Package: Cluster.OBeu (via r-universe)

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Type Package

Title Cluster Analysis 'OpenBudgets.eu'

Version 1.2.3

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Description Estimate and return the needed parameters for visualisations designed for 'OpenBudgets' <http://openbudgets.eu/> data. Calculate cluster analysis measures in Budget data of municipalities across Europe, according to the 'OpenBudgets' data model. It involves a set of techniques and algorithms used to find and divide the data into groups of similar observations. Also, can be used generally to extract visualisation parameters convert them to 'JSON' format and use them as input in a different graphical interface.

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URL https://github.com/okgreece/Cluster.OBeu

BugReports https://github.com/okgreece/Cluster.OBeu/issues

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Encoding UTF-8

LazyData TRUE

Imports car, cluster, clValid, data.tree, dendextend, graphics, jsonlite, mclust, methods, RCurl, reshape, reshape2, stringr, utils

RoxygenNote 7.0.0

Depends R (>= 3.5.0)

Suggests knitr, rmarkdown

VignetteBuilder knitr

NeedsCompilation no

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RemoteSubdir Cluster.OBeu

Contents

`city_data` *city data example*

Description

This dataset is an example data frame of the budget phase data

- Administrative_Unit
- Approved
- Draft
- Executed
- Revised

Format

A data frame with the previous characteristics as columns

`cl.analysis` *Cluster analusis*

Description

Clustering Analysis for OBEU datasets.

Usage

```
cl.analysis(cl.data, cl_feature = NULL, amount = NULL, cl.aggregate = "sum",
cl.meth = NULL, clust.numb = NULL, dist = "euclidean", tojson = FALSE)
```

Arguments

`cl.data`	The input data
`cl_feature`	The feature to be clustered (nominal variables)
`amount`	The numeric variables
`cl.aggregate`	Select a different aggregation in case of filtering the input data
`cl.meth`	The clustering method algorithm
`clust.numb`	The number of clusters
`dist`	The distance metric
`tojson`	If TRUE the results are returned in json format, default returns a list

Details

There are different clustering models to be selected through an evaluation process. The user should define the cl_feature, cl.aggregate and amount parameters to form the structure of cluster data. The clustering algorithm, the number of clusters and the distance metric of the clustering model are set to the best selection using internal and stability measures. The end user can also interact with the cluster analysis and these parameters by specifying the cl.method, cl.num and cl.dist parameters respectively.

Value

The final returns are the parameters needed for visualizing the cluster data depending on the selected algorithm and the specification parameters, as long as some comparison measure matrices.

- cluster.method - Label of the clustering algorithm
- raw.data - Input data
- data.pca - The principal components to visualize the input data
- modelparam - The results of this parameter depend of the selected clustering model
- compare - Clustering measures

Author(s)

Kleanthis Koupidis, Jaroslav Kuchar

See Also

cl.features, clValid, diana, agnes, pam, clara, fanny, Mclust

Examples

```
cl.analysis(city_data, cl.meth = "pam", clust.numb = 3)
```

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cl.features *Clustering features*

Description

Select clustering characteristic to form the clustering data

Usage

```
cl.features(data, features = NULL, amounts = NULL, aggregate = "sum", tojson = FALSE )
```

Arguments

data	The input data
features	The clustering features
amounts	The amount measures of the dataset
aggregate	The function to aggregate
tojson	If TRUE the results are returned in json format, default returns a list

Details

This function adapts the dataset according to the selected dimension of the dataset and the aggregation function.

Value

This function returns the dataset for cluster analysis adapted to the desired features.

Author(s)

Kleanthis Koupidis

See Also

cl.analysis

Examples

```
cl.features(city_data, features = 'Administrative_Unit')

# works also for other datasets
cl.features(iris, features = 'Species')
```

`cl.plot` *Clustering model plotting*

Description

`cl.plot` function plots the clustering model constructed by the `cl.analysis` function.

Usage

```
cl.plot(clustering.model, parameters = list())
```

Arguments

`clustering.model`	Object returned by the `cl.analysis` function.
`parameters`	List of parameters to indicate plotting of ellipses or convex hulls. Default values: `list(ellipses=FALSE, convex.hulls=FALSE)`.

Author(s)

Jaroslav Kuchar <https://github.com/jaroslav-kuchar>

See Also

`cl.analysis`

Examples

```
inputs.clustering <- cl.analysis(city_data, cl.meth="pam", clust.numb=2)
cl.plot(inputs.clustering, parameters = list(ellipses=TRUE))
```

cl.summary *Extract the proposed clustering method and the number of clusters from clvalid method*

Description

Extract the most frequent

Usage

```
cl.summary(clv)
```

Arguments

clv	A clValid object

Details

This function returns the proposed method or number of clusters or both according to the majority clustering indices of a clValid process

Value

A value that indicates the proposed method and number of clusters.

Author(s)

Kleanthis Koupidis

convex.hulls *Convex hull points*

Description

Computes points to plot a convex hull for each cluster of the clustering model

Usage

```
convex.hulls(clustering.model, data.pca)
```

Arguments

clustering.model	Object returned by the cl.analysis function.
data.pca	data as result of the stats::prcomp(clustering.model$data, scale. = T, center = T).

Value

List of vectors with points for each convex hull.

`ellipses` *Ellipse points*

Description

Computes points to plot an ellipse for each cluster of the clustering model

Usage

```
ellipses(clustering.model, data.pca)
```

Arguments

`clustering.model`	Object returned by the `cl.analysis` function.
`data.pca`	data as result of the `stats::prcomp(clustering.model$data, scale. = T, center = T)`.

Value

List of vectors with points for each ellipse.

`nums` *Select the numeric columns of a given dataset*

Description

Extract and return a data frame with the columns that include only numeric values

Usage

```
nums(data)
```

Arguments

`data`	The input data frame, matrix

Value

This function returns a data frame with the numeric columns of the input dataset.

Author(s)

Kleanthis Koupidis

Examples

```
nums(city_data)
```

`open_spending.cl` *Read and Calculate the Basic Information for Cluster Analysis Tasks from Open Spending API*

Description

Extract and analyze the input data provided from Open Spending API, using the `cl.analysis` function.

Usage

```
open_spending.cl(json_data, dimensions=NULL, amounts=NULL, measured.dimensions=NULL,
cl.aggregate="sum", cl.method=NULL, cl.num=NULL, cl.dist="euclidean")
```

Arguments

`json_data`	The json string, URL or file from Open Spending API
`dimensions`	The dimensions/feature of the input data
`amounts`	The measures of the input data
`measured.dimensions`	The dimensions to which correspond amount/numeric variables
`cl.aggregate`	Aggregate function of the input data
`cl.method`	The clustering algorithm
`cl.num`	The number of clusters
`cl.dist`	The distance metric

Details

This function is used to read data in json format from Open Spending API, in order to implement cluster analysis through `cl.analysis` function.

Value

A json string with the resulted parameters of the `cl.analysis` function.

Author(s)

Kleanthis Koupidis

See Also

cl.analysis

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