

# Package ‘Cluster.OBeu’

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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>

**License** GPL-2 | file LICENSE

**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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**Repository** CRAN

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city_data	<i>city data example</i>
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### 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

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cl.analysis	<i>Cluster analysis</i>
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### 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	<i>Clustering features</i>
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### 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')
```

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cl.plot	<i>Clustering model plotting</i>
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**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 <a href="#">cl.analysis</a> function.
parameters	List of parameters to indicate plotting of ellipses or convex hulls. Default values: <code>list(ellipses=FALSE, convex.hulls=FALSE)</code> .

**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))
```

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cl.summary	<i>Extract the proposed clustering method and the number of clusters from clvalid method</i>
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**Description**

Extract the most frequent

**Usage**

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

**Arguments**

clv	A clValid object
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**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

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`convex.hulls`*Convex hull points*

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**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.

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ellipses	<i>Ellipse points</i>
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**Description**

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

**Usage**

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

**Arguments**

clustering.model	
data.pca	Object returned by the <a href="#">cl.analysis</a> function. data as result of the <code>stats::prcomp(clustering.model\$data, scale. = T, center = T)</code> .

**Value**

List of vectors with points for each ellipse.

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nums	<i>Select the numeric columns of a given dataset</i>
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**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
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**Value**

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

**Author(s)**

Kleanthis Koupidis

**Examples**

```
nums(city_data)
```

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open_spending.cl	<i>Read and Calculate the Basic Information for Cluster Analysis Tasks from Open Spending API</i>
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**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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