# Package 'mabacR'

**Type** Package

**Title** Assisting Decision Makers

**Version** 0.1.0

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**Description**

Easy implementation of the MABAC multi-criteria decision method, that was introduced by Pamučar and Ćirović in the work entitled: ``The selection of transport and handling resources in logistics centers using Multi-Attributive Border Approximation area Comparison (MABAC)'' - <doi:10.1016/j.eswa.2014.11.057> - which aimed to choose implements for logistics centers. This package receives data, preferably in a spreadsheet, reads it and applies the mathematical algorithms inherent to the MABAC method to generate a ranking with the optimal solution according to the established criteria, weights and type of criteria. The data will be normalized, weighted by the weights, the border area will be determined, the distances to this border area will be calculated and finally a ranking with the optimal option will be generated.

**License** GPL (>= 2)

**URL** https://github.com/slabaverse/mabacR

**BugReports** https://github.com/slabaverse/mabacR/issues

**Depends** R (>= 4.3.0)

**Suggests** knitr, rmarkdown, testthat (>= 3.0.0)

**VignetteBuilder** knitr

**Encoding** UTF-8

**Language** en-US

**LazyData** true

**RoxygenNote** 7.3.2

**Config/testthat/edition** 3

**NeedsCompilation** no

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**Repository** CRAN

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# Contents

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check_format                          *check_format()*

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### Description

Verify if the database is correctly formatted

### Usage

```
check_format(mabac_df, verbose = TRUE)
```

### Arguments

| | |
|---|---|
| mabac_df | The original dataset to be validated |
| verbose | Logical. If TRUE, messages about errors and warnings will be printed to the console. |

### Value

A list containing:

| | |
|---|---|
| status | Logical, TRUE if the format is correct, FALSE if not. |
| message | A message providing details about any format issues. |

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mabacR                                *mabacR()*

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### Description

This package will execute the mathematical algorithms that make up the MABAC method, a multi-criteria decision method. The data will be normalized, weighted by the weights, the border area will be determined, the distances to this border area will be calculated and finally a ranking with the optimal option will be generated.

### Usage

```
mabacR(mabac_df)
```

## Arguments

mabac_df     The original dataset containing, necessarily in this order: 1. a column with the criteria; 2. a column with the weights (which must add up to 1); 3. A column with types (1 for maximization and -1 for minimization); 4. and the columns with the evaluated items.

## Value

A ranking with the optimal choice in accordance with your criteria, weights and type of criteria

## Examples

```
data(mabac_df)
        output <- mabacR(mabac_df)
```

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mabac_df                 *Data set about Forklifts*

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## Description

This is the database of the original paper that introduced the MABAC method. It presents the criteria defined for selecting items (C1, C2,...); the weights that each criterion will have in the final decision, ranging from 0 to 1, the closer to 1 the more impactful this criterion will be. The sum of the weights must be equal to 1; the type of criterion, whether it is maximization/benefit (1) or minimization/cost (-1) and the items evaluated (A1, A2,...).

## Usage

```
data(mabac_df)
```

## Format

An object of class `"data.frame"`

**criteria**  sets of criteria used for the decision. The data is located in the first column

**weights**  Weights defined by the decision maker for each criterion. The weights range from 0 to 1, with those close to 0 being the least relevant and those close to 1 being the most relevant The sum of the weights must be equal to 1. The weights are located in the second column.

**type**  The types, which are located in the third column, can be benefits (1), which are those that we want to maximize, or they can be costs (-1), which are those that we want to minimize.

**itens**  From the fourth column are the evaluated items. The values of these items do not need to be on the same scale and can be qualitative or quantitative.

## References

This data set was created by Dragan Pamucar and Goran Cirovic. PAMUČAR, D.; ĆIROVIĆ, G. The selection of transport and handling resources in logistics centers using Multi-Attributive Border Approximation area Comparison (MABAC). Expert systems with applications, v. 42, n. 6, p. 3016–3028, 2015.

## Examples

```
head(mabac_df)
```

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