric vector of parameter estimates for comparison
n	numeric vector indicating the sample size for the parameter estimates, if a single value is given it is assumed to apply to all estiamtes
dfModel	numeric value for the model degrees of freedom
dfError	numeric value for the error or residual degrees of freedom
mse	numeric value for the mean squared error from the model
C	numeric matrix, each row is a contrast that should sum to zero, see details
test	character, indicating which testing method should be used, see details
...	currently ignored

Details

The test argument can be one of the following: 'scheffe','bonferroni','hsd', or 'lsd'. 'hsd' is the Tukey HSD test. 'lsd' is th Fisher LSD test. The other two are the Scheffe test and Bonferroni adjustment.

The matrix C is the contrast matrix. Each row is a separate contrast. The number of columns of C must be equal to the `length(estVec)`. Row names for C are retained in the output, but they are not required.

Value

Object of class anova and data.frame

Examples

```
data(genericData)

mod <- lm(Y~A,data=genericData)
dfModel <- anovaTable(mod)['Model','df']
dfError <- anovaTable(mod)['Residual','df']
mse <- anovaTable(mod)['Residual','MS']
meanVec <- aggregate(Y~A,FUN=mean,data=genericData)$Y
n <- aggregate(Y~A,FUN=length,data=genericData)$Y
```

```
## can add names for ease of interpretation with the output
names(meanVec) <- c('group 1','group 2','group 3')
contrastTest(estVec=meanVec,n=n,dfModel=dfModel,dfError=dfError,mse=mse,test='hsd')

## each group vs the mean of the other two
C <- rbind(c(1,-0.5,-0.5),c(-0.5,1,-0.5),c(-0.5,-0.5,1))
## row names are not required but are helpful
row.names(C) <- c('1 vs 2+3','2 vs 1+3','3 vs 1+2')
contrastTest(estVec=meanVec,n=n,dfModel=dfModel,dfError=dfError,mse=mse,C=C,test='scheffe')
```

`depression` *Self Reported Depression*

Description

Self reported level of depression and other associated metrics.

Usage

```
data(depression)
```

Format

An object of class `data.frame` with 50 rows and 13 columns.

Details

This is a fictious dataset useful for teaching how to use and interpret linear statistical models. The variables are:

educate Level of Education: (1) professional degree (non-college), (2) 2 years of college, (3) 2+ years of college, but not a BS degree, (4) BS degree, (5) MS degree

income Annual Income: 1 = $10,0001 to $19,999; 2 = $20,000 to $29,999; ... 9 = $90,000 to $99,999; 10 = $100,000 or more

trauma Experience of Trauma; Percent of Life Events Viewed as Traumatic: 0 = 0%, 1 = 10%, 2= 20%, ..., 9 = 90%, 10 = 100%

satisfac Satisfied with your Life: 0 = No, 1 = Yes

control Feeling of Control; How much do you feel in control: 0 = Not at all, 1 = A Little, 2 = Some, 3 = A Lot, 4 = Completely

history Family History of Depression: 0 = No, 1 = Yes

exercise Weekly Amount of Exercise: 0 = None, 1 = 1 Hour, 2 = 2 Hours, 3 = 3 Hours, 4 = 4 Hours, 5 = 5 or more Hours

mhpg 3-methoxy-4-hydroxyphenylethyleneglycol, Depression Related Chemical Secreted in Urine; milligrams secreted per 24 hour period, labeled as `mg/24h`: 0 = 0 `mg/24h`, 1 = 100 `mg/24h`,..., 9 = 900 `mg/24h`, 10 = 1000+ `mg/24h`

sleep Amount of Sleep Problems: 0 = None, 1 = 10% of the time, ... , 9 = 90% of the time, 10 = 100% of the time

depress Perceived Level of Depression: 0 = None, 1 = 10% of the time, ... , 9 = 90% of the time, 10 = 100% of the time

depressYes Do I consider myself depressed: 0 = No, 1 = Yes

welbeing Feeling of Well Being; how often do you feel good about yourself: 0 = None, 1 = 10% of the time, ... , 9 = 90% of the time, 10 = 100% of the time

gender Your Sex: 0 = Male, 1 = Female

`genericData` *Generic Data Set*

Description

Generic data set with four ratio predictors (X1,X2,X3,X4), two categorical predictors (A,B) and one ratio response variable (Y).

Usage

```
data(depression)
```

Format

An object of class `data.frame` with 60 rows and 7 columns.

Details

This is a fictious dataset useful for teaching how to use and interpret linear statistical models.

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