Package 'dematel'

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Type Package

Title Decision Making Trial and Evaluation Laboratory Technique in R

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Description Developed to Solve the Multi-Criteria Decision Making Problems with Decision Making Trial and Evaluation Laboratory Technique in R.

Depends R (>= 3.5.0),

License GPL-3

Encoding UTF-8

LazyData true

Imports ggplot2, knitr

Suggests rmarkdown

VignetteBuilder knitr

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NeedsCompilation no

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Contents

`check_data` *Data checker*

Description

Throws an error message if data is not matrix format, checks names attribute of the matrix, assign new ones if not defined

Usage

```
check_data(x)
```

Arguments

`x`	numeric values containing the data of direct relationship decision matrix.

Value

This function checks whether `data` is matrix or not. Returns a matrix and assign new names if not defined.

Author(s)

Muhlis Ozdemir <muhlisoz@gmail.com>

`compare_criteria` *Relation results*

Description

Returns relation results that exceed threshold value of direct relationship decision matrix

Usage

```
compare_criteria(x, data_control = TRUE)
```

Arguments

x	a matrix containing the values of direct relationship decision matrix.
data_control	is a pre-defined logical parameter that whether data should checked.

Value

This function returns a num matrix.

Author(s)

Muhlis Ozdemir <muhlisoz@gmail.com>

See Also

apply function.

Examples

```
compare_criteria(dematel::hospitaldata)
compare_criteria(dematel::nurseselection)
compare_criteria(dematel::medicaldevice)
```

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dematel *A Technique of Multi-Criteria Decision Making*

Description

Easily solve Multi-Criteria Decision Making Problems with Decision Making Trial and Evaluation Laboratory Technique.

Author(s)

Muhlis Ozdemir <muhlisoz@gmail.com> Yakup Celikbilek <yakupcelikbilek@gmail.com>

Examples

```
normalize_data(dematel::nurseselection)

total_relationship_matrix(dematel::nurseselection)

relationships_between_criteria(dematel::nurseselection)

visualize(dematel::nurseselection)

threshold_value(dematel::nurseselection)

compare_criteria(dematel::nurseselection)
```

execute_dematel *Complete Dematel Analysis*

Description

Executes all functions and conducts dematel analysis at once

Usage

```
execute_dematel(x)
```

Arguments

x	a matrix containing the values of normalized initial direct-relation decision matrix.

Value

This function executes all functions, conducts dematel analysis at once and returns a `matrix` that contains data, a `matrix` that contains normalized data, a `matrix` that contains normalized initial direct-relation matrix, a `data.frame` that contains relationships between criteria, a `graph`, a `num` that contains threshold value, a `list` of criteria comparisons.

hospitaldata *Hospital Location Selection Data*

Description

A dataset containing hospital location selection problem data. This data set gathered from Celikbilek Y., Ozdemir M. Cok Kriterli Karar Verme Teknikleri Aciklamali ve Karsilastirmali Saglik Bilimleri Uygulamalari ile, pp. 12, NOBEL Akademik Yayincilik, Ankara, 2020.

Usage

```
hospitaldata
```

Format

A data frame of 10 rows and 10 columns

K1 Numeric values of land / building cost

K2 Numeric values of operational repair / maintenance costs

K3 Numeric values of population densitity

K4 Numeric values of distance to educational institutions in the neighbourhood

K5 Numeric values of people's income level in the neighbourhood

K6 Numeric values of distance to public transport vehicles

K7 Numeric values of distance to suppliers

K8 Numeric values of distance to other hospitals

K9 Numeric values of building / land opportunities for additional units planned to be built in the future

K10 Numeric values of convenient transportation for ambulances

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`medicaldevice` *Medical Device Selection Data*

Description

A dataset containing medical device selection problem data. This data set gathered from Celikbilek Y., Ozdemir M. Cok Kriterli Karar Verme Teknikleri Aciklamali ve Karsilastirmali Saglik Bilimleri Uygulamalari ile, pp. 12, NOBEL Akademik Yayincilik, Ankara, 2020.

Usage

```
medicaldevice
```

Format

A data frame of 5 rows and 5 columns

K1 Numeric values of price

K2 Numeric values of ease of use

K3 Numeric values of 24/7 technical support

K4 Numeric values of technical service speed

K5 Numeric values of electrode quality

`normalize_data` *Normalize Data*

Description

Normalizes matrix format data

Usage

```
normalize_data(x, data_control = TRUE)
```

Arguments

`x`	a matrix containing the values of direct relationship decision matrix.
`data_control`	is a pre-defined logical parameter that whether data should checked.

Value

This function returns a `list` of data, and normalized matrix.

`nurseselection` *Nurse Selection Data*

Description

A dataset containing nurse selection problem data. This data set gathered from Celikbilek Y., Ozdemir M. Cok Kriterli Karar Verme Teknikleri Aciklamali ve Karsilastirmali Saglik Bilimleri Uygulamalari ile, pp. 12, NOBEL Akademik Yayincilik, Ankara, 2020.

Usage

```
nurseselection
```

Format

A data frame of 8 rows and 8 columns

K1 Numeric values of graduation success

K2 Numeric values of overall success of the school she/he graduated from

K3 Numeric values of total experience time

K4 Numeric values of surgical and operating room nursing experience time

K5 Numeric values of personality inventory result

K6 Numeric values of communication ability result

K7 Numeric values of coordination ability result

K8 Numeric values of foreign language level

`relationships_between_criteria`
Relationships between criteria

Description

Returns total relationships between criteria data.frame

Usage

```
relationships_between_criteria(x, data_control = TRUE)
```

Arguments

x	a matrix containing the values of direct relationship decision matrix.
data_control	is a pre-defined logical parameter that whether data should checked.

Value

This function returns a data.frame

Author(s)

Muhlis Ozdemir <muhlisoz@gmail.com>

See Also

apply

Examples

```
relationships_between_criteria(dematel::hospitaldata)
relationships_between_criteria(dematel::nurseselection)
relationships_between_criteria(dematel::medicaldevice)
```

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threshold_value *Threshold value*

Description

Returns threshold value of direct relationship decision matrix

Usage

```
threshold_value(x, data_control = TRUE)
```

Arguments

x	a matrix containing the values of direct relationship decision matrix.
data_control	is a pre-defined logical parameter that whether data should checked.

Value

This function returns a num

Author(s)

Muhlis Ozdemir <muhlisoz@gmail.com>

Examples

```
threshold_value(dematel::hospitaldata)
threshold_value(dematel::nurseselection)
threshold_value(dematel::medicaldevice)
```

`total_relationship_matrix` *Relationship matrix*

Description

Returns total relationship matrix of direct relationship decision matrix

Usage

```
total_relationship_matrix(x, data_control = TRUE)
```

Arguments

`x`	a matrix containing the values of direct relationship decision matrix.
`data_control`	is a pre-defined logical parameter that whether data should checked.

Value

This function returns a `matrix`

Author(s)

Muhlis Ozdemir <muhlisoz@gmail.com>

See Also

`apply` function.

Examples

```
total_relationship_matrix(dematel::hospitaldata)
total_relationship_matrix(dematel::nurseselection)
total_relationship_matrix(dematel::medicaldevice)
```

visualize *Causal Diagram*

Description

Returns Causal Diagram of criteria

Usage

```
visualize(x, data_control = TRUE)
```

Arguments

x	a matrix containing the values of direct relationship decision matrix.
data_control	is a pre-defined logical parameter that whether data should checked.

Value

This function returns a graph

Author(s)

Muhlis Ozdemir <muhlisoz@gmail.com>

Examples

```
visualize(dematel::hospitaldata)
visualize(dematel::nurseselection)
visualize(dematel::medicaldevice)
```

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