Package 'vscc'

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Type Package

Title Variable selection for clustering and classification

Version 0.2

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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

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R topics documented:

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vscc-package *Variable selection for clustering and classification*

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](#)

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plot.vscc *Plotting for vscc objects*

Description

Dedicated plot function for objects of class vscc.

Usage

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

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)
```

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print.vscc	*Printing for vscc*

Description

Dedicated print function for objects of class vscc.

Usage

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

Arguments

x	An object of class vscc
...	Further arguments to be passed on

Details

Same as summary.

Author(s)

Jeffrey L. Andrews

See Also

summary.vscc, vscc

Examples

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

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summary.vscc   *Summary for VSCC*

Description

Dedicated summary function for objects of class vscc

Usage

```
## 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

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

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vscc   *Variable selection for clustering and classification*

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
```

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