

# dcDuplicated

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dcDuplicated	<i>Function to determine the duplicated patterns from input data matrix</i>
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## Description

dcDuplicated is supposed to determine the duplicated vectorised patterns from a matrix or data frame. The patterns can come from column-wise vectors or row-wise vectors. It returns an integer vector, in which the value indicates from which it duplicates.

## Usage

```
dcDuplicated(data, pattern.wise = c("column", "row"), verbose = T)
```

## Arguments

data	an input data matrix/frame
pattern.wise	a character specifying in which wise to define patterns from input data. It can be 'column' for column-wise vectors, and 'row' for row-wise vectors
verbose	logical to indicate whether the messages will be displayed in the screen. By default, it sets to TRUE for display

## Value

an interger vector, in which an entry indicates from which it duplicates. When viewing column-wise patterns (or row-wise patterns), the returned integer vector has the same length as the column number (or the row number) of input data.

## Note

none

## See Also

[dcAncestralMP](#), [dcAncestralMP](#), [dcAlgo](#)

**Examples**

```
# an input data matrix storing discrete states for tips (in rows) X four characters (in columns)
data1 <- matrix(c(0,rep(1,3),rep(0,2)), ncol=1)
data2 <- matrix(c(rep(0,4),rep(1,2)), ncol=1)
data3 <- matrix(c(1,rep(0,3),rep(1,2)), ncol=1)
data <- cbind(data1, data2, data1, data3)
colnames(data) <- c("C1", "C2", "C3", "C4")
data

# determine the duplicated patterns from input data matrix
res <- dcDuplicated(data, pattern.wise="column")
## return an integer vector
res
## get index for unique patterns
ind <- sort(unique(res))
## As seen above, the returned integer vector tells there are 3 unique patterns:
## they are in columns (1, 2, 4). The column 3 is duplicated from column 1.
```