**BufferedMatrix**

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**as.BufferedMatrix**  
Check or Coerce object to BufferedMatrix

**Description**

‘as.BufferedMatrix’ will coerce the supplied object into a BufferedMatrix. ‘is.BufferedMatrix’ checks whether the supplied argument is a BufferedMatrix.

**Usage**

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

```r
is.BufferedMatrix(x)
```

**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.

**Author(s)**

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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") sets the buffer size or resizes 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.
**BufferedMatrix-class**

- **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
- **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
**BufferedMatrix-class**

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

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createBufferedMatrix

Description

Creates a Buffered Matrix object

Usage

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

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

Author(s)

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