

# Package ‘BufferedMatrix’

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**Version** 1.42.0

**Title** A matrix data storage object held in temporary files

**Author** Ben Bolstad <bmb@bmbolstad.com>

**Maintainer** Ben Bolstad <bmb@bmbolstad.com>

**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.

**License** LGPL (>= 2)

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

**Collate** allGenerics.R BufferedMatrix.R as.BufferedMatrix.R  
createBufferedMatrix.R init.R

**LazyLoad** yes

**biocViews** Infrastructure

**NeedsCompilation** yes

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as.BufferedMatrix	<i>Check or Coerce object to BufferedMatrix</i>
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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)
```

**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.

**Author(s)**

B. M. Bolstad <bmb@bmbolstad.com>

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BufferedMatrix-class    *Class BufferedMatrix*

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**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 Buffered-Matrix 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

**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

**Author(s)**

B. M. Bolstad <bmb@bmbolstad.com>

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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**

<code>rows</code>	Number of rows in the matrix
<code>cols</code>	Initial number of columns in the matrix
<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>prefix</code>	String to be used as start of name for any temporary files
<code>directory</code>	path to directory where temporary files should be stored

### **Author(s)**

B. M. Bolstad <bmb@bmbolstad.com>

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## \*Topic **manip**

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