Package 'netCoin'

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Type Package

Version 2.1.9

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Title Interactive Analytic Networks

Description Create interactive analytic networks. It joins the data analysis power of R to obtain coincidences, co-occurrences and correlations, and the visualization libraries of 'JavaScript' in one package.

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Depends R (>= 3.5.0)

Imports rD3plot (>= 1.1.37), igraph (>= 1.0.1), Matrix (>= 1.2-4), haven (>= 1.1.0), MASS (>= 7.3), GPArotation(>= 2022.4), methods

Suggests knitr, rmarkdown, lavaan, shiny, htmltools, openxlsx, data.table, readr

VignetteBuilder knitr

NeedsCompilation no

Maintainer Modesto Escobar <modesto@usal.es>

URL https://modesto-escobar.github.io/netCoin-2.x/

Encoding UTF-8

BugReports https://github.com/Modesto-Escobar/netCoin-2.x/issues

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Contents

`netCoin-package` *The netCoin package.*

Description

Create interactive networked coincidences. It joins the data analysis power of R to study coincidences and the visualization libraries of JavaScript in one package.

Details

Coincidence analysis detects what events, characters, objects, attributes, or characteristics tend to occur together within certain limits.

These given limits are call scenarios (S) and are considered to be the units of analysis, and as such they have to be placed in the rows of a matrix or data.frame.

In each i scenario, a series of J events X_j, which are to be represented as dichotomous variables X_j in columns, may occur (1) or may not occur (0). Scenarios and events constitute an incidence matrix (**I**).

Incidence matrix

	X_1	X_2	X_3	...	X_J
S_1	0	1	0	...	1
S_2	1	0	1	...	0
...	...	...	...	...	...
S_n	1	1	0	...	1

From this incidences matrix, a coincidence (**C**) matrix can be obtained with the function `coin`. In this matrix the main diagonal represents frequencies of X_j, while the others elements are number of coincidences between two events.

Coincidence matrix

	X_1	X_2	X_3		X_J
X_1	2	1	1	...	1
X_2	1	2	0	...	2
X_3	1	0	1	...	0
...	...	...	...	...	...
X_J	1	2	0	...	2

Once there is a `coin` object, a similarity matrix can be obtained. Similarity matrices available in netCoin are:

- Matching (m), Rogers & Tanimoto (t) Gower (g) Sneath (s) and Anderberg (and).
- Jaccard (j), dice (d), antiDice (a), Ochiai (o) and Kulczynski (k).
- Hamann (ham), Yule (y), Pearson (p), odds ratio (od) and Rusell (r).

Other measures that can be obtained from `coin` are:

- Relative frequencies (x), conditional frequencies (i) coincidence degree (cc) and probable degree of coincidence (cp).
- Haberman (h) and Z value of Haberman (z)

To obtain similarity and other measures matrices, the function `sim` elaborates a list of them.

Similarity matrix

	X_1	X_2	X_3		X_J
X_1	1.73	-.87	.87	...	-.87
X_2	-.87	1.73	-1.73	...	1.73
X_3	.87	-1.73	1.73	...	-1.73
...	...	...	...	...	...
X_J	-.87	1.73	-1.73	...	1.73

`edgeList` makes a collecion of edges composed by a list of similarity measures whenever a criterium (generally p(Z)<.50) is met.

Edge list

	source	target	Haberman	P(z)
1	X1	X3	0.8660254	0.22509243
2	X2	X4	1.7320508	0.09084506

In order to make a graph, two data frames are needed: a nodes data frames with names and other nodes attributes (see `asNodes`) and an edge data frame (see `edgeList`). For more information go to `netCoin`.

Author

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

References

Escobar, M. (2009): "Redes Semanticas en Textos Periodisticos: Propuestas Tecnicas para su Representacion", en *Empiria*, 17, 13-39.

Escobar, M.(2015): "Studying Coincidences with Network Analysis and Other Multivariate Tools", in *The Stata Journal*, 15(4), 1118-1156.

Escobar, M. and J. Gomez Isla (2015): "The Expression of Identity through the Image: The Photographic Archives of Miguel de Unamuno and Joaquin Turina", en *Revista Espanola de Investigaciones Sociologicas*, 152, 23-46.

`addDescription` *Adds a description to a 'netCoin' object.*

Description

`addDescription` adds a description to a 'netCoin' object.

Usage

```
addDescription(x, description)
```

Arguments

`x`	A 'netCoin' object.
`description`	the description text.

Value

A 'netCoin' object.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

Examples

```
data(finches)
data(Galapagos)

Net<-allNet(Galapagos,nodes=finches, criteria="hyp", maxL=.05,
        lwidth ="Haberman",lweight="Haberman",
        size="frequency", color="species", layout="mds",
        main="Species coincidences in Galapagos Islands",
        note="Data source: Sanderson (2000)")

img <- system.file("extdata", "p.Crassirostris.png",
        package="netCoin")
Net <- addDescription(Net,"Species coincidences in Galapagos Islands")

## Not run:
multi <- multigraphCreate(Network=Net)
multiPages(multi,"Graph description example",show=TRUE)

## End(Not run)
```

---

addImage *Adds an image to a 'netCoin' object.*

Description

addImage adds an image to a 'netCoin' object.

Usage

```
addImage(x, img)
```

Arguments

x	A 'netCoin' object.
img	character vector indicating the image path.

Value

A 'netCoin' object.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

Examples

```
data(finches)
data(Galapagos)

Net<-allNet(Galapagos,nodes=finches, criteria="hyp", maxL=.05,
        lwidth ="Haberman",lweight="Haberman",
        size="frequency", color="species", layout="mds",
        main="Species coincidences in Galapagos Islands",
        note="Data source: Sanderson (2000)")

img <- system.file("extdata", "p.Crassirostris.png",
        package="netCoin")
Net <- addImage(Net,img)

## Not run:
multi <- multigraphCreate(Network=Net)
multiPages(multi,"Graph image example",show=TRUE)

## End(Not run)
```

---

addNetCoin *Networked coincidences.*

Description

addNetCoin changes netCoin object attributes.

Usage

```
addNetCoin(x, ...)
```

Arguments

x	A 'netCoin' object.
...	Any netCoin argument.

Value

This function returns a netCoin object. If the 'dir' attribute is specified, the function creates a folder in the computer with an HTML document named index.html which contains the produced graph. This file can be directly opened with your browser and sent to a web server to work properly.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

References

Escobar, M. and Martinez-Uribe, L. (2020) Network Coincidence Analysis: The netCoin R Package. *Journal of Statistical Software*, **93**, 1-32. doi:10.18637/jss.v093.i11.

Examples

```
# A character column (with separator)
frame <- data.frame(A = c("Man; Women", "Women; Women",
                          "Man; Man", "Undet.; Women; Man"))
data <- dichotomize(frame, "A", sep = "; ")[2:4]
C <- coin(data) # coincidence matrix
N <- asNodes(C) # node data frame
E <- edgeList(C) # edge data frame
net <- netCoin(N, E) # netCoin object
net <- addNetCoin(net, color="frequency") # netCoin object with color applied to nodes
```

---

addTutorial *Adds a tutorial for the gallery.*

Description

addTutorial adds a tutorial for a gallery.

Usage

```
addTutorial(x, image = NULL, description = NULL)
```

Arguments

x	object of class gallery_rd3.
image	character vector indicating the image path, header for the tutorial.
description	a character string indicating a desription text to insert in the tutorial.

Value

Object of class gallery_rd3.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

Examples

```
data("finches")
finches$species <- system.file("extdata", finches$species,
        package="netCoin") # copy path to the species field
g <- gallery(finches, image="species", main="Species in Galapagos Islands",
        note="Data source: Sanderson (2000)")

g <- addTutorial(g,
  description="Here you can see different finches species in Galapagos islands.")

## Not run:
plot(g)

## End(Not run)
```

---

allNet *Networked coincidences from incidences data.*

Description

allNet produces a network object of coincidences from a data frame or a matrix with dichotomous values.

Usage

```
allNet(incidences, weight = NULL, subsample = FALSE, pairwise = FALSE,
       minimum=1, maximum = nrow(incidences),
       sort = FALSE, decreasing = TRUE,
       frequency = FALSE, percentages = TRUE,
       procedures = "Haberman", criteria = "Z", Bonferroni = FALSE,
       support = -Inf, minL = -Inf, maxL = Inf,
       directed = FALSE, diagonal = FALSE,
       sortL = NULL, decreasingL = TRUE,
       igraph = FALSE, dir=NULL, ...)
```

Arguments

incidences	an incidence matrix or data frame with only 0/1 variables.
weight	a vector of weights. Optimal for data.framed tables.
subsample	retrict the analysis to scenarios with at least one event.
pairwise	Pairwise mode of handling missing values if TRUE. Listwise by default.
minimum	minimum frequency to be considered.
maximum	maximum frequency to be considered.
sort	sort the coincidence matrix according to frequency of events.
decreasing	decreasing or increasing sort of the matrix.

frequency	a logical value true if frequencies are to be shown. Default = FALSE.
percentages	a logical value true if percentages are to be shown. Default = TRUE.
procedures	a vector of statistics of similarity. See below.
criteria	statistic to be use for selection criteria.
Bonferroni	Bonferroni criterium of the signification test.
support	minimum value of the frequency of the coincidence to be edged.
minL	minimum value of the statistic to include the edge in the list.
maxL	maximum value of the statistic to include the edge in the list.
directed	includes same edges only once.
diagonal	includes auto-links.
sortL	sort the list according to the values of a statistic. See below.
decreasingL	order in a decreasing way.
igraph	Produces an igraph object instead of a netCoin object if TRUE.
dir	a "character" string representing the directory where the web files will be saved.
...	Any netCoin argument.

Details

Possible measures in procedures are

- Frequencies (f), Relative frequencies (x), Conditional frequencies (i), Coincidence degree (cc), Probable degree (cp),
- Expected (e), Confidence interval (con)
- Matching (m), Rogers & Tanimoto (t), Gower (g), Sneath (s), Anderberg (and),
- Jaccard (j), Dice (d), antiDice (a), Ochiai (o), Kulczynski (k),
- Hamann (ham), Yule (y), Pearson (p), odds ratio (od), Rusell (r),
- Haberman (h), Z value of Haberman (z),
- Hypergeometric p greater value (hyp).
- Convert a matrix into an edge list (shape).

Value

This function creates a netCoin object (or igraph) and, if stated, a folder in the computer with an HTML document named index.html which contains the produced graph. This file can be directly opened with your browser and sent to a web server to work properly.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

References

Escobar, M. and Martinez-Uribe, L. (2020) Network Coincidence Analysis: The netCoin R Package. *Journal of Statistical Software*, **93**, 1-32. doi:10.18637/jss.v093.i11.

Examples

```
# A character column (with separator)
frame <- data.frame(A = c("Man; Women", "Women; Women",
                          "Man; Man", "Undet.; Women; Man"))
data <- dichotomize(frame, "A", sep = "; ")[2:4]
allNet(data) # network object
```

---

asGallery *Images in a grid gallery.*

Description

asGallery produces a gallery_rd3 object.

Usage

```
asGallery(net)
```

Arguments

net	is a netCoin object. See netCoin

Value

Object of class gallery_rd3.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
data("Galapagos")
data("finches")
finches$species <- system.file("extdata", finches$species,
        package="netCoin") # copy path to the species field
Net <- allNet(Galapagos, nodes=finches, criteria="hyp", maxL=.05,
        image="species",
        main="Species coincidences in Galapagos Islands",
        note="Data source: Sanderson (2000)")
gallery <- asGallery(Net)
```

asNodes *Nodes data frame.*

Description

Nodes data frame from either an edge list or a coin object.

Usage

```
asNodes(C, frequency = TRUE, percentages = FALSE, language = c("en","es","ca"))
```

Arguments

C	has to be an edge list or, better, a coin object.
frequency	add frequency of nodes
percentages	add nodes percentages
language	a character vector (es=spanish; en=english; ca=catalan).

Value

A data frame with nodes' names and their frequency and/or percentages if the input is a coin object

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

References

Escobar, M. and Martinez-Uribe, L. (2020) Network Coincidence Analysis: The netCoin R Package. *Journal of Statistical Software*, **93**, 1-32. doi:10.18637/jss.v093.i11.

Examples

```
# From a random incidence matrix I(25X4)
I <- matrix(rbinom(100, 1, .5), nrow = 25, ncol = 4,
     dimnames = list(NULL, c("A", "B", "C", "D")))
C <- coin(I)
asNodes(C)
```

barCoin *Networked coincidences.*

Description

barCoin produces a barCoin object.

Usage

```
barCoin(data, variables = colnames(data), commonlabel = NULL,
        dichotomies = c("_all","_none"), valueDicho = 1, weight = NULL,
        subsample = FALSE, sort = NULL, decreasing = TRUE, nodes = NULL,
        name = NULL, select = NULL, scalebar = FALSE, note = NULL,
        label = NULL, text = NULL, color = NULL, defaultColor = "#1f77b4",
       expected = FALSE, confidence = FALSE, level = .95, significance = FALSE,
        minimum = 1 , maximum = nrow(data), percentages = FALSE,
        criteria = c("Z","hyp"), Bonferroni = FALSE,
        support = 1, minL = -Inf, maxL = 1,
        language = c("en","es","ca"), cex = 1.0, dir = NULL)
```

Arguments

data	a data frame
variables	a vector of variables included in the previous data frame
commonlabel	a vector of variables whose names are to be included in nodes labels
dichotomies	a vector of dichotomous variables to appear as just one categorie
valueDicho	value to be selected for dichotomous variables. Default is 1
weight	a vector of weights. Optimal for data.framed tables.
subsample	retrict the analysis to scenarios with at least one event.
sort	name of the vector in the nodes data frame to order the graph.
decreasing	decreasing or increasing sort of the graph order.
nodes	a data frame with at least two vectors of names and incidences.
name	name of the vector with names in the nodes data frame.
select	Name of the event (in nodes name column) to start the visualization.
scalebar	Should the bars fill the screen height? Default = FALSE.
note	lower title of the graph.
label	name of the vector with labels in the nodes data frame.
text	name of the vector with html text in the nodes data frame.
color	name of the vector with color variable in the nodes data frame.
defaultColor	a character vector giving a valid html color.
expected	name of the vector with expected coincidences in the links data frame.

confidence	name of the vector with confidence interval in the links data frame.
level	confidence level
significance	name of the vector with significance in the links data frame.
minimum	minimum frequency to be considered.
maximum	maximum frequency to be considered.
percentages	a logical value true if percentages are to be shown. Default = TRUE.
criteria	statistic to be use for selection criteria.
Bonferroni	Bonferroni criterium of the signification test.
support	minimum value of the frequency of the coincidence to be edged.
minL	minimum value of the statistic to include the edge in the list.
maxL	maximum value of the statistic to include the edge in the list.
language	a character vector (es=spanish; en=english; ca=catalan).
cex	number indicating the amount by which plotting text should be scaled relative to the default. Default = 1.
dir	a "character" string representing the directory where the web files will be saved.

Value

Object of class barCoin.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
# A character column (with separator)
frame <- data.frame(A = c("Man; Women", "Women; Women",
                          "Man; Man", "Undet.; Women; Man"))
data <- dichotomize(frame, "A", sep = "; ")[2:4]

barCoin(data,dichotomies="_all")
barCoin(data,dichotomies="_all",confidence=TRUE,percentages=TRUE)
```

---

calCentr *Categorize a network*

Description

This function calculates the centrality measures of a network.

Usage

```
calCentr(graph,
  measures = c("degree","wdegree","closeness","betweenness","eigen"),
  order = "")
```

Arguments

graph	A netCoin object.
measures	Character vector of the measures to be calculated (See details).
order	Sort the data.frame by the different measures.

Details

This function reproduces some of the most significant classic Social Network Theory's centrality measures. See Wasserman (1994), Freeman (1978), or Bonacich & Lloyd (2001) to know more.

a) Degree = Degree centrality is measured by the total amount of direct links with the other nodes.

b) Closeness = Closeness centrality is meant to measure one node to the others nodes' sum distances

c) Betweenness = Betweenness centrality measures one node undertaking "mediation" role in a network.

d) Eigen = Eigenvector centrality measures a node's importance while giving consideration to the importance of its neighbors.

By default, measures = "all", thus all the measures will be calculated. The function can be applied to an igraph or a netCoin object. In case the graph is undirected, it will show the degree, weighted degree, closeness, betweeness and eigen degree. Moreover, if it us directed, it will show the indegree, windegree and outdegree, both weighted and unweighted (See example.).

Value

This function creates a list containing two elements: 1) a data.frame (nodes) with all the centrality measures applied to the graph and 2) another data.frame (graph) with this measures applied to the whole network.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
# A character column (with separator)
frame <- data.frame(A = c("Man; Women", "Women; Women",
                          "Man; Man", "Undet.; Women; Man"))
data <- dichotomize(frame, "A", sep = "; ")[2:4]
C <- coin(data) # coincidence matrix
N <- asNodes(C) # node data frame
E <- edgeList(C) # edge data frame
G <- netCoin(N, E, showArrows=TRUE) # netCoin object
calCentr(G, "all")
```

caring *Produce interactive multi graphs.*

Description

caring produce an interactive multi graph from caring arguments.

Usage

```
caring(filepath,arguments)
```

Arguments

filepath	The path to the data file.
arguments	a list with the caring exported arguments.

Value

This function returns a mGraph object. The function creates a folder in your computer with an HTML document named index.html which contains the graph. This file can be directly opened with your browser.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

Examples

```
## Not run:
filename <- "demo.sav"
arguments <- list(
  variables = c("Gender", "Income category in thousands",
    "Primary vehicle price category"),
  plot = "network"
)
graph <- caring(filename,arguments)
plot(graph)

## End(Not run)
```

caring_create_graphs *Produce interactive multi graphs.*

Description

caring_create_graphs produce an interactive multi graph from caring arguments.

Usage

```
caring_create_graphs(data,arguments)
```

Arguments

data	A data frame.
arguments	a list with the caring exported arguments.

Value

This function returns a mGraph object. The function creates a folder in your computer with an HTML document named index.html which contains the graph. This file can be directly opened with your browser.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

Examples

```
data <- data.frame(Gender=c(rep("Man",3),rep("Woman",3)),
                   Opinion=c("Yes","Yes","No","No","No","Yes"))
arguments <- list(
  variables = c("Gender", "Opinion"),
  dichotomies = "Opinion",
  valueDicho = "Yes",
  plot = c("surCoin","network")
)
graph <- caring_create_graphs(data,arguments)
## Not run:
plot(graph)

## End(Not run)
```

caring_read_file *Read sav, dta, xlsx, tsv and csv files.*

Description

caring_read_file reads sav, dta, xlsx, tsv and csv files and prepares data for caring.

Usage

```
caring_read_file(filepath)
```

Arguments

filepath	The path to the data file.

Value

This function returns a data frame.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

Examples

```
## Not run:
filename <- "demo.sav"
data <- caring_read_file(filename)

## End(Not run)
```

cobCoin *CobWeb graph (Upton).*

Description

cobCoin produces a netCoin object to graph a CoWeb graphic (Upton 2000).

Usage

```
cobCoin(data, variables=names(data), degree=0, significance=.05, ...)
```

Arguments

data	a data frame.
variables	a vector of variables included in the previous data frame.
degree	degree to rotate the categories of the graph
significance	p value maximum to represent the links
...	Any surCoin or netCoin argument.

Value

This function creates a netCoin object (or igraph) and, if stated, a folder in the computer with an HTML document named index.html which contains the produced graph. This file can be directly opened with your browser and sent to a web server to work properly.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

References

Upton, Graham J.G. (2000) Cobweb diagrams for multiway contingency tables. *The Statistician*, **49**(1), 79-85.

Examples

```
# A data frame with two variables Gender and Opinion
frame <- data.frame(Gender=c(rep("Man",3),rep("Woman",3)),
                    Opinion=c("Yes","Yes","No","No","No","Yes"))
cobCoin(frame, significance=.5, degree=45) # netCoin object

# A data frame with two variables (Gender and Hand) and nodes
input <- data.frame(
  Gender = c("Women", "Men", "Men", "Women", "Women","Men",
             "Men", "Men", "Women", "Women", "Men", "Women"),
  Hand   = c("Right", "Left","Right", "Right", "Right", "Right",
             "Left", "Right", "Right", "Left","Right", "Right"))
nodes <- data.frame(
  name  = c("Gender:Men","Gender:Women", "Hand:Left", "Hand:Right"),
  label = c("Women(50\u25)","Men(50\u25)",
            "Left hand(25\u25)", "Right hand(75\u25)"))
G <- cobCoin(input, nodes=nodes, label="label", degree=22.5,
             showArrows=TRUE, significance=1)
```

coexist coexist *Interactive network of time coexistences of periods.*

Description

coexist produces interactive graphs representing coexistence. Two periods or lifes coexist if they share a given number of years.

Usage

```
coexist(periods, name="name", start="start", end="end",
        fields=names(periods), plusstart=0, minusend=0, igraph=FALSE, ...)
```

Arguments

periods	a data frame with at least three vectors with name, start and end of the periods.
name	name of the vector with names in the periods data frame.
start	name of the vector with starts in the periods data frame.
end	name of the vector with ends in the periods data frame.
fields	vector of the names of the periods data frame to be taken into account.
plusstart	number of years to be trimmed at the beginning of each period.
minusend	number of years to be trimmed at the end of each period.
igraph	produces an igraph object instead of a netCoin class.
...	Any netCoin argument.

Details

Two periods coexists if they have at least one year in common. Periods can be trimmed at the begining or at the end.

Value

This function creates a netCoin object (or igraph) and, if plotted, a folder in the computer with an HTML document named index.html which contains the produced graph. This file can be directly opened with your browser and sent to a web server to work properly.

A netCoin object has three elements:

nodes	A data frame with the periods.
links	A data frame with the events.
options	A list of options for the interactive graph.

Note

Periods could be the life of people, in whose case start is their birth and end their death year.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

See Also

timeCoin and dyncohort

Examples

```
# With sociologists data.
data(sociologists)
# Produce an igraph object:
coexist(sociologists, start="birth", end="death", igraph=TRUE)
# Omit as coexistence the 15 firts years of life:
sociologists$picture <- system.file("extdata", sociologists$picture,
        package="netCoin") # copy path to the picture field
coexist(sociologists, start="birth", end="death", plusstart=15, image="picture", imageName="name")
```

---

coin *Coincidence matrix.*

Description

A coin object is a squared matrix of coincidences with its names and the frequency of events as attributes.

Usage

```
coin(incidences, minimum = 1, maximum = nrow(incidences),
     sort = FALSE, decreasing = TRUE,
     total = FALSE, subsample = FALSE,
     weight = NULL, pairwise = FALSE)
```

Arguments

incidences	an incidence matrix or data frame with only 0/1 variables
minimum	minimum frequency to be considered
maximum	maximum frequency to be considered
sort	sort the coincidence matrix according to frequency of events
decreasing	decreasing or increasing sort of the matrix
total	add one first row and column with total
subsample	retrict the analysis to scenarios with at least one event
weight	a vector of weights. Optimal for data.framed tables
pairwise	Pairwise mode of handling missing values if TRUE. Listwise by default.

Details

Produce a matrix of coincidences from a matrix of incidences.

Value

An object of coin class

n	Number of scenarios (rows of the incidence matrix)
f	Coincidence matrix

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

References

Escobar, M. and Martinez-Uribe, L. (2020) Network Coincidence Analysis: The netCoin R Package. *Journal of Statistical Software*, **93**, 1-32. doi:10.18637/jss.v093.i11.

Examples

```
## Random incidence matrix: 25 scenarios, 4 events.
I <- matrix(rbinom(100, 1, .5), nrow = 25, ncol = 4,
            dimnames = list(NULL, c("A", "B", "C", "D")))
coin(I, sort = TRUE)

## Hair by Eye by Sex table from M. Friendly (2000)
data(HairEyeColor)
H<-as.data.frame(HairEyeColor)
W<-H$Freq
I<-dichotomize(H,c("Hair","Eye","Sex"),add=FALSE)
coin(I,w=W)
```

---

coocur *Coocurrence matrix.*

Description

A coocurrence object consists of a matrix with the number of ocurrences in its main diagonal and the number of coocurrences outside this diagonal. Besides, this object has two attributes: 1) n is the total of the sum of the ocurrences in each row.2) m is the sum of the maximum number of ocurrences in each row.

Usage

```
coocur(ocurrences, minimum = 1, maximum = Inf,
       sort = FALSE, decreasing = TRUE)
```

Arguments

ocurrences	an ocurrence matrix or data frame
minimum	minimum frequency to be considered
maximum	maximum frequency to be considered
sort	sort the coincidence matrix according to frequency of events
decreasing	decreasing or increasing sort of the matrix

Details

Produce a matrix of coocurrences from a matrix of occurences.

Value

An object of cooc class with a coocurrence matrix. It has two attributes:

n	Total sum of occurences)
m	Sum of maximum occurences in each row of the ocurrence matrix

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
## Tossing two coins five times.
D<-data.frame(Head=c(2,1,1,0,2),Tail=c(0,1,1,2,0))
coocur(D)
```

---

dice *Data: Roll a die (100 times).*

Description

Data frame with events as result.

Usage

```
data("dice")
```

Format

A data frame with 100 observations (scenarios) on the following 11 variables (events):

`dice` : a numeric vector, representing dice results

`1` : a dichotomous vector of the elemental event "1"

`2` : a dichotomous vector of the elemental event "2"

`3` : a dichotomous vector of the elemental event "3"

`4` : a dichotomous vector of the elemental event "4"

`5` : a dichotomous vector of the elemental event "5"

`6` : a dichotomous vector of the elemental event "6"

`odd` : a dichotomous vector of odd events

`even` : a dichotomous vector of even events

`small` : a dichotomous vector of small number events

`large` : a dichotomous vector of large number events

Source

Random extraction via `sample(1:6,100,replace=TRUE)`

References

See `events`.

Examples

```
data(dice)
head(dice,10)
```

`dichotomize` *Dichotomize.*

Description

This converts factor(s) o character(s) column(s) of a data frame into a set of dichotomous columns. Their names will correspond to the labels or text of every category.

Usage

```
dichotomize(data, variables,
            sep = "", min = 1, length = 0, values = NULL,
            sparse = FALSE, add = TRUE, sort = TRUE, nas = "None")
```

Arguments

data	a data frame with a factor or textual column which can be simple (only one value for each scenario) or multiple if components are delinited with a separator.
variables	vector of column names that have to be converted into dichotomous vectors.
sep	vector of characters used to divide columns with multiple events. If this separator is "", every unique cell of every column is converted into a dichotomus data frame's column.
min	convert to dichotomous vectors only label or text that has a frequency less or equal to the value of this parameter. If the value of min is between 0 and 1, its value is interpreted as a percentage
length	maximum number of dichotomous columns generated for every variable
values	vector of labels or texts selected to their conversion to dichotomous columns
sparse	produce a sparse matrix instead of a data.frame
add	add the new columns to the input data.frame
sort	order the new columns by their frequencies
nas	variable name to convert the NA values of the set of variables

Value

A data frame composed by the original plus the added dichotmous columns.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca, and Luis Martinez Uribe, Fundacion Juan March. See https://sociocav.usal.es/blog/modesto-escobar/

References

Escobar, M. and Martinez-Uribe, L. (2020) Network Coincidence Analysis: The netCoin R Package. *Journal of Statistical Software*, **93**, 1-32. doi:10.18637/jss.v093.i11.

Examples

```
# A character column
frame1 <- data.frame(A = c("Man", "Women", "Man", "Undet."))
dichotomize(frame1, "A", sep = "; ")

# A character column (with separator)
frame2 <- data.frame(A = c("Man; Women", "Women; Women",
                           "Man; Man", "Undet.; Women; Man"))
dichotomize(frame2, "A", sep = "; ")

# A character column and another factor column (same sepatator)
frame3 <- data.frame(A = c("Man; Women", "Women; Women",
                           "Man; Man", "Undet.; Women; Man"),
                     C = factor(c(1:4), labels = c("Paris", "New York",
                           "London; New York", "<NA>")))
```

```
dichotomize(frame3, c("A", "C"), sep = "; ")

# A set of simple character or factor (same levels) variables.
# In this case, you must use "C" separator.
frame4 <- data.frame(A = c("Man", "Women","Man", "Undet",NA),
                     B = c("Women","Women","Man","Women",NA),
 C = c(NA,NA,NA,"Man",NA))
dichotomize(frame4,c("A","B","C"), sep="C")
```

`distant` *Distance matrix.*

Description

Convert a similarity matrix into a distance matrix.

Usage

```
distant(s, t = FALSE)
```

Arguments

s	a similarity matrix
t	return the same matrix if t=FALSE

Details

For better resultas, use the parameter distance in `sim` function.

Value

A distance matrix.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
# From a random incidence matrix I(25X4)
I <- matrix(rbinom(100, 1, .5), nrow = 25, ncol = 4,
     dimnames = list(NULL, c("A", "B", "C", "D")))
J <- sim(I, "Jaccard")
distant(J, t = TRUE)
#Same results
sim(I, "Jaccard", distance = TRUE)
```

dyncohort *Interactive graphs of dynamic cohorts.*

Description

dyncohort produces interactive graphs representing dynamic cohorts. Two periods or lifes belongs to the same cohort if there are a difference of years in their start less or equal to a given number. In case of people's life, 15 or 25 are appropiate quantities to set. If year is equal to 0, a cohort is defined a those periods or lifes that begin at the same year.

Usage

```
dyncohort(periods, name="name", start="start", fields=names(periods),
          years=0, igraph=FALSE, ...)
```

Arguments

periods	a data frame with at least two vectors with name and start of the periods or lives.
name	name of the vector with names in the data frame.
start	name of the vector with starts in the data frame.
fields	vector of the names of the periods data frame to be taken into account.
years	number of years to be considered as length of the cohort.
igraph	produces an igraph object instead of a netCoin class.
...	Any netCoin argument.

Value

This function creates a timeCoin object (or igraph) and, if plotted, a folder in the computer with an HTML document named index.html which contains the produced graph. This file can be directly opened with your browser and sent to a web server to work properly.

A netCoin object has three elements:

nodes	A data frame with the periods.
links	A data frame with the events.
options	A list of options for the interactive graph.

Note

Periods could be the life of people, in whose case start is their birth year.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

See Also

timeCoin and coexist

Examples

```
# With sociologists data.
data(sociologists)
dyncohort(sociologists, start="birth")
# Condider 15 year dynamic cohort:
sociologists$picture <- system.file("extdata", sociologists$picture,
        package="netCoin") # copy path to the picture field
dyncohort(sociologists, start="birth", year=15, image="picture", imageName="name")
```

---

d_netCorr *Dynamic networked correlations.*

Description

netCorr produces a network object of dynamic correlations. Its input has to be at least one set of quantitative variables.

Usage

```
d_netCorr(variables, nodes = NULL, weight=NULL,
        pairwise=FALSE, minimum=-Inf, maximum=Inf,
        frequency=FALSE, means=TRUE,
     method=c("pearson", "kendall", "spearman"), criteria="value", Bonferroni=FALSE,
        minL=0, maxL=Inf,
        sortL=NULL, decreasingL=TRUE,
        factorial=c("null", "pc", "nf", "vf", "of"),
        components=TRUE, backcomponents=FALSE,
        sequence=seq(.20, 1, .01), textFilter=c(1, .99), speed=50,
        dir=NULL, ...)
```

Arguments

variables	a data frame with at least two quantitative variables.
nodes	a data frame with at least one vector of names and other information from the nodes
weight	a vector of weights. Optimal for data.framed tables
pairwise	Pairwise mode of handling missing values if TRUE. Listwise by default.
minimum	minimum mean to be considered
maximum	maximum mean to be considered
frequency	a logical value true if frequencies are to be shown. Default=FALSE.
means	a logical value true if means are to be shown. Default=TRUE.

method	a vector of statistics of similarity. Pearson correlation by default. Spearman and Kendall are also possible
criteria	statistic to be use for selection criteria.
Bonferroni	Bonferroni criterium of the signification test.
minL	minimum value of the statistic to include the edge in the list.
maxL	maximum value of the statistic to include the edge in the list.
sortL	sort the list according to the values of a statistic. See below
decreasingL	order in a decreasing way.
factorial	factorial layout: Principal components (pc), factorial (nf), factorial with varimax rotation (vf), and factorial with oblimin rotation (of) are possible
components	display following graph in sequence only when the components are unequal
backcomponents	display following graph in sequence even if there are less components
sequence	evolution of the dinamic graphs. c(first threshold, last threshold, step)
textFilter	limits for showing the correlations as text on the graph. This limit is the minimun value of the first (absolute), and the second (threshold plus its value)
speed	speed of the dynamic evolution from 0 to 100
dir	a "character" string representing the directory where the web files will be saved.
...	any netCoin argument.

Value

The function creates a list object to create a multigraph and eventually a folder in the computer with an HTML document named index.html which contains the produced dynamic graphs. This file can be directly opened with your browser and sent to a web server to work properly.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
# A character column (with separator)
data(iris)
d_netCorr(iris[,1:4],ltext="value", sequence=seq(.80, 1, .05), zoom=3, textFilter=.85,
 main="Correlations between measurements of Iris Species", components=FALSE,
 note="Anderson, Edgar (1935) y Fisher, R. A. (1936)") # network object
```

edgeList *Edge list.*

Description

Convert a coincidence/similarity/distance matrix into an edge list form.

Usage

```
edgeList(data, procedures="Haberman",
         criteria="Z", level=.95, Bonferroni=FALSE,
         min=-Inf, max=Inf, support=-Inf, directed=FALSE,
         diagonal=FALSE, sort=NULL, decreasing=TRUE, pairwise=FALSE)
```

Arguments

data	a coin object, let's say an R matrix with frequencies and an attribute (n) giving the number of scenarios. In case of change of shape, data should be a matrix.
procedures	a vector of statistics of similarity. See below.
criteria	statistic to be use for selection criteria.
level	confidence level
Bonferroni	Bonferroni criterium of the signification test.
min	minimum value of the statistic to include the edge in the list.
max	maximum value of the statistic to include the edge in the list.
support	minimum value of the frequency of the coincidence to be edged
directed	includes same edges only once.
diagonal	includes auto-links
sort	sort the list according to the values of a statistic. See below
decreasing	order in a decreasing way.
pairwise	Pairwise mode of handling missing values if TRUE. Listwise by default.

Details

Possible measures in procedures are

- Frequencies (f), Relative frequencies (x), Conditional frequencies (i), Coincidence degree (cc), Probable degree (cp),
- Expected (e), Confidence interval (con)
- Matching (m), Rogers & Tanimoto (t), Gower (g), Sneath (s), Anderberg (and),
- Jaccard (j), Dice (d), antiDice (a), Ochiai (o), Kulczynski (k),
- Hamann (ham), Yule (y), Pearson (p), odds ratio (od), Rusell (r),
- Haberman (h), Z value of Haberman (z),
- Hypergeometric p greater value (hyp).
- Convert a matrix into an edge list (shape).

Value

A data frame in which the two first columns are source and target. The rest of the columns are the different statistics explicited in `funcs` parameter.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

References

Escobar, M. and Martinez-Uribe, L. (2020) Network Coincidence Analysis: The `netCoin` `R` Package. *Journal of Statistical Software*, **93**, 1-32. doi:10.18637/jss.v093.i11.

Examples

```
# From a random incidence matrix I(25X4)
I<-matrix(rbinom(100,1,.5),nrow=25,ncol=4,
dimnames=list(NULL,c("A","B","C","D")))
C<-coin(I)
edgeList(C)
```

---

ess *Data: European Social Survey, Round-8.*

Description

A sample size of 1,000 respondents from the European Social Survey, Round-8.

Usage

```
data("ess")
```

Format

A data frame with 1000 cases (respondents) and 5 variables:

`Gender` Gender (factor vector): Female, Male.

`Age` Age (recoded factor vector): 15-29, 30-30, 40-49, 50-59, 60-69, 70 and +.

`Social participation` Social participation (factor vector): No, Yes.

`Political participation` Political participation (factor vector): No, Yes.

`cweight` cweight (numeric vector): Cases weight.

References

ESS Round 8: European Social Survey Round 8 Data (2016). Data file edition 2.1. NSD - Norwegian Centre for Research Data, Norway - Data Archive and distributor of ESS data for ESS ERIC. doi:10.21338/NSD-ESS8-2016.

Examples

```
data("ess")
head(ess,10)
```

`events` *Data: Attributes of the dice events.*

Description

Data frame with the attributes of the events of dice.

Usage

```
data("events")
```

Format

A data frame with 10 observations on the following 4 variables:

`name` : a factor vector with 10 levels

`label` : a factor vector with 10 levels

`frequency` : a numeric vector

`type` : a factor vector with 2 levels

Source

data(dice); coin.dice<-coin(dice); asNodes(coin.dice)

References

See `dice`.

Examples

```
data(events)
events
```

exhibit *Images in a grid gallery.*

Description

exhibit produces an interactive image gallery (alternative display).

Usage

```
exhibit(nodes, name = NULL, label = NULL, subtitle = NULL, order = NULL,
  decreasing = FALSE, ntext = NULL,
  mainframeHeight = NULL, mainframeWidth = NULL,
  image = NULL, zoom = NULL, main = NULL, note = NULL,
  frequencies = FALSE, tutorial = FALSE, tableButton = FALSE, export = FALSE,
  colorScheme = 0, language = c("en", "es", "ca"), dir = NULL)
```

Arguments

nodes	a data frame with at least one column with the names of the gallery's elements.
name	name of the vector with names in the nodes data frame.
label	column name with image labels in the nodes data frame.
subtitle	column name with image subtitles in the nodes data frame.
order	name of the column with node order in the nodes data frame.
decreasing	decreasing or increasing sort of the nodes.
ntext	column name with html text in the nodes data frame.
mainframeHeight	a number between 0.1 and 1 to reduce mainframe height.
mainframeWidth	a number to proportionally change mainframe width.
image	column name which indicates the image paths in the nodes data frame.
zoom	a number between 0.1 and 1 to reduce item sizes.
main	upper title of the graph.
note	lower title of the graph.
frequencies	a logical value true if barplots representing node attributes frequencies will be added to the final graph.
tutorial	Should tutorial be displayed?
tableButton	A button will appear to show the data as a table.
export	A button will appear to export gallery as excel.
colorScheme	Select a color theme for display (0-11).
language	a character string indicating the language of the graph (en=english (default); es=spanish; ca=catalan).
dir	a character string representing the directory where the web files will be saved.

Value

Object of class `gallery_rd3`.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
data("finches")
finches$species <- system.file("extdata", finches$species,
        package="netCoin") # copy path to the species field
exhibit(finches, image="species")
```

`expectedList` *Expected list.*

Description

Converts a `coin` object to a links data frame with coincidences and expected values.

Usage

```
expectedList(data, names = NULL, min = 1, confidence=FALSE)
```

Arguments

`data`	is a `coin` object. See `coin`
`names`	a character vector.
`min`	minimum value of the statistic to include the edge in the list.
`confidence`	add the confidence interval if TRUE.

Value

A links data frame with coincidences and expected values.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
# A character column (with separator)
frame <- data.frame(A = c("Man; Women", "Women; Women",
                          "Man; Man", "Undet.; Women; Man"))
data <- dichotomize(frame, "A", sep = "; ")[2:4]
C <- coin(data) # coincidence matrix
expectedList(C) # edge data frame
```

`families` *Data: Italian families in the Renaissance.*

Description

Data frame with the characteristics of powerful families of Renaissance Italy.

Usage

```
data("families")
```

Format

A data frame with 16 families (rows) and 6 characteristics.

`name` Family's name

`f.Marriages` number of marriage links

`f.Business` number of business links

`wealth` wealth's index

`priorates` number of priorates on control

`seat` At least priorate

Source

PADGETT, J. F. Y C. K. ANSELL (1993): "Robust Action and the Rise of the Medici, 1400-1434", in American Journal of Sociology, 98, 1259-1319. (http://www.jstor.org/stable/2781822)

Examples

```
data("families")
head(families)
```

finches *Data: Finches'attributes in Galapagos islands.*

Description

Data frame with events as result.

Usage

```
data("finches")
```

Format

A data frame with 13 observations (pinches) and 4 variables (name and characteristics):

`name` : Genus and species of the finche

`frequency` : number of islands where the finche can be found

`type` : Genus of the finche

`species` : name of the file containing the picture of the finche

References

Sanderson, James (2000). Testing Ecological Patterns: A Well-known Algorithm from Computer Science Aids the Evaluation of Species Distributions. American Scientist, 88, pp. 332-339.

Examples

```
data(finches)
head(finches,10)
```

fromIgraph *Produce interactive networks from igraph objects.*

Description

`fromIgraph` produce an interactive network from an igraph object.

Usage

```
fromIgraph(G, ...)
```

Arguments

`G`	an igraph object.
`...`	Any netCoin argument.

Value

This function returns a netCoin object. If the 'dir' attribute is specified, the function creates a folder in the computer with an HTML document named index.html which contains the produced graph. This file can be directly opened with your browser and sent to a web server to work properly.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

References

Escobar, M. and Martinez-Uribe, L. (2020) Network Coincidence Analysis: The netCoin R Package. *Journal of Statistical Software*, **93**, 1-32. doi:10.18637/jss.v093.i11.

Examples

```
g <- igraph::make_ring(10)
fromIgraph(g)
```

Galapagos *Data: Finches' presence in Galapagos Islands.*

Description

Data frame with absence(0) presence(1) of finches in the Galagos Islands.

Usage

```
data("Galapagos")
```

Format

A data frame with 17 localizations (islands) and 13 variables (Genus and species of the finches):

Geospiza magnirostris

Geospiza fortis

Geospiza fuliginosa

Geospiza difficilis

Geospiza scandens

Geospiza conirostris

Camarhynchus psitticula

Camarhynchus pauper

Camarhynchus parvulus

Platyspiza crassirostris

Cactospiza pallida

Cactospiza heliobates

Certhidea olivacea

References

Sanderson, James (2000). Testing Ecological Patterns: A Well-known Algorithm from Computer Science Aids the Evaluation of Species Distributions. American Scientist, 88, pp. 332-339.

Examples

```
data(Galapagos)
head(Galapagos,10)
```

---

gallery *Images in a grid gallery.*

Description

gallery produces an interactive image gallery.

Usage

```
gallery(nodes, name = NULL, label = NULL, color = NULL,
    border = NULL, ntext = NULL, info = NULL, infoFrame = c("right","left"),
    image = NULL, zoom = 1, itemsPerRow = NULL, main = NULL, note = NULL,
    showLegend = TRUE, frequencies = FALSE, labelTooltip = TRUE,
    cexTooltip = 1, help = NULL, helpOn = FALSE, tutorial = FALSE,
    description = NULL, descriptionWidth = NULL, roundedItems = FALSE,
    ntextctrl = FALSE, controls = 1:5, cex = 1, defaultColor = "#1f77b4",
    language = c("en", "es", "ca"), dir = NULL)
```

Arguments

nodes	a data frame with at least one column with the names of the gallery's elements.
name	name of the vector with names in the nodes data frame.
label	column name with image labels in the nodes data frame.
color	column name with image background color variable in the nodes data frame.
border	column name with image border width variable in the nodes data frame or a numeric vector.
ntext	column name with html text in the nodes data frame.
info	column name with information to display in a panel in the nodes data frame.
infoFrame	In which panel should the information be displayed? The left panel is only available if frequencies are not showing.
image	column name which indicates the image paths in the nodes data frame.

zoom	a number between 0.1 and 10 as initial displaying zoom.
itemsPerRow	number of items in each row.
main	upper title of the graph.
note	lower title of the graph.
frequencies	a logical value true if barplots representing node attributes frequencies will be added to the final graph.
labelTooltip	show label on mouseover.
cexTooltip	number indicating the amount by which plotting text should be scaled relative to the default in the label tooltip.
showLegend	a logical value true if the legend is to be shown.
help	a character string indicating a help text of the graph.
helpOn	Should the help be shown at the beginning?
tutorial	Should tutorial be displayed?
description	a character string indicating a desription text for the graph.
descriptionWidth	a percentage indicating a width for the description panel (25 by default).
roundedItems	Display items with rounded borders.
ntextctrl	Previous tooltips will be closed unless you hold down the control key (FALSE by default).
controls	a numeric vector indicating which controls will be shown. 1 = topbar, 2 = xlsx exportation, 3 = table, 4 = netCoin logo, 5 = topbar buttons. NULL hide all controls, negative values deny each control and 0 deny all.
cex	number indicating the amount by which plotting text should be scaled relative to the default.
defaultColor	a character vector giving a valid html color for node representation.
language	a character string indicating the language of the graph (en=english (default); es=spanish; ca=catalan).
dir	a character string representing the directory where the web files will be saved.

Value

Object of class `gallery_rd3`.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
data("finches")
finches$species <- system.file("extdata", finches$species,
        package="netCoin") # copy path to the species field
gallery(finches, image="species", main="Species in Galapagos Islands",
        note="Data source: Sanderson (2000)")
```

get_panel_template *Create an html panel for nodes from different items (for galleries).*

Description

Create an html panel for nodes from different items (for galleries).

Usage

```
get_panel_template(data, title=NULL, description=NULL, img=NULL,
                   text=NULL, color="auto", cex=1, mode = 1)
```

Arguments

data	data frame which contains the data.
title	column name which contains the first title of the vignette.
description	column name which contains the main text of the vignette.
img	column name which contains the names of the image files.
text	column name which contains the main text of the vignette.
color	color of the panel (It also could be a column name which contains colors).
cex	number indicating the amount by which plotting text should be scaled relative to the default.
mode	There are two display modes.

Value

a character vector of html formatted panel.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
## Not run:
data("sociologists")
sociologists$picture <- system.file("extdata", sociologists$picture,
        package="netCoin")
sociologists$html <- get_panel_template(sociologists, title="name",
  description="birth_country",img="picture", text="school")
plot(gallery(sociologists, info="html"))

## End(Not run)
```

get_template *Create a drop-down vignette for nodes from different items (for galleries).*

Description

Create a drop-down vignette for nodes from different items (for galleries).

Usage

```
get_template(
  data,
  title = NULL,
  title2 = NULL,
  text = NULL,
  img = NULL,
  wiki = NULL,
  width = 300,
  color = "auto",
  cex = 1,
  roundedImg = FALSE,
  mode = 1
)
```

Arguments

data	data frame which contains the data.
title	column name which contains the first title of the vignette.
title2	column name which contains the secondary title of the vignette.
text	column name which contains the main text of the vignette.
img	column name which contains the names of the image files.
wiki	column name which contains the wiki URL for the vignette.
width	length of the vignette's width.
color	color of the vignette's strip (It also could be a column name which contains colors).
cex	number indicating the amount by which plotting text should be scaled relative to the default.
roundedImg	Display images with rounded borders.
mode	2 display images next to the text. 1 by default.

Value

a character vector of html formatted vignettes.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
## Not run:
data("sociologists")
sociologists$picture <- system.file("extdata", sociologists$picture,
        package="netCoin")
sociologists$html <- get_template(sociologists, title="name",
  title2="birth_country", text="school",img="picture", mode=2)
plot(gallery(sociologists, ntext="html"))

## End(Not run)
```

`get_template2` *Create a drop-down vignette for nodes from different items (for galleries).*

Description

Create a drop-down vignette for nodes from different items (for galleries).

Usage

```
get_template2(data, title=NULL, title2=NULL, text=NULL, wiki=NULL)
```

Arguments

`data`	data frame which contains the data.
`title`	column name which contains the first title of the vignette.
`title2`	column name which contains the secondary title of the vignette.
`text`	column name which contains the main text of the vignette.
`wiki`	column name which contains the wiki URL for the vignette.

Value

a character vector of html formatted vignettes.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
## Not run:
data("sociologists")
sociologists$html <- get_template2(sociologists, title="name",
  title2="birth_country", text="school")
plot(exhibit(sociologists, ntext="html"))

## End(Not run)
```

---

glmCoin *Regression Graphs*

Description

produces a netCoin object from a set of glm regressions.

Usage

```
glmCoin(formulas, data, weights=NULL, pmax=.05,
                    twotail=FALSE, showArrows=TRUE,
                    frequency = FALSE, percentage = TRUE,
                    color="variable", lwidth="z.value",
                    circle= NA, language=c("en","es","ca"),
                    igraph=FALSE, ...)
```

Arguments

formulas	A set of formulas separated, folowed by the family and a return. For example: model <- "counts ~ outcome + treatment, poisson counts ~ outcome, poisson"
data	Data frame containing the variables in the model.
weights	Optional vector of weights to be used in the fitting process.
pmax	Selection of links with Pr(>|z|) less than p (one-tail by default).
twotail	Logical value indicating if twotail test must be appied. Defaul=FALSE.
showArrows	a logical value true if the directional arrows are to be shown. Default = FALSE.
frequency	a logical value true if frequencies are to be shown. Default=FALSE.
percentage	a logical value true if percentages are to be shown. Default=TRUE.
color	Nodes' attribute to be used for expressing color ("variable" by default).
lwidth	Nodes' attribute to be used for widht of arrows ("z.value" by default).
circle	Degre of rotation in case of fixed circled dependent variables.
language	Language of the graph controls.
igraph	Produces an igraph object instead of a netCoin object if TRUE.
...	Any netCoin argument.

Value

This function creates a netCoin object (or igraph) and, if stated, a folder in the computer with an HTML document named index.html which contains the produced graph. This file can be directly opened with your browser and sent to a web server to work properly.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
## Dobson (1990) Page 93: Randomized Controlled Trial :
counts <- c(18,17,15,20,10,20,25,13,12)
outcome <- gl(3,1,9)
treatment <- gl(3,3)
Dobson <- data.frame(counts=counts, outcome=outcome, treatment=treatment)
model <- "counts ~ outcome + treatment, poisson"
glmCoin(model,Dobson)
```

---

incTime *Time incidences.*

Description

Convert a data frame with two numbers (normally a beginning year and end year) into an incidences matrix whose rows are the intermediate numbers, and whose columns are the content of the names column.

Usage

```
incTime(data, name = "name", beginning = "birth", end= "death")
```

Arguments

data	a data frame a name and two numbers.
name	Column with the names (default= "name").
beginning	Column with the beginning number to include (default= "birth").
end	Column with the end number to include (default= "death").

Value

A data frame in which the two first columns are source and target. The rest of the columns are sim.=(1+threshold-real difference) and dist.=(difference between numbers)

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
# From sociologists data
data("sociologists")
head(incTime(sociologists))[,1:5]
```

---

layoutCircle *Produce a circle layout of any number of nodes.*

Description

`layoutCircle` produces a circle layout of any number of nodes.

Usage

```
layoutCircle(N,nodes=seq_len(nrow(N)),deg=0,name=NULL)
```

Arguments

`N`	a data frame of nodes.
`nodes`	a vector specifing nodes.
`deg`	degrees to rotate.
`name`	name of column with node names.

Value

This function returns the input data frame of nodes with the resulting layout applied.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
A <- data.frame(name=letters)

L <- layoutCircle(A,name="name")

netCoin(A,layout=L)
```

`layoutGrid` *Produce a layout of any number of nodes.*

Description

`layoutGrid` produces a grid layout of any number of nodes.

Usage

```
layoutGrid(N,string,name=NULL,byrow=FALSE)
```

Arguments

`N`	a data frame of nodes.
`string`	a character vector specifing grouped nodes.
`name`	name of column with node names.
`byrow`	logical. If 'FALSE' (the default) the layout is filled by columns, otherwise the layout is filled by rows.

Value

This function returns the input data frame of nodes with the resulting layout applied.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
A <- data.frame(name=letters)

L <- layoutGrid(A,"a,b,c,d,e.f,g,h,i,j.k,l,m,n,o,p.q,r,s,t,u.v,w,x,y,z","name")

netCoin(A,layout=L)
```

links *Data: Links between Italian families in the Renaissance.*

Description

Data frame with the marriage and business links.

Usage

```
data("links")
```

Format

A data frame with 36 links (rows) amongst 16 Italian families in the Renaissance.

`Albizzi`

`Acciaiuoli`

`Barbadori`

`Bischeri`

`Castellani`

`Guadagni`

`Lamberteschi`

`Medici`

`Pazzi`

`Peruzzi`

`Ridolfi`

`Salviati`

`Strozzi`

`Tornabuoni`

`Ginori`

`Pucci`

`link` Type of link: marriage or business

Source

PADGETT, J. F. Y C. K. ANSELL (1993): "Robust Action and the Rise of the Medici, 1400-1434", in American Journal of Sociology, 98, 1259-1319. (http://www.jstor.org/stable/2781822)

Examples

```
data("links")
head(links)
```

logCoin *Networked log-linear models.*

Description

logCoin produces a network object from loglinear models parameters.

Usage

```
logCoin(data, variables=names(data), exogenous=NULL, noFirstCat= NULL,
        weight=NULL, order= 2, pairwise=FALSE, twotails = FALSE,
        pmax = 0.05, frequency = FALSE, percentage = FALSE,
        directed=FALSE, igraph=FALSE, ...)
```

Arguments

data	a data frame.
variables	a vector of names of variables included in the previous data frame.
exogenous	a vector of names of variables whose relations amongst them are of no interest. None by default.
noFirstCat	a vector of names of dichotomous variables to appear without the category (no characteristic).
weight	a vector of weights. Optimal for dataframed tables.
order	maximum order parameters to be included in the loglinear model (default=2)
pairwise	Pairwise mode of handling missing values if TRUE. Listwise by default.
twotails	Application of twotail tests to the parameters (default: FALSE, i.e., onetail)
pmax	maximum value of the statistic to include the edge in the list. By default is 0.05, but 0.5 is recommended if data has not been sampled.
frequency	a logical value true if frequencies are to be shown. Default=FALSE.
percentage	a logical value true if percentages are to be shown. Default=TRUE.
directed	includes arrows to the links (target would be the categories of first mention variables).
igraph	Produces an igraph object instead of a netCoin object if TRUE.
...	Any netCoin argument.

Value

This function creates a netCoin object (or igraph) and, if stated, a folder in the computer with an HTML document named index.html which contains the produced graph. This file can be directly opened with your browser and sent to a web server to work properly.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

References

Escobar, M. and Martinez-Uribe, L. (2020) Network Coincidence Analysis: The netCoin R Package. *Journal of Statistical Software*, **93**, 1-32. doi:10.18637/jss.v093.i11.

Examples

```
# A n=1,000 sample from the European Social Survey.(Round 8, 2016)
data("ess")
logCoin(ess, c("Social participation", "Political participation"),
  noFirstCat=c("Social participation", "Political participation"),
  exogenous=c("Age", "Gender"),  weight = "cweight",
  order=3, pmax=.05,percentage = TRUE, frequency = TRUE ) # network object
```

---

lower *Similarity/distance matrix display.*

Description

Display the lower part of a matrix with a specified number of decimals.

Usage

```
lower(matrix, decimals = 3)
```

Arguments

matrix	a symmetric similarity/distance matrix
decimals	number of decimals to be displayed

Value

A data frame of characters.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
# From a random incidence matrix I(25X4)
I <- matrix(rbinom(100, 1, .5), nrow = 25, ncol = 4,
     dimnames = list(NULL, c("A", "B", "C", "D")))
lower(sim(I, "Jaccard"), 2)
```

makeT *Create a vignette (for galleries).*

Description

Create a vignette from w_EntityInfo from wikiTools package (for galleries).

Usage

```
makeT(data, imageDir=NULL, imageDefault=NULL, language=c("en","es","ca"))
```

Arguments

data	A data-frame created with w_EntityInfo from wikiTools package.
imageDir	A directory where images will be found. The name must be the 'entity' column content follow by the image extension and the allowed formats are jpg, jpeg, gif, png and svg.
imageDefault	This image will be assigned if 'entity' image is not found in imageDir or no imageDir is specified.
language	a character string indicating the language of the graph (en=english (default); es=spanish; ca=catalan).

Value

a data frame wich includes a column of html formatted vignettes called 'info'.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

makeT2 *Create a vignette (for galleries).*

Description

Create a vignette from some specific information supplied (for galleries).

Usage

```
makeT2(entityLabel, image=NA, entityDescription=NA,
    byear=NA, bplace=NA, bcountry=NA, dyear=NA, dplace=NA, dcountry=NA,
    gender=NA, occupation=NA, language=c("en","es","ca"))
```

Arguments

entityLabel	A character string of names.
image	A character string of image paths.
entityDescription	A character string of descriptions.
byear	A character string of birth years.
bplace	A character string of birth places.
bcountry	A character string of birth countries.
dyear	A character string of death years.
dplace	A character string of death places.
dcountry	A character string of death countries.
gender	A character string of genders.
occupation	A character string of occupations.
language	a character string indicating the language of the graph (en=english (default); es=spanish; ca=catalan).

Value

a data frame wich includes a column of html formatted vignettes called 'info'.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

---

mobileEdges *Mobile Edges.*

Description

Convert a data frame with one number (normally a year) into an edge list form with those whose numbers (years) have a difference lower or equal to a quantity.

Usage

```
mobileEdges(data, name = 1, number = 2, difference=0)
```

Arguments

data	a data frame with a name and a number (year).
name	Column with the names (default= first column).
number	Column with the number (year) to compare (default= second column.
difference	Minimum difference between numbers of every two pair of names to create the edge or link (default=15).

Value

A data frame in which the two first columns are source and target. The rest of the columns are sim.=(1+threshold-real difference) and dist.=(difference between numbers)

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
# From a random incidence matrix I(25X4)
data("sociologists")
mobileEdges(sociologists)
```

`multigraphCreate` *Produce interactive multi graphs.*

Description

`multigraphCreate` produce an interactive multi graph.

Usage

```
multigraphCreate(..., mode = c("default","parallel","frame"),
  mfrow = c(1,2),
  frame = 0, speed = 50, loop = FALSE, lineplots = NULL,
  dir = NULL, show = FALSE)
```

Arguments

`...`	rD3plot graphs (network_rd3, barplot_rd3, timeplot_rd3) objects or html "directories".
`mode`	a string specifying the displaying mode. The "default" displays graphs one by one, "parallel" splits screen and "frame" allows dinamic graphs in time.
`mfrow`	a vector of the form 'c(nr, nc)'. Subsequent graphs will be drawn in an 'nr'-by-'nc' array on the device by rows. (Only applied in 'parallel' mode)
`frame`	number of frame to start a dynamic network.
`speed`	a percentage for frame speed in dynamic networks.
`loop`	allowing continuous repetition.
`lineplots`	a character vector giving the node attributes to show as lineplots.
`dir`	a "character" string representing the directory where the graph will be saved.
`show`	a logical value true if the graph is to be shown. Default = FALSE.

Value

This function returns a mGraph object. The function creates a folder in your computer with an HTML document named index.html which contains the graph. This file can be directly opened with your browser.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
# A character column (with separator)
frame <- data.frame(A = c("Man; Women", "Women; Women",
                          "Man; Man", "Undet.; Women; Man"))
data <- dichotomize(frame, "A", sep = "; ")[2:4]
C <- coin(data) # coincidence matrix
N <- asNodes(C) # node data frame
E <- edgeList(C,c("frequency","expected","haberman")) # edge data frame
bC<- barCoin(data,dichotomies="_all") # barCoin object
cC<- barCoin(data,dichotomies="_all",expected=TRUE) # barCoin object
nC<- netCoin(N,E) # netCoin object
multi <- multigraphCreate("Bar graph" = bC,
                  "Conditional bar graph" = cC,
                  "Net graph"=nC)
## Not run:
plot(multi)

## End(Not run)
```

---

multiPages *Produces a gallery of 'netCoin' graphs.*

Description

multiPages produces a gallery page to explore multiple 'netCoin' graphs.

Usage

```
multiPages(x, title = NULL, columns = NULL, imageSize = NULL,
  description = NULL, note = NULL,
  cex = 1, dir = tempDir(), show = FALSE)
```

Arguments

x	is a mGraph object. See multigraphCreate
title	the text for a main title.

columns	a numeric vector giving the number of columns to display items in gallery. Default = 3.
imageSize	a numeric vector giving the size of images in gallery. Default = 75.
description	a description text for the gallery.
note	a footer text for the gallery.
cex	number indicating the amount by which plotting text should be scaled relative to the default. Default = 1.
dir	a "character" string representing the directory where the graph will be saved.
show	a logical value true if the graph is to be shown. Default = FALSE.

Value

The function creates a folder in your computer with an HTML document named index.html which contains the graph. This file can be directly opened with your browser.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

Examples

```
# A character column (with separator)
frame <- data.frame(A = c("Man; Women", "Women; Women",
                          "Man; Man", "Undet.; Women; Man"))
data <- dichotomize(frame, "A", sep = "; ")[2:4]
C <- coin(data) # coincidence matrix
N <- asNodes(C) # node data frame
E <- edgeList(C,c("frequency","expected","haberman")) # edge data frame
bC<- barCoin(data,dichotomies="_all") # barCoin object
cC<- barCoin(data,dichotomies="_all",expected=TRUE) # barCoin object
nC<- netCoin(N,E) # netCoin object
multi <- multigraphCreate("Bar graph" = bC,
                  "Conditional bar graph" = cC,
                  "Net graph"=nC)
## Not run:
multiPages(multi,"Some graphs",show=TRUE)

## End(Not run)
```

---

netCoin *Networked coincidences.*

Description

netCoin produces a netCoin object of coincidences. Its input has to be two data.frames: one of attributes of events or nodes, and the other of attributes of the edges or links.

Usage

```
netCoin(nodes = NULL, links = NULL, tree = NULL,
        community = NULL, layout = NULL,
        name = NULL, label = NULL, group = NULL, groupText = FALSE,
        labelSize = NULL, size = NULL, color = NULL, shape = NULL,
        border = NULL, legend = NULL, sort = NULL, decreasing = FALSE,
        ntext = NULL, info = NULL, image = NULL, imageNames = NULL,
        centrality = NULL,
        nodeBipolar = FALSE, nodeFilter = NULL, degreeFilter = NULL,
        lwidth = NULL, lweight = NULL, lcolor = NULL, ltext = NULL,
        intensity = NULL, linkBipolar = FALSE, linkFilter = NULL,
        repulsion = 25, distance = 10, zoom = 1,
        fixed = showCoordinates, limits = NULL,
        main = NULL, note = NULL, showCoordinates = FALSE, showArrows = FALSE,
        showLegend = TRUE, frequencies = FALSE, showAxes = FALSE,
        axesLabels = NULL, scenarios = NULL, help = NULL, helpOn = FALSE,
        mode = c("network","heatmap"), roundedItems = FALSE, controls = 1:8,
        cex = 1, background = NULL, defaultColor = "#1f77b4",
        language = c("en","es","ca"), dir = NULL)
```

Arguments

nodes	a data frame with at least one vector of names.
links	a data frame with at least two vectors with source and target, including names of nodes.
tree	a data frame with two vectors: source and target, describing relationships between nodes.
name	name of the vector with names in the nodes data frame. By default, if language="en", name is "name".
label	name of the vector with labels in the nodes data frame.
group	name of the vector with groups in the nodes data frame.
groupText	show names of the groups.
community	algorithm to make communities: edge_betweenness("ed"), fast_greedy("fa"), label_prop("la"), leiden_eigen("le"), louvain("lo"), optimal("op"), spinglass("sp"), walktrap("wa")
centrality	calculates the centrality measures of a network. See calCentr.
labelSize	name of the vector with label size in the nodes data frame.
size	name of the vector with size in the nodes data frame.
color	name of the vector with color variable in the nodes data frame.
shape	name of the vector with shape variable in the nodes data frame.
border	name of the column with border width in the nodes data frame.
legend	name of the vector with the variable to represent as a legend in the nodes data frame.
ntext	name of the vector with html text in the nodes data frame.

info	name of the vector with information to display in a panel in the nodes data frame.
sort	name of the vector with node order in the nodes data frame (only for heatmap).
decreasing	decreasing or increasing sort of the nodes (only for heatmap).
intensity	name of the vector with intensity variable in the links data frame (only for heatmap).
lwidth	name of the vector with width variable in the links data frame.
lweight	name of the vector with weight variable in the links data frame.
lcolor	name of the vector with color variable in the links data frame.
ltext	name of the vector with labels in the links data frame.
nodeFilter	condition for filtering nodes.
linkFilter	condition for filtering links.
degreeFilter	numeric vector to filter the resulting network by degree.
nodeBipolar	a logical value that polarizes negative and positive node values in the graphical representation. Default = FALSE.
linkBipolar	a logical value that polarizes negative and positive link values in the graphical representation. Default = FALSE.
defaultColor	a character vector giving a valid html color.
repulsion	a percentage for repulsion between nodes.
distance	a percentage for distance of links.
zoom	a number between 0.1 and 10 to start displaying zoom.
fixed	prevent nodes from being dragged.
scenarios	a note showing number of scenarios.
main	upper title of the graph.
note	lower title of the graph.
frequencies	a logical value true if the frequencies can be shown in barplots. Default = FALSE.
help	help text of the graph.
helpOn	Should the help be shown at the beginning?
background	background color or image of the graph.
layout	a matrix with two columns or an algorithm to elaborate the coordinates: davidson.harel drl("da"), circle("ci"), Force-Atlas-2("fo"), fruchterman.reingold("fr"), gem("ge"), grid("gr"), kamada.kawai("ka"), lgl("lg"), mds("md"), random("ra"), reingold.tilford("re"), star("sta"), sugiyama("sug")
limits	vector indicating size references to display layout, must be a numeric vector of length 4: x1, y1, x2, y2.
cex	number indicating the amount by which plotting text should be scaled relative to the default. Default = 1.
roundedItems	Display items with rounded borders.

controls	a numeric vector indicating which controls will be shown. 1 = sidebar, 2 = selection buttons, 3 = export buttons, 4 = nodes table, 5 = links table, 6 = search, 7 = zoom, 8 = legend. NULL hide all controls, negative values deny each control and 0 deny all.
mode	a character vector indicating the graph mode allowed: network, heatmap or both (both by default).
showCoordinates	a logical value true if the coordinates are to be shown in tables and axes. Default = FALSE.
showArrows	a logical value true if the directional arrows are to be shown. Default = FALSE.
showLegend	a logical value true if the legend is to be shown. Default = TRUE.
showAxes	a logical value true if the axes are to be shown. Default = FALSE.
axesLabels	a character vector giving the axes names.
language	a character vector (es=spanish; en=english; ca=catalan).
image	name of the vector with image files in the nodes data frame.
imageNames	name of the vector with names for image files in the nodes data frame.
dir	a "character" string representing the directory where the web files will be saved.

Value

This function returns a netCoin object. If the 'dir' attribute is specified, the function creates a folder in the computer with an HTML document named index.html which contains the produced graph. This file can be directly opened with your browser and sent to a web server to work properly.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

References

Escobar, M. and Martinez-Uribe, L. (2020) Network Coincidence Analysis: The netCoin R Package. *Journal of Statistical Software*, **93**, 1-32. doi:10.18637/jss.v093.i11.

Examples

```
# A character column (with separator)
frame <- data.frame(A = c("Man; Women", "Women; Women",
                          "Man; Man", "Undet.; Women; Man"))
data <- dichotomize(frame, "A", sep = "; ")[2:4]
C <- coin(data) # coincidence matrix
N <- asNodes(C) # node data frame
E <- edgeList(C) # edge data frame
netCoin(N, E) # netCoin object
```

netCorr *Networked correlations.*

Description

netCorr produces a network object of correlations. Its input has to be at least one set of quantitative variables.

Usage

```
netCorr(variables, weight=NULL, pairwise=FALSE,
        minimum=-Inf, maximum=Inf, sort=FALSE, decreasing=TRUE,
        frequency=FALSE, means=TRUE,
        method=c("pearson", "kendall", "spearman"),
        criteria="p", Bonferroni=FALSE, minL=0, maxL=Inf,
        sortL=NULL, decreasingL=TRUE,
        igraph=FALSE, ...)
```

Arguments

variables	a data frame with at least two quantitative variables.
weight	a vector of weights. Optimal for data.framed tables
pairwise	Pairwise mode of handling missing values if TRUE. Listwise by default.
minimum	minimum frequency to be considered
maximum	maximum frequency to be considered
sort	sort the correlation matrix according to the frequency of the events
decreasing	decreasing or increasing sort of the matrix
frequency	a logical value true if frequencies are to be shown. Default=FALSE.
means	a logical value true if means are to be shown. Default=TRUE.
method	a vector of statistics of similarity. Pearson correlation by default. spearman and kendall are also possible
criteria	statistic to be use for selection criteria.
Bonferroni	Bonferroni criterium of the signification test.
minL	minimum value of the statistic to include the edge in the list.
maxL	maximum value of the statistic to include the edge in the list.
sortL	sort the list according to the values of a statistic. See below
decreasingL	order in a decreasing way.
igraph	Produces an igraph object instead of a netCoin object if TRUE
...	Any netCoin argument.

Value

The function creates a netCoin object and eventually a folder in the computer with an HTML document named index.html which contains the produced graph. This file can be directly opened with your browser and sent to a web server to work properly.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
# A character column (with separator)
data(iris)
netCorr(iris[,1:4],ltext="value",
 main="Correlations between measurements of Iris Species",
 note="Anderson, Edgar (1935) y Fisher, R. A. (1936)") # network object
```

---

netExhibit *Images in a grid gallery.*

Description

`netExhibit` produces an interactive image gallery (alternative display).

Usage

```
netExhibit(tree, initialType = NULL, tableformat = FALSE, ...)
```

Arguments

`tree`	a data frame with two columns: source and target, describing relationships between nodes. It indicates a hierarchy between nodes which can be dynamically explored. Optionally, another two columns describing types can be passed.
`initialType`	A character vector indicating which node type will be shown at start.
`tableformat`	If the tree is especified as a table, one column per level.
`...`	Any exhibit argument.

Value

Object of class `treeGallery_rd3`.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

Examples

```
# Create some film data
tree <- data.frame(
 film = c("The Shawshank Redemption", "The Godfather", "The Dark Knight", "The Godfather Part II",
    "12 Angry Men", "Schindler's List", "The Lord of the Rings: The Return of the King",
    "Pulp Fiction", "The Lord of the Rings: The Fellowship of the Ring",
    "The Good, the Bad and the Ugly"),
  director = c("Frank Darabont", "Francis Ford Coppola", "Christopher Nolan",
    "Francis Ford Coppola", "Sidney Lumet", "Steven Spielberg", "Peter Jackson",
    "Quentin Tarantino", "Peter Jackson", "Sergio Leone"),
 actor = c("Tim Robbins|Morgan Freeman|Bob Gunton", "Marlon Brando|Al Pacino|James Caan",
   "Christian Bale|Heath Ledger|Aaron Eckhart", "Al Pacino|Robert De Niro|Robert Duvall",
    "Henry Fonda|Lee J. Cobb|Martin Balsam", "Liam Neeson|Ralph Fiennes|Ben Kingsley",
  "Elijah Wood|Viggo Mortensen|Ian McKellen", "John Travolta|Uma Thurman|Samuel L. Jackson",
   "Elijah Wood|Viggo Mortensen|Ian McKellen", "Clint Eastwood|Eli Wallach|Lee Van Cleef")
)

gallery <- netExhibit(tree, initialType="film", tableformat=TRUE)

## Not run:
plot(gallery)

## End(Not run)
```

`netGallery` *Images in a grid gallery.*

Description

`netGallery` produces an interactive image gallery.

Usage

```
netGallery(tree, deep = FALSE, initialType = NULL, tableformat = FALSE, ...)
```

Arguments

`tree`	a data frame with two columns: source and target, describing relationships between nodes. It indicates a hierarchy between nodes which can be dynamically explored. Optionally, another two columns describing types can be passed.
`deep`	The tree is especified in a structure that preserves paths. Each column will be a tree level, colnames as node types.
`initialType`	A character vector indicating which node type will be shown at start. No effects in 'deep' mode.
`tableformat`	If the tree is especified as a table, one column per level. No effects in 'deep' mode.
`...`	Any gallery argument.

Value

Object of class `netGallery`.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca.

Examples

```
# simply linked tree
tree <- data.frame(
  parent=c("a","a","b","b","b","ab","ab","ab","ab","ba","ba","baa","ba"),
  child=c("aa","ab","ba","bb","bc","aba","abb","abc","abd","baa","bab","baaa","aba")
)

gallery <- netGallery(tree)

## Not run:
plot(gallery)

## End(Not run)

# Create some film data
tree <- data.frame(
 film = c("The Shawshank Redemption", "The Godfather", "The Dark Knight", "The Godfather Part II",
    "12 Angry Men", "Schindler's List", "The Lord of the Rings: The Return of the King",
    "Pulp Fiction", "The Lord of the Rings: The Fellowship of the Ring",
    "The Good, the Bad and the Ugly"),
  director = c("Frank Darabont", "Francis Ford Coppola", "Christopher Nolan",
    "Francis Ford Coppola", "Sidney Lumet", "Steven Spielberg", "Peter Jackson",
    "Quentin Tarantino", "Peter Jackson", "Sergio Leone"),
 actor = c("Tim Robbins|Morgan Freeman|Bob Gunton", "Marlon Brando|Al Pacino|James Caan",
   "Christian Bale|Heath Ledger|Aaron Eckhart", "Al Pacino|Robert De Niro|Robert Duvall",
    "Henry Fonda|Lee J. Cobb|Martin Balsam", "Liam Neeson|Ralph Fiennes|Ben Kingsley",
  "Elijah Wood|Viggo Mortensen|Ian McKellen", "John Travolta|Uma Thurman|Samuel L. Jackson",
   "Elijah Wood|Viggo Mortensen|Ian McKellen", "Clint Eastwood|Eli Wallach|Lee Van Cleef")
)

gallery <- netGallery(tree, initialType="film", tableformat=TRUE, color="type", zoom=2)

## Not run:
plot(gallery)

## End(Not run)

# example with path preservation
tree <- rbind(
c("a1","b1","c1|c2"),
c("a2","b2","c3|c4"),
c("a3","b2","c4|c5"),
c("a4","b3|b4","c6|c7|c8")
)
```

```
colnames(tree) <- c("a","b","c")

gallery<-netGallery(tree,deep=TRUE,color="type")
## Not run:
plot(gallery)

## End(Not run)
```

---

pathCoin *Structural Equation Models Graphs.*

Description

pathCoin produces a netCoin object from a lavaan object, i.e., parameters of structural equation model.

Usage

```
pathCoin(model, estimates=c("b","se","z","pvalue","beta"),
         fitMeasures=c("chisq", "cfi", "rmsea"), ...)
```

Arguments

model	a lavaan object.
estimates	A vector with at least one element amongst "b", "se", "z", "pvalue", "beta".
fitMeasures	Default values: "chisq", "df", "pvalue", "cfi", "rmsea"
...	Any netCoin argument.

Value

The function creates a netCoin object and eventually a folder in the computer with an HTML document named index.html which contains the produced graph. This file can be directly opened with your browser and sent to a web server to work properly.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
# Classic Wheaton et al. model
library(lavaan)
lower <- '
11.834
6.947 9.364
6.819 5.091 12.532
```

```
4.783 5.028 7.495 9.986
-3.839 -3.889 -3.841 -3.625 9.610
-21.899 -18.831 -21.748 -18.775 35.522 450.288 '
wheaton.cov <- getCov(lower,
               names = c("anomia67", "powerless67","anomia71", "powerless71",
                         "education", "sei"))
wheaton.model <- '
# latent variables
ses =~ education + sei
alien67 =~ anomia67 + powerless67
alien71 =~ anomia71 + powerless71
# regressions
alien71 ~ alien67 + ses
alien67 ~ ses
# correlated residuals
anomia67 ~~ anomia71
powerless67 ~~ powerless71
'
fit <- sem(wheaton.model, sample.cov = wheaton.cov, sample.nobs = 932)

pathCoin(fit)
```

---

pieCoin *pie charts.*

Description

It generates pie charts from a coin object.

Usage

```
pieCoin(x, colors = c("#000000","#8dc7e6", "#ffffff","#005587"),
  nodes = NULL, links = NULL, name = NULL, lcolor = NULL, expected = TRUE,
  abline = NULL, main = NULL, note = NULL, showLegend = TRUE, help = NULL,
  helpOn = FALSE, cex = 1, language = c("en", "es", "ca"), dir = NULL)
```

Arguments

x	a coin object.
nodes	a data frame with information for each event.
links	a data frame with information for each pie.
name	name of the column with names in the nodes data frame.
colors	a vector of colors to be used when filling the slices.
lcolor	name of the column with color variable in the links data frame.
expected	Should expected coincidences be displayed?
abline	adds one or more straight lines between pies.

main	upper title of the graph.
note	lower title of the graph.
showLegend	a logical value true if the legend is to be shown.
help	a character string indicating a help text of the graph.
helpOn	Should the help be shown at the beginning?
cex	number indicating the amount by which plotting text should be scaled relative to the default.
language	a character vector (es=spanish; en=english; ca=catalan).
dir	a "character" string representing the directory where the web files will be saved.

Value

a pieCoin object.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
## Hair by Eye by Sex table from M. Friendly (2000)
data(HairEyeColor)
H<-as.data.frame(HairEyeColor)
W<-H$Freq
I<-dichotomize(H,c("Hair","Eye","Sex"),add=FALSE)
C <- coin(I,w=W)
pie <- pieCoin(C)
## Not run:
plot(pie)

## End(Not run)
```

---

propCoin *Express Coin Entries as Fraction of Marginal Table*

Description

This is like 'prop.table' for 'coin' objects.

Usage

```
propCoin(x, margin= 0, decimals=1)
```

Arguments

x	'coin' object.
margin	index, or vector of indices to generate margin for.
decimals	integer indicating the number of decimal places to be used.

Value

Table like 'x' expressed relative to 'margin'.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
## Random incidence matrix: 25 scenarios, 4 events.
I <- matrix(rbinom(100, 1, .5), nrow = 25, ncol = 4,
            dimnames = list(NULL, c("A", "B", "C", "D")))
C <- coin(I, sort = TRUE)

propCoin(C, 1)
```

---

renderLinks *Create an html list of links.*

Description

Create an html list of links.

Usage

```
renderLinks(data, columns, labels = NULL, target = "_blank", sites = NULL)
```

Arguments

data	data frame which contains the data.
columns	column name which contains the urls.
labels	column name which contains the text to display.
target	The target attribute specifies where to open the linked document: '_blank' opens the linked document in a new window or tab; '_self' opens the linked document in the same frame as it was clicked; *framename* opens the linked document in the named iframe.
sites	A data frame of 3 columns (url, name, icon) with the sites that the function will recognize.

Value

a character vector of html formatted links.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
links <- data.frame(name = c(
    "Camarhynchus psitticula",
    "Camarhynchus pauper",
    "Camarhynchus parvulus"
  ), wikipedia=c(
    "https://en.wikipedia.org/wiki/Large_tree_finch",
    "https://en.wikipedia.org/wiki/Medium_tree_finch",
    "https://en.wikipedia.org/wiki/Small_tree_finch"
  ),wikidata=c(
    "https://www.wikidata.org/wiki/Q578835",
    "https://www.wikidata.org/wiki/Q1125857",
    "https://www.wikidata.org/wiki/Q1086136"
  ))
html <- renderLinks(links,c("wikipedia","wikidata"))
```

---

saveGhml *Save a netCoin object as a .graphml file to be read in Gephi, Pajek, ...*

Description

saveGhml produces a .graphml file from a netCoin object.

Usage

```
saveGhml(net, file="netCoin.graphml")
```

Arguments

net	A netCoin object.
file	The name of the file. If not extension, .gexf is used as default.

Value

The function creates a file with vertices and arcs or edges of a netCoin object.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
## Not run:
# A character column (with separator)
frame <- data.frame(A = c("Man; Women", "Women; Women",
                          "Man; Man", "Undet.; Women; Man"))
data <- dichotomize(frame, "A", add=FALSE, sep = "; ")
graph <- allNet(data, maxL=.5) # graph from an incidence matrix

saveGhml(graph,"graph") # save graph.net file

## End(Not run)
```

---

savePajek *Save a netCoin object as a .net (.paj) file to be read in Pajek, Gephi, ...*

Description

savePajek produces a .net (.paj) file from a netCoin object.

Usage

```
savePajek(net, file="file.net", arcs=NULL, edges=NULL,
          partitions=NULL, vectors=NULL)
```

Arguments

net	a netCoin object.
file	The name of the file without extension. It will be .net or .paj acoording to data. The default is file.net or file.paj
arcs	Names of netCoin$links to be included and considered as arcs in the Pajek file..
edges	Names of netCoin$links to be included and considered as edges in the Pajek file..
partitions	Names of netCoin$nodes to be included and considered as partitions in the Pajek file.
vectors	Names of netCoin$nodes to be included and considered as vectors in the Pajek file.

Value

The function creates a file with vertices and arcs or edges of a netCoin objetct. Vectors and partitions can be also included. .

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
## Not run:
# A character column (with separator)
frame <- data.frame(A = c("Man; Women", "Women; Women",
                          "Man; Man", "Undet.; Women; Man"))
data <- dichotomize(frame, "A", add=FALSE, sep = "; ")
graph <- allNet(data) # graph from an incidence matrix

savePajek(graph,"graph",edges="Haberman") # save graph.net file

## End(Not run)
```

---

shinyCoin *Include netCoin Plots in Shiny.*

Description

Load a netCoin plot to display in shiny.

Usage

```
shinyCoin(x)
```

Arguments

x	is a netCoin, barCoin or timeCoin object.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
## Not run:
# A character column (with separator)
frame <- data.frame(A = c("Man; Women", "Women; Women",
                          "Man; Man", "Undet.; Women; Man"))
data <- dichotomize(frame, "A", sep="; ")[2:4]
C <- coin(data) # coincidence matrix
N <- asNodes(C) # node data frame
E <- edgeList(C) # edge data frame
net <- netCoin(N, E) # netCoin object
shinyCoin(net)

## End(Not run)
```

`sim` *Similarity matrix.*

Description

It calculates a similarity/distance matrix from either an incidence data frame/matrix or a coin object.

Usage

```
sim(input, procedures="Jaccard", level=.95, distance=FALSE,
    minimum=1, maximum=Inf, sort=FALSE, decreasing=FALSE,
    weight = NULL, pairwise = FALSE)
```

Arguments

`input`	a binary data frame or a coin object, let's say an R list composed by a number of scenarios (`$n`) and a coincidence matrix with frequencies (`$f`).
`procedures`	a vector of statistics of similarity. See details below.
`level`	confidence level
`distance`	convert the similarity matrix into a distance matrix
`minimum`	minimum frequency to obtain a similarity/distance measure.
`maximum`	maxium frequency to obtain a similarity/distance measure.
`sort`	sort the list according to the values of a statistic. See details below
`decreasing`	order in a decreasing way.
`weight`	a vector of weights. Optimal for data.framed tables
`pairwise`	Pairwise mode of handling missing values if TRUE. Listwise by default.

Details

Possible measures in procedures are

- Frequencies (f), Relative frequencies (x), Conditional frequencies (i), Coincidence degree (cc), Probable degree (cp),
- Expected (e), Confidence interval (con)
- Matching (m), Rogers & Tanimoto (t), Gower (g), Sneath (s), Anderberg (and),
- Jaccard (j), Dice (d), antiDice (a), Ochiai (o), Kulczynski (k),
- Hamann (ham), Yule (y), Pearson (p), odds ratio (od), Rusell (r),
- Haberman (h), Z value of Haberman (z).
- Hypergeometric p greater value (hyp).

Value

A similarity/distance matrix.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
# From a random incidence matrix I(25X4)
I<-matrix(rbinom(100,1,.5),nrow=25,ncol=4,
   dimnames=list(NULL,c("A","B","C","D")))
sim(I)
#Same results
C<-coin(I)
sim(C)
```

`sociologists` *Data: Classical sociologists.*

Description

Data frame with names, birth and death year data, birth country and movement.

Usage

```
data("sociologists")
```

Format

A data frame with life's period of 16 sociologists and the following 11 variables to study time coincidences:

`name` : name and last name of the sociologist.

`birth` : birth year.

`death` : death year.

`birth_place` : birth place.

`birth_country` : birth country.

`death_place` : death place.

`death_country` : death country.

`label` : combination of name, birth and death dates.

`generation` : generation (every 25 years) of the sociologists.

`school` : school of thought.

`picture` : name of the file where their picture is.

Source

Own elaboration from manuals of sociology.

References

See events.

Examples

```
data(sociologists)
head(sociologists, 10)
tail(sociologists, 10)
```

---

surCoin *Networked coincidences from a data frame.*

Description

surCoin produces a network object of coincidences from a data frame converting variables into dichotomies.

Usage

```
surCoin(data,variables=names(data), commonlabel=NULL,
        dichotomies=NULL, valueDicho=1, metric=NULL, exogenous=NULL,
        weight=NULL, subsample=FALSE, pairwise=FALSE,
        minimum=1, maximum=nrow(data), sort=FALSE, decreasing=TRUE,
        frequency=FALSE, percentages=TRUE,
        procedures="Haberman", criteria="Z", Bonferroni=FALSE,
        support=-Inf, minL=-Inf, maxL=Inf,
        directed=FALSE, diagonal=FALSE, sortL=NULL, decreasingL=TRUE,
        igraph=FALSE, coin=FALSE, dir=NULL, ...)
```

Arguments

data	a data frame.
variables	a vector of variables included in the previous data frame.
commonlabel	a vector of variables whose names are to be included in nodes labels.
dichotomies	a vector of dichotomous variables to appear as just one category.
valueDicho	value or values to be selected for dichotomous variables. Default is 1.
metric	a vector of metrics.
exogenous	a vector of variables whose relations amongst them are of no interest. None by default.
weight	a vector of weights. Optimal for data.framed tables.
subsample	retrict the analysis to scenarios with at least one event.
pairwise	Pairwise mode of handling missing values if TRUE. Listwise by default.
minimum	minimum frequency to be considered.
maximum	maximum frequency to be considered.

sort	sort the coincidence matrix according to frequency of events.
decreasing	decreasing or increasing sort of the matrix.
frequency	a logical value true if frequencies are to be shown. Default=FALSE.
percentages	a logical value true if percentages are to be shown. Default=TRUE.
procedures	a vector of statistics of similarity. See below.
criteria	statistic to be use for selection criteria.
Bonferroni	Bonferroni criterium of the signification test.
support	minimum value of the frequency of the coincidence to be edged.
minL	minimum value of the statistic to include the edge in the list.
maxL	maximum value of the statistic to include the edge in the list. By default is +Inf, except if criteria="Z" or criteria="hyp", in which case it is .5. It is recommnended to change it to .05 if data has been sampled.
directed	includes same edges only once.
diagonal	includes auto-links.
sortL	sort the list according to the values of a statistic. See below.
decreasingL	order in a decreasing way.
igraph	Produces an igraph object instead of a netCoin object if TRUE.
coin	Only return the coincidences matrix if TRUE.
dir	a "character" string representing the directory where the web files will be saved.
...	Any netCoin argument.

Details

Possible measures in procedures are

- Frequencies (f), Relative frequencies (x), Conditional frequencies (i), Coincidence degree (cc), Probable degree (cp),
- Expected (e), Confidence interval (con)
- Matching (m), Rogers & Tanimoto (t), Gower (g), Sneath (s), Anderberg (and),
- Jaccard (j), Dice (d), antiDice (a), Ochiai (o), Kulczynski (k),
- Hamann (ham), Yule (y), Pearson (p), odds ratio (od), Rusell (r),
- Haberman (h), Z value of Haberman (z),
- Hypergeometric p greater value (hyp).
- Convert a matrix into an edge list (shape).

Value

This function creates a netCoin object (or igraph) and, if stated, a folder in the computer with an HTML document named index.html which contains the produced graph. This file can be directly opened with your browser and sent to a web server to work properly.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

References

Escobar, M. and Martinez-Uribe, L. (2020) Network Coincidence Analysis: The netCoin R Package. *Journal of Statistical Software*, **93**, 1-32. doi:10.18637/jss.v093.i11.

Examples

```
# A data frame with two variables Gender and Opinion
frame <- data.frame(Gender=c(rep("Man",3),rep("Woman",3)),
                    Opinion=c("Yes","Yes","No","No","No","Yes"))
surCoin(frame,commonlabel="") # network object

# A data frame with two variables (Gender and Hand) and nodes
input <- data.frame(
  Gender = c("Women", "Men", "Men", "Women", "Women","Men",
             "Men", "Men", "Women", "Women", "Men", "Women"),
  Hand   = c("Right", "Left","Right", "Right", "Right", "Right",
             "Left", "Right", "Right", "Left","Right", "Right"))
nodes <- data.frame(
  name  = c("Gender:Men","Gender:Women", "Hand:Left", "Hand:Right"),
  label = c("Women(50\u25)","Men(50\u25)",
            "Left hand(25\u25)", "Right hand(75\u25)"))
G <- surCoin(input, nodes=nodes, proc=c("h","i"), label="label",
             ltext="i", showArrows=TRUE, maxL=.99)
```

---

surScat *Networked coincidences from a data frame.*

Description

surScat produces a network object of coincidences from a data frame converting variables into dichotomies.

Usage

```
surScat(data, variables=names(data), active=variables, type=c("mca", "pca"), nclusters=2,
        maxN=2000, ...)
```

Arguments

data	a data frame.
variables	a vector of variables included in the previous data frame.
active	a vector of variables actived in the previous data frame.

type	Factorial type: mca for qualitative active variables, pca for quantitative active variables.
nclusters	number of clusters.
maxN	Maximum number or rows.
...	Any netCoin argument.

Details

Possible measures in procedures are

- Frequencies (f), Relative frequencies (x), Conditional frequencies (i), Coincidence degree (cc), Probable degree (cp),
- Expected (e), Confidence interval (con)
- Matching (m), Rogers & Tanimoto (t), Gower (g), Sneath (s), Anderberg (and),
- Jaccard (j), Dice (d), antiDice (a), Ochiai (o), Kulczynski (k),
- Hamann (ham), Yule (y), Pearson (p), odds ratio (od), Rusell (r),
- Haberman (h), Z value of Haberman (z),
- Hypergeometric p greater value (hyp).
- Convert a matrix into an edge list (shape).

Value

This function creates a netCoin object (or igraph) and, if stated, a folder in the computer with an HTML document named index.html which contains the produced graph. This file can be directly opened with your browser and sent to a web server to work properly.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

References

Escobar, M. and Martinez-Uribe, L. (2020) Network Coincidence Analysis: The netCoin R Package. *Journal of Statistical Software*, **93**, 1-32. doi:10.18637/jss.v093.i11.

Examples

```
# A data frame with two variables Gender and Opinion
frame<-data.frame(Gender=c(rep("Man",3),rep("Woman",3)),
                  Opinion=c("Yes","Yes","No","No","No","Yes"))
surScat(frame) # network object
```

timeCoin *Networked coincidences.*

Description

timeCoin produces a timeCoin object.

Usage

```
timeCoin(periods, name = "name", start = "start", end = "end", group = NULL,
         text = NULL, main = NULL, note = NULL, info = NULL,
         events = NULL, eventNames = "name", eventPeriod = "period",
         eventTime = "date", eventColor = NULL, eventShape = NULL,
         cex = 1, language = c("en","es","ca"), dir = NULL)
```

Arguments

periods	a data frame with at least three vectors of name, start and end of the periods.
name	name of the vector with names in the periods data frame.
start	name of the vector with starts in the periods data frame.
end	name of the vector with ends in the periods data frame.
group	name of the vector with groups in the periods data frame.
text	name of the vector with html text in the periods data frame.
main	upper title of the graph.
note	lower title of the graph.
info	name of the vector with information to display in a panel in the periods data frame.
events	a data frame of events included into the periods with three columns: event name, periodParent and eventTime
eventNames	name of the vector with names in the events data frame.
eventPeriod	name of the vector with period names in the events data frame.
eventTime	name of the vector with time points in the events data frame.
eventColor	name of the vector with color criteria in the events data frame.
eventShape	name of the vector with shape criteria in the events data frame.
cex	number indicating the amount by which plotting text should be scaled relative to the default. Default = 1.
language	a character vector (es=spanish; en=english; ca=catalan).
dir	a "character" string representing the directory where the web files will be saved.

Value

Object of class timeCoin.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
# Database of the classical sociologists.
# Only periods
data(sociologists)
timeCoin(sociologists, "name", "birth", "death", "school")

# Periods and events
data(works)
timeCoin(sociologists, "name", "birth", "death", "school",
         events=works, eventNames="label", eventPeriod="author", eventTime="date")
```

---

toIgraph *igraph object.*

Description

igraph object from a netCoin object.

Usage

```
toIgraph(net)
```

Arguments

net	is a netCoin object. See netCoin

Value

An igraph object.

Author(s)

Modesto Escobar, Department of Sociology and Communication, University of Salamanca. See https://sociocav.usal.es/blog/modesto-escobar/

Examples

```
# A character column (with separator)
frame <- data.frame(A = c("Man; Women", "Women; Women",
                          "Man; Man", "Undet.; Women; Man"))
data <- dichotomize(frame, "A", sep = "; ")[2:4]
C <- coin(data) # coincidence matrix
N <- asNodes(C) # node data frame
E <- edgeList(C)
```

```
net <- netCoin(N, E)
toIgraph(net) # conversion into a igraph object
```

---

works *Data: Classical sociological works.*

Description

Data frame with classical sociological works writen by authors in the sociologists data frame.

Usage

```
data("sociologists")
```

Format

A data frame with 54 observations (events) and the following 4 variables to study coincidences in time:

`name` : name and last name of the author of the work.

`label` : abbreviation of the complete name.

`works` : work's name.

`date` : year of its first publication.

Author(s)

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Source

Own elaboration from manuals of sociology.

References

See events.

Examples

```
data(works)
head(works, 10)
tail(works, 10)
```

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