

Package ‘fastMatMR’

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Title High-Performance Matrix Market File Operations

Version 1.2.8

Description An interface to the 'fast_matrix_market' 'C++' library, this package offers efficient read and write operations for Matrix Market files in R. It supports both sparse and dense matrix formats. Peer-reviewed at 'rOpenSci' (<<https://github.com/ropensci/software-review/issues/606>>).

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Depends R (>= 3.1.0)

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SystemRequirements C++17

Encoding UTF-8

RoxygenNote 7.2.3

LinkingTo cpp11 (>= 0.5.0)

Suggests ggplot2, knitr, Matrix, methods, microbenchmark, rmarkdown, spam, SparseM, testthat (>= 3.0.0)

URL <https://github.com/ropensci/fastMatMR>

BugReports <https://github.com/ropensci/fastMatMR/issues>

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VignetteBuilder knitr

NeedsCompilation yes

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fmm_to_mat	<i>Convert Matrix Market File to Matrix</i>
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Description

This function reads a Matrix Market file and converts it to a matrix in R.

Usage

```
fmm_to_mat(filename)
```

Arguments

filename The name of the input Matrix Market file to be read.

Value

A matrix containing the data read from the Matrix Market file.

Examples

```
# Create
sample_mat <- matrix(c(1, 2, 3, 4), nrow = 2)
temp_file_mat <- tempfile(fileext = ".mtx")
write_fmm(sample_mat, temp_file_mat)
# Read
mat <- fmm_to_mat(temp_file_mat)
```

fmm_to_spam*Convert Matrix Market File to spam Sparse Matrix*

Description

This function reads a Matrix Market file and converts it to a sparse matrix using the spam package.

Usage

```
fmm_to_spam(filename)
```

Arguments

filename The name of the input Matrix Market file to be read.

Value

A spam object containing the data read from the Matrix Market file.

Examples

```
sample_sparse <- Matrix::Matrix(c(1, 0, 0, 2), nrow = 2, sparse = TRUE)
tmp <- tempfile(fileext = ".mtx")
write_fmm(sample_sparse, tmp)
sp <- fmm_to_spam(tmp)
```

fmm_to_SparseM*Convert Matrix Market File to SparseM matrix.csr*

Description

This function reads a Matrix Market file and converts it to a matrix.csr object using the SparseM package.

Usage

```
fmm_to_SparseM(filename)
```

Arguments

filename The name of the input Matrix Market file to be read.

Value

A matrix.csr object containing the data read from the Matrix Market file.

Examples

```
sample_sparse <- Matrix::Matrix(c(1, 0, 0, 2), nrow = 2, sparse = TRUE)
tmp <- tempfile(fileext = ".mtx")
write_fmm(sample_sparse, tmp)
csr <- fmm_to_SparseM(tmp)
```

fmm_to_sparse_Matrix *Convert Matrix Market File to Sparse Matrix*

Description

This function reads a Matrix Market file and converts it to a sparse matrix in R using the Matrix package.

Usage

```
fmm_to_sparse_Matrix(filename)
```

Arguments

filename The name of the input Matrix Market file to be read.

Value

A dgCMatrix object containing the data read from the Matrix Market file.

Examples

```
# Create
sample_sparse_mat <- Matrix::Matrix(c(1, 0, 0, 2), nrow = 2, sparse = TRUE)
temp_file <- tempfile(fileext = ".mtx")
write_fmm(sample_sparse_mat, temp_file)
# Read
sparse_mat <- fmm_to_sparse_Matrix(temp_file)
```

fmm_to_vec *Convert Matrix Market File to Numeric Vector*

Description

This function reads a Matrix Market file and converts it to a numeric vector in R.

Usage

```
fmm_to_vec(filename)
```

Arguments

filename The name of the input Matrix Market file to be read.

Value

A numeric vector containing the data read from the Matrix Market file.

Examples

```
# Create
sample_vec <- c(1, 2, 3)
temp_file_vec <- tempfile(fileext = ".mtx")
write_fmm(sample_vec, temp_file_vec)
# Read
vec <- fmm_to_vec(temp_file_vec)
```

intmat_to_fmm

Convert a Numeric Matrix to Matrix Market Format

Description

This function takes a numeric matrix and converts it into a Matrix Market file.

Arguments

input A numeric matrix to be converted.

filename The name of the output file where the Matrix Market formatted data will be saved.

Value

A boolean indicating success or failure. Writes a MTX file to disk.

Examples

```
intmat <- matrix(c(1L, 2L, 3L, 4L), nrow = 2)
intmat_to_fmm(intmat, tempfile(fileext = ".mtx"))
```

intvec_to_fmm	<i>Convert a numeric integer vector to Matrix Market Format</i>
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Description

This function takes a numeric intvector and converts it into a Matrix Market output file.

Arguments

input	A numeric integer vector to be converted.
filename	The name of the output file where the Matrix Market formatted data will be saved.

Value

A boolean indicating success or failure. Writes a MTX file to disk.

Examples

```
intvec <- c(1L, 2L, 3L)
intvec_to_fmm(intvec, tempfile(fileext = ".mtx"))
```

mat_to_fmm	<i>Convert a Numeric Matrix to Matrix Market Format</i>
------------	---

Description

This function takes a numeric matrix and converts it into a Matrix Market file.

Arguments

input	A numeric matrix to be converted.
filename	The name of the output file where the Matrix Market formatted data will be saved.

Value

A boolean indicating success or failure. Writes a MTX file to disk.

Examples

```
mat <- matrix(c(1, 2, 3, 4), nrow = 2)
mat_to_fmm(mat, tempfile(fileext = ".mtx"))
```

`spam_to_fmm`*Convert a spam Sparse Matrix to Matrix Market Format*

Description

This function takes a spam sparse matrix and converts it into a Matrix Market file.

Usage

```
spam_to_fmm(input, filename)
```

Arguments

<code>input</code>	A spam sparse matrix to be converted.
<code>filename</code>	The name of the output file where the Matrix Market formatted data will be saved.

Value

A boolean indicating success or failure. Writes a MTX file to disk.

Examples

```
sp <- spam::spam(c(1, 0, 0, 2), nrow = 2)
spam_to_fmm(sp, tempfile(fileext = ".mtx"))
```

`SparseM_to_fmm`*Convert a SparseM matrix.csr to Matrix Market Format*

Description

This function takes a SparseM matrix.csr and converts it into a Matrix Market file.

Arguments

<code>input</code>	A matrix.csr object to be converted.
<code>filename</code>	The name of the output file where the Matrix Market formatted data will be saved.

Value

A boolean indicating success or failure. Writes a MTX file to disk.

Examples

```
csr <- SparseM::as.matrix.csr(matrix(c(1, 0, 0, 2), nrow = 2))
SparseM_to_fmm(csr, tempfile(fileext = ".mtx"))
```

`sparse_Matrix_to_fmm` *Convert a Sparse Numeric Matrix to Matrix Market Format*

Description

This function takes a sparse numeric matrix and converts it into a Matrix Market file.

Arguments

<code>input</code>	A sparse numeric matrix to be converted.
<code>filename</code>	The name of the output file where the Matrix Market formatted data will be saved.

Value

A boolean indicating success or failure. Writes a MTX file to disk.

Examples

```
sparse_mat <- Matrix::Matrix(c(1, 0, 0, 2), nrow = 2, sparse = TRUE)
sparse_Matrix_to_fmm(sparse_mat, tempfile(fileext = ".mtx"))
```

`vec_to_fmm` *Convert a Numeric Vector to Matrix Market Format*

Description

This function takes a numeric vector and converts it into a Matrix Market output file.

Arguments

<code>input</code>	A numeric vector to be converted.
<code>filename</code>	The name of the output file where the Matrix Market formatted data will be saved.

Value

A boolean indicating success or failure. Writes a MTX file to disk.

Examples

```
vec <- c(1, 2, 3)
vec_to_fmm(vec, tempfile(fileext = ".mtx"))
```

write_fmm

Convert Various Numeric Types to Matrix Market Format

Description

This function takes different types of numeric inputs—vectors, matrices, and sparse matrices— and converts them into Matrix Market files. The output file is written to disk.

Usage

```
write_fmm(input, filename = "out.mtx")
```

Arguments

input	A numeric object to be converted. This can be a numeric vector, a matrix, or a sparse matrix.
filename	The name of the output file where the Matrix Market formatted data will be saved. It is recommended to use a filename ending with ".mtx" for clarity.

Value

A boolean indicating success or failure. Writes a MTX file to disk.

Examples

```
vec <- c(1, 2, 3)
mat <- matrix(c(1, 2, 3, 4), nrow = 2)
sparse_mat_diag <- Matrix::Matrix(c(1, 0, 0, 2), nrow = 2, sparse = TRUE)
## Diagonal ^-
sparse_mat <- Matrix::Matrix(c(1, 1, 0, 2), nrow = 2, sparse = TRUE)
## And not diagonal -^
write_fmm(vec, tempfile(fileext = ".mtx"))
write_fmm(mat, tempfile(fileext = ".mtx"))
write_fmm(sparse_mat_diag, tempfile(fileext = ".mtx"))
write_fmm(sparse_mat, tempfile(fileext = ".mtx"))
```

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