Package ‘BufferedMatrix’

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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.

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URL https://github.com/bmbolstad/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

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

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

BufferedMatrix-class *Class BufferedMatrix*

Description

This is a class representation of a buffered matrix (of numeric data). In this case data is primarily stored outide 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

Author(s)

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

`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 coulmns 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)

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

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