Package ‘dBlockmodeling’

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Type Package
Title Deterministic Blockmodeling of Signed and Two-Mode Networks
Version 0.1.1
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Description It contains functions to apply blockmodeling of signed (positive and negative weights are assigned to the links) and two-mode (two sets of nodes are considered, e.g. employees and organizations) networks (Brusco et al. (2019) <doi:10.1111/bmsp.12192>).
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The New York Times advertisement data

Description

The data pertain to the Turning Point Project (TPP), where \( n = 108 \) organizations signed one or more of \( m = 25 \) environmental activist-oriented, full-page advertisements in the New York Times (NYT) during 1999-2000.

Usage

```r
data("nyt")
```

Format

The data set is a binary network matrix with 108 rows (organizations) and 25 columns (full-page advertisements). An element of the binary network matrix assumes a value of 1 if organization \( i \) signed advertisement \( j \) and 0 otherwise.

References


Examples

```r
data(nyt)

# Plot the network.
# (The function plotMat is from blockmodeling package.)
# plotMat(nyt)
```

Relocation Heuristic for Generalized Structural Balance

Description

This function runs relocation heuristic for generalized structural balance on an \( N \times N \) asymmetric matrix. The main diagonal is ignored.

Usage

```r
rhgsbt(A, C, TLIMIT)
```
Arguments

A  An $N \times N$ signed network matrix.
C  The number of clusters ($1 < C < N$, where $N$ is the number of nodes).
TLIMIT  A desired time limit.

Value

The function returns the following:

- **obj** - the Doreian & Mrvar objective value;
- **P** - $N$-dimensional vector of cluster assignments; and
- **restarts** - the number of restarts within the time limit.

Author(s)

Michael Brusco

References


Examples

```r
# Load the Sampson (1968) monastery network (3rd time point).
data("sampsonT3")
# Run relocation heuristic for generalized structural balance.
res <- rhgsbt(A = sampsonT3, C = 3, TLIMIT = 1)
# See the results.
res
```

---

**rhrsbt**  
Relocation Heuristic for Relaxed Structural Balance

Description

This function runs relocation heuristic for relaxed structural balance on an $M \times M$ asymmetric matrix. The main diagonal is ignored.
Usage

\texttt{rhrsbt(A, C, TLIMIT)}

Arguments

\begin{itemize}
  \item \textbf{A} \hspace{1cm} An $N\times N$ signed network matrix.
  \item \textbf{C} \hspace{1cm} The number of clusters ($1 < C < N$, where $N$ is the number of nodes).
  \item \textbf{TLIMIT} \hspace{1cm} A desired time limit.
\end{itemize}

Value

The function returns the following:

\begin{itemize}
  \item \texttt{obj} - the Doreian & Mrvar objective value;
  \item \texttt{P} - $N$-dimensional vector of cluster assignments; and
  \item \texttt{restarts} - the number of restarts within the time limit.
\end{itemize}

Author(s)

Michael Brusco

References


Examples

\begin{verbatim}
# Load the Sampson (1968) monastery network (3rd time point).
data("sampsonT3")

# Run relocation heuristic for relaxed structural balance.
res <- rhrsbt(A = sampsonT3, C = 3, TLIMIT = 1)

# See the results.
res
\end{verbatim}
Sampson (1968) collected network data among \( n = 18 \) trainee monks at multiple time periods. Network ties were collected with respect to several different relations including affect, esteem, influence, and sanction.

With respect to affect, Sampson (1968) asked each of the 18 trainees (egos) to identify and rank the three other members (alters) of the cohort they liked the most, as well the three members they liked the least.

The data sampsonT3 refers to affect network data, collected at the third time point (Doreian et al., 2005, p. 33).

Usage

data("sampsonT3")

Format

The data set is a 18 x 18 (signed weighted) network matrix. The egos are in lines and the alters are in columns. The entries are egos’ answers. The elements of the network matrix are discrete values between -3 and 3.

The edge from a given ego to the most-liked alter (by this ego) is assigned with an edge weight of +3, the edge to the second-most-liked alter is assigned with a weight of +2, and the edge to the third-most-liked alter is assigned with +1. Likewise, the edge from a given ego to the most-disliked alter is assigned with an edge weight of −3, the edge to the second-most-disliked alter is assigned with a weight of −2, and the edge to the third-most-liked alter with a value of −1.

References


Examples

data(sampsonT3)

# Plot the network.
# (The function plotMat is from blockmodeling package.)
# plotMat(sampsonT3)
Two-Mode KL-Means Heuristic

Description

This function runs two-mode K-means for an ROxCO network matrix.

Usage

\texttt{tmklm(A, RC, CC, TLIMIT)}

Arguments

- \( A \): An ROxCO two-mode network matrix.
- \( RC \): The number of clusters for row objects (1 < RC < RO).
- \( CC \): The number of clusters for column objects (1 < CC < CO).
- \( TLIMIT \): A desired time limit.

Value

The function returns the following:

- \( \text{vaf} \) - the variance-accounted-for;
- \( \text{RP} \) - an RO-dimensional vector of row cluster assignments;
- \( \text{RC} \) - an RC-dimensional vector of column cluster assignments;
- \( \text{restarts} \) - the number of restarts within the time limit.

Author(s)

Michael Brusco

References


Examples

# Load the Turning Point Project network (Brusco & Doreian, 2015) data.
data("nyt")

# Run two-mode K-means procedure.
res <- tmklmed(nyt, RC = 9, CC = 5, TLIMIT = 1)

# See the results.
res

---

tmklmed

Two-Mode Blockmodeling (Structural Equivalence) Heuristic

Description

This function runs two-mode KL-medians for an ROxC network matrix.

Usage

```
tmklmed(A, RC, CC, TLIMIT)
```

Arguments

- **A**: An ROxC two-mode network matrix.
- **RC**: The number of clusters for row objects (1 < RC < RO).
- **CC**: The number of clusters for column objects (1 < CC < CO).
- **TLIMIT**: A desired time limit.

Value

The function returns the following:

- **objval**: total number of inconsistencies;
- **RP**: an RO-dimensional vector of row cluster assignments;
- **RC**: an RC-dimensional vector of column cluster assignments;
- **restarts**: the number of restarts within the time limit.

Author(s)

Michael Brusco
References


Examples

```r
# Load the Turning Point Project network (Brusco & Doreian, 2015) data.
data("nyt")

# Run the two-mode blockmodeling heuristic procedure.
res <- tmklmed(nyt, RC = 9, CC = 5, TLIMIT = 1)

# See the results.
res
```
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