Package ‘BufferedMatrix’
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Title A matrix data storage object held in temporary files
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Depends R (&gt;= 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.
License LGPL (&gt;= 2)
URL https://github.com/bmbolstad/BufferedMatrix

createBufferedMatrix.R init.R

LazyLoad yes
biocViews Infrastructure

NeedsCompilation yes

R topics documented:

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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())
is.BufferedMatrix(x)
**BufferedMatrix-class**

**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"):: 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.


```r
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)
```
**BufferedMatrix-class**

**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**

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**createBufferedMatrix**  
createBufferedMatrix

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**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

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