

Package ‘BufferedMatrix’

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Title A matrix data storage object held in temporary files

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Depends R (>= 2.6.0), methods

Description A tabular style data object where most data is stored outside main memory. A buffer is used to speed up access to data.

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URL <https://github.com/bmbolstad/BufferedMatrix>

Collate allGenerics.R BufferedMatrix.R as.BufferedMatrix.R
createBufferedMatrix.R

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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

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

Arguments

| | |
|-------------------------|--|
| <code>x</code> | an R object |
| <code>bufferrows</code> | number of rows to be buffered if the row buffer is activated |
| <code>buffercols</code> | number of columns to be buffered |
| <code>directory</code> | 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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`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^{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

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 *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 coulmnns 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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