Package 'relimp'

July 23, 2025

Version 1.0-5

Date 2016-03-19

Title Relative Contribution of Effects in a Regression Model

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URL http://warwick.ac.uk/relimp

Description Functions to facilitate inference on the relative importance of predictors in a linear or generalized linear model, and a couple of useful Tcl/Tk widgets.

Depends R (>= 2.0.0)

Suggests tcltk, nnet, MASS, Rcmdr

Imports stats, utils

License GPL (>= 2)

NeedsCompilation no

Repository CRAN

Date/Publication 2016-03-30 20:35:30

Contents

pickFrom *Pick Subsets from a Vector*

Description

Provides a Tk dialog or a text-based menu for interactive selection of one or more subsets from a vector.

Usage

```
pickFrom(vec, nsets = 1, return.indices = FALSE,
                 setlabels = NULL, edit.setlabels = TRUE,
                 subset = TRUE,
                 warningText = "one or more selections empty",
                 title = "Subset picker",
                 items.label = "Pick from",
                 labels.prompt = "Your label for this set",
                 list.height = 20,
                 items.scrollbar = TRUE,
                 preserve.order = TRUE,
                 graphics = TRUE,
                 listFont = "Courier 12",
                 labelFont = "Helvetica 11",
                 windowPos = "+150+30")
```

Arguments

vec	a vector
nsets	a positive integer, the number of subsets to be selected
return.indices	logical, whether indices (TRUE) or vector contents (FALSE) are to be returned
setlabels	a character vector of labels for the subsets
edit.setlabels	logical, determines whether a textbox is provided for editing the label of each subset
subset	logical, character or numeric vector indicating which elements of vec should be made available for selection. Default is to make all elements available.
warningText	character, text to use as a warning in situations where no selection is made into one or more of the specified sets
title	character, title of the Tk dialog window
items.label	character, a label for the set of items to be selected from
labels.prompt	character, a prompt for textual set label(s)
list.height	maximum number of elements of vec to display at once
items.scrollbar	logical, whether a scrollbar is to be provided when vec is longer than list.height

preserve.order	logical: should the order of items in vec be maintained in all of the returned subsets?
graphics	logical: should a dialog be used, if possible?
listFont	a Tk font specification for the items list and subsets
labelFont	a Tk font specification for the labels entrybox
windowPos	position of the Tk dialog, in pixels from top left of display

Details

If graphics = TRUE and the tcltk package is operational, a Tk dialog is used, otherwise a text menu.

If return.indices is used together with subset, the indices returned relate to vec, not to vec[subset].

Value

EITHER (in the case of a text menu or if the dialog is ended with "OK") a list, with nsets components. Each component is a selected sub-vector, or a numeric vector of indices for a selected sub-vector (if return.indices is TRUE). The component names are as specified in setlabels, or as specified interactively.

OR (if the dialog is ended either "Cancel" or the close-window control button is used) NULL.

Author(s)

David Firth, with contributions from Heather Turner

Examples

```
## These examples cannot be run by example() but should be OK when pasted
## into an interactive R session
## Not run:
pickFrom(c("apple", "banana", "plum", "grapefruit"), nsets = 2,
  preserve.order = FALSE,
  setlabels = c("Fruits I like", "Fruits I tolerate"))

## End(Not run)
## Not run:
## Type selections as e.g. 1:2, 4
pickFrom(c("apple", "banana", "plum", "grapefruit"), nsets = 2,
  preserve.order = FALSE,
  setlabels = c("Fruits I like", "Fruits I tolerate"),
  graphics = FALSE)

## End(Not run)
```

R.to.Tcl *Convert a Character Vector to Tcl Format*

Description

Converts a character vector into a brace-delimited Tcl list

Usage

```
R.to.Tcl(character.vector)
```

Arguments

character.vector	A character vector

Value

A character vector of length 1

Author(s)

David Firth, <d.firth@warwick.ac.uk>

See Also

Tcl.to.R

Examples

```
R.to.Tcl(c("apple","banana"))
```

relimp *Relative Importance of Predictors in a Regression Model*

Description

Produces a summary of the relative importance of two predictors or two sets of predictors in a fitted model object.

Usage

```
relimp(object, set1=NULL,  set2=NULL, label1="set1", label2="set2",
          subset=TRUE,
          response.cat=NULL, ...)
## S3 method for class 'relimp'
print(x, digits=3, ...)
```

Arguments

object	A model object of class lm, glm, coxph, survreg, multinom, polr or gls
set1	An index or vector of indices for the effects to be included in the numerator of the comparison
set2	An index or vector of indices for the effects to be included in the denominator of the comparison
label1	A character string; mnemonic name for the variables in set1
label2	A character string; mnemonic name for the variables in set2
subset	Either a vector of numeric indices for the cases to be included in the standardization of effects, or a vector of logicals (TRUE for inclusion) whose length is the same as the number of rows in the model frame, object$model. The default choice is to include all cases in the model frame.
response.cat	If object is of class multinom, this is a character string used to specify which regression is of interest (i.e., the regression which predicts the log odds on response cat versus the model's reference category). The response.cat argument should be an element of object$lab; or NULL if object is not of class multinom.
...	For models of class glm, one may additionally set the dispersion parameter for the family (for example, dispersion=1.69). By default it is obtained from object. Supplying it here permits explicit allowance for over-dispersion, for example.
x	an object of class relimp
digits	The number of decimal places to be used in the printed summary. Default is 3.

Details

If set1 and set2 both have length 1, relative importance is measured by the ratio of the two standardized coefficients. Equivalently this is the ratio of the standard deviations of the two contributions to the linear predictor, and this provides the generalization to comparing two sets rather than just a pair of predictors.

The computed ratio is the square root of the variance-ratio quantity denoted as 'omega' in Silber, J H, Rosenbaum, P R and Ross, R N (1995). Estimated standard errors are calculated by the delta method, as described in that paper for example.

If set1 and set2 are unspecified, and if the tcltk package has been loaded, a dialog box is provided (by a call to pickFrom) for the choice of set1 and set2 from the available model coefficients.

Value

An object of class relimp, with at least the following components:

model	The call used to construct the model object summarized
sets	The two sets of indices specified as arguments
log.ratio	The natural logarithm of the ratio of effect standard deviations corresponding to the two sets specified
se.log.ratio	An estimated standard error for log.ratio

If `dispersion` was supplied as an argument, its value is stored as the `dispersion` component of the resultant object.

Author(s)

David Firth <d.firth@warwick.ac.uk>

References

Silber, J. H., Rosenbaum, P. R. and Ross, R N (1995) Comparing the Contributions of Groups of Predictors: Which Outcomes Vary with Hospital Rather than Patient Characteristics? *JASA* **90**, 7–18.

See Also

`relrelimp`

Examples

```
set.seed(182)  ## an arbitrary number, just for reproducibility
x <- rnorm(100)
z <- rnorm(100)
w <- rnorm(100)
y <- 3 + (2 * x) + z + w + rnorm(100)
test <- lm(y ~ x + z + w)
print(test)
relimp(test, 2, 3)    #  compares effects of x and z
relimp(test, 2, 3:4)  #  compares effect of x with that of (z,w) combined
##
##  Data on housing and satisfaction, from Venables and Ripley
##  -- multinomial logit model
library(MASS)
library(nnet)
data(housing)
house.mult <- multinom(Sat ~ Infl + Type + Cont, weights = Freq,
  data = housing)
relimp(house.mult, set1 = 2:3, set2 = 7, response.cat = "High")
```

`relrelimp` *Comparison of Relative Importances in a Multinomial Logit Model*

Description

Produces a summary of the relative importance of two predictors or two sets of predictors in a fitted `multinom` model object, and compares relative importances across two of the fitted logit models.

Usage

```
relrelimp(object, set1=NULL, set2=NULL, label1="set1", label2="set2",
          subset=TRUE,
          response.cat1=NULL, response.cat2=NULL)
```

Arguments

object	A model object of class multinom
set1	An index or vector of indices for the effects to be included in the numerator of the comparison
set2	An index or vector of indices for the effects to be included in the denominator of the comparison
label1	A character string; mnemonic name for the variables in set1
label2	A character string; mnemonic name for the variables in set2
subset	Either a vector of numeric indices for the cases to be included in the standardization of effects, or a vector of logicals (TRUE for inclusion) whose length is the same as the number of rows in the model frame, object$model. The default choice is to include all cases in the model frame.
response.cat1	A character string used to specify the first regression of interest (i.e., the regression which predicts the log odds on response.cat1 versus the model's reference category). The response.cat1 argument should be an element of object$lab.
response.cat2	A character string used to specify the second regression of interest (i.e., the regression which predicts the log odds on response.cat2 versus the model's reference category). The response.cat2 argument should be an element of object$lab.

Details

Computes a relative importance summary as described in relimp, for each of the two regressions specified by response.cat1 and response.cat2 (relative to the same reference category); and computes the difference of those two relative importance summaries, along with an estimated standard error for that difference.

Value

An object of class relrelimp, with at least the following components:

model	The call used to construct the model object summarized
sets	The two sets of indices specified as arguments
response.category	A character vector containing the specified response.cat1 and response.cat2
log.ratio	The natural logarithm of the ratio of effect standard deviations corresponding to the two sets specified. A vector with three components: the first is for response.cat1 versus the reference category, the second for response.cat2 versus the reference category, the third is the difference.
se.log.ratio	Estimated standard errors for the elements of log.ratio

Author(s)

David Firth, <d.firth@warwick.ac.uk>

See Also

relimp

Examples

```
##  Data on housing and satisfaction, from Venables and Ripley
library(MASS)
library(nnet)
data(housing)
house.mult <- multinom(Sat ~ Infl + Type + Cont, weights = Freq,
  data = housing)
relrelimp(house.mult, set1 = 2:3, set2 = 7,
                      label1 = "Influence", label2 = "Contact",
                      response.cat1 = "Medium", response.cat2 = "High")
## Computes the relative contribution of Influence and Contact in
## each of the two logistic regressions (Med/Low and High/Low), and
## compares those two relative-contribution measures.
```

---

showData *Display a Data Frame in a Tk Text Widget*

Description

Displays the contents of a data frame in a modeless Tk text window, for inspection. Objects not of class `data.frame`, for example objects of class `table`, or `matrix`, are coerced using `as.data.frame` prior to display.

Usage

```
showData(dataframe,
       colname.bgcolor = "grey50",
       rowname.bgcolor = "grey50",
       body.bgcolor = "white",
       colname.textcolor = "white",
       rowname.textcolor = "white",
       body.textcolor = "black",
       font = "Courier 12",
       maxheight = 30,
       maxwidth = 80,
       title = NULL,
       rowname.bar = "left",
       colname.bar = "top",
       rownumbers = FALSE,
       placement = "-20-40",
       suppress.X11.warnings = TRUE)
```

Arguments

dataframe	A data frame, or an object to which as.data.frame() can be validly applied
colname.bgcolor	A background colour for the variable-names panel
rowname.bgcolor	A background colour for the row-names panel
body.bgcolor	A background colour for the data
colname.textcolor	A colour for the variable names
rowname.textcolor	A colour for the row names
body.textcolor	A colour for the data
font	The text font used – should be a monospaced font
maxheight	The maximum number of rows to display
maxwidth	The maximum width of display, in characters
title	A title for the window. Default is to use the name of the dataframe as given in the call to showData()
rowname.bar	position of sidebar for row names, "left" or "right", or c("left","right"), or NULL
colname.bar	position of column names, "top" or "bottom", or c("top","bottom"), or NULL
rownumbers	logical, whether row numbers should be displayed
placement	Position of the bottom right corner of the window
suppress.X11.warnings	logical, if TRUE then any X11 warnings are suppressed

Value

Invisibly returns the Tk window containing the displayed data frame.

Note

An error results if the printed representation of dataframe exceeds the maximum allowed width of 10000 characters; see options.

Text can be copied from the Tk window to the system clipboard, using <Control-C> or via a right-click pop-up menu.

On some systems the window may take a few seconds to appear if the data frame is very large.

Author(s)

David Firth, <d.firth@warwick.ac.uk>; with Rcmdr-specific features contributed by John Fox

Examples

```
## This cannot be run by example() but should be OK when pasted
## into an interactive R session
## Not run:
data(mtcars)
showData(mtcars)
## End(Not run)
```

`Tcl.to.R` *Convert a Tcl List to R Character Vector*

Description

Converts a brace-delimited list from Tcl into a character vector

Usage

```
Tcl.to.R(tcl.list)
```

Arguments

`tcl.list`	a character string

Value

a character vector

Author(s)

David Firth, <d.firth@warwick.ac.uk>

See Also

`R.to.Tcl`

Examples

```
Tcl.to.R("{apple} {banana} {pear}")
```

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