Package ‘dendroextras’

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Title Extra Functions to Cut, Label and Colour Dendrogram Clusters
Type Package
Description Provides extra functions to manipulate dendrograms that build on the base functions provided by the 'stats' package. The main functionality it is designed to add is the ability to colour all the edges in an object of class 'dendrogram' according to cluster membership i.e. each subtree is coloured, not just the terminal leaves. In addition it provides some utility functions to cut 'dendrogram' and 'hclust' objects and to set/get labels.

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dendroextras-package  Extra functions to cut, label and colour dendrogram clusters

Description

Extra functions to cut, label and colour dendrogram clusters

Cutting clusters

dendroextras provides the `slice` function as an alternative to the base `cut` function. In contrast to cut, slice returns group membership in dendrogram order i.e. the first element in the group vector that is returned will be the leftmost member of the leftmost cluster (cluster #1).

Colouring clusters

dendroextras provides `colour_clusters` to colour all of the edges forming clusters cut by height or number of groups. You can also set and retrieve the leaf colours (i.e. the terminal nodes) using `set_leaf_colours` and `leaf_colours`.

Labels

dendroextras provides `labels` and `labels<-` methods to get and set the labels of cluster members.

See Also

dendrogram, hclust in stats package.

colour_clusters  Colour sub-clusters of a tree (dendrogram/hclust) object

Description

The distinctive feature of this function is to colour both the terminal leaves of a cluster and the edges leading to those leaves. The edgePar attribute of nodes will be augmented by a new list item col. The groups will be defined by a call to `slice` using the k or h parameters.

Usage

```r
colour_clusters(d, k = NULL, h = NULL, col = rainbow, groupLabels = NULL)

color_clusters(d, k = NULL, h = NULL, col = rainbow, groupLabels = NULL)
```
**Arguments**

- `d`: A dendrogram or hclust tree object
- `k`: number of groups (passed to `slice`)
- `h`: height at which to cut tree (passed to `slice`)
- `col`: Function or vector of colours
- `groupLabels`: If TRUE add numeric group label - see Details for options

**Details**

If `groupLabels=TRUE` then numeric group labels will added to each cluster. If a vector is supplied then these entries will be used as the group labels. If a function is supplied then it will be passed a numeric vector of groups (e.g. 1:5) and must return the formatted group labels.

**Value**

a tree object of class dendrogram.

**Author(s)**

jefferis

**See Also**

`slice`, `cutree`, `dendrogram`

**Examples**

```r
d5 = colour_clusters(hclust(dist(USArrests), "ave"), 5)
plot(d5)
d5g = colour_clusters(hclust(dist(USArrests), "ave"), 5, groupLabels=TRUE)
plot(d5g)
d5gr = colour_clusters(hclust(dist(USArrests), "ave"), 5, groupLabels=as.roman)
plot(d5gr)
```

**Description**

NB will return labels in dendrogram order, not in the order of the original labels retained in object$labels usually corresponding to the row or column names of the `dist` object provided to `hclust`.

**Usage**

```r
## S3 method for class 'hclust'
labels(object, ...)
```
labels<-

Arguments
  object      hclust object from which to extract labels
  ...     Additional arguments (ignored)

Value
  character vector of labels in dendrogram order

Author(s)
  jefferis

See Also
  labels,hclust

Examples
  hc <- hclust(dist(USArrests), "ave")
  dend <- as.dendrogram(hc)
  stopifnot(all.equal(labels(hc),labels(dend)))

labels<-
         Set the labels of an object

Description
  Set the labels of an object
  Set the labels of a dendrogram

Usage
  labels(x,...) <- value

Arguments
  x          Object on which to set labels
  ...     Additional parameters passed to specific methods
  value     New labels

Value
  object of class dendrogram
**leaf_colours**

**Author(s)**

jefferis

**See Also**

dendrogram, labels

**Examples**

```r
e <- hclust(dist(UAarrest), "ave")
dend <- as.dendrogram(e)
labels(dend) <- abbreviate(labels(dend), minlength=2)

leaf_colours(dend)
```

**Description**

Return the leaf colours of a dendrogram

**Usage**

```r
leaf_colours(d, col_to_return = c("edge", "node", "label"))
```

**Arguments**

- **d**: the dendrogram
- **col_to_return**: Character scalar - kind of colour attribute to return

**Details**

The returned colours will be in dendrogram order.

**Value**

named character vector of colours, NA_character_ where missing

**Author(s)**

jefferis

**See Also**

slice, colour_clusters

**Examples**

```r
d5 = colour_clusters(hclust(dist(UAarrest), "ave"), 5)
leaf_colours(d5)
```
set_leaf_colours  
Set the leaf colours of a dendrogram

Description
Set the leaf colours of a dendrogram

Usage
set_leaf_colours(d, col, col_to_set = c("edge", "node", "label"))
set_leaf_colors(d, col, col_to_set = c("edge", "node", "label"))

Arguments

- **d**: the dendrogram
- **col**: Single colour or named character vector of colours. When NA no colour will be set.
- **col_to_set**: Character scalar - kind of colour attribute to set

Author(s)
jefferis

See Also
slice, colour_clusters

Examples

d5=colour_clusters(hclust(dist(USArrests), "ave"),5)
dred=set_leaf_colours(d5,'red','edge')
stopifnot(isTRUE(all(leaf_colours(dred)=='red')))  
d52=set_leaf_colours(d5,leaf_colours(d5),'edge')
stopifnot(all.equal(d5,d52))

slice  
Cut a tree-like object into groups numbered in tree order

Description
In comparison with cutree, the groups are numbered from left to right as per the tree when plotted in its standard horizontal form. Note also that the return value will have the leaves sorted in dendrogram order.
slice

Usage

slice(x, k = NULL, h = NULL, ...)

Arguments

x       tree like object
k       an integer scalar with the desired number of groups
h       numeric scalar with height where the tree should be cut
...     Additional parameters passed to methods

Value

a named vector with group memberships

Author(s)

jefferis

See Also

cutree, cut.dendrogram, rect.hclust

Examples

hc <- hclust(dist(USArrests), "ave")
# return groups, leaves ordered by dendrogram
slice(hc,k=5)
# return groups, leaves ordered as originally passed to hclust
slice(hc,k=5)[order(hc$order)]
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