Package ‘BufferedMatrix’

April 25, 2017

Version 1.40.0
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.
License LGPL (>= 2)
URL https://github.com/bmbolstad/BufferedMatrix
createBufferedMatrix.R init.R
LazyLoad yes
biocViews Infrastructure
NeedsCompilation yes

R topics documented:

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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.

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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 `signature(object = "BufferedMatrix")`: Returns the number of columns in the matrix
- `nrow`: signature `signature(object = "BufferedMatrix")`: Returns the number of rows in the matrix
- `dim`: signature `signature(object = "BufferedMatrix")`: Returns the dimensions of the matrix
- `buffer.dim`: signature `signature(object = "BufferedMatrix")`: Returns the number of columns and the number of rows to be stored in the buffer
- `set.buffer.dim`: signature `signature(object = "BufferedMatrix")`: Set the buffer size or resize it
- `[ ` signature `signature(object = "BufferedMatrix")`: matrix accessor
- `[-`: signature `signature(object = "BufferedMatrix")`: matrix replacer
- `show`: signature `signature(object = "BufferedMatrix")`: prints basic information about the BufferedMatrix out to screen
- `is.RowMode`: signature `signature(object = "BufferedMatrix")`: returns TRUE if the row buffer is active and FALSE otherwise.
 BufferedMatrix-class

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

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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