Package: compindPCA (via r-universe)

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Type Package

Title Computation of Relative Weights of Variables and Composite Index Values Based on PCA

Version 0.1.0

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Description It helps in development of a principal component analysis based composite index by assigning weights to variables and combining the weighted variables. For method details see Sendhil, R., Jha, A., Kumar, A. and Singh, S. (2018). <doi:10.1016/j.ecolind.2018.02.053>, and Wu, T. (2021). <doi:10.1016/j.ecolind.2021.108006>.

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Contents

compind	*Computation of PCA based composite index values*

Description

The "compind" function estimates the relative weights of variables using principal component analysis method, and then computes the composite index values by aggregating the weighted variables.

Usage

```
compind(data, var_p, var_n)
```

Arguments

data	Multivariate data set comprises positive and negative variables.
var_p	A set of positive variables. Example: var_p = c("A", "B", "C", "D", "F", "G", "H", "I", "J"), where "A", "B", "C", "D", "F", "G", "H", "I", "J" are positive variables.
var_n	A set of negative variables. Example: var_n = c("E"), where "E" is negative varible.

Details

Variables measured in different scales, and having different units are often required to be aggregated for summarizing the phenomenon under study. As the variables may have different degrees of importance with respect to the phenomenon under question, their relative importance need to be evaluated before aggregating them. The present package offers a principal component analysis based method to derive weights of the constituent variables of the phenomenon under question, and thereby combining the weighted variables for a composite index value.

Value

Index	Composite index value.
Weights	Principal component analysis based derived weights of the constituent variables.

References

Sendhil, R., Jha, A., Kumar, A. and Singh, S. (2018). Extent of vulnerability in wheat producing agro ecologies of India: Tracking from indicators of cross section and multi dimension data. Ecological Indicators, 89(2018): 771–780.

Wu, T. (2021). Quantifying coastal flood vulnerability for climate adaptation policy using principal component analysis. Ecological Indicators, 129(2021): 108006.

See Also

Data_sample

Examples

```
data("Data_sample")
compind(Data_sample, var_p=c("A", "B", "C", "D", "F", "G", "H", "I",  "J"), var_n = c("E"))
```

Data_sample   *Sample data for the PCA based compositive index.*

Description

Multivariate data which contains set of positive and negative variables.

Usage

```
data("Data_sample")
```

Details

The multivariate data set comprises ten hypothetical variables 'A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', and 'J' which are carefully chosen indicators of the hypothetical construct for which the composite index is intended to be developed. The variables have different degrees of importance to define the whole phenomenon represented through the hypothetical construct. The ten variables need to be assigned relative weights and aggregated to get the composite index value. Variable 'E' has a negative relationship with the construct, meaning the larger the value of the variable 'E', the lesser its effect on the construct. The reverse consideration is made for the remaining nine positive variables. The variables have different units of measurement.

Examples

```
data(Data_sample)
```

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