

# Package ‘dematel’

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**Type** Package

**Title** Decision Making Trial and Evaluation Laboratory Technique in R

**Version** 0.1.0

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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

**RoxygenNote** 7.1.1

**NeedsCompilation** no

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check\_data                      *Data checker*

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### **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>

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compare\_criteria                      *Relation results*

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### **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*

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**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)
```

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execute\_dematel      *Complete Dematel Analysis*

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### 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.

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hospitaldata      *Hospital Location Selection Data*

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### 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

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

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normalize_data	<i>Normalize Data</i>
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### 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.

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nurseselection	<i>Nurse Selection Data</i>
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**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

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relationships_between_criteria	<i>Relationships between criteria</i>
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**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	<i>Threshold value</i>
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### 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)
```

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```
total_relationship_matrix
      Relationship matrix
```

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**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)
```



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`visualize`*Causal Diagram*

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**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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