

# Package ‘linearModel’

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**Type** Package

**Title** Linear Model Functions

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**Depends** R (>= 3.6.0)

**Imports** stats, utils

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

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**RoxygenNote** 7.1.2

**NeedsCompilation** no

**Repository** CRAN

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`anovaTable`*ANOVA Table*

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**Description**

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

**Usage**

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

**Arguments**

<code>object</code>	lm or aov model object
<code>...</code>	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)
```

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`contrastTest`*Test Contrasts*

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**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 estimates
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 the Fisher LSD test. The other two are the Scheffé 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')
```

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depression

*Self Reported Depression*


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### 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 fictitious 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 = \$10,000 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

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genericData

*Generic Data Set*

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### **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 fictitious dataset useful for teaching how to use and interpret linear statistical models.

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