

Package ‘RMaCzek’

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Type Package

Title Czekanowski's Diagrams

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Description Allows for production of Czekanowski's Diagrams. See A. Vasterlund (2019) Master thesis, Linköping University.

Depends R(>= 3.4)

Imports GA(>= 3.2), graphics, methods, seriation, stats

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register_seriate_ga.R RMaCzek.R seriate_ga.R Um_factor.R

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`czek_matrix`*Preprocess data to produce a Czekanowski's Diagram.*

Description

This is a function that divided the values inside a distance matrix into classes. The output can be used in the plot function to produce a Czekanowski's Diagram.

Usage

```
czek_matrix(x, order = "OLO", n_classes = 5, interval_breaks = NULL,  
           monitor = FALSE, distfun = dist, scale_data = TRUE, ...)
```

Arguments

<code>x</code>	a numeric matrix, data frame or a 'dist' object.
<code>order</code>	specifies which seriation method should be applied. The standard setting is the seriation method OLO.
<code>n_classes</code>	specifies how many classes the distances should be divided into. The standard setting is 5 classes.
<code>interval_breaks</code>	specifies the partition boundaries for the distances. As a standard setting, each class represents an equal amount of distances.
<code>monitor</code>	specifies if the distribution of the distances should be visualized. The standard setting is that the distribution will not be visualized. TRUE and "cumulativ_plot" is available.
<code>distfun</code>	specifies which distance function should be used. Standard setting is the dist function which uses the Euclidean distance.
<code>scale_data</code>	specifies if the data set should be scaled. The standard setting is that the data will be scaled.
<code>...</code>	specifies further parameters that can be passed on to the seriate function in the seriation package.

Value

The function returns a matrix with class `czek_matrix`. The return from the function is expected to be passed to the plot function.

Author(s)

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References

J. Czekanowski. (1909). Zur Differentialdiagnose der Neandertalgruppe. Korespondentblatt der Deutschen Gesellschaft für Anthropologie, Ethnologie und Urgeschichte, XL(6/7):44-47,

A Soltysiak and P. Jaskulski (1999). Czekanowski's diagram. a method of multidimensional clustering. New Techniques for Old Times. CAA 98. Computer Applications and Quantitative Methods in Archaeology. Proceedings of the 26th Conference, Barcelona, March 1998, number 757 in BAR International Series, pages 175-184, Oxford.

Vasterlund, A. (2019). Czekanowski's Diagram: Implementing and exploring Czekanowski's Diagram with different seriation methods Master thesis, Linköping University

Examples

```
# Set data #####
x<-mtcars

# Different type of input that give same result #####
czek_matrix(x)
czek_matrix(stats::dist(scale(x)))

## below a number of other options are shown
## but they take too long to run

# Change seriation method #####
#seriation::show_seriation_methods("dist")
czek_matrix(x,order = "GW")
czek_matrix(x,order = "ga")
czek_matrix(x,order = sample(1:nrow(x)))

# Change number of classes #####
czek_matrix(x,n_classes = 3)

# Change the partition boundaries #####
czek_matrix(x,interval_breaks = c(0.1,0.4,0.5)) #10%, 40% and 50%
czek_matrix(x,interval_breaks = c(0,1,4,6,8.48)) #[0,1] (1,4] (4,6] (6,8.48]
czek_matrix(x,interval_breaks = "equal_width_between_classes")
#[0,1.7] (1.7,3.39] (3.39,5.09] (5.09,6.78] (6.78,8.48]

# Change number of classes #####
czek_matrix(x,monitor = TRUE)
czek_matrix(x,monitor = "cumulativ_plot")

# Change distance function #####
czek_matrix(x,distfun = function(x) stats::dist(x,method = "manhattan"))

# Change dont scale the data #####
```

```

czek_matrix(x,scale_data = FALSE)
czek_matrix(stats::dist(x))

# Change additional settings to the seriation method #####
czek_matrix(x,order="ga",control=list(popSize=200,
                                     suggestions=c("SPIN_STS","QAP_2SUM")))

```

plot.czek_matrix *Produce a Czekanowski's Diagram*

Description

This is a function that can produce Czekanowski's Diagram.

Usage

```

## S3 method for class 'czek_matrix'
plot(x, values = NULL, type = "symbols",
     plot_pch = NULL, plot_cex = 1.5, label.cex = 0.6,
     plot_title = "Czekanowski's diagram", legend = FALSE, axis = TRUE,
     ...)

```

Arguments

x	a matrix with class <code>czek_matrix</code> .
values	specifies the color or the size of the symbols in the graph. The standard setting is a grey scale for a color graph and a vector with the values 2,1,0.5,0.25 and 0 for a graph with symbols.
type	specifies if the graph should use color or symbols. The standard setting is symbols.
plot_pch	specifies which symbols the graph should use. The standard setting is 19, which is a black circle.
plot_cex	specifies the size of the cells in a color graph. The standard setting is 1.5.
label.cex	specifies the size of the labels for the objects. The standard setting is 0.6.
plot_title	specifies the main title in the graph.
legend	specifies if a legend should be included or not. The standard setting is that the legend will not be included.
axis	specifies if the labels for the objects should be included. The standard setting is that the labels are included.
...	specifies further parameters that can be passed on to the <code>seriate</code> function in the <code>seriation</code> package.

Value

The function returns a Czekanowski's Diagram.

Author(s)

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References

J. Czekanowski. (1909). Zur Differentialdiagnose der Neandertalgruppe. Korespondentblatt der Deutschen Gesellschaft für Anthropologie, Ethnologie und Urgeschichte, XL(6/7):44-47,

A Soltysiak and P. Jaskulski (1999). Czekanowski's diagram. a method of multidimensional clustering. New Techniques for Old Times. CAA 98. Computer Applications and Quantitative Methods in Archaeology. Proceedings of the 26th Conference, Barcelona, March 1998, number 757 in BAR International Series, pages 175-184, Oxford.

Vasterlund, A. (2019). Czekanowski's Diagram: Implementing and exploring Czekanowski's Diagram with different seriation methods Master thesis, Linköping University

Examples

```
# Set data ####
x<-czek_matrix(mtcars)

# Standard plot #####
plot(x)
plot.czek_matrix(x)

# Specify values #####
plot(x,values=c(1.5,1,0.75,0.25,0 ))
plot(x,values=grDevices::colorRampPalette(c("black","red","white"))(5))

# Specify type #####
plot(x,type = "symbols")
plot(x,type = "col")

# Specify plot_pch #####
plot(x,plot_pch = 15)

# Specify plot_cex #####
plot(x,type="col",plot_cex = 1)

# Specify plot_cex #####
plot(x,label.cex = 0.45)

# Specify the main title #####
plot(x,plot_title = "Czekanowski's Diagram of mtcars")

# Add legend #####
plot(x,legend = TRUE)
```

```
# Remove axis name #####
plot(x,axis = FALSE)

# Change additinal settings to the plot function #####
plot(x,col.main="blue",font.main=9,cex.main=2)
```

RMaCzek

RMaCzek: A package that can produce Czekanowski's diagram

Description

This package produces Czekanowski's diagram.

This software comes AS IS in the hope that it will be useful WITHOUT ANY WARRANTY, NOT even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. Please understand that there may still be bugs and errors. Use it at your own risk. We take no responsibility for any errors or omissions in this package or for any misfortune that may befall you or others as a result of its use. Please send comments and report bugs to Krzysztof Bartoszek at krzbar@protonmail.ch .

Details

Package:	RMaCzek
Type:	Package
Version:	1.0.0
Date:	2019-08-02
License:	GPL-3
LazyLoad:	yes

This package produces Czekanowski's diagram.

The packages functions

czek_matrix A function that returns a distance matrix where the distances are divided into classes. The return from the function is expected to be passed into the plot function.

plot.czek_matrix A function that returns Czekanowski's Diagram.

Author(s)

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References

J. Czekanowski. (1909). Zur Differentialdiagnose der Neandertalgruppe. Korespondentblatt der Deutschen Gesellschaft fur Anthropologie, Ethnologie und Urgeschichte, XL(6/7):44-47,

A Soltysiak and P. Jaskulski (1999). Czekanowski's diagram. a method of multidimensional clustering. *New Techniques for Old Times. CAA 98. Computer Applications and Quantitative Methods in Archaeology. Proceedings of the 26th Conference, Barcelona, March 1998, number 757 in BAR International Series, pages 175-184, Oxford.*

Vasterlund, A. (2019). *Czekanowski's Diagram: Implementing and exploring Czekanowski's Diagram with different seriation methods* Master thesis, Linköping University

Examples

```
# Set data ####  
x<-czek_matrix(mtcars)  
  
# Standard plot #####  
plot(x)  
plot.czek_matrix(x)
```

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