

LIBMATIO API 1.3.4

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Chapter 1

Library Documentation

1.1 Matlab MAT File I/O Library

Data Structures

- struct [ComplexSplit](#)
Complex data type using split storage.
- struct [mat_t](#)
Matlab MAT File information.
- struct [matvar_t](#)
Matlab variable information.
- struct [sparse_t](#)
sparse data information

Typedefs

- typedef struct [mat_t](#) [mat_t](#)
Matlab MAT File information.
- typedef struct [matvar_t](#) [matvar_t](#)
Matlab variable information.
- typedef struct [sparse_t](#) [sparse_t](#)
sparse data information

Enumerations

- enum { [BY_NAME](#) = 1, [BY_INDEX](#) = 2 }
- enum [mat_acc](#) { [MAT_ACC_RDONLY](#) = 1, [MAT_ACC_RDWR](#) = 2 }
MAT file access types.
- enum [mat_ft](#) { [MAT_FT_MAT5](#) = 1, [MAT_FT_MAT4](#) = 1 << 16 }
MAT file versions.

- enum `matio_classes` {
`MAT_C_CELL` = 1, `MAT_C_STRUCT` = 2, `MAT_C_OBJECT` = 3, `MAT_C_CHAR` = 4,
`MAT_C_SPARSE` = 5, `MAT_C_DOUBLE` = 6, `MAT_C_SINGLE` = 7, `MAT_C_INT8` = 8,
`MAT_C_UINT8` = 9, `MAT_C_INT16` = 10, `MAT_C_UINT16` = 11, `MAT_C_INT32` = 12,
`MAT_C_UINT32` = 13, `MAT_C_INT64` = 14, `MAT_C_UINT64` = 15, `MAT_C_FUNCTION` = 16
}
- Matlab variable classes.*
- enum `matio_compression` { `COMPRESSION_NONE` = 0, `COMPRESSION_ZLIB` = 1 }
- Matlab compression options.*
- enum `matio_flags` { `MAT_F_COMPLEX` = 0x0800, `MAT_F_GLOBAL` = 0x0400, `MAT_F_LOGICAL` = 0x0200, `MAT_F_CLASS_T` = 0x00ff }
- Matlab array flags.*
- enum `matio_types` {
`MAT_T_UNKNOWN` = 0, `MAT_T_INT8` = 1, `MAT_T_UINT8` = 2, `MAT_T_INT16` = 3,
`MAT_T_UINT16` = 4, `MAT_T_INT32` = 5, `MAT_T_UINT32` = 6, `MAT_T_SINGLE` = 7,
`MAT_T_DOUBLE` = 9, `MAT_T_INT64` = 12, `MAT_T_UINT64` = 13, `MAT_T_MATRIX` = 14,
`MAT_T_COMPRESSED` = 15, `MAT_T_UTF8` = 16, `MAT_T_UTF16` = 17, `MAT_T_UTF32` = 18,
`MAT_T_STRING` = 20, `MAT_T_CELL` = 21, `MAT_T_STRUCT` = 22, `MAT_T_ARRAY` = 23,
`MAT_T_FUNCTION` = 24 }
- Matlab data types.*

Functions

- int `Mat_CalcSingleSubscript` (int rank, int *dims, int *subs)
Calculate a single subscript from a set of subscript values.
- int * `Mat_CalcSubscripts` (int rank, int *dims, int index)
Calculate a set of subscript values from a single(linear) subscript.
- int `Mat_Close` (mat_t *mat)
Closes an open Matlab MAT file.
- mat_t * `Mat_Create` (const char *matname, const char *hdr_str)
Creates a new Matlab MAT file.
- mat_t * `Mat_Open` (const char *matname, int mode)
Opens an existing Matlab MAT file.
- int `Mat_Rewind` (mat_t *mat)
Rewinds a Matlab MAT file to the first variable.
- size_t `Mat_SizeOfClass` (int class_type)
Returns the size of a Matlab Class.
- int `Mat_VarAddStructField` (matvar_t *matvar, matvar_t **fields)
Adds a field to a structure.
- matvar_t * `Mat_VarCalloc` (void)
Allocates memory for a new `matvar_t` and initializes all the fields.
- matvar_t * `Mat_VarCreate` (const char *name, int class_type, int data_type, int rank, int *dims, void *data, int opt)
Creates a MAT Variable with the given name and (optionally) data.
- int `Mat_VarDelete` (mat_t *mat, char *name)
Deletes a variable from a file.
- matvar_t * `Mat_VarDuplicate` (const matvar_t *in, int opt)
Duplicates a `matvar_t` structure.

- void `Mat_VarFree` (`matvar_t *matvar`)
Frees all the allocated memory associated with the structure.
- `matvar_t * Mat_VarGetCell` (`matvar_t *matvar`, `int index`)
Returns a pointer to the Cell array at a specific index.
- `matvar_t ** Mat_VarGetCells` (`matvar_t *matvar`, `int *start`, `int *stride`, `int *edge`)
Indexes a cell array.
- `matvar_t ** Mat_VarGetCellsLinear` (`matvar_t *matvar`, `int start`, `int stride`, `int edge`)
Indexes a cell array.
- `int Mat_VarGetNumberOfFields` (`matvar_t *matvar`)
Returns the number of fields in a structure variable.
- `size_t Mat_VarGetSize` (`matvar_t *matvar`)
Calculates the size of a matlab variable in bytes.
- `matvar_t * Mat_VarGetStructField` (`matvar_t *matvar`, `void *name_or_index`, `int opt`, `int index`)
Finds a field of a structure.
- `matvar_t * Mat_VarGetStructs` (`matvar_t *matvar`, `int *start`, `int *stride`, `int *edge`, `int copy_fields`)
Indexes a structure.
- `matvar_t * Mat_VarGetStructsLinear` (`matvar_t *matvar`, `int start`, `int stride`, `int edge`, `int copy_fields`)
Indexes a structure.
- void `Mat_VarPrint` (`matvar_t *matvar`, `int printdata`)
Prints the variable information.
- `matvar_t * Mat_VarRead` (`mat_t *mat`, `char *name`)
Reads the variable with the given name from a MAT file.
- `int Mat_VarReadData` (`mat_t *mat`, `matvar_t *matvar`, `void *data`, `int *start`, `int *stride`, `int *edge`)
Reads MAT variable data from a file.
- `int Mat_VarReadDataAll` (`mat_t *mat`, `matvar_t *matvar`)
Reads all the data for a matlab variable.
- `int Mat_VarReadDataLinear` (`mat_t *mat`, `matvar_t *matvar`, `void *data`, `int start`, `int stride`, `int edge`)
Reads MAT variable data from a file.
- `matvar_t * Mat_VarReadInfo` (`mat_t *mat`, `char *name`)
Reads the information of a variable with the given name from a MAT file.
- `matvar_t * Mat_VarReadNext` (`mat_t *mat`)
Reads the next variable in a MAT file.
- `matvar_t * Mat_VarReadNextInfo` (`mat_t *mat`)
Reads the information of the next variable in a MAT file.
- `int Mat_VarWrite` (`mat_t *mat`, `matvar_t *matvar`, `int compress`)
Writes the given MAT variable to a MAT file.
- `int Mat_VarWriteData` (`mat_t *mat`, `matvar_t *matvar`, `void *data`, `int *start`, `int *stride`, `int *edge`)
Writes the given data to the MAT variable.
- `int Mat_VarWriteInfo` (`mat_t *mat`, `matvar_t *matvar`)
Writes the given MAT variable to a MAT file.

1.1.1 Detailed Description

1.1.2 Typedef Documentation

1.1.2.1 `typedef struct mat_t mat_t`

Contains information about a Matlab MAT file

1.1.2.2 `typedef struct matvar_t matvar_t`

Contains information about a Matlab variable

1.1.2.3 `typedef struct sparse_t sparse_t`

Contains information and data for a sparse matrix

1.1.3 Enumeration Type Documentation

1.1.3.1 anonymous enum

matio lookup type

Enumerator:

BY_NAME Lookup by name

BY_INDEX Lookup by index

1.1.3.2 `enum mat_acc`

MAT file access types

Enumerator:

MAT_ACC_RDONLY Read only file access.

MAT_ACC_RDWR Read/Write file access.

1.1.3.3 `enum mat_ft`

MAT file versions

Enumerator:

MAT_FT_MAT5 Matlab level-5 file.

MAT_FT_MAT4 Version 4 file.

1.1.3.4 enum matio_classes

Matlab variable classes

Enumerator:

MAT_C_CELL Matlab cell array class.
MAT_C_STRUCT Matlab structure class.
MAT_C_OBJECT Matlab object class.
MAT_C_CHAR Matlab character array class.
MAT_C_SPARSE Matlab sparse array class.
MAT_C_DOUBLE Matlab double-precision class.
MAT_C_SINGLE Matlab single-precision class.
MAT_C_INT8 Matlab signed 8-bit integer class.
MAT_C_UINT8 Matlab unsigned 8-bit integer class.
MAT_C_INT16 Matlab signed 16-bit integer class.
MAT_C_UINT16 Matlab unsigned 16-bit integer class.
MAT_C_INT32 Matlab signed 32-bit integer class.
MAT_C_UINT32 Matlab unsigned 32-bit integer class.
MAT_C_INT64 Matlab unsigned 32-bit integer class.
MAT_C_UINT64 Matlab unsigned 32-bit integer class.
MAT_C_FUNCTION Matlab unsigned 32-bit integer class.

1.1.3.5 enum matio_compression

Matlab compression options

Enumerator:

COMPRESSION_NONE No compression.
COMPRESSION_ZLIB zlib compression

1.1.3.6 enum matio_flags

Matlab array flags

Enumerator:

MAT_F_COMPLEX Complex bit flag.
MAT_F_GLOBAL Global bit flag.
MAT_F_LOGICAL Logical bit flag.
MAT_F_CLASS_T Class-Type bits flag.

1.1.3.7 enum matio_types

Matlab data types

Enumerator:

MAT_T_UNKNOWN UNKNOWN data type.
MAT_T_INT8 8-bit signed integer data type
MAT_T_UINT8 8-bit unsigned integer data type
MAT_T_INT16 16-bit signed integer data type
MAT_T_UINT16 16-bit unsigned integer data type
MAT_T_INT32 32-bit signed integer data type
MAT_T_UINT32 32-bit unsigned integer data type
MAT_T_SINGLE IEEE 754 single precision data type.
MAT_T_DOUBLE IEEE 754 double precision data type.
MAT_T_INT64 64-bit signed integer data type
MAT_T_UINT64 64-bit unsigned integer data type
MAT_T_MATRIX matrix data type
MAT_T_COMPRESSED compressed data type
MAT_T_UTF8 8-bit unicode text data type
MAT_T_UTF16 16-bit unicode text data type
MAT_T_UTF32 32-bit unicode text data type
MAT_T_STRING String data type.
MAT_T_CELL Cell array data type.
MAT_T_STRUCT Structure data type.
MAT_T_ARRAY Array data type.
MAT_T_FUNCTION Function data type.

1.1.4 Function Documentation

1.1.4.1 int Mat_CalcSingleSubscript (int *rank*, int * *dims*, int * *subs*)

Calculates a single linear subscript (0-relative) given a 1-relative subscript for each dimension. The calculation uses the formula below where index is the linear index, s is an array of length RANK where each element is the subscript for the corresponding dimension, D is an array whose elements are the dimensions of the variable.

$$index = \sum_{k=0}^{RANK-1} [(s_k - 1) \prod_{l=0}^k D_l]$$

Parameters

<i>rank</i>	Rank of the variable
<i>dims</i>	dimensions of the variable
<i>subs</i>	Dimension subscripts

Returns

Single (linear) subscript

1.1.4.2 int* Mat_CalcSubscripts (int *rank*, int * *dims*, int *index*)

Calculates 1-relative subscripts for each dimension given a 0-relative linear index. Subscripts are calculated as follows where *s* is the array of dimension subscripts, *D* is the array of dimensions, and *index* is the linear index.

$$s_k = \lfloor \frac{1}{L} \prod_{l=0}^k D_l \rfloor + 1$$

$$L = index - \sum_{l=k}^{RANK-1} s_l \prod_{m=0}^k D_m$$

Parameters

<i>rank</i>	Rank of the variable
<i>dims</i>	dimensions of the variable
<i>index</i>	linear index

Returns

Array of dimension subscripts

1.1.4.3 int Mat_Close (mat_t * *mat*)

Closes the given Matlab MAT file and frees any memory with it.

Parameters

<i>mat</i>	Pointer to the MAT file
------------	-------------------------

Return values

0	
---	--

References *mat_t::filename*, *mat_t::fp*, *mat_t::header*, and *mat_t::subsys_offset*.

Referenced by *Mat_Open()*, and *Mat_VarDelete()*.

1.1.4.4 mat_t* Mat_Create (const char * *matname*, const char * *hdr_str*)

Tries to create a new Matlab MAT file with the given name and optional header string. If no header string is given, the default string is used containing the software, version, and date in it. If a header string is given, at most the first 116 characters is written to the file. The given header string need not be the full 116 characters, but MUST be NULL terminated.

Parameters

<i>matname</i>	Name of MAT file to create
<i>hdr_str</i>	Optional header string, NULL to use default

Returns

A pointer to the MAT file or NULL if it failed. This is not a simple FILE * and should not be used as one.

References `mat_t::bof`, `mat_t::byteswap`, `mat_t::filename`, `mat_t::fp`, `mat_t::header`, `MAT_ACC_RDWR`, `mat_t::mode`, `mat_t::subsys_offset`, and `mat_t::version`.

Referenced by `Mat_Open()`, and `Mat_VarDelete()`.

1.1.4.5 `mat_t*` `Mat_Open (const char * matname, int mode)`

Tries to open a Matlab MAT file with the given name

Parameters

<i>matname</i>	Name of MAT file to open
<i>mode</i>	File access mode (<code>MAT_ACC_RDONLY</code> , <code>MAT_ACC_RDWR</code> , etc).

Returns

A pointer to the MAT file or NULL if it failed. This is not a simple FILE * and should not be used as one.

References `mat_t::bof`, `mat_t::byteswap`, `mat_t::filename`, `mat_t::fp`, `mat_t::header`, `MAT_ACC_RDONLY`, `MAT_ACC_RDWR`, `Mat_Close()`, `Mat_Create()`, `MAT_FT_MAT4`, `Mat_int16Swap()`, `mat_t::mode`, `mat_t::subsys_offset`, and `mat_t::version`.

Referenced by `Mat_VarDelete()`.

1.1.4.6 `int` `Mat_Rewind (mat_t * mat)`

Rewinds a Matlab MAT file to the first variable

Parameters

<i>mat</i>	Pointer to the MAT file
------------	-------------------------

Return values

<code>0</code>	on success
----------------	------------

References `mat_t::fp`, `MAT_FT_MAT4`, and `mat_t::version`.

1.1.4.7 `size_t` `Mat_SizeOfClass (int class_type)`

Returns the size (in bytes) of the matlab class `class_type`

Parameters

<i>class_type</i>	Matlab class type (MAT_C_*)
-------------------	-----------------------------

Returns

Size of the class

References MAT_C_CHAR, MAT_C_DOUBLE, MAT_C_INT16, MAT_C_INT32, MAT_C_INT64, MAT_C_INT8, MAT_C_SINGLE, MAT_C_UINT16, MAT_C_UINT32, MAT_C_UINT64, and MAT_C_UINT8.

Referenced by Mat_VarGetSize().

1.1.4.8 int Mat_VarAddStructField (matvar_t * *matvar*, matvar_t ** *fields*)

Adds the given field to the structure. *fields* should be an array of [matvar_t](#) pointers of the same size as the structure (i.e. 1 field per structure element).

Parameters

<i>matvar</i>	Pointer to the Structure MAT variable
<i>fields</i>	Array of fields to be added

Return values

0	on success
---	------------

References *matvar_t::data*, *matvar_t::dims*, *matvar_t::nbytes*, and *matvar_t::rank*.

1.1.4.9 matvar_t* Mat_VarCalloc (void)**Returns**

A newly allocated [matvar_t](#)

References *matvar_t::class_type*, *matvar_t::compression*, *matvar_t::data*, *matvar_t::data_size*, *matvar_t::data_type*, *matvar_t::datapos*, *matvar_t::dims*, *matvar_t::fp*, *matvar_t::fpos*, *matvar_t::isComplex*, *matvar_t::isGlobal*, *matvar_t::isLogical*, *matvar_t::mem_conserve*, *matvar_t::name*, *matvar_t::nbytes*, *matvar_t::rank*, and *matvar_t::z*.

Referenced by Mat_VarCreate(), Mat_VarReadNextInfo5(), and ReadNextCell().

1.1.4.10 matvar_t* Mat_VarCreate (const char * *name*, int *class_type*, int *data_type*, int *rank*, int * *dims*, void * *data*, int *opt*)

Creates a MAT variable that can be written to a Matlab MAT file with the given name, data type, dimensions and data. Rank should always be 2 or more. i.e. Scalar values would have rank=2 and *dims*[2] = {1,1}. Data type is one of the MAT_T types. MAT adds MAT_T_STRUCT and MAT_T_CELL to create Structures and Cell Arrays respectively. For MAT_T_STRUCT, data should be a NULL terminated array of [matvar_t](#) * variables (i.e. for a 3x2 structure with 10 fields, there should be 61 [matvar_t](#) * variables where the last one is NULL). For cell arrays, the NULL termination isn't necessary. So to create a cell array of size 3x2, data would be the address of an array of 6 [matvar_t](#) * variables.

EXAMPLE: To create a struct of size 3x2 with 3 fields:

```
int rank=2, dims[2] = {3,2}, nfields = 3;
matvar_t **vars;

vars = malloc((3*2*nfields+1)*sizeof(matvar_t *));
vars[0] = Mat_VarCreate(...);
:
vars[3*2*nfields-1] = Mat_VarCreate(...);
vars[3*2*nfields] = NULL;
```

EXAMPLE: To create a cell array of size 3x2:

```
int rank=2, dims[2] = {3,2};
matvar_t **vars;

vars = malloc(3*2*sizeof(matvar_t *));
vars[0] = Mat_VarCreate(...);
:
vars[5] = Mat_VarCreate(...);
```

Parameters

<i>name</i>	Name of the variable to create
<i>class_type</i>	class type of the variable in Matlab(one of the mx Classes)
<i>data_type</i>	data type of the variable (one of the MAT_T_ Types)
<i>rank</i>	Rank of the variable
<i>dims</i>	array of dimensions of the variable of size rank
<i>data</i>	pointer to the data
<i>opt</i>	0, or bitwise or of the following options: <ul style="list-style-type: none"> MEM_CONSERVE to just use the pointer to the data and not copy the data itself. Note that the pointer should not be freed until you are done with the mat variable. The Mat_VarFree function will NOT free data that was created with MEM_CONSERVE, so free it yourself. MAT_F_COMPLEX to specify that the data is complex. The data variable should be a contiguous piece of memory with the real part written first and the imaginary second MAT_F_GLOBAL to assign the variable as a global variable MAT_F_LOGICAL to specify that it is a logical variable

Returns

A MAT variable that can be written to a file or otherwise used

References `matvar_t::class_type`, `matvar_t::compression`, `COMPRESSION_NONE`, `matvar_t::data`, `matvar_t::data_size`, `matvar_t::data_type`, `matvar_t::dims`, `ComplexSplit::Im`, `matvar_t::isComplex`, `matvar_t::isGlobal`, `matvar_t::isLogical`, `MAT_C_CHAR`, `MAT_C_SPARSE`, `MAT_F_COMPLEX`, `MAT_F_GLOBAL`, `MAT_F_LOGICAL`, `MAT_T_CELL`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT64`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_STRUCT`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT64`, `MAT_T_UINT8`, `MAT_T_UTF16`, `MAT_T_UTF32`, `MAT_T_UTF8`, `Mat_VarCalloc()`, `Mat_VarFree()`, `MEM_CONSERVE`, `matvar_t::mem_conserve`, `matvar_t::name`, `matvar_t::nbytes`, `matvar_t::rank`, and `ComplexSplit::Re`.

1.1.4.11 int Mat_VarDelete (mat_t * mat, char * name)

Parameters

<i>mat</i>	Pointer to the mat_t file structure
<i>name</i>	Name of the variable to delete

Returns

0 on success

References [mat_t::filename](#), [mat_t::fp](#), [mat_t::header](#), [Mat_Close\(\)](#), [Mat_Create\(\)](#), [Mat_Open\(\)](#), [Mat_VarFree\(\)](#), [Mat_VarReadNext\(\)](#), [Mat_VarWrite\(\)](#), [mat_t::mode](#), and [matvar_t::name](#).

1.1.4.12 [matvar_t*](#) Mat_VarDuplicate ([const matvar_t*](#) *in*, int *opt*)

Provides a clean function for duplicating a [matvar_t](#) structure.

Parameters

<i>in</i>	pointer to the matvar_t structure to be duplicated
<i>opt</i>	0 does a shallow duplicate and only assigns the data pointer to the duplicated array. 1 will do a deep duplicate and actually duplicate the contents of the data. Warning: If you do a shallow copy and free both structures, the data will be freed twice and memory will be corrupted. This may be fixed in a later release.

Returns

Pointer to the duplicated [matvar_t](#) structure.

References [matvar_t::class_type](#), [matvar_t::compression](#), [matvar_t::data](#), [matvar_t::data_size](#), [matvar_t::data_type](#), [matvar_t::datapos](#), [matvar_t::dims](#), [matvar_t::fpos](#), [ComplexSplit::Im](#), [matvar_t::isComplex](#), [matvar_t::isGlobal](#), [matvar_t::isLogical](#), [MAT_C_CELL](#), [MAT_C_STRUCT](#), [Mat_VarDuplicate\(\)](#), [matvar_t::mem_conserve](#), [matvar_t::name](#), [matvar_t::nbytes](#), [matvar_t::rank](#), [ComplexSplit::Re](#), and [matvar_t::z](#).

Referenced by [Mat_VarDuplicate\(\)](#), [Mat_VarGetStructs\(\)](#), and [Mat_VarGetStructsLinear\(\)](#).

1.1.4.13 void Mat_VarFree ([matvar_t*](#) *matvar*)

Frees memory used by a MAT variable. Frees the data associated with a MAT variable if it's non-NULL and MEM_CONSERVE was not used.

Parameters

<i>matvar</i>	Pointer to the matvar_t structure
---------------	---

References [matvar_t::class_type](#), [matvar_t::compression](#), [COMPRESSION_ZLIB](#), [matvar_t::data](#), [sparse_t::data](#), [matvar_t::data_size](#), [matvar_t::dims](#), [ComplexSplit::Im](#), [sparse_t::ir](#), [matvar_t::isComplex](#), [sparse_t::jc](#), [MAT_C_CELL](#), [MAT_C_SPARSE](#), [MAT_C_STRUCT](#), [Mat_VarFree\(\)](#), [matvar_t::mem_conserve](#), [matvar_t::name](#), [matvar_t::nbytes](#), [ComplexSplit::Re](#), and [matvar_t::z](#).

Referenced by [Mat_VarCreate\(\)](#), [Mat_VarDelete\(\)](#), [Mat_VarFree\(\)](#), [Mat_VarGetStructs\(\)](#), [Mat_VarReadInfo\(\)](#), [Mat_VarReadNextInfo5\(\)](#), [ReadNextCell\(\)](#), and [ReadNextStructField\(\)](#).

1.1.4.14 `matvar_t* Mat_VarGetCell (matvar_t * matvar, int index)`

Returns a pointer to the Cell Array Field at the given 1-relative index. MAT file must be a version 5 matlab file.

Parameters

<i>matvar</i>	Pointer to the Cell Array MAT variable
<i>index</i>	linear index of cell to return

Returns

Pointer to the Cell Array Field on success, NULL on error

References `matvar_t::data`, `matvar_t::dims`, and `matvar_t::rank`.

1.1.4.15 `matvar_t** Mat_VarGetCells (matvar_t * matvar, int * start, int * stride, int * edge)`

Finds cells of a cell array given a start, stride, and edge for each. dimension. The cells are placed in a pointer array. The cells should not be freed, but the array of pointers should be. If copies are needed, use `Mat_VarDuplicate` on each cell. MAT File version must be 5.

Parameters

<i>matvar</i>	Cell Array matlab variable
<i>start</i>	vector of length rank with 0-relative starting coordinates for each diemnsion.
<i>stride</i>	vector of length rank with strides for each diemnsion.
<i>edge</i>	vector of length rank with the number of elements to read in each diemnsion.

Returns

an array of pointers to the cells

References `matvar_t::data`, `matvar_t::dims`, and `matvar_t::rank`.

1.1.4.16 `matvar_t** Mat_VarGetCellsLinear (matvar_t * matvar, int start, int stride, int edge)`

Finds cells of a cell array given a linear indexed start, stride, and edge. The cells are placed in a pointer array. The cells themselves should not be freed as they are part of the original cell array, but the pointer array should be. If copies are needed, use `Mat_VarDuplicate` on each of the cells. MAT file version must be 5.

Parameters

<i>matvar</i>	Cell Array matlab variable
<i>start</i>	starting index
<i>stride</i>	stride
<i>edge</i>	Number of cells to get

Returns

an array of pointers to the cells

References `matvar_t::data`, and `matvar_t::rank`.

1.1.4.17 int Mat_VarGetNumberOfFields (matvar_t * *matvar*)

Returns the number of fields in the given structure. MAT file version must be 5.

Parameters

<i>matvar</i>	Structure matlab variable
---------------	---------------------------

Returns

Number of fields, or a negative number on error

References `matvar_t::class_type`, `matvar_t::data_size`, `matvar_t::dims`, `MAT_C_STRUCT`, `matvar_t::nbytes`, and `matvar_t::rank`.

1.1.4.18 size_t Mat_VarGetSize (matvar_t * *matvar*)**Parameters**

<i>matvar</i>	matlab variable
---------------	-----------------

Returns

size of the variable in bytes

References `matvar_t::class_type`, `matvar_t::data`, `matvar_t::data_size`, `matvar_t::dims`, `MAT_C_CELL`, `MAT_C_STRUCT`, `Mat_SizeOfClass()`, `Mat_VarGetSize()`, `matvar_t::nbytes`, and `matvar_t::rank`.

Referenced by `Mat_VarGetSize()`.

1.1.4.19 matvar_t* Mat_VarGetStructField (matvar_t * *matvar*, void * *name_or_index*, int *opt*, int *index*)

Returns a pointer to the structure field at the given 0-relative index. MAT file version must be 5.

Parameters

<i>matvar</i>	Pointer to the Structure MAT variable
<i>name_or_index</i>	Name of the field, or the 1-relative index of the field. If the index is used, it should be the address of an integer variable whose value is the index number.
<i>opt</i>	BY_NAME if the <i>name_or_index</i> is the name or BY_INDEX if the index was passed.
<i>index</i>	linear index of the structure to find the field of

Returns

Pointer to the Structure Field on success, NULL on error

References BY_INDEX, BY_NAME, `matvar_t::data`, `matvar_t::dims`, `matvar_t::name`, `matvar_t::nbytes`, and `matvar_t::rank`.

1.1.4.20 `matvar_t* Mat_VarGetStructs (matvar_t * matvar, int * start, int * stride, int * edge, int copy_fields)`

Finds structures of a structure array given a start, stride, and edge for each dimension. The structures are placed in a new structure array. If `copy_fields` is non-zero, the indexed structures are copied and should be freed, but if `copy_fields` is zero, the indexed structures are pointers to the original, but should still be freed since the `mem_conserve` flag is set so that the structures are not freed. MAT File version must be 5.

Parameters

<i>matvar</i>	Structure matlab variable
<i>start</i>	vector of length rank with 0-relative starting coordinates for each dimension.
<i>stride</i>	vector of length rank with strides for each dimension.
<i>edge</i>	vector of length rank with the number of elements to read in each dimension.
<i>copy_fields</i>	1 to copy the fields, 0 to just set pointers to them. If 0 is used, the fields should not be freed themselves.

Returns

A new structure with fields indexed from `matvar`.

References `matvar_t::class_type`, `matvar_t::data`, `matvar_t::data_size`, `matvar_t::dims`, `MAT_C_STRUCT`, `Mat_VarDuplicate()`, `Mat_VarFree()`, `matvar_t::mem_conserve`, `matvar_t::nbytes`, and `matvar_t::rank`.

1.1.4.21 `matvar_t* Mat_VarGetStructsLinear (matvar_t * matvar, int start, int stride, int edge, int copy_fields)`

Finds structures of a structure array given a single (linear) start, stride, and edge. The structures are placed in a new structure array. If `copy_fields` is non-zero, the indexed structures are copied and should be freed, but if `copy_fields` is zero, the indexed structures are pointers to the original, but should still be freed since the `mem_conserve` flag is set so that the structures are not freed. MAT File version must be 5.

Parameters

<i>matvar</i>	Structure matlab variable
<i>start</i>	starting index
<i>stride</i>	stride
<i>edge</i>	Number of structures to get
<i>copy_fields</i>	1 to copy the fields, 0 to just set pointers to them. If 0 is used, the fields should not be freed themselves.

Returns

A new structure with fields indexed from `matvar`

References `matvar_t::data`, `matvar_t::data_size`, `matvar_t::dims`, `Mat_VarDuplicate()`, `matvar_t::mem_conserve`, `matvar_t::nbytes`, and `matvar_t::rank`.

1.1.4.22 void Mat_VarPrint (matvar_t * matvar, int printdata)

Prints to stdout the values of the `matvar_t` structure

Parameters

<i>matvar</i>	Pointer to the <code>matvar_t</code> structure
<i>printdata</i>	set to 1 if the Variables data should be printed, else 0

References `matvar_t::fp`, `MAT_FT_MAT4`, `Mat_VarPrint5()`, and `mat_t::version`.

Referenced by `Mat_VarPrint5()`.

1.1.4.23 matvar_t* Mat_VarRead (mat_t * mat, char * name)

Reads the next variable in the Matlab MAT file

Parameters

<i>mat</i>	Pointer to the MAT file
<i>name</i>	Name of the variable to read

Returns

Pointer to the `matvar_t` structure containing the MAT variable information

References `mat_t::fp`, and `Mat_VarReadInfo()`.

1.1.4.24 int Mat_VarReadData (mat_t * mat, matvar_t * matvar, void * data, int * start, int * stride, int * edge)

Reads data from a MAT variable. The variable must have been read by `Mat_VarReadInfo`.

Parameters

<i>mat</i>	MAT file to read data from
<i>matvar</i>	MAT variable information
<i>data</i>	pointer to store data in (must be pre-allocated)
<i>start</i>	array of starting indeces
<i>stride</i>	stride of data
<i>edge</i>	array specifying the number to read in each direction

Return values

0	on success
---	------------

References MAT_FT_MAT4, ReadData5(), and mat_t::version.

1.1.4.25 int Mat_VarReadDataAll (mat_t * *mat*, matvar_t * *matvar*)

Allocates memory for an reads the data for a given matlab variable.

Parameters

<i>mat</i>	Matlab MAT file structure pointer
<i>matvar</i>	Variable whose data is to be read

Returns

non-zero on error

1.1.4.26 int Mat_VarReadDataLinear (mat_t * *mat*, matvar_t * *matvar*, void * *data*, int *start*, int *stride*, int *edge*)

Reads data from a MAT variable using a linear indexingmode. The variable must have been read by Mat_VarReadInfo.

Parameters

<i>mat</i>	MAT file to read data from
<i>matvar</i>	MAT variable information
<i>data</i>	pointer to store data in (must be pre-allocated)
<i>start</i>	starting index
<i>stride</i>	stride of data
<i>edge</i>	number of elements to read

Return values

0	on success
---	------------

References mat_t::byteswap, matvar_t::class_type, matvar_t::compression, COMPRESSION_NONE, COMPRESSION_ZLIB, matvar_t::data_size, matvar_t::data_type, matvar_t::datapos, matvar_t::dims, mat_t::fp, InflateDataType(), InflateSkip(), InflateSkipData(), MAT_C_DOUBLE, MAT_C_INT16, MAT_C_INT32, MAT_C_INT64, MAT_C_INT8, MAT_C_SINGLE, MAT_C_UINT16, MAT_C_UINT32, MAT_C_UINT64, MAT_C_UINT8, MAT_FT_MAT4, Mat_int32Swap(), MAT_T_DOUBLE, MAT_T_INT16, MAT_T_INT32, MAT_T_INT64, MAT_T_INT8, MAT_T_SINGLE, MAT_T_UINT16, MAT_T_UINT32, MAT_T_UINT64, MAT_T_UINT8, matvar_t::rank, ReadCompressedDoubleData(), ReadCompressedInt16Data(), ReadCompressedInt32Data(), ReadCompressedInt64Data(), ReadCompressedInt8Data(), ReadCompressedSingleData(), ReadDoubleData(), ReadInt16Data(), ReadInt32Data(), ReadInt64Data(), ReadInt8Data(), ReadSingleData(), mat_t::version, and matvar_t::z.

1.1.4.27 matvar_t* Mat_VarReadInfo (mat_t * *mat*, char * *name*)

Reads the named variable (or the next variable if name is NULL) information (class,flags-complex/global/logical,rank,dimension name) from the Matlab MAT file

Parameters

<i>mat</i>	Pointer to the MAT file
<i>name</i>	Name of the variable to read

Returns

Pointer to the [matvar_t](#) structure containing the MAT variable information

References `mat_t::bof`, `mat_t::byteswap`, `mat_t::fp`, `Mat_int32Swap()`, `Mat_VarFree()`, `Mat_VarReadNextInfo()`, and `matvar_t::name`.

Referenced by `Mat_VarRead()`.

1.1.4.28 `matvar_t* Mat_VarReadNext (mat_t * mat)`

Reads the next variable in the Matlab MAT file

Parameters

<i>mat</i>	Pointer to the MAT file
------------	-------------------------

Returns

Pointer to the [matvar_t](#) structure containing the MAT variable information

References `mat_t::fp`, and `Mat_VarReadNextInfo()`.

Referenced by `Mat_VarDelete()`.

1.1.4.29 `matvar_t* Mat_VarReadNextInfo (mat_t * mat)`

Reads the next variable's information (class, flags-complex/global/logical, rank, dimensions, name, etc) from the Matlab MAT file. After reading, the MAT file is positioned past the current variable.

Parameters

<i>mat</i>	Pointer to the MAT file
------------	-------------------------

Returns

Pointer to the [matvar_t](#) structure containing the MAT variable information

References `Mat_VarReadNextInfo5()`, and `mat_t::version`.

Referenced by `Mat_VarReadInfo()`, `Mat_VarReadNext()`, and `ReadNextFunctionHandle()`.

1.1.4.30 `int Mat_VarWrite (mat_t * mat, matvar_t * matvar, int compress)`

Writes the MAT variable information stored in `matvar` to the given MAT file. The variable will be written to the end of the file.

Parameters

<i>mat</i>	MAT file to write to
<i>matvar</i>	MAT variable information to write
<i>compress</i>	Whether or not to compress the data (Only valid for version 5 MAT files and variables with numeric data)

Return values

0	on success
---	------------

References MAT_FT_MAT4, mat_t::version, and Write5().

Referenced by Mat_VarDelete().

1.1.4.31 `int Mat_VarWriteData (mat_t * mat, matvar_t * matvar, void * data, int * start, int * stride, int * edge)`

Writes data to a MAT variable. The variable must have previously been written with Mat_VarWriteInfo.

Parameters

<i>mat</i>	MAT file to write to
<i>matvar</i>	MAT variable information to write
<i>data</i>	pointer to the data to write
<i>start</i>	array of starting indeces
<i>stride</i>	stride of data
<i>edge</i>	array specifying the number to read in each direction

Return values

0	on success
---	------------

References matvar_t::class_type, matvar_t::compression, COMPRESSION_NONE, COMPRESSION_ZLIB, matvar_t::data_type, matvar_t::datapos, matvar_t::dims, mat_t::fp, MAT_C_CHAR, MAT_C_DOUBLE, MAT_C_INT16, MAT_C_INT32, MAT_C_INT64, MAT_C_INT8, MAT_C_SINGLE, MAT_C_UINT16, MAT_C_UINT32, MAT_C_UINT64, MAT_C_UINT8, matvar_t::rank, WriteCharDataSlab2(), WriteData(), WriteDataSlab2(), and matvar_t::z.

1.1.4.32 `int Mat_VarWriteInfo (mat_t * mat, matvar_t * matvar)`

Writes the MAT variable information stored in matvar to the given MAT file. The variable will be written to the end of the file.

Parameters

<i>mat</i>	MAT file to write to
<i>matvar</i>	MAT variable information to write

Return values

0	on success
---	------------

References `mat_t::fp`, `MAT_FT_MAT4`, `mat_t::version`, and `WriteInfo5()`.

1.2 Internal Functions

Macros

- `#define swap(a, b) a^=b;b^=a;a^=b`
swap the bytes a and b

Functions

- `int InflateArrayFlags (mat_t *mat, matvar_t *matvar, void *buf)`
Inflates the Array Flags Tag and the Array Flags data.
- `int InflateData (mat_t *mat, z_stream *z, void *buf, int nBytes)`
Inflates the data.
- `int InflateDataTag (mat_t *mat, matvar_t *matvar, void *buf)`
Inflates the data's tag.
- `int InflateDataType (mat_t *mat, z_stream *z, void *buf)`
Inflates the data's type.
- `int InflateDimensions (mat_t *mat, matvar_t *matvar, void *buf)`
Inflates the dimensions tag and the dimensions data.
- `int InflateFieldNameLength (mat_t *mat, matvar_t *matvar, void *buf)`
Inflates the structure's fieldname length.
- `int InflateFieldNames (mat_t *mat, matvar_t *matvar, void *buf, int nfields, int fieldname_length, int padding)`
Inflates the structure's fieldnames.
- `int InflateFieldNamesTag (mat_t *mat, matvar_t *matvar, void *buf)`
Inflates the structure's fieldname tag.
- `int InflateSkip (mat_t *mat, z_stream *z, int nbytes)`
Inflate the data until nbytes of uncompressed data has been inflated.
- `int InflateSkip2 (mat_t *mat, matvar_t *matvar, int nbytes)`
Inflate the data until nbytes of compressed data has been inflated.
- `int InflateSkipData (mat_t *mat, z_stream *z, int data_type, int len)`
Inflate the data until len elements of compressed data with data type data_type has been inflated.
- `int InflateVarName (mat_t *mat, matvar_t *matvar, void *buf, int N)`
Inflates the variable name.
- `int InflateVarNameTag (mat_t *mat, matvar_t *matvar, void *buf)`
Inflates the variable name tag.
- `int InflateVarTag (mat_t *mat, matvar_t *matvar, void *buf)`
Inflates the variable's tag.
- `double Mat_doubleSwap (double *a)`
swap the bytes of a 4 or 8 byte double-precision float
- `float Mat_floatSwap (float *a)`
swap the bytes of a 4 byte single-precision float
- `mat_int16_t Mat_int16Swap (mat_int16_t *a)`
swap the bytes of a 16-bit signed integer
- `mat_int32_t Mat_int32Swap (mat_int32_t *a)`
swap the bytes of a 32-bit signed integer
- `mat_int64_t Mat_int64Swap (mat_int64_t *a)`

- swap the bytes of a 64-bit signed integer*

 - `mat_uint16_t Mat_uint16Swap (mat_uint16_t *a)`
- swap the bytes of a 16-bit unsigned integer*

 - `mat_uint32_t Mat_uint32Swap (mat_uint32_t *a)`
- swap the bytes of a 32-bit unsigned integer*

 - `mat_uint64_t Mat_uint64Swap (mat_uint64_t *a)`
- swap the bytes of a 64-bit unsigned integer*

 - `void Mat_VarPrint5 (matvar_t *matvar, int printdata)`

Prints the mat variable.
- `matvar_t * Mat_VarReadNextInfo5 (mat_t *mat)`

Reads the header information for the next MAT variable.
- `void Read5 (mat_t *mat, matvar_t *matvar)`

Reads the data of a version 5 MAT variable.
- `int ReadCompressedCharData (mat_t *mat, z_stream *z, char *data, int data_type, int len)`

Reads data of type `data_type` into a char type.
- `int ReadCompressedDataSlab2 (mat_t *mat, z_stream *z, void *data, int class_type, int data_type, int *dims, int *start, int *stride, int *edge)`

Reads data of type `data_type` by user-defined dimensions for 2-D data.
- `int ReadCompressedDataSlabN (mat_t *mat, z_stream *z, void *data, int class_type, int data_type, int rank, int *dims, int *start, int *stride, int *edge)`

Reads data of type `data_type` by user-defined dimensions.
- `int ReadCompressedDoubleData (mat_t *mat, z_stream *z, double *data, int data_type, int len)`

Reads data of type `data_type` into a double type.
- `int ReadCompressedInt16Data (mat_t *mat, z_stream *z, mat_int16_t *data, int data_type, int len)`

Reads data of type `data_type` into a signed 16-bit integer type.
- `int ReadCompressedInt32Data (mat_t *mat, z_stream *z, mat_int32_t *data, int data_type, int len)`

Reads data of type `data_type` into a signed 32-bit integer type.
- `int ReadCompressedInt64Data (mat_t *mat, z_stream *z, mat_int64_t *data, int data_type, int len)`

Reads data of type `data_type` into a signed 64-bit integer type.
- `int ReadCompressedInt8Data (mat_t *mat, z_stream *z, mat_int8_t *data, int data_type, int len)`

Reads data of type `data_type` into a signed 8-bit integer type.
- `int ReadCompressedSingleData (mat_t *mat, z_stream *z, float *data, int data_type, int len)`

Reads data of type `data_type` into a float type.
- `int ReadCompressedUInt16Data (mat_t *mat, z_stream *z, mat_uint16_t *data, int data_type, int len)`

Reads data of type `data_type` into an unsigned 16-bit integer type.
- `int ReadCompressedUInt32Data (mat_t *mat, z_stream *z, mat_uint32_t *data, int data_type, int len)`

Reads data of type `data_type` into an unsigned 32-bit integer type.
- `int ReadCompressedUInt64Data (mat_t *mat, z_stream *z, mat_uint64_t *data, int data_type, int len)`

Reads data of type `data_type` into an unsigned 64-bit integer type.
- `int ReadCompressedUInt8Data (mat_t *mat, z_stream *z, mat_uint8_t *data, int data_type, int len)`

Reads data of type `data_type` into an unsigned 8-bit integer type.
- `int ReadData5 (mat_t *mat, matvar_t *matvar, void *data, int *start, int *stride, int *edge)`

Reads a slab of data from the mat variable `matvar`.
- `int ReadDataSlab2 (mat_t *mat, void *data, int class_type, int data_type, int *dims, int *start, int *stride, int *edge)`

- Reads data of type `data_type` by user-defined dimensions for 2-D data.*
- int [ReadDataSlabN](#) ([mat_t](#) *mat, void *data, int class_type, int data_type, int rank, int *dims, int *start, int *stride, int *edge)
- Reads data of type `data_type` by user-defined dimensions.*
- int [ReadDoubleData](#) ([mat_t](#) *mat, double *data, int data_type, int len)
- Reads data of type `data_type` into a double type.*
- int [ReadInt16Data](#) ([mat_t](#) *mat, [mat_int16_t](#) *data, int data_type, int len)
- Reads data of type `data_type` into a signed 16-bit integer type.*
- int [ReadInt32Data](#) ([mat_t](#) *mat, [mat_int32_t](#) *data, int data_type, int len)
- Reads data of type `data_type` into a signed 32-bit integer type.*
- int [ReadInt64Data](#) ([mat_t](#) *mat, [mat_int64_t](#) *data, int data_type, int len)
- Reads data of type `data_type` into a signed 64-bit integer type.*
- int [ReadInt8Data](#) ([mat_t](#) *mat, [mat_int8_t](#) *data, int data_type, int len)
- Reads data of type `data_type` into a signed 8-bit integer type.*
- int [ReadNextCell](#) ([mat_t](#) *mat, [matvar_t](#) *matvar)
- Reads the next cell of the cell array in `matvar`.*
- int [ReadNextFunctionHandle](#) ([mat_t](#) *mat, [matvar_t](#) *matvar)
- Reads the function handle data of the function handle in `matvar`.*
- int [ReadNextStructField](#) ([mat_t](#) *mat, [matvar_t](#) *matvar)
- Reads the next struct field of the structure in `matvar`.*
- int [ReadSingleData](#) ([mat_t](#) *mat, float *data, int data_type, int len)
- Reads data of type `data_type` into a float type.*
- int [ReadUInt16Data](#) ([mat_t](#) *mat, [mat_uint16_t](#) *data, int data_type, int len)
- Reads data of type `data_type` into an unsigned 16-bit integer type.*
- int [ReadUInt32Data](#) ([mat_t](#) *mat, [mat_uint32_t](#) *data, int data_type, int len)
- Reads data of type `data_type` into an unsigned 32-bit integer type.*
- int [ReadUInt64Data](#) ([mat_t](#) *mat, [mat_uint64_t](#) *data, int data_type, int len)
- Reads data of type `data_type` into an unsigned 64-bit integer type.*
- int [ReadUInt8Data](#) ([mat_t](#) *mat, [mat_uint8_t](#) *data, int data_type, int len)
- Reads data of type `data_type` into an unsigned 8-bit integer type.*
- int [Write5](#) ([mat_t](#) *mat, [matvar_t](#) *matvar, int compress)
- Writes a matlab variable to a version 5 matlab file.*
- int [WriteCellArrayField](#) ([mat_t](#) *mat, [matvar_t](#) *matvar)
- Writes the header and data for an element of a cell array.*
- int [WriteCellArrayFieldInfo](#) ([mat_t](#) *mat, [matvar_t](#) *matvar)
- Writes the header and blank data for a cell array.*
- int [WriteCharData](#) ([mat_t](#) *mat, void *data, int N, int data_type)
- Writes `data` as character data.*
- int [WriteCharDataSlab2](#) ([mat_t](#) *mat, void *data, int data_type, int *dims, int *start, int *stride, int *edge)
- size_t [WriteCompressedCellArrayField](#) ([mat_t](#) *mat, [matvar_t](#) *matvar, z_stream *z)
- Writes the header and data for a field of a compressed cell array.*
- size_t [WriteCompressedCharData](#) ([mat_t](#) *mat, z_stream *z, void *data, int N, int data_type)
- Writes `data` as compressed character data.*
- size_t [WriteCompressedStructField](#) ([mat_t](#) *mat, [matvar_t](#) *matvar, z_stream *z)
- Writes the header and data for a field of a compressed struct array.*
- int [WriteDataSlab2](#) ([mat_t](#) *mat, void *data, int data_type, int *dims, int *start, int *stride, int *edge)

- int [WriteEmptyCharData](#) ([mat_t](#) *mat, int N, int data_type)
Writes empty characters to the MAT file.
- void [WriteInfo5](#) ([mat_t](#) *mat, [matvar_t](#) *matvar)
Writes the variable information and empty data.
- int [WriteStructField](#) ([mat_t](#) *mat, [matvar_t](#) *matvar)
Writes the header and data for a field of a struct array.

1.2.1 Detailed Description

1.2.2 Function Documentation

1.2.2.1 int InflateArrayFlags ([mat_t](#) * *mat*, [matvar_t](#) * *matvar*, void * *buf*)

buf must hold at least 16 bytes

Parameters

<i>mat</i>	Pointer to the MAT file
<i>matvar</i>	Pointer to the MAT variable
<i>buf</i>	Pointer to store the 16-byte array flags tag and data

Returns

Number of bytes read from the file

References [mat_t::fp](#), and [matvar_t::z](#).

Referenced by [Mat_VarReadNextInfo5\(\)](#), [ReadNextCell\(\)](#), and [ReadNextStructField\(\)](#).

1.2.2.2 int InflateData ([mat_t](#) * *mat*, [z_stream](#) * *z*, void * *buf*, int *nBytes*)

buf must hold at least `nBytes` bytes

Parameters

<i>mat</i>	Pointer to the MAT file
<i>z</i>	zlib compression stream
<i>buf</i>	Pointer to store the data type
<i>nBytes</i>	Number of bytes to inflate

Returns

Number of bytes read from the file

References [mat_t::fp](#).

Referenced by [ReadCompressedCharData\(\)](#), [ReadCompressedDoubleData\(\)](#), [ReadCompressedInt16Data\(\)](#), [ReadCompressedInt32Data\(\)](#), [ReadCompressedInt64Data\(\)](#), [ReadCompressedInt8Data\(\)](#), [ReadCompressedSingleData\(\)](#), [ReadCompressedUInt16Data\(\)](#), [ReadCompressedUInt32Data\(\)](#), [ReadCompressedUInt64Data\(\)](#), and [ReadCompressedUInt8Data\(\)](#).

1.2.2.3 int InflateDataTag (mat_t * *mat*, matvar_t * *matvar*, void * *buf*)

buf must hold at least 8 bytes

Parameters

<i>mat</i>	Pointer to the MAT file
<i>matvar</i>	Pointer to the MAT variable
<i>buf</i>	Pointer to store the data tag

Returns

Number of bytes read from the file

References *mat_t::fp*, *matvar_t::name*, and *matvar_t::z*.

1.2.2.4 int InflateDataType (mat_t * *mat*, z_stream * *z*, void * *buf*)

buf must hold at least 4 bytes

Parameters

<i>mat</i>	Pointer to the MAT file
<i>matvar</i>	Pointer to the MAT variable
<i>buf</i>	Pointer to store the data type

Returns

Number of bytes read from the file

References *mat_t::fp*.

Referenced by *Mat_VarReadDataLinear()*, *Read5()*, and *ReadData5()*.

1.2.2.5 int InflateDimensions (mat_t * *mat*, matvar_t * *matvar*, void * *buf*)

buf must hold at least (8+4*rank) bytes where rank is the number of dimensions. If the end of the dimensions data is not aligned on an 8-byte boundary, this function eats up those bytes and stores then in *buf*.

Parameters

<i>mat</i>	Pointer to the MAT file
<i>matvar</i>	Pointer to the MAT variable
<i>buf</i>	Pointer to store the dimensions flag and data

Returns

Number of bytes read from the file

References *mat_t::byteswap*, *mat_t::fp*, *Mat_int32Swap()*, *MAT_T_INT32*, and *matvar_t::z*.

Referenced by *Mat_VarReadNextInfo5()*, *ReadNextCell()*, and *ReadNextStructField()*.

1.2.2.6 int InflateFieldNameLength (mat_t * *mat*, matvar_t * *matvar*, void * *buf*)

buf must hold at least 8 bytes

Parameters

<i>mat</i>	Pointer to the MAT file
<i>matvar</i>	Pointer to the MAT variable
<i>buf</i>	Pointer to store the fieldname length

Returns

Number of bytes read from the file

References *mat_t::fp*, and *matvar_t::z*.

Referenced by ReadNextStructField().

1.2.2.7 int InflateFieldNames (mat_t * *mat*, matvar_t * *matvar*, void * *buf*, int *nfields*, int *fieldname_length*, int *padding*)

buf must hold at least *nfields* * *fieldname_length* bytes

Parameters

<i>mat</i>	Pointer to the MAT file
<i>matvar</i>	Pointer to the MAT variable
<i>buf</i>	Pointer to store the fieldnames
<i>nfields</i>	Number of fields
<i>fieldname_length</i>	Maximum length in bytes of each field
<i>padding</i>	Number of padding bytes

Returns

Number of bytes read from the file

References *mat_t::fp*, and *matvar_t::z*.

Referenced by ReadNextStructField().

1.2.2.8 int InflateFieldNamesTag (mat_t * *mat*, matvar_t * *matvar*, void * *buf*)

buf must hold at least 8 bytes

Parameters

<i>mat</i>	Pointer to the MAT file
<i>matvar</i>	Pointer to the MAT variable
<i>buf</i>	Pointer to store the fieldname tag

Returns

Number of bytes read from the file

References `mat_t::fp`, and `matvar_t::z`.

Referenced by `ReadNextStructField()`.

1.2.2.9 int InflateSkip (mat_t * *mat*, z_stream * *z*, int *nbytes*)**Parameters**

<i>mat</i>	Pointer to the MAT file
<i>z</i>	zlib compression stream
<i>nbytes</i>	Number of uncompressed bytes to skip

Returns

Number of bytes read from the file

References `mat_t::fp`.

Referenced by `InflateSkipData()`, `Mat_VarReadDataLinear()`, `Read5()`, `ReadData5()`, `ReadNextCell()`, and `ReadNextStructField()`.

1.2.2.10 int InflateSkip2 (mat_t * *mat*, matvar_t * *matvar*, int *nbytes*)**Parameters**

<i>mat</i>	Pointer to the MAT file
<i>z</i>	zlib compression stream
<i>nbytes</i>	Number of uncompressed bytes to skip

Returns

Number of bytes read from the file

References `mat_t::fp`, `matvar_t::name`, and `matvar_t::z`.

1.2.2.11 int InflateSkipData (mat_t * *mat*, z_stream * *z*, int *data_type*, int *len*)**Parameters**

<i>mat</i>	Pointer to the MAT file
<i>z</i>	zlib compression stream
<i>data_type</i>	Data type (<code>matio_types</code> enumerations)
<i>len</i>	Number of elements of datatype <code>data_type</code> to skip

Returns

Number of bytes read from the file

References InflateSkip(), MAT_T_DOUBLE, MAT_T_INT16, MAT_T_INT32, MAT_T_INT64, MAT_T_INT8, MAT_T_SINGLE, MAT_T_UINT16, MAT_T_UINT32, MAT_T_UINT64, and MAT_T_UINT8.

Referenced by Mat_VarReadDataLinear(), ReadCompressedDataSlab2(), and ReadCompressedDataSlabN().

1.2.2.12 int InflateVarName (mat_t * *mat*, matvar_t * *matvar*, void * *buf*, int *N*)**Parameters**

<i>mat</i>	Pointer to the MAT file
<i>matvar</i>	Pointer to the MAT variable
<i>buf</i>	Pointer to store the variables name
<i>N</i>	Number of characters in the name

Returns

Number of bytes read from the file

References mat_t::fp, and matvar_t::z.

Referenced by Mat_VarReadNextInfo5().

1.2.2.13 int InflateVarNameTag (mat_t * *mat*, matvar_t * *matvar*, void * *buf*)**Parameters**

<i>mat</i>	Pointer to the MAT file
<i>matvar</i>	Pointer to the MAT variable
<i>buf</i>	Pointer to store the variables name tag

Returns

Number of bytes read from the file

References mat_t::fp, and matvar_t::z.

Referenced by Mat_VarReadNextInfo5(), ReadNextCell(), and ReadNextStructField().

1.2.2.14 int InflateVarTag (mat_t * *mat*, matvar_t * *matvar*, void * *buf*)

buf must hold at least 8 bytes

Parameters

<i>mat</i>	Pointer to the MAT file
<i>matvar</i>	Pointer to the MAT variable
<i>buf</i>	Pointer to store the 8-byte variable tag

Returns

Number of bytes read from the file

References `mat_t::fp`, and `matvar_t::z`.

Referenced by `Mat_VarReadNextInfo5()`, `ReadNextCell()`, and `ReadNextStructField()`.

1.2.2.15 double Mat_doubleSwap (double * a)**Parameters**

<i>a</i>	pointer to integer to swap
----------	----------------------------

Returns

the swapped integer

References `swap`.

Referenced by `ReadCompressedDoubleData()`, `ReadCompressedInt16Data()`, `ReadCompressedInt32Data()`, `ReadCompressedInt64Data()`, `ReadCompressedInt8Data()`, `ReadCompressedSingleData()`, `ReadCompressedUInt16Data()`, `ReadCompressedUInt32Data()`, `ReadCompressedUInt64Data()`, `ReadCompressedUInt8Data()`, `ReadDoubleData()`, `ReadInt16Data()`, `ReadInt32Data()`, `ReadInt64Data()`, `ReadInt8Data()`, `ReadSingleData()`, `ReadUInt16Data()`, `ReadUInt32Data()`, `ReadUInt64Data()`, and `ReadUInt8Data()`.

1.2.2.16 float Mat_floatSwap (float * a)**Parameters**

<i>a</i>	pointer to integer to swap
----------	----------------------------

Returns

the swapped integer

References `swap`.

Referenced by `ReadCompressedInt16Data()`, `ReadCompressedInt32Data()`, `ReadCompressedInt64Data()`, `ReadCompressedInt8Data()`, `ReadCompressedSingleData()`, `ReadCompressedUInt16Data()`, `ReadCompressedUInt32Data()`, `ReadCompressedUInt64Data()`, `ReadCompressedUInt8Data()`, `ReadDoubleData()`, `ReadInt16Data()`, `ReadInt32Data()`, `ReadInt64Data()`, `ReadInt8Data()`, `ReadSingleData()`, `ReadUInt16Data()`, `ReadUInt32Data()`, `ReadUInt64Data()`, and `ReadUInt8Data()`.

1.2.2.17 mat_int16_t Mat_int16Swap (mat_int16_t * a)**Parameters**

<i>a</i>	pointer to integer to swap
----------	----------------------------

Returns

the swapped integer

References swap.

Referenced by Mat_Open(), ReadCompressedDoubleData(), ReadCompressedInt16Data(), ReadCompressedInt32Data(), ReadCompressedInt64Data(), ReadCompressedInt8Data(), ReadCompressedSingleData(), ReadCompressedUInt16Data(), ReadCompressedUInt32Data(), ReadCompressedUInt64Data(), ReadCompressedUInt8Data(), ReadDoubleData(), ReadInt16Data(), ReadInt32Data(), ReadInt64Data(), ReadInt8Data(), ReadSingleData(), ReadUInt16Data(), ReadUInt32Data(), ReadUInt64Data(), and ReadUInt8Data().

1.2.2.18 mat_int32_t Mat_int32Swap (mat_int32_t * a)**Parameters**

<i>a</i>	pointer to integer to swap
----------	----------------------------

Returns

the swapped integer

References swap.

Referenced by InflateDimensions(), Mat_VarReadDataLinear(), Mat_VarReadInfo(), Mat_VarReadNextInfo5(), Read5(), ReadCompressedDoubleData(), ReadCompressedInt16Data(), ReadCompressedInt32Data(), ReadCompressedInt64Data(), ReadCompressedInt8Data(), ReadCompressedSingleData(), ReadCompressedUInt16Data(), ReadCompressedUInt32Data(), ReadCompressedUInt64Data(), ReadCompressedUInt8Data(), ReadData5(), ReadDoubleData(), ReadInt16Data(), ReadInt32Data(), ReadInt64Data(), ReadInt8Data(), ReadSingleData(), ReadUInt16Data(), ReadUInt32Data(), ReadUInt64Data(), ReadUInt8Data(), WriteCellArrayField(), WriteCellArrayFieldInfo(), and WriteStructField().

1.2.2.19 mat_int64_t Mat_int64Swap (mat_int64_t * a)**Parameters**

<i>a</i>	pointer to integer to swap
----------	----------------------------

Returns

the swapped integer

References swap.

Referenced by ReadCompressedInt64Data(), ReadCompressedUInt64Data(), ReadInt64Data(), and ReadUInt64Data().

1.2.2.20 mat_uint16_t Mat_uint16Swap (mat_uint16_t * a)**Parameters**

<i>a</i>	pointer to integer to swap
----------	----------------------------

Returns

the swapped integer

References swap.

Referenced by ReadCompressedCharData(), ReadCompressedDoubleData(), ReadCompressedInt16Data(), ReadCompressedInt32Data(), ReadCompressedInt64Data(), ReadCompressedInt8Data(), ReadCompressedSingleData(), ReadCompressedUInt16Data(), ReadCompressedUInt32Data(), ReadCompressedUInt64Data(), ReadCompressedUInt8Data(), ReadDoubleData(), ReadInt16Data(), ReadInt32Data(), ReadInt64Data(), ReadInt8Data(), ReadSingleData(), ReadUInt16Data(), ReadUInt32Data(), ReadUInt64Data(), and ReadUInt8Data().

1.2.2.21 mat_uint32_t Mat_uint32Swap (mat_uint32_t * a)**Parameters**

<i>a</i>	pointer to integer to swap
----------	----------------------------

Returns

the swapped integer

References swap.

Referenced by Mat_VarReadNextInfo5(), Read5(), ReadCompressedDoubleData(), ReadCompressedInt16Data(), ReadCompressedInt32Data(), ReadCompressedInt64Data(), ReadCompressedInt8Data(), ReadCompressedSingleData(), ReadCompressedUInt16Data(), ReadCompressedUInt32Data(), ReadCompressedUInt64Data(), ReadCompressedUInt8Data(), ReadDoubleData(), ReadInt16Data(), ReadInt32Data(), ReadInt64Data(), ReadInt8Data(), ReadNextCell(), ReadNextStructField(), ReadSingleData(), ReadUInt16Data(), ReadUInt32Data(), ReadUInt64Data(), and ReadUInt8Data().

1.2.2.22 mat_uint64_t Mat_uint64Swap (mat_uint64_t * a)**Parameters**

<i>a</i>	pointer to integer to swap
----------	----------------------------

Returns

the swapped integer

References swap.

Referenced by ReadCompressedInt64Data(), ReadCompressedUInt64Data(), ReadInt64Data(), and ReadUInt64Data().

1.2.2.23 void Mat_VarPrint5 (matvar_t * matvar, int printdata)**Parameters**

<i>mat</i>	MAT file pointer
<i>matvar</i>	pointer to the mat variable

References `matvar_t::class_type`, `matvar_t::data`, `sparse_t::data`, `matvar_t::data_size`, `matvar_t::data_type`, `matvar_t::dims`, `ComplexSplit::Im`, `sparse_t::ir`, `matvar_t::isComplex`, `sparse_t::jc`, `MAT_C_CELL`, `MAT_C_CHAR`, `MAT_C_DOUBLE`, `MAT_C_INT16`, `MAT_C_INT32`, `MAT_C_INT64`, `MAT_C_INT8`, `MAT_C_SINGLE`, `MAT_C_SPARSE`, `MAT_C_STRUCT`, `MAT_C_UINT16`, `MAT_C_UINT32`, `MAT_C_UINT64`, `MAT_C_UINT8`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT64`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT64`, `MAT_T_UINT8`, `Mat_VarPrint()`, `matvar_t::name`, `matvar_t::nbytes`, `sparse_t::ndata`, `sparse_t::njc`, `matvar_t::rank`, and `ComplexSplit::Re`.

Referenced by `Mat_VarPrint()`.

1.2.2.24 `matvar_t* Mat_VarReadNextInfo5 (mat_t * mat)`

Parameters

<i>mat</i>	MAT file pointer pointer to the MAT variable or NULL
------------	--

References `mat_t::byteswap`, `matvar_t::class_type`, `matvar_t::compression`, `matvar_t::data`, `matvar_t::data_size`, `matvar_t::data_type`, `matvar_t::datapos`, `matvar_t::dims`, `mat_t::fp`, `matvar_t::fp`, `matvar_t::fpos`, `InflateArrayFlags()`, `InflateDimensions()`, `InflateVarName()`, `InflateVarNameTag()`, `InflateVarTag()`, `matvar_t::isComplex`, `matvar_t::isGlobal`, `matvar_t::isLogical`, `MAT_C_CELL`, `MAT_C_FUNCTION`, `MAT_C_SPARSE`, `MAT_C_STRUCT`, `MAT_F_CLASS_T`, `MAT_F_COMPLEX`, `MAT_F_GLOBAL`, `MAT_F_LOGICAL`, `Mat_int32Swap()`, `MAT_T_COMPRESSED`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_MATRIX`, `MAT_T_UINT32`, `Mat_uint32Swap()`, `Mat_VarCalloc()`, `Mat_VarFree()`, `matvar_t::mem_conserve`, `matvar_t::name`, `matvar_t::nbytes`, `matvar_t::rank`, `ReadNextCell()`, `ReadNextFunctionHandle()`, `ReadNextStructField()`, and `matvar_t::z`.

Referenced by `Mat_VarReadNextInfo()`.

1.2.2.25 `void Read5 (mat_t * mat, matvar_t * matvar)`

Parameters

<i>mat</i>	MAT file pointer
<i>matvar</i>	MAT variable pointer to read the data

References `mat_t::byteswap`, `matvar_t::class_type`, `matvar_t::compression`, `COMPRESSION_NONE`, `COMPRESSION_ZLIB`, `matvar_t::data`, `sparse_t::data`, `matvar_t::data_size`, `matvar_t::data_type`, `matvar_t::datapos`, `matvar_t::dims`, `mat_t::fp`, `matvar_t::fp`, `ComplexSplit::Im`, `InflateDataType()`, `InflateSkip()`, `sparse_t::ir`, `matvar_t::isComplex`, `sparse_t::jc`, `MAT_C_CELL`, `MAT_C_CHAR`, `MAT_C_DOUBLE`, `MAT_C_FUNCTION`, `MAT_C_INT16`, `MAT_C_INT32`, `MAT_C_INT64`, `MAT_C_INT8`, `MAT_C_SINGLE`, `MAT_C_SPARSE`, `MAT_C_STRUCT`, `MAT_C_UINT16`, `MAT_C_UINT32`, `MAT_C_UINT64`, `MAT_C_UINT8`, `Mat_int32Swap()`, `MAT_T_CELL`, `MAT_T_DOUBLE`, `MAT_T_FUNCTION`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT64`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_STRUCT`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT64`, `MAT_T_UINT8`, `Mat_uint32Swap()`, `matvar_t::name`, `matvar_t::nbytes`, `sparse_t::ndata`, `sparse_t::nir`, `sparse_t::njc`, `sparse_t::nzmax`, `matvar_t::rank`, `ComplexSplit::Re`, `Read5()`, `ReadCompressedCharData()`, `ReadCompressedDoubleData()`, `ReadCompressedInt16Data()`, `ReadCompressedInt32Data()`, `ReadCompressedInt64Data()`, `ReadCompressedInt8Data()`, `ReadCompressedSingleData()`, `ReadCompressedUInt16Data()`, `ReadCompressedUInt32Data()`, `ReadCompressedUInt8Data()`, `ReadDoubleData()`, `ReadInt16Data()`, `ReadInt32Data()`, `ReadInt64Data()`, `ReadInt8Data()`, `ReadSingleData()`, `ReadUInt16Data()`, `ReadUInt32Data()`, `ReadUInt8Data()`, and `matvar_t::z`.

Referenced by `Read5()`.

1.2.2.26 `int ReadCompressedCharData (mat_t * mat, z_stream * z, char * data, int data_type, int len)`

Reads from the MAT file `len` compressed elements of data type `data_type` storing them as char's in `data`.

Parameters

<i>mat</i>	MAT file pointer
<i>z</i>	Pointer to the zlib stream for inflation
<i>data</i>	Pointer to store the output char values (<code>len*sizeof(char)</code>)
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <code>data_type</code> to read from the file

Return values

<i>Number</i>	of bytes read from the file
---------------	-----------------------------

References `mat_t::byteswap`, `mat_t::fp`, `InflateData()`, `MAT_T_INT16`, `MAT_T_INT8`, `MAT_T_UINT16`, `MAT_T_UINT8`, `MAT_T_UTF8`, and `Mat_uint16Swap()`.

Referenced by `Read5()`, and `ReadCompressedDataSlab2()`.

1.2.2.27 `int ReadCompressedDataSlab2 (mat_t * mat, z_stream * z, void * data, int class_type, int data_type, int * dims, int * start, int * stride, int * edge)`

Parameters

<i>mat</i>	MAT file pointer
<i>z</i>	zlib compression stream
<i>data</i>	Pointer to store the output data
<i>class_type</i>	Type of data class (<code>matio_classes</code> enumerations)
<i>data_type</i>	Datatype of the stored data (<code>matio_types</code> enumerations)
<i>dims</i>	Dimensions of the data
<i>start</i>	Index to start reading data in each dimension
<i>stride</i>	Read every <code>stride</code> elements in each dimension
<i>edge</i>	Number of elements to read in each dimension

Return values

<i>Number</i>	of bytes read from the file, or -1 on error
---------------	---

References `mat_t::fp`, `InflateSkipData()`, `MAT_C_CHAR`, `MAT_C_DOUBLE`, `MAT_C_INT16`, `MAT_C_INT32`, `MAT_C_INT64`, `MAT_C_INT8`, `MAT_C_SINGLE`, `MAT_C_UINT16`, `MAT_C_UINT32`, `MAT_C_UINT64`, `MAT_C_UINT8`, `ReadCompressedCharData()`, `ReadCompressedDoubleData()`, `ReadCompressedInt16Data()`, `ReadCompressedInt32Data()`, `ReadCompressedInt64Data()`, `ReadCompressedInt8Data()`, `ReadCompressedSingleData()`, `ReadCompressedUInt16Data()`, `ReadCompressedUInt32Data()`, `ReadCompressedUInt64Data()`, and `ReadCompressedUInt8Data()`.

Referenced by `ReadData5()`.

1.2.2.28 `int ReadCompressedDataSlabN (mat_t * mat, z_stream * z, void * data, int class_type, int data_type, int rank, int * dims, int * start, int * stride, int * edge)`

Parameters

<i>mat</i>	MAT file pointer
<i>z</i>	zlib compression stream
<i>data</i>	Pointer to store the output data
<i>class_type</i>	Type of data class (<code>matio_classes</code> enumerations)
<i>data_type</i>	Datatype of the stored data (<code>matio_types</code> enumerations)
<i>rank</i>	Number of dimensions in the data
<i>dims</i>	Dimensions of the data
<i>start</i>	Index to start reading data in each dimension
<i>stride</i>	Read every <code>stride</code> elements in each dimension
<i>edge</i>	Number of elements to read in each dimension

Return values

<i>Number</i>	of bytes read from the file, or -1 on error
---------------	---

References `mat_t::fp`, `InflateSkipData()`, `MAT_C_DOUBLE`, `MAT_C_INT16`, `MAT_C_INT32`, `MAT_C_INT64`, `MAT_C_INT8`, `MAT_C_SINGLE`, `MAT_C_UINT16`, `MAT_C_UINT32`, `MAT_C_UINT64`, `MAT_C_UINT8`, `ReadCompressedDoubleData()`, `ReadCompressedInt16Data()`, `ReadCompressedInt32Data()`, `ReadCompressedInt64Data()`, `ReadCompressedInt8Data()`, `ReadCompressedSingleData()`, `ReadCompressedUInt16Data()`, `ReadCompressedUInt32Data()`, `ReadCompressedUInt64Data()`, and `ReadCompressedUInt8Data()`.

Referenced by `ReadData5()`.

1.2.2.29 `int ReadCompressedDoubleData (mat_t * mat, z_stream * z, double * data, int data_type, int len)`

Reads from the MAT file `len` compressed elements of data type `data_type` storing them as double's in `data`.

Parameters

<i>mat</i>	MAT file pointer
<i>z</i>	Pointer to the zlib stream for inflation
<i>data</i>	Pointer to store the output double values (<code>len*sizeof(double)</code>)
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <code>data_type</code> to read from the file

Return values

<i>Number</i>	of bytes read from the file
---------------	-----------------------------

References `mat_t::byteswap`, `InflateData()`, `Mat_doubleSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT8`, `Mat_uint16Swap()`, and `Mat_uint32Swap()`.

Referenced by `Mat_VarReadDataLinear()`, `Read5()`, `ReadCompressedDataSlab2()`, and `ReadCompressedDataSlabN()`.

1.2.2.30 `int ReadCompressedInt16Data (mat_t * mat, z_stream * z, mat_int16_t * data, int data_type, int len)`

Reads from the MAT file `len` compressed elements of data type `data_type` storing them as signed 16-bit integers in `data`.

Parameters

<i>mat</i>	MAT file pointer
<i>z</i>	Pointer to the zlib stream for inflation
<i>data</i>	Pointer to store the output signed 16-bit integer values (<code>len*sizeof(mat_int16_t)</code>)
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <code>data_type</code> to read from the file

Return values

<i>Number</i>	of bytes read from the file
---------------	-----------------------------

References `mat_t::byteswap`, `InflateData()`, `Mat_doubleSwap()`, `Mat_floatSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT8`, `Mat_uint16Swap()`, and `Mat_uint32Swap()`.

Referenced by `Mat_VarReadDataLinear()`, `Read5()`, `ReadCompressedDataSlab2()`, and `ReadCompressedDataSlabN()`.

1.2.2.31 `int ReadCompressedInt32Data (mat_t * mat, z_stream * z, mat_int32_t * data, int data_type, int len)`

Reads from the MAT file `len` compressed elements of data type `data_type` storing them as signed 32-bit integers in `data`.

Parameters

<i>mat</i>	MAT file pointer
<i>z</i>	Pointer to the zlib stream for inflation
<i>data</i>	Pointer to store the output signed 32-bit integer values (<code>len*sizeof(mat_int32_t)</code>)
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <code>data_type</code> to read from the file

Return values

<i>Number</i>	of bytes read from the file
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References `mat_t::byteswap`, `InflateData()`, `Mat_doubleSwap()`, `Mat_floatSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT8`, `Mat_uint16Swap()`, and `Mat_uint32Swap()`.

Referenced by `Mat_VarReadDataLinear()`, `Read5()`, `ReadCompressedDataSlab2()`, and `ReadCompressedDataSlabN()`.

1.2.2.32 `int ReadCompressedInt64Data (mat_t * mat, z_stream * z, mat_int64_t * data, int data_type, int len)`

Reads from the MAT file `len` compressed elements of data type `data_type` storing them as signed 64-bit integers in `data`.

Parameters

<i>mat</i>	MAT file pointer
<i>z</i>	Pointer to the zlib stream for inflation
<i>data</i>	Pointer to store the output signed 64-bit integer values (<code>len*sizeof(mat_int64_t)</code>)
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <code>data_type</code> to read from the file

Return values

<i>Number</i>	of bytes read from the file
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References `mat_t::byteswap`, `InflateData()`, `Mat_doubleSwap()`, `Mat_floatSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `Mat_int64Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT64`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT64`, `MAT_T_UINT8`, `Mat_uint16Swap()`, `Mat_uint32Swap()`, and `Mat_uint64Swap()`.

Referenced by `Mat_VarReadDataLinear()`, `Read5()`, `ReadCompressedDataSlab2()`, and `ReadCompressedDataSlabN()`.

1.2.2.33 `int ReadCompressedInt8Data (mat_t * mat, z_stream * z, mat_int8_t * data, int data_type, int len)`

Reads from the MAT file `len` compressed elements of data type `data_type` storing them as signed 8-bit integers in `data`.

Parameters

<i>mat</i>	MAT file pointer
<i>z</i>	Pointer to the zlib stream for inflation
<i>data</i>	Pointer to store the output signed 8-bit integer values (<code>len*sizeof(mat_int8_t)</code>)
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <code>data_type</code> to read from the file

Return values

<i>Number</i>	of bytes read from the file
---------------	-----------------------------

References `mat_t::byteswap`, `InflateData()`, `Mat_doubleSwap()`, `Mat_floatSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT8`, `Mat_uint16Swap()`, and `Mat_uint32Swap()`.

Referenced by `Mat_VarReadDataLinear()`, `Read5()`, `ReadCompressedDataSlab2()`, and `ReadCompressedDataSlabN()`.

1.2.2.34 int ReadCompressedSingleData (mat_t * mat, z_stream * z, float * data, int data_type, int len)

Reads from the MAT file `len` compressed elements of data type `data_type` storing them as float's in `data`.

Parameters

<i>mat</i>	MAT file pointer
<i>z</i>	Pointer to the zlib stream for inflation
<i>data</i>	Pointer to store the output float values (<code>len*sizeof(float)</code>)
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <code>data_type</code> to read from the file

Return values

<i>Number</i>	of bytes read from the file
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References `mat_t::byteswap`, `InflateData()`, `Mat_doubleSwap()`, `Mat_floatSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT8`, `Mat_uint16Swap()`, and `Mat_uint32Swap()`.

Referenced by `Mat_VarReadDataLinear()`, `Read5()`, `ReadCompressedDataSlab2()`, and `ReadCompressedDataSlabN()`.

1.2.2.35 int ReadCompressedUInt16Data (mat_t * mat, z_stream * z, mat_uint16_t * data, int data_type, int len)

Reads from the MAT file `len` compressed elements of data type `data_type` storing them as unsigned 16-bit integers in `data`.

Parameters

<i>mat</i>	MAT file pointer
<i>z</i>	Pointer to the zlib stream for inflation
<i>data</i>	Pointer to store the output <code>n</code> unsigned 16-bit integer values (<code>len*sizeof(mat_uint16_t)</code>)
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <code>data_type</code> to read from the file

Return values

<i>Number</i>	of bytes read from the file
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References `mat_t::byteswap`, `InflateData()`, `Mat_doubleSwap()`, `Mat_floatSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT8`, `Mat_uint16Swap()`, and `Mat_uint32Swap()`.

Referenced by `Read5()`, `ReadCompressedDataSlab2()`, and `ReadCompressedDataSlabN()`.

1.2.2.36 int ReadCompressedUInt32Data (mat_t * mat, z_stream * z, mat_uint32_t * data, int data_type, int len)

Reads from the MAT file `len` compressed elements of data type `data_type` storing them as unsigned 32-bit integers in `data`.

Parameters

<i>mat</i>	MAT file pointer
<i>z</i>	Pointer to the zlib stream for inflation
<i>data</i>	Pointer to store the output unsigned 32-bit integer values (len*sizeof(mat_uint32_t))
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <code>data_type</code> to read from the file

Return values

<i>Number</i>	of bytes read from the file
---------------	-----------------------------

References `mat_t::byteswap`, `InflateData()`, `Mat_doubleSwap()`, `Mat_floatSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT8`, `Mat_uint16Swap()`, and `Mat_uint32Swap()`.

Referenced by `Read5()`, `ReadCompressedDataSlab2()`, and `ReadCompressedDataSlabN()`.

1.2.2.37 `int ReadCompressedUInt64Data (mat_t * mat, z_stream * z, mat_uint64_t * data, int data_type, int len)`

Reads from the MAT file `len` compressed elements of data type `data_type` storing them as unsigned 64-bit integers in `data`.

Parameters

<i>mat</i>	MAT file pointer
<i>z</i>	Pointer to the zlib stream for inflation
<i>data</i>	Pointer to store the output unsigned 64-bit integer values (len*sizeof(mat_uint64_t))
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <code>data_type</code> to read from the file

Return values

<i>Number</i>	of bytes read from the file
---------------	-----------------------------

References `mat_t::byteswap`, `InflateData()`, `Mat_doubleSwap()`, `Mat_floatSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `Mat_int64Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT64`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT64`, `MAT_T_UINT8`, `Mat_uint16Swap()`, `Mat_uint32Swap()`, and `Mat_uint64Swap()`.

Referenced by `ReadCompressedDataSlab2()`, and `ReadCompressedDataSlabN()`.

1.2.2.38 `int ReadCompressedUInt8Data (mat_t * mat, z_stream * z, mat_uint8_t * data, int data_type, int len)`

Reads from the MAT file `len` compressed elements of data type `data_type` storing them as unsigned 8-bit integers in `data`.

Parameters

<i>mat</i>	MAT file pointer
<i>z</i>	Pointer to the zlib stream for inflation

<i>data</i>	Pointer to store the output 8-bit integer values (len*sizeof(mat_uint8_t))
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <code>data_type</code> to read from the file

Return values

<i>Number</i>	of bytes read from the file
---------------	-----------------------------

References `mat_t::byteswap`, `InflateData()`, `Mat_doubleSwap()`, `Mat_floatSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT8`, `Mat_uint16Swap()`, and `Mat_uint32Swap()`.

Referenced by `Read5()`, `ReadCompressedDataSlab2()`, and `ReadCompressedDataSlabN()`.

1.2.2.39 `int ReadData5 (mat_t * mat, matvar_t * matvar, void * data, int * start, int * stride, int * edge)`

Parameters

<i>mat</i>	MAT file pointer
<i>matvar</i>	pointer to the mat variable
<i>data</i>	pointer to store the read data in (must be of size <code>edge[0]*...edge[rank-1]*Mat_SizeOfClass(matvar->class_type)</code>)
<i>start</i>	index to start reading data in each dimension
<i>stride</i>	write data every <code>stride</code> elements in each dimension
<i>edge</i>	number of elements to read in each dimension

Return values

<i>0</i>	on success
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References `mat_t::byteswap`, `matvar_t::class_type`, `matvar_t::compression`, `COMPRESSION_NONE`, `COMPRESSION_ZLIB`, `matvar_t::data_size`, `matvar_t::data_type`, `matvar_t::datapos`, `matvar_t::dims`, `mat_t::fp`, `ComplexSplit::Im`, `InflateDataType()`, `InflateSkip()`, `matvar_t::isComplex`, `MAT_C_DOUBLE`, `MAT_C_INT16`, `MAT_C_INT32`, `MAT_C_INT64`, `MAT_C_INT8`, `MAT_C_SINGLE`, `MAT_C_UINT16`, `MAT_C_UINT32`, `MAT_C_UINT64`, `MAT_C_UINT8`, `Mat_int32Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT64`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT64`, `MAT_T_UINT8`, `matvar_t::rank`, `ComplexSplit::Re`, `ReadCompressedDataSlab2()`, `ReadCompressedDataSlabN()`, `ReadDataSlab2()`, `ReadDataSlabN()`, and `matvar_t::z`.

Referenced by `Mat_VarReadData()`.

1.2.2.40 `int ReadDataSlab2 (mat_t * mat, void * data, int class_type, int data_type, int * dims, int * start, int * stride, int * edge)`

Parameters

<i>mat</i>	MAT file pointer
<i>data</i>	Pointer to store the output data
<i>class_type</i>	Type of data class (<code>matio_classes</code> enumerations)
<i>data_type</i>	Datatype of the stored data (<code>matio_types</code> enumerations)
<i>dims</i>	Dimensions of the data

<i>start</i>	Index to start reading data in each dimension
<i>stride</i>	Read every <i>stride</i> elements in each dimension
<i>edge</i>	Number of elements to read in each dimension

Return values

<i>Number</i>	of bytes read from the file, or -1 on error
---------------	---

References `mat_t::fp`, `MAT_C_DOUBLE`, `MAT_C_INT16`, `MAT_C_INT32`, `MAT_C_INT64`, `MAT_C_INT8`, `MAT_C_SINGLE`, `MAT_C_UINT16`, `MAT_C_UINT32`, `MAT_C_UINT64`, `MAT_C_UINT8`, `ReadDoubleData()`, `ReadInt16Data()`, `ReadInt32Data()`, `ReadInt64Data()`, `ReadInt8Data()`, `ReadSingleData()`, `ReadUInt16Data()`, `ReadUInt32Data()`, `ReadUInt64Data()`, and `ReadUInt8Data()`.

Referenced by `ReadData5()`.

1.2.2.41 `int ReadDataSlabN (mat_t * mat, void * data, int class_type, int data_type, int rank, int * dims, int * start, int * stride, int * edge)`

Parameters

<i>mat</i>	MAT file pointer
<i>data</i>	Pointer to store the output data
<i>class_type</i>	Type of data class (<code>matio_classes</code> enumerations)
<i>data_type</i>	Datatype of the stored data (<code>matio_types</code> enumerations)
<i>rank</i>	Number of dimensions in the data
<i>dims</i>	Dimensions of the data
<i>start</i>	Index to start reading data in each dimension
<i>stride</i>	Read every <i>stride</i> elements in each dimension
<i>edge</i>	Number of elements to read in each dimension

Return values

<i>Number</i>	of bytes read from the file, or -1 on error
---------------	---

References `mat_t::fp`, `MAT_C_DOUBLE`, `MAT_C_INT16`, `MAT_C_INT32`, `MAT_C_INT64`, `MAT_C_INT8`, `MAT_C_SINGLE`, `MAT_C_UINT16`, `MAT_C_UINT32`, `MAT_C_UINT64`, `MAT_C_UINT8`, `ReadDoubleData()`, `ReadInt16Data()`, `ReadInt32Data()`, `ReadInt64Data()`, `ReadInt8Data()`, `ReadSingleData()`, `ReadUInt16Data()`, `ReadUInt32Data()`, `ReadUInt64Data()`, and `ReadUInt8Data()`.

Referenced by `ReadData5()`.

1.2.2.42 `int ReadDoubleData (mat_t * mat, double * data, int data_type, int len)`

Reads from the MAT file *len* elements of data type *data_type* storing them as double's in *data*.

Parameters

<i>mat</i>	MAT file pointer
<i>data</i>	Pointer to store the output double values (<i>len</i> *sizeof(double))
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <i>data_type</i> to read from the file

Return values

<i>Number</i>	of bytes read from the file
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References `mat_t::byteswap`, `mat_t::fp`, `Mat_doubleSwap()`, `Mat_floatSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT8`, `Mat_uint16Swap()`, and `Mat_uint32Swap()`.

Referenced by `Mat_VarReadDataLinear()`, `Read5()`, `ReadDataSlab2()`, and `ReadDataSlabN()`.

1.2.2.43 int ReadInt16Data (mat_t * mat, mat_int16_t * data, int data_type, int len)

Reads from the MAT file `len` elements of data type `data_type` storing them as signed 16-bit integers in `data`.

Parameters

<i>mat</i>	MAT file pointer
<i>data</i>	Pointer to store the output signed 16-bit integer values (<code>len*sizeof(mat_int16_t)</code>)
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <code>data_type</code> to read from the file

Return values

<i>Number</i>	of bytes read from the file
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References `mat_t::byteswap`, `mat_t::fp`, `Mat_doubleSwap()`, `Mat_floatSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT8`, `Mat_uint16Swap()`, and `Mat_uint32Swap()`.

Referenced by `Mat_VarReadDataLinear()`, `Read5()`, `ReadDataSlab2()`, and `ReadDataSlabN()`.

1.2.2.44 int ReadInt32Data (mat_t * mat, mat_int32_t * data, int data_type, int len)

Reads from the MAT file `len` elements of data type `data_type` storing them as signed 32-bit integers in `data`.

Parameters

<i>mat</i>	MAT file pointer
<i>data</i>	Pointer to store the output signed 32-bit integer values (<code>len*sizeof(mat_int32_t)</code>)
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <code>data_type</code> to read from the file

Return values

<i>Number</i>	of bytes read from the file
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References `mat_t::byteswap`, `mat_t::fp`, `Mat_doubleSwap()`, `Mat_floatSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT8`, `Mat_uint16Swap()`, and `Mat_uint32Swap()`.

Referenced by `Mat_VarReadDataLinear()`, `Read5()`, `ReadDataSlab2()`, and `ReadDataSlabN()`.

1.2.2.45 int ReadInt64Data (mat_t * *mat*, mat_int64_t * *data*, int *data_type*, int *len*)

Reads from the MAT file *len* elements of data type *data_type* storing them as signed 64-bit integers in *data*.

Parameters

<i>mat</i>	MAT file pointer
<i>data</i>	Pointer to store the output signed 64-bit integer values (<i>len</i> *sizeof(mat_int64_t))
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <i>data_type</i> to read from the file

Return values

<i>Number</i>	of bytes read from the file
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References `mat_t::byteswap`, `mat_t::fp`, `Mat_doubleSwap()`, `Mat_floatSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `Mat_int64Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT64`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT64`, `MAT_T_UINT8`, `Mat_uint16Swap()`, `Mat_uint32Swap()`, and `Mat_uint64Swap()`.

Referenced by `Mat_VarReadDataLinear()`, `Read5()`, `ReadDataSlab2()`, and `ReadDataSlabN()`.

1.2.2.46 int ReadInt8Data (mat_t * *mat*, mat_int8_t * *data*, int *data_type*, int *len*)

Reads from the MAT file *len* elements of data type *data_type* storing them as signed 8-bit integers in *data*.

Parameters

<i>mat</i>	MAT file pointer
<i>data</i>	Pointer to store the output signed 8-bit integer values (<i>len</i> *sizeof(mat_int8_t))
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <i>data_type</i> to read from the file

Return values

<i>Number</i>	of bytes read from the file
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References `mat_t::byteswap`, `mat_t::fp`, `Mat_doubleSwap()`, `Mat_floatSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT8`, `Mat_uint16Swap()`, and `Mat_uint32Swap()`.

Referenced by `Mat_VarReadDataLinear()`, `Read5()`, `ReadDataSlab2()`, and `ReadDataSlabN()`.

1.2.2.47 int ReadNextCell (mat_t * *mat*, matvar_t * *matvar*)

Parameters

<i>mat</i>	MAT file pointer
<i>matvar</i>	MAT variable pointer

Returns

Number of bytes read

References `mat_t::byteswap`, `matvar_t::class_type`, `matvar_t::compression`, `matvar_t::data`, `matvar_t::data_size`, `matvar_t::datapos`, `matvar_t::dims`, `mat_t::fp`, `matvar_t::fpos`, `InflateArrayFlags()`, `InflateDimensions()`, `InflateSkip()`, `InflateVarNameTag()`, `InflateVarTag()`, `matvar_t::isComplex`, `matvar_t::isGlobal`, `matvar_t::isLogical`, `MAT_C_CELL`, `MAT_C_SPARSE`, `MAT_C_STRUCT`, `MAT_F_CLASS_T`, `MAT_F_COMPLEX`, `MAT_F_GLOBAL`, `MAT_F_LOGICAL`, `MAT_T_INT32`, `MAT_T_MATRIX`, `MAT_T_UINT32`, `Mat_uint32Swap()`, `Mat_VarCalloc()`, `Mat_VarFree()`, `matvar_t::name`, `matvar_t::nbytes`, `matvar_t::rank`, `ReadNextCell()`, `ReadNextStructField()`, and `matvar_t::z`.

Referenced by `Mat_VarReadNextInfo5()`, `ReadNextCell()`, and `ReadNextStructField()`.

1.2.2.48 int ReadNextFunctionHandle (`mat_t * mat`, `matvar_t * matvar`)**Parameters**

<i>mat</i>	MAT file pointer
<i>matvar</i>	MAT variable pointer

Returns

Number of bytes read

References `matvar_t::data`, `matvar_t::data_size`, `matvar_t::dims`, `Mat_VarReadNextInfo()`, `matvar_t::nbytes`, and `matvar_t::rank`.

Referenced by `Mat_VarReadNextInfo5()`.

1.2.2.49 int ReadNextStructField (`mat_t * mat`, `matvar_t * matvar`)

Reads the next struct fields (fieldname length,names,data headers for all the fields

Parameters

<i>mat</i>	MAT file pointer
<i>matvar</i>	MAT variable pointer

Returns

Number of bytes read

References `mat_t::byteswap`, `matvar_t::class_type`, `matvar_t::compression`, `COMPRESSION_ZLIB`, `matvar_t::data`, `matvar_t::data_size`, `matvar_t::datapos`, `matvar_t::dims`, `mat_t::fp`, `matvar_t::fpos`, `InflateArrayFlags()`, `InflateDimensions()`, `InflateFieldNameLength()`, `InflateFieldNames()`, `InflateFieldNamesTag()`, `InflateSkip()`, `InflateVarNameTag()`, `InflateVarTag()`, `matvar_t::isComplex`, `matvar_t::isGlobal`, `matvar_t::isLogical`, `MAT_C_CELL`, `MAT_C_SPARSE`, `MAT_C_STRUCT`, `MAT_F_CLASS_T`, `MAT_F_COMPLEX`, `MAT_F_GLOBAL`, `MAT_F_LOGICAL`, `MAT_T_INT32`, `MAT_T_MATRIX`, `MAT_T_UINT32`, `Mat_uint32Swap()`, `Mat_VarFree()`, `matvar_t::name`, `matvar_t::nbytes`, `matvar_t::rank`, `ReadNextCell()`, `ReadNextStructField()`, and `matvar_t::z`.

Referenced by `Mat_VarReadNextInfo5()`, `ReadNextCell()`, and `ReadNextStructField()`.

1.2.2.50 int ReadSingleData (mat_t * mat, float * data, int data_type, int len)

Reads from the MAT file `len` elements of data type `data_type` storing them as float's in `data`.

Parameters

<i>mat</i>	MAT file pointer
<i>data</i>	Pointer to store the output float values (<code>len*sizeof(float)</code>)
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <code>data_type</code> to read from the file

Return values

<i>Number</i>	of bytes read from the file
---------------	-----------------------------

References `mat_t::byteswap`, `mat_t::fp`, `Mat_doubleSwap()`, `Mat_floatSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT8`, `Mat_uint16Swap()`, and `Mat_uint32Swap()`.

Referenced by `Mat_VarReadDataLinear()`, `Read5()`, `ReadDataSlab2()`, and `ReadDataSlabN()`.

1.2.2.51 int ReadUInt16Data (mat_t * mat, mat_uint16_t * data, int data_type, int len)

Reads from the MAT file `len` elements of data type `data_type` storing them as unsigned 16-bit integers in `data`.

Parameters

<i>mat</i>	MAT file pointer
<i>data</i>	Pointer to store the output unsigned 16-bit integer values (<code>len*sizeof(mat_uint16_t)</code>)
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <code>data_type</code> to read from the file

Return values

<i>Number</i>	of bytes read from the file
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References `mat_t::byteswap`, `mat_t::fp`, `Mat_doubleSwap()`, `Mat_floatSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT8`, `Mat_uint16Swap()`, and `Mat_uint32Swap()`.

Referenced by `Read5()`, `ReadDataSlab2()`, and `ReadDataSlabN()`.

1.2.2.52 int ReadUInt32Data (mat_t * mat, mat_uint32_t * data, int data_type, int len)

Reads from the MAT file `len` elements of data type `data_type` storing them as unsigned 32-bit integers in `data`.

Parameters

<i>mat</i>	MAT file pointer
<i>data</i>	Pointer to store the output unsigned 32-bit integer values (<code>len*sizeof(mat_uint32_t)</code>)
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <code>data_type</code> to read from the file

Return values

<i>Number</i>	of bytes read from the file
---------------	-----------------------------

References `mat_t::byteswap`, `mat_t::fp`, `Mat_doubleSwap()`, `Mat_floatSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT8`, `Mat_uint16Swap()`, and `Mat_uint32Swap()`.

Referenced by `Read5()`, `ReadDataSlab2()`, and `ReadDataSlabN()`.

1.2.2.53 int ReadUInt64Data (mat_t * mat, mat_uint64_t * data, int data_type, int len)

Reads from the MAT file `len` elements of data type `data_type` storing them as unsigned 64-bit integers in `data`.

Parameters

<i>mat</i>	MAT file pointer
<i>data</i>	Pointer to store the output unsigned 64-bit integer values (<code>len*sizeof(mat_uint64_t)</code>)
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <code>data_type</code> to read from the file

Return values

<i>Number</i>	of bytes read from the file
---------------	-----------------------------

References `mat_t::byteswap`, `mat_t::fp`, `Mat_doubleSwap()`, `Mat_floatSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `Mat_int64Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT64`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT64`, `MAT_T_UINT8`, `Mat_uint16Swap()`, `Mat_uint32Swap()`, and `Mat_uint64Swap()`.

Referenced by `ReadDataSlab2()`, and `ReadDataSlabN()`.

1.2.2.54 int ReadUInt8Data (mat_t * mat, mat_uint8_t * data, int data_type, int len)

Reads from the MAT file `len` elements of data type `data_type` storing them as unsigned 8-bit integers in `data`.

Parameters

<i>mat</i>	MAT file pointer
<i>data</i>	Pointer to store the output unsigned 8-bit integer values (<code>len*sizeof(mat_uint8_t)</code>)
<i>data_type</i>	one of the <code>matio_types</code> enumerations which is the source data type in the file
<i>len</i>	Number of elements of type <code>data_type</code> to read from the file

Return values

<i>Number</i>	of bytes read from the file
---------------	-----------------------------

References `mat_t::byteswap`, `mat_t::fp`, `Mat_doubleSwap()`, `Mat_floatSwap()`, `Mat_int16Swap()`, `Mat_int32Swap()`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT8`, `Mat_uint16Swap()`, and `Mat_uint32Swap()`.

Referenced by `Read5()`, `ReadDataSlab2()`, and `ReadDataSlabN()`.

1.2.2.55 int Write5 (mat_t * *mat*, matvar_t * *matvar*, int *compress*)

Parameters

<i>mat</i>	MAT file pointer
<i>matvar</i>	pointer to the mat variable
<i>compress</i>	option to compress the variable (only works for numeric types)

Return values

0	on success
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References `matvar_t::class_type`, `COMPRESSION_NONE`, `COMPRESSION_ZLIB`, `matvar_t::data`, `sparse_t::data`, `matvar_t::data_size`, `matvar_t::data_type`, `matvar_t::datapos`, `mat_t::fp`, `ComplexSplit::Im`, `sparse_t::ir`, `matvar_t::isComplex`, `matvar_t::isGlobal`, `matvar_t::isLogical`, `sparse_t::jc`, `MAT_C_CELL`, `MAT_C_CHAR`, `MAT_C_DOUBLE`, `MAT_C_INT16`, `MAT_C_INT32`, `MAT_C_INT64`, `MAT_C_INT8`, `MAT_C_SINGLE`, `MAT_C_SPARSE`, `MAT_C_STRUCT`, `MAT_C_UINT16`, `MAT_C_UINT32`, `MAT_C_UINT64`, `MAT_C_UINT8`, `MAT_F_CLASS_T`, `MAT_F_COMPLEX`, `MAT_F_GLOBAL`, `MAT_F_LOGICAL`, `MAT_T_COMPRESSED`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_MATRIX`, `MAT_T_UINT32`, `matvar_t::name`, `matvar_t::nbytes`, `sparse_t::ndata`, `sparse_t::nir`, `sparse_t::njc`, `matvar_t::rank`, `ComplexSplit::Re`, `WriteCellArrayField()`, `WriteCharData()`, `WriteCompressedCellArrayField()`, `WriteCompressedCharData()`, `WriteCompressedStructField()`, `WriteData()`, `WriteStructField()`, and `matvar_t::z`.

Referenced by `Mat_VarWrite()`.

1.2.2.56 int WriteCellArrayField (mat_t * *mat*, matvar_t * *matvar*)

Parameters

<i>mat</i>	MAT file pointer
<i>matvar</i>	pointer to the mat variable

Return values

0	on success
---	------------

References `mat_t::byteswap`, `matvar_t::class_type`, `matvar_t::data`, `sparse_t::data`, `matvar_t::data_size`, `matvar_t::data_type`, `matvar_t::dims`, `mat_t::fp`, `ComplexSplit::Im`, `sparse_t::ir`, `matvar_t::isComplex`, `matvar_t::isGlobal`, `matvar_t::isLogical`, `sparse_t::jc`, `MAT_C_CELL`, `MAT_C_CHAR`, `MAT_C_DOUBLE`, `MAT_C_INT16`, `MAT_C_INT32`, `MAT_C_INT64`, `MAT_C_INT8`, `MAT_C_SINGLE`, `MAT_C_SPARSE`, `MAT_C_STRUCT`, `MAT_C_UINT16`, `MAT_C_UINT32`, `MAT_C_UINT64`, `MAT_C_UINT8`, `MAT_F_CLASS_T`, `MAT_F_COMPLEX`, `MAT_F_GLOBAL`, `MAT_F_LOGICAL`, `Mat_int32Swap()`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_MATRIX`, `MAT_T_UINT32`, `matvar_t::name`, `matvar_t::nbytes`, `sparse_t::ndata`, `sparse_t::nir`, `sparse_t::njc`, `matvar_t::rank`, `ComplexSplit::Re`, `WriteCellArrayField()`, `WriteCharData()`, `WriteData()`, and `WriteStructField()`.

Referenced by `Write5()`, `WriteCellArrayField()`, and `WriteStructField()`.

1.2.2.57 int WriteCellArrayFieldInfo (mat_t * *mat*, matvar_t * *matvar*)

Parameters

<i>mat</i>	MAT file pointer
<i>matvar</i>	pointer to the mat variable

Returns

number of bytes written

References `mat_t::byteswap`, `matvar_t::class_type`, `matvar_t::data`, `matvar_t::data_size`, `matvar_t::data_type`, `matvar_t::datapos`, `matvar_t::dims`, `mat_t::fp`, `matvar_t::isComplex`, `matvar_t::isGlobal`, `matvar_t::isLogical`, `MAT_C_CELL`, `MAT_C_CHAR`, `MAT_C_DOUBLE`, `MAT_C_INT16`, `MAT_C_INT32`, `MAT_C_INT64`, `MAT_C_INT8`, `MAT_C_SINGLE`, `MAT_C_UINT16`, `MAT_C_UINT32`, `MAT_C_UINT64`, `MAT_C_UINT8`, `MAT_F_CLASS_T`, `MAT_F_COMPLEX`, `MAT_F_GLOBAL`, `MAT_F_LOGICAL`, `Mat_int32Swap()`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_MATRIX`, `MAT_T_UINT32`, `matvar_t::name`, `matvar_t::nbytes`, `matvar_t::rank`, `WriteCellArrayFieldInfo()`, and `WriteEmptyCharData()`.

Referenced by `WriteCellArrayFieldInfo()`, and `WriteInfo5()`.

1.2.2.58 int WriteCharData (mat_t * *mat*, void * *data*, int *N*, int *data_type*)

This function uses the knowledge that the data is part of a character class to avoid some pitfalls with Matlab listed below.

- Matlab character data cannot be unsigned 8-bit integers, it needs at least unsigned 16-bit integers

Parameters

<i>mat</i>	MAT file pointer
<i>data</i>	character data to write
<i>N</i>	Number of elements to write
<i>data_type</i>	character data type (enum <code>matio_types</code>)

Returns

number of bytes written

References `mat_t::fp`, `MAT_T_INT8`, `MAT_T_UINT16`, `MAT_T_UINT8`, and `MAT_T_UTF8`.

Referenced by `Write5()`, `WriteCellArrayField()`, and `WriteStructField()`.

1.2.2.59 int WriteCharDataSlab2 (mat_t * *mat*, void * *data*, int *data_type*, int * *dims*, int * *start*, int * *stride*, int * *edge*)**Parameters**

<i>Writes</i>	a 2-D slab of character data to the MAT file
---------------	--

This function uses the knowledge that the data is part of a character class to avoid some pitfalls with Matlab listed below.

- Matlab character data cannot be unsigned 8-bit integers, it needs at least unsigned 16-bit integers

should return the number of bytes written, but currently returns 0

Parameters

<i>mat</i>	MAT file pointer
<i>data</i>	pointer to the slab of data
<i>data_type</i>	data type of the data (enum <code>matio_types</code>)
<i>dims</i>	dimensions of the dataset
<i>start</i>	index to start writing the data in each dimension
<i>stride</i>	write data every <code>stride</code> elements
<i>edge</i>	number of elements to write in each dimension

Returns

number of byteswritten

References `mat_t::fp`, `MAT_T_INT8`, `MAT_T_UINT16`, `MAT_T_UINT8`, and `MAT_T_UTF8`.

Referenced by `Mat_VarWriteData()`.

1.2.2.60 `size_t WriteCompressedCellArrayField (mat_t * mat, matvar_t * matvar, z_stream * z)`

Parameters

<i>mat</i>	MAT file pointer
<i>matvar</i>	pointer to the mat variable

Returns

number of bytes written to the MAT file

References `matvar_t::class_type`, `matvar_t::data`, `sparse_t::data`, `matvar_t::data_size`, `matvar_t::data_type`, `matvar_t::datapos`, `matvar_t::dims`, `mat_t::fp`, `ComplexSplit::Im`, `sparse_t::ir`, `matvar_t::isComplex`, `matvar_t::isGlobal`, `matvar_t::isLogical`, `sparse_t::jc`, `MAT_C_CELL`, `MAT_C_CHAR`, `MAT_C_DOUBLE`, `MAT_C_INT16`, `MAT_C_INT32`, `MAT_C_INT64`, `MAT_C_INT8`, `MAT_C_SINGLE`, `MAT_C_SPARSE`, `MAT_C_STRUCT`, `MAT_C_UINT16`, `MAT_C_UINT32`, `MAT_C_UINT64`, `MAT_C_UINT8`, `MAT_F_CLASS_T`, `MAT_F_COMPLEX`, `MAT_F_GLOBAL`, `MAT_F_LOGICAL`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_MATRIX`, `MAT_T_UINT32`, `matvar_t::name`, `matvar_t::nbytes`, `sparse_t::ndata`, `sparse_t::nir`, `sparse_t::njc`, `matvar_t::rank`, `ComplexSplit::Re`, `WriteCompressedCellArrayField()`, `WriteCompressedCharData()`, and `WriteCompressedStructField()`.

Referenced by `Write5()`, `WriteCompressedCellArrayField()`, and `WriteCompressedStructField()`.

1.2.2.61 `size_t WriteCompressedCharData (mat_t * mat, z_stream * z, void * data, int N, int data_type)`

This function uses the knowledge that the data is part of a character class to avoid some pitfalls with Matlab listed below.

- Matlab character data cannot be unsigned 8-bit integers, it needs at least unsigned 16-bit integers

Parameters

<i>mat</i>	MAT file pointer
<i>z</i>	pointer to the zlib compression stream
<i>data</i>	character data to write
<i>N</i>	Number of elements to write
<i>data_type</i>	character data type (enum <code>matio_types</code>)

Returns

number of bytes written

References `mat_t::fp`, `MAT_T_INT8`, `MAT_T_UINT16`, `MAT_T_UINT8`, and `MAT_T_UTF8`.

Referenced by `Write5()`, `WriteCompressedCellArrayField()`, and `WriteCompressedStructField()`.

1.2.2.62 `size_t WriteCompressedStructField (mat_t * mat, matvar_t * matvar, z_stream * z)`

Currently does not work for cell arrays or sparse data

Parameters

<i>mat</i>	MAT file pointer
<i>matvar</i>	pointer to the mat variable

Returns

number of bytes written to the MAT file

References `matvar_t::class_type`, `matvar_t::data`, `sparse_t::data`, `matvar_t::data_size`, `matvar_t::data_type`, `matvar_t::datapos`, `matvar_t::dims`, `mat_t::fp`, `ComplexSplit::Im`, `sparse_t::ir`, `matvar_t::isComplex`, `matvar_t::isGlobal`, `matvar_t::isLogical`, `sparse_t::jc`, `MAT_C_CELL`, `MAT_C_CHAR`, `MAT_C_DOUBLE`, `MAT_C_INT16`, `MAT_C_INT32`, `MAT_C_INT64`, `MAT_C_INT8`, `MAT_C_SINGLE`, `MAT_C_SPARSE`, `MAT_C_STRUCT`, `MAT_C_UINT16`, `MAT_C_UINT32`, `MAT_C_UINT64`, `MAT_C_UINT8`, `MAT_F_CLASS_T`, `MAT_F_COMPLEX`, `MAT_F_GLOBAL`, `MAT_F_LOGICAL`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_MATRIX`, `MAT_T_UINT32`, `matvar_t::name`, `matvar_t::nbytes`, `sparse_t::ndata`, `sparse_t::nir`, `sparse_t::njc`, `matvar_t::rank`, `ComplexSplit::Re`, `WriteCompressedCellArrayField()`, `WriteCompressedCharData()`, and `WriteCompressedStructField()`.

Referenced by `Write5()`, `WriteCompressedCellArrayField()`, and `WriteCompressedStructField()`.

1.2.2.63 `int WriteDataSlab2 (mat_t * mat, void * data, int data_type, int * dims, int * start, int * stride, int * edge)`**Parameters**

<i>Writes</i>	a 2-D slab of data to the MAT file
---------------	------------------------------------

should return the number of bytes written, but currently returns 0

Parameters

<i>mat</i>	MAT file pointer
<i>data</i>	pointer to the slab of data

<i>data_type</i>	data type of the data (enum <code>matio_types</code>)
<i>dims</i>	dimensions of the dataset
<i>start</i>	index to start writing the data in each dimension
<i>stride</i>	write data every <code>stride</code> elements
<i>edge</i>	number of elements to write in each dimension

Returns

number of byteswritten

References `mat_t::fp`, `MAT_T_DOUBLE`, `MAT_T_INT16`, `MAT_T_INT32`, `MAT_T_INT64`, `MAT_T_INT8`, `MAT_T_SINGLE`, `MAT_T_UINT16`, `MAT_T_UINT32`, `MAT_T_UINT64`, and `MAT_T_UINT8`.

Referenced by `Mat_VarWriteData()`.

1.2.2.64 `int WriteEmptyCharData (mat_t * mat, int N, int data_type)`

This function uses the knowledge that the data is part of a character class to avoid some pitfalls with Matlab listed below.

- Matlab character data cannot be unsigned 8-bit integers, it needs at least unsigned 16-bit integers

Parameters

<i>mat</i>	MAT file pointer
<i>data</i>	character data to write
<i>N</i>	Number of elements to write
<i>data_type</i>	character data type (enum <code>matio_types</code>)

Returns

number of bytes written

References `mat_t::fp`, `MAT_T_INT8`, `MAT_T_UINT16`, `MAT_T_UINT8`, and `MAT_T_UTF8`.

Referenced by `WriteCellArrayFieldInfo()`, and `WriteInfo5()`.

1.2.2.65 `void WriteInfo5 (mat_t * mat, matvar_t * matvar)`

Parameters

<i>mat</i>	MAT file pointer
<i>matvar</i>	pointer to the mat variable

References `matvar_t::class_type`, `matvar_t::compression`, `COMPRESSION_NONE`, `COMPRESSION_ZLIB`, `matvar_t::data`, `matvar_t::data_size`, `matvar_t::data_type`, `matvar_t::datapos`, `matvar_t::dims`, `mat_t::fp`, `matvar_t::isComplex`, `matvar_t::isGlobal`, `matvar_t::isLogical`, `MAT_C_CELL`, `MAT_C_CHAR`, `MAT_C_DOUBLE`, `MAT_C_INT16`, `MAT_C_INT32`, `MAT_C_INT64`, `MAT_C_INT8`, `MAT_C_SINGLE`, `MAT_C_SPARSE`, `MAT_C_STRUCT`, `MAT_C_UINT16`, `MAT_C_UINT32`, `MAT_C_UINT64`, `MAT_C_UINT8`, `MAT_F_CLASS_T`, `MAT_F_COMPLEX`, `MAT_F_GLOBAL`, `MAT_F_LOGICAL`, `MAT_T_COMPRESSED`, `MAT_T_INT32`, `MAT_T_INT8`, `MAT_T_MATRIX`, `MAT_T_UINT32`, `matvar-`

_t::name, matvar_t::nbytes, matvar_t::rank, WriteCellArrayFieldInfo(), WriteEmptyCharData(), WriteInfo5(), and matvar_t::z.

Referenced by Mat_VarWriteInfo(), and WriteInfo5().

1.2.2.66 int WriteStructField (mat_t * *mat*, matvar_t * *matvar*)

Parameters

<i>mat</i>	MAT file pointer
<i>matvar</i>	pointer to the mat variable

Return values

0	on success
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References mat_t::byteswap, matvar_t::class_type, matvar_t::data, sparse_t::data, matvar_t::data_size, matvar_t::data_type, matvar_t::dims, mat_t::fp, ComplexSplit::Im, sparse_t::ir, matvar_t::isComplex, matvar_t::isGlobal, matvar_t::isLogical, sparse_t::jc, MAT_C_CELL, MAT_C_CHAR, MAT_C_DOUBLE, MAT_C_INT16, MAT_C_INT32, MAT_C_INT64, MAT_C_INT8, MAT_C_SINGLE, MAT_C_SPARSE, MAT_C_STRUCT, MAT_C_UINT16, MAT_C_UINT32, MAT_C_UINT64, MAT_C_UINT8, MAT_F_CLASS_T, MAT_F_COMPLEX, MAT_F_GLOBAL, MAT_F_LOGICAL, Mat_int32Swap(), MAT_T_INT32, MAT_T_INT8, MAT_T_MATRIX, MAT_T_UINT32, matvar_t::name, matvar_t::nbytes, sparse_t::ndata, sparse_t::nir, sparse_t::njc, matvar_t::rank, ComplexSplit::Re, WriteCellArrayField(), WriteCharData(), WriteData(), and WriteStructField().

Referenced by Write5(), WriteCellArrayField(), and WriteStructField().

Chapter 2

Data Structure Documentation

2.1 ComplexSplit Struct Reference

Complex data type using split storage.

Data Fields

- void * [Im](#)
- void * [Re](#)

2.1.1 Detailed Description

Complex data type using split real/imaginary pointers

2.1.2 Field Documentation

2.1.2.1 void* ComplexSplit::Im

Pointer to the imaginary part

Referenced by `Mat_VarCreate()`, `Mat_VarDuplicate()`, `Mat_VarFree()`, `Mat_VarPrint5()`, `Read5()`, `ReadData5()`, `Write5()`, `WriteCellArrayField()`, `WriteCompressedCellArrayField()`, `WriteCompressedStructField()`, and `WriteStructField()`.

2.1.2.2 void* ComplexSplit::Re

Pointer to the real part

Referenced by `Mat_VarCreate()`, `Mat_VarDuplicate()`, `Mat_VarFree()`, `Mat_VarPrint5()`, `Read5()`, `ReadData5()`, `Write5()`, `WriteCellArrayField()`, `WriteCompressedCellArrayField()`, `WriteCompressedStructField()`, and `WriteStructField()`.

2.2 fmat_t Struct Reference

Data Fields

- char **header** [128]
- [mat_t](#) * **mat_t_c_ptr**

2.3 fmatvar_t Struct Reference

Data Fields

- int **class_type**
- int **data_size**
- int **data_type**
- int **dims** [7]
- int **isComplex**
- int **isGlobal**
- int **isLogical**
- [matvar_t](#) * **matvar_t_c_ptr**
- char **name** [64]
- int **nbytes**
- int **rank**

2.4 mat_t Struct Reference

Matlab MAT File information.

Data Fields

- long [bof](#)
- int [byteswap](#)
- char * [filename](#)
- FILE * [fp](#)
- char * [header](#)
- int [mode](#)
- char * [subsys_offset](#)
- int [version](#)

2.4.1 Detailed Description

Contains information about a Matlab MAT file

2.4.2 Field Documentation

2.4.2.1 long mat.t::bof

Beginning of file not including header

Referenced by [Mat_Create\(\)](#), [Mat_Open\(\)](#), and [Mat_VarReadInfo\(\)](#).

2.4.2.2 int mat_t::byteswap

1 if byte swapping is required, 0 else

Referenced by InflateDimensions(), Mat_Create(), Mat_Open(), Mat_VarReadDataLinear(), Mat_VarReadInfo(), Mat_VarReadNextInfo5(), Read5(), ReadCompressedCharData(), ReadCompressedDoubleData(), ReadCompressedInt16Data(), ReadCompressedInt32Data(), ReadCompressedInt64Data(), ReadCompressedInt8Data(), ReadCompressedSingleData(), ReadCompressedUInt16Data(), ReadCompressedUInt32Data(), ReadCompressedUInt64Data(), ReadCompressedUInt8Data(), ReadData5(), ReadDoubleData(), ReadInt16Data(), ReadInt32Data(), ReadInt64Data(), ReadInt8Data(), ReadNextCell(), ReadNextStructField(), ReadSingleData(), ReadUInt16Data(), ReadUInt32Data(), ReadUInt64Data(), ReadUInt8Data(), WriteCellArrayField(), WriteCellArrayFieldInfo(), and WriteStructField().

2.4.2.3 char* mat_t::filename

Name of the file that fp points to

Referenced by Mat_Close(), Mat_Create(), Mat_Open(), and Mat_VarDelete().

2.4.2.4 FILE* mat_t::fp

Pointer to the MAT file

Referenced by InflateArrayFlags(), InflateData(), InflateDataTag(), InflateDataType(), InflateDimensions(), InflateFieldNameLength(), InflateFieldNames(), InflateFieldNamesTag(), InflateSkip(), InflateSkip2(), InflateVarName(), InflateVarNameTag(), InflateVarTag(), Mat_Close(), Mat_Create(), Mat_Open(), Mat_Rewind(), Mat_VarDelete(), Mat_VarRead(), Mat_VarReadDataLinear(), Mat_VarReadInfo(), Mat_VarReadNext(), Mat_VarReadNextInfo5(), Mat_VarWriteData(), Mat_VarWriteInfo(), Read5(), ReadCompressedCharData(), ReadCompressedDataSlab2(), ReadCompressedDataSlabN(), ReadData5(), ReadDataSlab2(), ReadDataSlabN(), ReadDoubleData(), ReadInt16Data(), ReadInt32Data(), ReadInt64Data(), ReadInt8Data(), ReadNextCell(), ReadNextStructField(), ReadSingleData(), ReadUInt16Data(), ReadUInt32Data(), ReadUInt64Data(), ReadUInt8Data(), Write5(), WriteCellArrayField(), WriteCellArrayFieldInfo(), WriteCharData(), WriteCharDataSlab2(), WriteCompressedCellArrayField(), WriteCompressedCharData(), WriteCompressedStructField(), WriteData(), WriteDataSlab2(), WriteEmptyCharData(), WriteInfo5(), and WriteStructField().

2.4.2.5 char* mat_t::header

MAT File header string

Referenced by Mat_Close(), Mat_Create(), Mat_Open(), and Mat_VarDelete().

2.4.2.6 int mat_t::mode

Access mode

Referenced by Mat_Create(), Mat_Open(), and Mat_VarDelete().

2.4.2.7 char* mat_t::subsys_offset

offset

Referenced by Mat_Close(), Mat_Create(), and Mat_Open().

2.4.2.8 int mat_t::version

MAT File version

Referenced by Mat_Create(), Mat_Open(), Mat_Rewind(), Mat_VarPrint(), Mat_VarReadData(), Mat_VarReadDataLinear(), Mat_VarReadNextInfo(), Mat_VarWrite(), and Mat_VarWriteInfo().

2.5 matvar_t Struct Reference

Matlab variable information.

Data Fields

- int [class_type](#)
- int [compression](#)
- void * [data](#)
- int [data_size](#)
- int [data_type](#)
- long [datapos](#)
- int * [dims](#)
- [mat_t](#) * [fp](#)
- long [fpos](#)
- int [isComplex](#)
- int [isGlobal](#)
- int [isLogical](#)
- int [mem_conserve](#)
- char * [name](#)
- int [nbytes](#)
- int [rank](#)
- [z_stream](#) * [z](#)

2.5.1 Detailed Description

Contains information about a Matlab variable

2.5.2 Field Documentation

2.5.2.1 int matvar_t::class_type

Class type in Matlab(mxDOUBLE_CLASS, etc)

Referenced by Mat_VarCalloc(), Mat_VarCreate(), Mat_VarDuplicate(), Mat_VarFree(), Mat_VarGetNumberOfFields(), Mat_VarGetSize(), Mat_VarGetStructs(), Mat_VarPrint5(), Mat_VarReadDataLinear(), Mat_VarReadNextInfo5(), Mat_VarWriteData(), Read5(), ReadData5(), ReadNextCell(), ReadNextStructField(), Write5(), WriteCellArrayField(), WriteCellArrayFieldInfo(), WriteCompressedCellArrayField(), WriteCompressedStructField(), WriteInfo5(), and WriteStructField().

2.5.2.2 int matvar_t::compression

Compression (0=>None,1=>ZLIB)

Referenced by Mat_VarCalloc(), Mat_VarCreate(), Mat_VarDuplicate(), Mat_VarFree(), Mat_VarReadDataLinear(), Mat_VarReadNextInfo5(), Mat_VarWriteData(), Read5(), ReadData5(), ReadNextCell(), ReadNextStructField(), and WriteInfo5().

2.5.2.3 void* matvar_t::data

Pointer to the data

Referenced by Mat_VarAddStructField(), Mat_VarCalloc(), Mat_VarCreate(), Mat_VarDuplicate(), Mat_VarFree(), Mat_VarGetCell(), Mat_VarGetCells(), Mat_VarGetCellsLinear(), Mat_VarGetSize(), Mat_VarGetStructField(), Mat_VarGetStructs(), Mat_VarGetStructsLinear(), Mat_VarPrint5(), Mat_VarReadNextInfo5(), Read5(), ReadNextCell(), ReadNextFunctionHandle(), ReadNextStructField(), Write5(), WriteCellArrayField(), WriteCellArrayFieldInfo(), WriteCompressedCellArrayField(), WriteCompressedStructField(), WriteInfo5(), and WriteStructField().

2.5.2.4 int matvar_t::data_size

Bytes / element for the data

Referenced by Mat_VarCalloc(), Mat_VarCreate(), Mat_VarDuplicate(), Mat_VarFree(), Mat_VarGetNumberOfFields(), Mat_VarGetSize(), Mat_VarGetStructs(), Mat_VarGetStructsLinear(), Mat_VarPrint5(), Mat_VarReadDataLinear(), Mat_VarReadNextInfo5(), Read5(), ReadData5(), ReadNextCell(), ReadNextFunctionHandle(), ReadNextStructField(), Write5(), WriteCellArrayField(), WriteCellArrayFieldInfo(), WriteCompressedCellArrayField(), WriteCompressedStructField(), WriteInfo5(), and WriteStructField().

2.5.2.5 int matvar_t::data_type

Data type(MAT_T_*)

Referenced by Mat_VarCalloc(), Mat_VarCreate(), Mat_VarDuplicate(), Mat_VarPrint5(), Mat_VarReadDataLinear(), Mat_VarReadNextInfo5(), Mat_VarWriteData(), Read5(), ReadData5(), Write5(), WriteCellArrayField(), WriteCellArrayFieldInfo(), WriteCompressedCellArrayField(), WriteCompressedStructField(), WriteInfo5(), and WriteStructField().

2.5.2.6 long matvar_t::datapos

Offset from the beginning of the MAT file to the data

Referenced by Mat_VarCalloc(), Mat_VarDuplicate(), Mat_VarReadDataLinear(), Mat_VarReadNextInfo5(), Mat_VarWriteData(), Read5(), ReadData5(), ReadNextCell(), ReadNextStructField(), Write5(), WriteCellArrayFieldInfo(), WriteCompressedCellArrayField(), WriteCompressedStructField(), and WriteInfo5().

2.5.2.7 int* matvar_t::dims

Array of lengths for each dimension

Referenced by Mat_VarAddStructField(), Mat_VarCalloc(), Mat_VarCreate(), Mat_VarDuplicate(), Mat_VarFree(), Mat_VarGetCell(), Mat_VarGetCells(), Mat_VarGetNumberOfFields(), Mat_VarGetSize(), Mat_VarGetStructField(), Mat_VarGetStructs(), Mat_VarGetStructsLinear(), Mat_VarPrint5(), Mat_VarRead-

DataLinear(), Mat_VarReadNextInfo5(), Mat_VarWriteData(), Read5(), ReadData5(), ReadNextCell(), ReadNextFunctionHandle(), ReadNextStructField(), Write5(), WriteCellArrayField(), WriteCellArrayFieldInfo(), WriteCompressedCellArrayField(), WriteCompressedStructField(), WriteInfo5(), and WriteStructField().

2.5.2.8 `mat_t* matvar_t::fp`

Pointer to the MAT file structure ([mat_t](#))

Referenced by Mat_VarCalloc(), Mat_VarPrint(), Mat_VarReadNextInfo5(), and Read5().

2.5.2.9 `long matvar_t::fpos`

Offset from the beginning of the MAT file to the variable

Referenced by Mat_VarCalloc(), Mat_VarDuplicate(), Mat_VarReadNextInfo5(), ReadNextCell(), and ReadNextStructField().

2.5.2.10 `int matvar_t::isComplex`

non-zero if the data is complex, 0 if real

Referenced by Mat_VarCalloc(), Mat_VarCreate(), Mat_VarDuplicate(), Mat_VarFree(), Mat_VarPrint5(), Mat_VarReadNextInfo5(), Read5(), ReadData5(), ReadNextCell(), ReadNextStructField(), Write5(), WriteCellArrayField(), WriteCellArrayFieldInfo(), WriteCompressedCellArrayField(), WriteCompressedStructField(), WriteInfo5(), and WriteStructField().

2.5.2.11 `int matvar_t::isGlobal`

non-zero if the variable is global

Referenced by Mat_VarCalloc(), Mat_VarCreate(), Mat_VarDuplicate(), Mat_VarReadNextInfo5(), ReadNextCell(), ReadNextStructField(), Write5(), WriteCellArrayField(), WriteCellArrayFieldInfo(), WriteCompressedCellArrayField(), WriteCompressedStructField(), WriteInfo5(), and WriteStructField().

2.5.2.12 `int matvar_t::isLogical`

non-zero if the variable is logical

Referenced by Mat_VarCalloc(), Mat_VarCreate(), Mat_VarDuplicate(), Mat_VarReadNextInfo5(), ReadNextCell(), ReadNextStructField(), Write5(), WriteCellArrayField(), WriteCellArrayFieldInfo(), WriteCompressedCellArrayField(), WriteCompressedStructField(), WriteInfo5(), and WriteStructField().

2.5.2.13 `int matvar_t::mem_conserve`

1 if Memory was conserved with data

Referenced by Mat_VarCalloc(), Mat_VarCreate(), Mat_VarDuplicate(), Mat_VarFree(), Mat_VarGetStructs(), Mat_VarGetStructsLinear(), and Mat_VarReadNextInfo5().

2.5.2.14 `char* matvar_t::name`

Name of the variable

Referenced by `InflateDataTag()`, `InflateSkip2()`, `Mat_VarCalloc()`, `Mat_VarCreate()`, `Mat_VarDelete()`, `Mat_VarDuplicate()`, `Mat_VarFree()`, `Mat_VarGetStructField()`, `Mat_VarPrint5()`, `Mat_VarReadInfo()`, `Mat_VarReadNextInfo5()`, `Read5()`, `ReadNextCell()`, `ReadNextStructField()`, `Write5()`, `WriteCellArrayField()`, `WriteCellArrayFieldInfo()`, `WriteCompressedCellArrayField()`, `WriteCompressedStructField()`, `WriteInfo5()`, and `WriteStructField()`.

2.5.2.15 int matvar_t::nbytes

Number of bytes for the MAT variable

Referenced by `Mat_VarAddStructField()`, `Mat_VarCalloc()`, `Mat_VarCreate()`, `Mat_VarDuplicate()`, `Mat_VarFree()`, `Mat_VarGetNumberOfFields()`, `Mat_VarGetSize()`, `Mat_VarGetStructField()`, `Mat_VarGetStructs()`, `Mat_VarGetStructsLinear()`, `Mat_VarPrint5()`, `Mat_VarReadNextInfo5()`, `Read5()`, `ReadNextCell()`, `ReadNextFunctionHandle()`, `ReadNextStructField()`, `Write5()`, `WriteCellArrayField()`, `WriteCellArrayFieldInfo()`, `WriteCompressedCellArrayField()`, `WriteCompressedStructField()`, `WriteInfo5()`, and `WriteStructField()`.

2.5.2.16 int matvar_t::rank

Rank (Number of dimensions) of the data

Referenced by `Mat_VarAddStructField()`, `Mat_VarCalloc()`, `Mat_VarCreate()`, `Mat_VarDuplicate()`, `Mat_VarGetCell()`, `Mat_VarGetCells()`, `Mat_VarGetCellsLinear()`, `Mat_VarGetNumberOfFields()`, `Mat_VarGetSize()`, `Mat_VarGetStructField()`, `Mat_VarGetStructs()`, `Mat_VarGetStructsLinear()`, `Mat_VarPrint5()`, `Mat_VarReadDataLinear()`, `Mat_VarReadNextInfo5()`, `Mat_VarWriteData()`, `Read5()`, `ReadData5()`, `ReadNextCell()`, `ReadNextFunctionHandle()`, `ReadNextStructField()`, `Write5()`, `WriteCellArrayField()`, `WriteCellArrayFieldInfo()`, `WriteCompressedCellArrayField()`, `WriteCompressedStructField()`, `WriteInfo5()`, and `WriteStructField()`.

2.5.2.17 z_stream* matvar_t::z

zlib compression state

Referenced by `InflateArrayFlags()`, `InflateDataTag()`, `InflateDimensions()`, `InflateFieldNameLength()`, `InflateFieldNames()`, `InflateFieldNamesTag()`, `InflateSkip2()`, `InflateVarName()`, `InflateVarNameTag()`, `InflateVarTag()`, `Mat_VarCalloc()`, `Mat_VarDuplicate()`, `Mat_VarFree()`, `Mat_VarReadDataLinear()`, `Mat_VarReadNextInfo5()`, `Mat_VarWriteData()`, `Read5()`, `ReadData5()`, `ReadNextCell()`, `ReadNextStructField()`, `Write5()`, and `WriteInfo5()`.

2.6 sparse_t Struct Reference

sparse data information

Data Fields

- void * [data](#)
- int * [ir](#)
- int * [jc](#)
- int [ndata](#)
- int [nir](#)
- int [njc](#)
- int [nzmax](#)

2.6.1 Detailed Description

Contains information and data for a sparse matrix

2.6.2 Field Documentation

2.6.2.1 `void* sparse_t::data`

Array of data elements

Referenced by `Mat_VarFree()`, `Mat_VarPrint5()`, `Read5()`, `Write5()`, `WriteCellArrayField()`, `WriteCompressedCellArrayField()`, `WriteCompressedStructField()`, and `WriteStructField()`.

2.6.2.2 `int* sparse_t::ir`

Array of size `nzmax` where `ir[k]` is the row of `data[k]`. $0 \leq k \leq nzmax$

Referenced by `Mat_VarFree()`, `Mat_VarPrint5()`, `Read5()`, `Write5()`, `WriteCellArrayField()`, `WriteCompressedCellArrayField()`, `WriteCompressedStructField()`, and `WriteStructField()`.

2.6.2.3 `int* sparse_t::jc`

Array size `N+1` (`N` is number of columns) with `jc[k]` being the index into `ir/data` of the first non-zero element for row `k`.

Referenced by `Mat_VarFree()`, `Mat_VarPrint5()`, `Read5()`, `Write5()`, `WriteCellArrayField()`, `WriteCompressedCellArrayField()`, `WriteCompressedStructField()`, and `WriteStructField()`.

2.6.2.4 `int sparse_t::ndata`

Number of complex/real data values

Referenced by `Mat_VarPrint5()`, `Read5()`, `Write5()`, `WriteCellArrayField()`, `WriteCompressedCellArrayField()`, `WriteCompressedStructField()`, and `WriteStructField()`.

2.6.2.5 `int sparse_t::nir`

number of elements in `ir`

Referenced by `Read5()`, `Write5()`, `WriteCellArrayField()`, `WriteCompressedCellArrayField()`, `WriteCompressedStructField()`, and `WriteStructField()`.

2.6.2.6 `int sparse_t::njc`

Number of elements in `jc`

Referenced by `Mat_VarPrint5()`, `Read5()`, `Write5()`, `WriteCellArrayField()`, `WriteCompressedCellArrayField()`, `WriteCompressedStructField()`, and `WriteStructField()`.

2.6.2.7 `int sparse_t::nzmax`

Maximum number of non-zero elements

Referenced by Read5().