Package 'DendSer'

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Title Dendrogram Seriation: Ordering for Visualisation

Description Re-arranges a dendrogram to optimize visualisation-based cost functions.

Depends gclus,seriation

License GPL-2

NeedsCompilation yes

Repository CRAN

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Contents

`costARc` *Cost functions for DendSer*

Description

Each of these functions evaluates the cost of an ordering.

Usage

```
costARc(sw, o, target = nrow(sw) - 1, ...)
costBAR(sw, o, target=max(2,floor(nrow(sw)/5)),...)
costLS(sw, o, target=seq_along(sw),...)
costPL(sw, o, ...)
costLPL(sw, o, target=(nrow(sw)-1):1,...)
costED(sw, o, node,se,...)
```

Arguments

sw	For cost=costLS, this is a vector of object weights. Otherwise is a symmetric matrix.
o	An ordering vector.
node	The node
se	Extra info
target	Parameter used by cost function.
...	Other args.

Value

Result of cost

Author(s)

Catherine Hurley & Denise Earle

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crit2cost *Cost function from seriation criterion*

Description

Returns a cost function from seriation criterion (package seriation)

Usage

```
crit2cost(crit)
```

Arguments

crit	One of seriation::list_criterion_methods("dist")

Examples

```
require(DendSer)

d<- dist(iris[1:20,-5])
h <- hclust(d)
DendSer(h,d,cost=function(x,o,...) criterion(as.dist(x),o,method="AR_deviations"))
DendSer(h,d,cost=crit2cost("AR_deviations")) # short version of above
DendSer(h,d,cost=crit2cost("ME"))

# use DendSer methods via seriate
# get_order(seriate(d,method="Dendser", control=list(hclust=h,cost=costARc)))
DendSer(h,d,cost=costARc)
```

DendSer *Implements dendrogram seriation*

Description

Implements dendrogram seriation.

Usage

```
DendSer(h, ser_weight, cost = costBAR, node_op = NULL, costArg = NULL,
maxloops = NULL, saveinfo = FALSE, direction = NULL,  GW=NULL,...)
```

Arguments

h	An object of class hclust
ser_weight	Used by cost function to evaluate ordering. For cost=costLS, this is a vector of object weights. Otherwise is a dist or symmetric matrix.
cost	Function used to evaluate permutation.Current choices are costLS, costPL, costLPL, costED, costARc, costBAR.
node_op	Function used to reorder branches at a dendrogram node. DendSer picks default depending on cost function. NULL means use default depending on cost.
costArg	Other args for cost function.
maxloops	Maximum number of iterations allowed. NULL means use default depending on cost.
saveinfo	Logical, whether info associated with search is saved.
direction	Order of visiting nodes. Values are "up" or "down", for nodes in order of increasing or decreasing height.NULL means use default depending on cost.
GW	Logical, initial GW step or not. NULL means use default depending on cost.
...	Not used.

Details

costED uses the Gruvaeus and Wainer 1972 algorithm, as provided by package gclus.

Value

Numeric vector giving an optimal dendrogram order

Author(s)

Catherine Hurley & Denise Earle

References

Gruvaeus, G. \& Wainer, H. (1972), "Two additions to hierarchical cluster analysis", British Journal of Mathematical and Statistical Psychology, 25, 200-206.

See Also

dser

Examples

```
require(DendSer)

d<- dist(iris[,-5])
h <- hclust(d,method="average")
ob<- DendSer(h,d)
opl<- DendSer(h,d,cost=costPL)
plotAsColor(d,ob)

w <- rowSums(iris[,-5])
ow <- DendSer(h,w,cost=costLS) # arranges cases by size, within hclust
stars(iris[ow,-5],labels=NULL, col.stars=cutree(h,3)[ow]) # and color by cluster
#stars(iris[ow,-5],labels=NULL, col.stars=iris[ow,5]) # or by species
```

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dser *Implements dendrogram seriation. Interface to DendSer.*

Description

Implements dendrogram seriation. Interface to DendSer.

Usage

```
dser(x,ser_weight,cost=costBAR, ...)

## S3 method for class 'data.frame'
dser(x,ser_weight,cost=costBAR,...)

## S3 method for class 'matrix'
dser(x,ser_weight,cost=costBAR,scale=TRUE,dmethod="euclidean",...)

## S3 method for class 'dist'
dser(x,ser_weight,cost=costBAR,hmethod="average",...)

## S3 method for class 'hclust'
dser(x,ser_weight,cost=costBAR,...)
```

Arguments

x	Used to select method.
ser_weight	Seriation weights. For cost=costLS, defaults to first column of matrix x, otherwise to symmetric matrix version of dist d.
cost	Current choices are costLS, costPL, costLPL, costED, costARc, costBAR.
scale	Logical value,controls whether matrix x should be scaled prior to forming dist.
dmethod	Method of dist calculation. See function `dist`.
hmethod	Method of hclust calculation. See function `hclust`.
...	Other args

Details

When x is a matrix or data.drame, forms a dist of rows using function dist with method = dmethod. When x is a dist, forms a hclust with method = hmethod which is then reordered.

Value

Numeric vector giving an optimal dendrogram order

Author(s)

Catherine Hurley & Denise Earle

Examples

```
require(DendSer)

iriss <- scale(iris[,-5])
plotAsColor(iriss,order.row=dser(iriss))
```

```
w <- prcomp(iris[,-5],scale=TRUE)$x[,1]
h<- hclust(dist(iriss))
h$order <- ow <- dser(h,w,cost=costLS) # arranges cases along first PC, within dendrogram


# compare re-ordered dendrogram to PC scores, w
dev.new(width=10,height=5)
par(mar=c(0,2,1,1))
layout(matrix(1:2, nrow = 2), heights = c(4,1.5) )
par(cex=.7)
plot(h,main="",xlab="",hang=-1,labels=FALSE)
u <- par("usr")
par(mar=c(1,2,0,1))


plot.new()
par(usr=c(u[1:2],min(w),max(w)))

x<- 1:length(w)
rect(x-.5,0,x+.5,w[ow],col=cutree(h,3)[ow]+1)
```

---

plotAsColor *Function that plots a matrix as a color image*

Description

Function that plots a matrix as a color image, in matrix order.

Usage

```
plotAsColor(m,  order = NULL, order.col = order, order.row = order,
rank = FALSE, border.color = "grey70", labels = FALSE,x=1:ncol(d),y=1:nrow(d), ...)
```

Arguments

m	Numeric matrix.
order	Default order used for rows and columns.
order.col	Column order.
order.row	Row order
rank	Logical, whether matrix m should be converted to ranks or not.
border.color	Color of border. Null for no border.
labels	If TRUE, add labels obtained from m.
x	X coordinates, passed to image.
y	Y coordinates, passed to image.
...	passed to image.

See Also

See Also as image.

Examples

```
require(DendSer)

d<- dist(scale(iris[,-5]))
plotAsColor(d,dser(d,hmethod="average"))
```

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