Package ‘vscc’

February 20, 2015

Type Package

Title Variable selection for clustering and classification

Version 0.2

Date 2013-11-16

Author Jeffrey L. Andrews, Paul D. McNicholas

Maintainer Jeffrey L. Andrews <jeffrey.andrews@macewan.ca>

Description Performs variable selection/feature reduction under a clustering or classification framework. In particular, it can be used in an automated fashion using mixture model-based methods (tEIGEN and MCLUST are currently supported).

License GPL (>= 2)

Imports teigen, mclust

NeedsCompilation no

Repository CRAN

Date/Publication 2013-11-17 08:24:55

R topics documented:

vscc-package ....................................................... 2
plot.vscc .......................................................... 2
print.vscc .......................................................... 3
summary.vscc ..................................................... 4
vscc ............................................................... 5

Index 7
Description

Performs variable selection under a clustering or classification framework. Automated implementation using model-based clustering is based on teigen version 2.0 and mclust version 4.0; issues *may* arise when using different versions.

Details

Package: vscc
Type: Package
Version: 0.2
Date: 2013-11-16
License: GPL>=2

Author(s)

Jeffrey L. Andrews and Paul D. McNicholas
Maintainer: Jeffrey L. Andrews <jeffrey.andrews@macewan.ca>

References

See citation("vscc").

See Also

vscc

plot.vscce

plot.vscce

Description

Dedicated plot function for objects of class vscc.

Usage

```r
## S3 method for class 'vscc'
plot(x, ...)
```
print.vscc

Arguments

x An object of class vscc.

... Further arguments to be passed on

Details

Provides a scatterplot matrix of the selected variables with colours corresponding to each group.

Author(s)

Jeffrey L. Andrews

See Also

vscc

Examples

require("mclust")
data(banknote)
bankrun <- vscc(banknote[, -1])
plot(bankrun)
See Also

summary.vscc, vscc

Examples

```r
require("mclust")
data(banknote)
vscc(banknote[, -1])
```

---

### Summary for VSCC

**Description**

Dedicated summary function for objects of class vscc

**Usage**

```r
## S3 method for class 'vscc'
summary(object, ...)
```

**Arguments**

- `object` An object of class vscc
- `...` Additional arguments to be passed

**Author(s)**

Jeffrey L. Andrews

**See Also**

vscc

**Examples**

```r
require("mclust")
data(banknote)
summary(vscc(banknote[, -1]))
```
Description

Performs variable selection under a clustering or classification framework. Automated implementation using model-based clustering is based on teigen version 2.0 and mclust version 4.0; issues may arise when using different versions.

Usage

vscc(x, G=1:9, automate = "mclust", initial = NULL, train = NULL, forcereduction = FALSE)

Arguments

- **x**: Data frame or matrix to perform variable selection on.
- **G**: Vector for the number of groups to consider during initialization and/or post-selection analysis. Default is 1-9.
- **automate**: Character string ("teigen", "mclust" (default), or NULL only) indicating which mixture model family to implement as initialization and/or post-selection analysis. If NULL, the function assumes manual operation of the algorithm (meaning an initial clustering vector must be given, and no post-selection analysis is performed).
- **initial**: Optional vector giving the initial clustering.
- **train**: Optional vector of training data (for classification framework).
- **forcereduction**: Logical indicating if the full data set should be considered (FALSE) when selecting the ‘best’ variable subset via total model uncertainty. Not used if automate=NULL.

Value

- **selected**: A list containing the subsets of variables selected for each relation. Each set is numbered according to the number in the exponential of the relationship. For instance, vscc_object$selected[[3]] corresponds to the variable subset selected by the cubic relationship.
- **family**: The family used as initialization and/or post selection. (Same as user input automate, and can be NULL).
- **wss**: The within-group variance associated with each variable from the full data set.

The remaining values are provided as long as automate is not NULL:

- **topselected**: The best variable subset according to the total model uncertainty.
- **initialrun**: Results from the initialization; an object of class teigen or mclust.
- **bestmodel**: Results from the best model on the selected variable subset; an object of class teigen or mclust.
chosenrelation Numeric indication of the relationship chosen according to total model uncertainty. The number corresponds to exponent in the relationship: for instance, a value of '4' suggests the quartic relationship. If the value "full dataset" is given, then the unreduced data provides the best model uncertainty; can be avoided by specifying forcereduction=TRUE in the function call.

uncertainty Total model uncertainty associated with the best relationship.

allmodelfit List containing the results (teigen or mclust objects) from the post-selection analysis on each variable subset. Number corresponds to the exponent in the relationship. For instance, vscc_object$allmodelfit[[1]] gives the results from the analysis on the variables selected by the linear relationship.

Author(s)
Jeffrey L. Andrews, Paul D. McNicholas

References
See citation("vscc") for the variable selection references. See also citation("teigen") and citation("mclust") if using those families of models via the automate call.

See Also
teigen, Mclust

Examples
require("mclust")
data(banknote) # Load data
head(banknote[, -1]) # Show preview of full data set
bankrun <- vscc(banknote[, -1])
head(bankrun$topselected) # Show preview of selected variables
table(banknote[, 1], bankrun$initialrun$classification) # Clustering results on full data set
table(banknote[, 1], bankrun$bestmodel$classification) # Clustering results on reduced data set
Index

*Topic \textasciitilde kwd1
  plot.vscc, 2
  print.vscc, 3
  summary.vscc, 4
  vscc, 5

*Topic \textasciitilde kwd2
  vscc, 5

*Topic package
  vscc-package, 2

Mclust, 6
plot.vscc, 2
print.vscc, 3
summary.vscc, 4, 4
teigen, 6

vscc, 2–4, 5
vscc-package, 2