Package ‘FindMinIC’

February 19, 2015

Type   Package
Title   Find Models with Minimum IC
Version 1.6
Date  2013-11-15
Author Nicholas Lange, Tom Fletcher, Kristen Zygmunt
Maintainer Kristen Zygmunt <krismz@sci.utah.edu>
Imports nlme, sets
Description Creates models from all combinations of a list of variables and sorts by minimum IC (information criterion).
License LGPL (>= 3.0)
NeedsCompilation no
Repository CRAN
Date/Publication 2013-12-18 01:26:03

R topics documented:

FindMinIC-package .................................................. 1
cm ........................................................................ 2
FindMinIC .............................................................. 4
FindMinIC-internal .................................................. 6

Index 8

FindMinIC-package   Find Minimum Information Criterion package

Description

Find and rank the best models by information criterion such as AIC. Looks at models of all possible combinations of the candidate variables with fixed variables always included.
Author(s)
Nicholas Lange, Tom Fletcher, Kristen Zygmunt

References

See Also
FindMinIC

---

**cm**

Handling “cm” and “cmlist” objects

---

**Description**
Methods for working with candidate model ("cm") and candidate model list ("cmlist") objects.

**Usage**

getNthModel(object, index)
getFirstModel(object)

summaryTable(object, index, ...)

## S3 method for class 'cmlist'
summary(object, ...)

## S3 method for class 'summary.cmlist'
print(x, ...)

## S3 method for class 'cm'
formula(x, ...)

## S3 method for class 'cm'
IC(object)

## S3 method for class 'cm'
summary(object, ...)

## S3 method for class 'summary.cm'
print(x, ...)
Arguments

object
index
x

Arguments

object
index
x

Details

Since FindMinIC returns a potentially large list of candidate models, functions such as getNthModel, getFirstModel, summaryTable and summary can be used to either return specific models or summarize the list of models. Once a particular candidate model (cm) has been extracted, functions such as IC, formula, and summary can be used to further understand that particular model.

Value

a cmList is a list containing the following components:

results
data
best
modeltype

a cm object is a candidate model containing the following components:

call
IC
formula

Author(s)

Nicholas Lange, Tom Fletcher, Kristen Zygmunt

See Also

FindMinIC

Examples

data(iris)
coly="Sepal.Length"
fixed="Sepal.Width"
candidates=c("Species","-1","Sepal.Width:Species")

results.lm = FindMinIC(coly, candidates, fixed, iris)
FindMinIC

Find Model with Minimum IC

Description

Evaluates all models in a set of candidates, and ranks them by IC such as AIC. Either `lm` or `lme` can be used for the model.

Usage

# Find the minimum IC
## Default S3 method:
FindMinIC(coly, candidates = c(""), fixed = c(""), data = list(),
  modeltype = "lm", random = ~1, ic = "AIC", ...)
## S3 method for class 'formula'
FindMinIC(formula, data=list(), na.action=na.omit, fixed = c(""), random = ~1, ...)

# find the minimum IC, fmi is the shorter name form of FindMinIC
## Default S3 method:
fmi(coly, candidates = c(""), fixed = c(""), data = list(),
  modeltype = "lm", random = ~1, ic = "AIC", ...)
## S3 method for class 'formula'
fmi(formula, data=list(), na.action=na.omit, fixed = c(""), random = ~1, ...)

Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>formula</td>
<td>A formula containing the response variable and terms. All the terms of the formula become candidates for inclusion as covariates.</td>
</tr>
<tr>
<td>na.action</td>
<td>action to use when data contains NAs. Options include na.omit, na.exclude, na.fail</td>
</tr>
<tr>
<td>coly</td>
<td>The name of the column to use for the response variable y of the model</td>
</tr>
<tr>
<td>candidates</td>
<td>A list of names of columns that are candidates for inclusion as covariates in the model</td>
</tr>
</tbody>
</table>
FindMinIC

fixed  A list of names of columns (can be empty) that must always be included in every model.
data  An object containing the variables for use in the model.
modeltype  Currently a choice between "lm" (the default) and "lme". If a model follows the calling convention of lm, it might work here, but it is not guaranteed.
random  When modeltype = "lme", use random the same way as would inside a call to lme and to indicate the variable for groupedData.
ic  Type of information criterion to used. Defaults to "AIC". Other options are "AICc" or "BIC".
...  Extra arguments are passed directly into the call to lm or lme.

Details

FindMinIC tries all possible model combinations of the candidate covariates, while always including the same response variable and fixed variables. It returns a list of candidate models ranked by IC. The model combinations include all 2-way interactions among the candidate variables. Other interactions (like age^2) can be directly included in the candidates or fixed lists.

Value

FindMinIC returns a list of candidate models sorted by information criterion IC. The first model has the "best" IC. The list is of class("cmList") while each element of that list is of class("cm") see cmList for more details.

Author(s)

Nicholas Lange, Tom Fletcher, Kristen Zygmunt

References


See Also

getFirstModel

Examples

data(iris)
coly="Sepal.Length"
fixed="Sepal.Width"
candidates=c("Species", "-1", "Sepal.Width:Species")

results.lm = FindMinIC(coly, candidates, fixed, iris)

# model with lowest IC:
FindMinIC-internal

FindMinIC internal functions

Description

These are internal functions used by FindMinIC. These should generally not be used directly.

Usage

splitvars(fixed)
getx(formula)
gety(formula)
getIC(fit, ictype)

Arguments

fixed       a list of strings
formula     a formula object
fit a model fit object such as an object returned by lm
ictype type of IC to use, options are "AIC", "AICc", "BIC"

Details
splitvars splits the variables in fixed into their component variables. For instance, splitvars(c("A","B","C*A","-1","A:D","E:F:G","H|I/J")) will return c("A","B","C","1","D","E","F","G","H","I","J"
getx and gety will return the x and y sides of the given formula respectively
getIC returns the AIC, AICc, or BIC for the given model based on which type was passed in)

Value
see details above

Author(s)
Nicholas Lange, Tom Fletcher, Kristen Zygmunt

See Also
FindMinIC which should be used directly instead of these methods.
Index

*Topic methods
  cm, 2
  FindMinIC-internal, 6
*Topic models
  FindMinIC, 4
  FindMinIC-package, 1
*Topic multivariate
  FindMinIC, 4
  FindMinIC-package, 1
*Topic package
  FindMinIC-package, 1
*Topic print
  cm, 2
  cmlist, 5
  cmlist (cm), 2
  FindMinIC, 2, 3, 4, 7
  FindMinIC-internal, 6
  FindMinIC-package, 1
  fmi, 3
  fmi (FindMinIC), 4
  formula.cm (cm), 2
  getFirstModel, 5
  getFirstModel (cm), 2
  getIC(FindMinIC-internal), 6
  getNthModel (cm), 2
  getx(FindMinIC-internal), 6
  gety(FindMinIC-internal), 6
  groupedData, 5
  IC.cm (cm), 2
  lm, 5
  lme, 5
  print.summary.cm (cm), 2
  print.summary.cmlist (cm), 2
  splitvars(FindMinIC-internal), 6
  summary.cm (cm), 2
  summary.cmlist (cm), 2
  summaryTable (cm), 2