BufferedMatrix
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BufferedMatrix-class

Class BufferedMatrix

Description

This is a class representation of a buffered matrix (of numeric data). In this case data is primarily stored outside main memory in temporary files.

Objects from the Class

Objects can be created using the function `createBufferedMatrix`

Slots

- `rawBufferedMatrix`: a pointer to an external structure used to access and store the matrix data.
- `rownames`: rownames for the matrix.
- `colnames`: colnames for the matrix.

Methods

- `ncol` signature(object = "BufferedMatrix"): Returns the number of columns in the matrix
- `nrow` signature(object = "BufferedMatrix"): Returns the number of rows in the matrix
- `dim` signature(object = "BufferedMatrix"): Returns the dimensions of the matrix
- `buffer.dim` signature(object = "BufferedMatrix"): Returns the number of columns and the number of rows to be stored in the buffer
- `set.buffer.dim` signature(object = "BufferedMatrix"): Set the buffer size or resize it
- `[` signature(object = "BufferedMatrix"): matrix accessor
- `<-` signature(object = "BufferedMatrix"): matrix replacer
- `show` signature(object = "BufferedMatrix"): prints basic information about the BufferedMatrix out to screen
is.RowMode signature(object = "BufferedMatrix"): returns TRUE if the row buffer is active and FALSE otherwise.

is.ColMode signature(object = "BufferedMatrix"): returns TRUE if the row buffer is inactive and FALSE otherwise.

RowMode signature(object = "BufferedMatrix"): Activate the row buffer.

ColMode signature(object = "BufferedMatrix"): Deactivate the row buffer

duplicate signature(object = "BufferedMatrix"): Make a copy of the BufferedMatrix

prefix signature(object = "BufferedMatrix"): return the initial part of the string used for temporary files

directory signature(object = "BufferedMatrix"): return the location where temporary files are stored

filenames signature(object = "BufferedMatrix"): return the fully pathed filenames for each column in the matrix

ewApply signature(object = "BufferedMatrix"): apply a function elementwise

exp signature(object = "BufferedMatrix"): Compute the exponential elementwise of the matrix

sqrt signature(object = "BufferedMatrix"): Compute the square-root elementwise of the matrix

pow signature(object = "BufferedMatrix"): Compute \(x^\text{power}\) elementwise of the matrix

log signature(object = "BufferedMatrix"): Compute logarithm elementwise of the matrix

colMax signature(object = "BufferedMatrix"): Returns a vector containing maximums by column

rowMax signature(object = "BufferedMatrix"): Returns a vector containing maximums by row

colMeans signature(object = "BufferedMatrix"): Returns a vector containing means by column

rowMeans signature(object = "BufferedMatrix"): Returns a vector containing means by row

colMin signature(object = "BufferedMatrix"): Returns a vector containing minimums by column

rowMin signature(object = "BufferedMatrix"): Returns a vector containing minimums by row

colVars signature(object = "BufferedMatrix"): Returns a vector containing sample variances by column

rowVars signature(object = "BufferedMatrix"): Returns a vector containing sample variances by row

colSd signature(object = "BufferedMatrix"): Returns a vector containing sample standard deviations by column

rowSd signature(object = "BufferedMatrix"): Returns a vector containing sample standard deviations by row

colSums signature(object = "BufferedMatrix"): Returns a vector containing sum by column
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- **rowSums** `signature(object = "BufferedMatrix")`: Returns a vector containing sum by row.
- **colMedians** `signature(object = "BufferedMatrix")`: Returns a vector containing medians by column.
- **rowMedians** `signature(object = "BufferedMatrix")`: Returns a vector containing medians by row. Best only used when the matrix is in RowMode (otherwise it is extremely slow).
- **Max** `signature(object = "BufferedMatrix")`: Returns the maximum of all elements in the matrix.
- **Min** `signature(object = "BufferedMatrix")`: Returns the minimum of all elements in the matrix.
- **Var** `signature(object = "BufferedMatrix")`: Returns the sample variance of all elements in the matrix.
- **Sd** `signature(object = "BufferedMatrix")`: Returns the sample standard deviations of all elements in the matrix.
- **Sum** `signature(object = "BufferedMatrix")`: Returns the sum of all elements in the matrix.
- **mean** `signature(object = "BufferedMatrix")`: Returns the mean of all elements in the matrix.
- **colApply** `signature(object = "BufferedMatrix")`: apply a function columnwise. Returns either a vector or BufferedMatrix.
- **rowApply** `signature(object = "BufferedMatrix")`: apply a function row-wise. Returns either a vector or BufferedMatrix.
- **as.matrix** `signature(object = "BufferedMatrix")`: coerce BufferedMatrix into a regular R matrix.
- **subBufferedMatrix** `signature(object = "BufferedMatrix")`: gets data from BufferedMatrix and returns it in another BufferedMatrix.
- **rownames** `signature(object = "BufferedMatrix")`: access the row names.
- **colnames** `signature(object = "BufferedMatrix")`: access the column names.
- **rownames<-** `signature(object = "BufferedMatrix")`: replace the row names.
- **colnames<-** `signature(object = "BufferedMatrix")`: replace the column names.
- **dimnames** `signature(object = "BufferedMatrix")`: Access the row and column names.
- **dimnames** `signature(object = "BufferedMatrix")`: Replace the row and column names.
- **ReadOnlyMode** `signature(object = "BufferedMatrix")`: Toggles the Read Only mode on and off.
- **is.ReadOnlyMode** `signature(object = "BufferedMatrix")`: Finds out if it is in Read Only Mode.
- **memory.usage** `signature(object = "BufferedMatrix")`: Give amount of RAM currently in use by BufferedMatrix object.
- **disk.usage** `signature(object = "BufferedMatrix")`: Give amount of disk space currently in use by BufferedMatrix object.
- **as(matrix, BufferedMatrix)**: Coerce matrix to BufferedMatrix.
- **as(BufferedMatrix, matrix)**: Coerce the Buffered to matrix.
- **AddColumn**: Add an additional column to the matrix. Will be all empty (set to 0).
- **MoveStorageDirectory**: Move the temporary files used to store the matrix from one location to another.
createBufferedMatrix

Author(s)
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Description
'as.BufferedMatrix' will coerce the supplied object into a BufferedMatrix. 'is.BufferedMatrix' checks whether the supplied argument is a BufferedMatrix.

Usage
```
as.BufferedMatrix(x, bufferrows=1, buffercols=1, directory=getwd())
```

Arguments
- **x**: an R object
- **bufferrows**: number of rows to be buffered if the row buffer is activated
- **buffercols**: number of columns to be buffered
- **directory**: path to directory where temporary files should be stored

Details
These functions are useful for converting between R matrix objects and BufferedMatrix objects.

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createBufferedMatrix

Description
Creates a Buffered Matrix object

Usage
```
createBufferedMatrix(rows, cols=0, bufferrows=1, buffercols=1, prefix="BM", directory=getwd())
```
createBufferedMatrix

Arguments

- **rows**: Number of rows in the matrix
- **cols**: Initial number of columns in the matrix
- **bufferrows**: Number of rows to be buffered if the row buffer is activated
- **buffercols**: Number of columns to be buffered
- **prefix**: String to be used as start of name for any temporary files
- **directory**: Path to directory where temporary files should be stored

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