

Package ‘dematel’

February 22, 2021

Type Package

Title Decision Making Trial and Evaluation Laboratory Technique in R

Version 0.1.0

Date 2021-02-18

Maintainer Muhlis Ozdemir <muhlisoz@gmail.com>

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

RoxygenNote 7.1.1

NeedsCompilation no

Author Muhlis Ozdemir [aut, cre] (<<https://orcid.org/0000-0002-4921-8209>>),
Yakup Celikbilek [aut, ctb] (<<https://orcid.org/0000-0003-0585-1085>>)

Repository CRAN

Date/Publication 2021-02-22 11:10:05 UTC

R topics documented:

check_data	2
compare_criteria	2
dematel	3
execute_dematel	4
hospitaldata	4
medicaldevice	5
normalize_data	5

nurseselection	6
relationships_between_criteria	6
threshold_value	7
total_relationship_matrix	8
visualize	9

Index **10**

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)
```

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 Yayıncılık, 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 density

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

medicaldevice	<i>Medical Device Selection Data</i>
---------------	--------------------------------------

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 Yayıncılık, 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	<i>Normalize Data</i>
----------------	-----------------------

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	<i>Nurse Selection Data</i>
----------------	-----------------------------

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 Yayıncılık, 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	<i>Relationships between criteria</i>
--------------------------------	---------------------------------------

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)
```

threshold_value	<i>Threshold value</i>
-----------------	------------------------

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)
```

Index

* datasets

- hospitaldata, 4
- medicaldevice, 5
- nurseselection, 6

apply, 3, 7, 8

check_data, 2

compare_criteria, 2

dematel, 3

dematel-package (dematel), 3

execute_dematel, 4

hospitaldata, 4

medicaldevice, 5

normalize_data, 5

nurseselection, 6

relationships_between_criteria, 6

threshold_value, 7

total_relationship_matrix, 8

visualize, 9