

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 Typedef Documentation

1.1.1.1 typedef struct mat_t mat_t

Contains information about a Matlab MAT file

1.1.1.2 typedef struct matvar_t matvar_t

Contains information about a Matlab variable

1.1.1.3 typedef struct sparse_t sparse_t

Contains information and data for a sparse matrix

1.1.2 Enumeration Type Documentation

1.1.2.1 anonymous enum

matio lookup type

Enumerator:

BY_NAME Lookup by name
BY_INDEX Lookup by index

1.1.2.2 enum mat_acc

MAT file access types

Enumerator:

MAT_ACC_RDONLY Read only file access.
MAT_ACC_RDWR Read/Write file access.

1.1.2.3 enum mat_ft

MAT file versions

Enumerator:

MAT_FT_MAT5 Matlab level-5 file.
MAT_FT_MAT4 Version 4 file.

1.1.2.4 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.

1.1.2.5 enum matio_compression

Matlab compression options

Enumerator:

COMPRESSION_NONE No compression.

COMPRESSION_ZLIB zlib compression

1.1.2.6 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.

1.1.2.7 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.

1.1.3 Function Documentation

1.1.3.1 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	1 whitetableShadegray
<i>dims</i>	dimensions of the variable	
<i>subs</i>	Dimension subscripts	

Returns

Single (linear) subscript

1.1.3.2 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	1 whitetableShadegray
<i>dims</i>	dimensions of the variable	
<i>index</i>	linear index	

Returns

Array of dimension subscripts

1.1.3.3 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	1 whitetableShadegray
------------	-------------------------	-----------------------

Return values

0	1 whitetableShadegray
---	-----------------------

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

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

1.1.3.4 `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	1 whitetableShadegray
<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()`.

1.1.3.5 `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	1 whitetableShadegray
<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()`.

1.1.3.6 `int Mat.Rewind ( mat_t * mat )`

Rewinds a Matlab MAT file to the first variable

Parameters

<i>mat</i>	Pointer to the MAT file	1 whitetableShadegray
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Return values

0	on success	1 whitetableShadegray
---	------------	-----------------------

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

1.1.3.7 `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 (<code>MAT_C_*</code>)	1 whitetableShadegray
-------------------	--	-----------------------

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()`.

1.1.3.8 `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	1 whitetableShadegray
<i>fields</i>	Array of fields to be added	

Return values

0	on success	1 whitetableShadegray
---	------------	-----------------------

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

1.1.3.9 `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()`.

1.1.3.10 `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	1 whitetableShadegray
<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: • 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(), matvar_t::mem_conserve, MEM_CONSERVE, matvar_t::name, matvar_t::nbytes, matvar_t::rank, and ComplexSplit::Re.

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

Parameters

<i>mat</i>	Pointer to the mat_t file structure	1 whitetableShadegray
<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.

1.1.3.12 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	1 whitetableShadegray
<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().

1.1.3.13 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	1 whitetableShadegray
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References `matvar_t::class_type`, `matvar_t::compression`, `COMPRESSION_ZLIB`, `sparse_t::data`, `matvar_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()`.

1.1.3.14 `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	1 whitetableShadegray
<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`.

1.1.3.15 `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	1 whitetableShadegray
<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`.

1.1.3.16 `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	1 whitetableShadegray
<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`.

1.1.3.17 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	1 whitetableShadegray
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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`.

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

<i>matvar</i>	matlab variable	1 whitetableShadegray
---------------	-----------------	-----------------------

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()`.

1.1.3.19 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	1 whitetableShadegray
<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 name_or_index 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.

1.1.3.20 **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	1 whitetableShadegray
<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.	
<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.

1.1.3.21 **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	1 whitetableShadegray
<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.

1.1.3.22 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 matvar_t structure	1 whitetableShadegray
<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\(\)](#).

1.1.3.23 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	1 whitetableShadegray
<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\(\)](#).

1.1.3.24 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	1 whitetableShadegray
<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	1 whitetableShadegray
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References [MAT_FT_MAT4](#), [ReadData5\(\)](#), and [mat_t::version](#).

1.1.3.25 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	1 whitetableShadegray
<i>matvar</i>	Variable whose data is to be read	

Returns

non-zero on error

1.1.3.26 `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 indexing mode. The variable must have been read by `Mat_VarReadInfo`.

Parameters

<i>mat</i>	MAT file to read data from	1 whitetableShadegray
<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	1 whitetableShadegray
---	------------	-----------------------

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`.

1.1.3.27 `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	1 whitetableShadegray
<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()`.

1.1.3.28 `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	1 whitetableShadegray
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Returns

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

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

Referenced by `Mat_VarDelete()`.

1.1.3.29 `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	1 whitetableShadegray
------------	-------------------------	-----------------------

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()`.

1.1.3.30 `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	1 whitetableShadegray
<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	1 whitetableShadegray
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References `MAT_FT_MAT4`, `mat_t::version`, and `Write5()`.

Referenced by Mat_VarDelete().

1.1.3.31 `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	1 whitetableShadegray
<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	1 whitetableShadegray
---	------------	-----------------------

References `matvar_t::class_type`, `matvar_t::compression`, `COMPRESSION_NONE`, `COMPRESSION_ZLIB`, `matvar_t::data_type`, `matvar_t::datapoints`, `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`.

1.1.3.32 `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	1 whitetableShadegray
<i>matvar</i>	MAT variable information to write	

Return values

0	on success	1 whitetableShadegray
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References `mat_t::fp`, `MAT_FT_MAT4`, `mat_t::version`, and `WriteInfo5()`.

1.2 Internal Functions

Defines

- `#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 Function Documentation

1.2.1.1 `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	1 whitetableShadegray
<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()`.

1.2.1.2 `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	1 whitetableShadegray
<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()`.

1.2.1.3 `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	lwhitetableShadegray
<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`.

1.2.1.4 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	lwhitetableShadegray
<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()`.

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

`buf` must hold at least $(8+4*\text{rank})$ 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 them in `buf`.

Parameters

<i>mat</i>	Pointer to the MAT file	lwhitetableShadegray
<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()`.

1.2.1.6 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	l whitetableShadegray
<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()`.

1.2.1.7 `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	l whitetableShadegray
<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()`.

1.2.1.8 `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	l whitetableShadegray
<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()`.

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

<i>mat</i>	Pointer to the MAT file	1 whitetableShadegray
<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().

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

<i>mat</i>	Pointer to the MAT file	1 whitetableShadegray
<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.

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

<i>mat</i>	Pointer to the MAT file	1 whitetableShadegray
<i>z</i>	zlib compression stream	
<i>data_type</i>	Data type (matio_types enumerations)	
<i>len</i>	Number of elements of datatype <i>data_type</i> 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().

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

<i>mat</i>	Pointer to the MAT file	1 whitetableShadegray
<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()`.

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

<i>mat</i>	Pointer to the MAT file	1 whitetableShadegray
<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()`.

1.2.1.14 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	1 whitetableShadegray
<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()`.

1.2.1.15 double Mat_doubleSwap (double * a)**Parameters**

<i>a</i>	pointer to integer to swap	1 whitetableShadegray
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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().

1.2.1.16 float Mat_floatSwap (float * *a*)

Parameters

<i>a</i>	pointer to integer to swap	1 whitetableShadegray
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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().

1.2.1.17 mat_int16_t Mat_int16Swap (mat_int16_t * *a*)

Parameters

<i>a</i>	pointer to integer to swap	1 whitetableShadegray
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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().

1.2.1.18 mat_int32_t Mat_int32Swap (mat_int32_t * *a*)

Parameters

<i>a</i>	pointer to integer to swap	1 whitetableShadegray
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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().

1.2.1.19 `mat_int64_t Mat_int64Swap ( mat_int64_t * a )`

Parameters

<i>a</i>	pointer to integer to swap	1 whitetableShadegray
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Returns

the swapped integer

References swap.

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

1.2.1.20 `mat_uint16_t Mat_uint16Swap ( mat_uint16_t * a )`

Parameters

<i>a</i>	pointer to integer to swap	1 whitetableShadegray
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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().

1.2.1.21 `mat_uint32_t Mat_uint32Swap ( mat_uint32_t * a )`

Parameters

<i>a</i>	pointer to integer to swap	1 whitetableShadegray
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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().

1.2.1.22 `mat_uint64_t Mat_uint64Swap ( mat_uint64_t * a )`

Parameters

<i>a</i>	pointer to integer to swap	l whitetableShadegray
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Returns

the swapped integer

References swap.

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

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

Parameters

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

References `matvar_t::class_type`, `sparse_t::data`, `matvar_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()`.

1.2.1.24 `matvar_t* Mat_VarReadNextInfo5 ( mat_t * mat )`

Parameters

<i>mat</i>	MAT file pointer pointer to the MAT variable or NULL	l whitetableShadegray
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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`, `matvar_t::fp`, `mat_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()`.

1.2.1.25 void Read5 (mat_t * mat, matvar_t * matvar)**Parameters**

<i>mat</i>	MAT file pointer	1 whitetableShadegray
<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`, `sparse_t::data`, `matvar_t::data`, `matvar_t::data_size`, `matvar_t::data_type`, `matvar_t::datapos`, `matvar_t::dims`, `matvar_t::fp`, `mat_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()`.

1.2.1.26 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	1 whitetableShadegray
<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	1 whitetableShadegray
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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()`.

1.2.1.27 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	1 whitetableShadegray
<i>z</i>	zlib compression stream	
<i>data</i>	Pointer to store the output data	

<i>class_type</i>	Type of data class (matio_classes enumerations)
<i>data_type</i>	Datatype of the stored data (matio_types 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	1 whitetableShadegray
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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()`.

1.2.1.28 `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	1 whitetableShadegray
<i>z</i>	zlib compression stream	
<i>data</i>	Pointer to store the output data	
<i>class_type</i>	Type of data class (matio_classes enumerations)	
<i>data_type</i>	Datatype of the stored data (matio_types 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	1 whitetableShadegray
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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()`.

1.2.1.29 `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	l whitetableShadegray
<i>z</i>	Pointer to the zlib stream for inflation	
<i>data</i>	Pointer to store the output double values (len*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 <code>data_type</code> to read from the file	

Return values

<i>Number</i>	of bytes read from the file	l whitetableShadegray
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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()`.

1.2.1.30 `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	l whitetableShadegray
<i>z</i>	Pointer to the zlib stream for inflation	
<i>data</i>	Pointer to store the output signed 16-bit integer values (len*sizeof(mat_int16_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	l whitetableShadegray
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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()`.

1.2.1.31 `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	l whitetableShadegray
<i>z</i>	Pointer to the zlib stream for inflation	
<i>data</i>	Pointer to store the output signed 32-bit integer values (len*sizeof(mat_int32_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	1 whitetableShadegray
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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()`.

1.2.1.32 `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	1 whitetableShadegray
<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	1 whitetableShadegray
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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()`.

1.2.1.33 `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	1 whitetableShadegray
<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	1 whitetableShadegray
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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()`.

1.2.1.34 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	1 whitetableShadegray
<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	1 whitetableShadegray
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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()`.

1.2.1.35 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	1 whitetableShadegray
<i>z</i>	Pointer to the zlib stream for inflation	
<i>data</i>	Pointer to store the output n 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	1 whitetableShadegray
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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().

1.2.1.36 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	1 whitetableShadegray
<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 <i>data_type</i> to read from the file	

Return values

<i>Number</i>	of bytes read from the file	1 whitetableShadegray
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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().

1.2.1.37 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	1 whitetableShadegray
<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 <i>data_type</i> to read from the file	

Return values

<i>Number</i>	of bytes read from the file	1 whitetableShadegray
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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 ReadCompressedDataSlab2(), and ReadCompressedDataSlabN().

1.2.1.38 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	1 whitetableShadegray
<i>z</i>	Pointer to the zlib stream for inflation	
<i>data</i>	Pointer to store the output 8-bit integer values (<i>len</i> *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 <i>data_type</i> to read from the file	

Return values

<i>Number</i>	of bytes read from the file	1 whitetableShadegray
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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()`.

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

Parameters

<i>mat</i>	MAT file pointer	1 whitetableShadegray
<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 <i>stride</i> elements in each dimension	
<i>edge</i>	number of elements to read in each dimension	

Return values

<i>0</i>	on success	1 whitetableShadegray
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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()`.

1.2.1.40 `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	1 whitetableShadegray
<i>data</i>	Pointer to store the output data	
<i>class_type</i>	Type of data class (matio_classes enumerations)	
<i>data_type</i>	Datatype of the stored data (matio_types 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	1 whitetableShadegray
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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()`.

1.2.1.41 `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	1 whitetableShadegray
<i>data</i>	Pointer to store the output data	
<i>class_type</i>	Type of data class (matio_classes enumerations)	
<i>data_type</i>	Datatype of the stored data (matio_types 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	1 whitetableShadegray
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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()`.

1.2.1.42 `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	1 whitetableShadegray
<i>data</i>	Pointer to store the output double values (len*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 <code>data_type</code> to read from the file	

Return values

<i>Number</i>	of bytes read from the file	1 whitetableShadegray
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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()`.

1.2.1.43 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	1 whitetableShadegray
<i>data</i>	Pointer to store the output signed 16-bit integer values (len*sizeof(mat_int16_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	1 whitetableShadegray
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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()`.

1.2.1.44 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	1 whitetableShadegray
<i>data</i>	Pointer to store the output signed 32-bit integer values (len*sizeof(mat_int32_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	1 whitetableShadegray
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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()`.

1.2.1.45 `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	1 whitetableShadegray
<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	1 whitetableShadegray
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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()`.

1.2.1.46 `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	1 whitetableShadegray
<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	1 whitetableShadegray
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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()`.

1.2.1.47 int ReadNextCell (mat_t * *mat*, matvar_t * *matvar*)**Parameters**

<i>mat</i>	MAT file pointer	1 whitetableShadegray
<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().

1.2.1.48 int ReadNextFunctionHandle (mat_t * *mat*, matvar_t * *matvar*)**Parameters**

<i>mat</i>	MAT file pointer	1 whitetableShadegray
<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().

1.2.1.49 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	1 whitetableShadegray
<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().

1.2.1.50 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	1 whitetableShadegray
<i>data</i>	Pointer to store the output float values (<i>len</i> *sizeof(float))	
<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	1 whitetableShadegray
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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()`.

1.2.1.51 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	1 whitetableShadegray
<i>data</i>	Pointer to store the output unsigned 16-bit integer values (<i>len</i> *sizeof(mat_uint16_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	1 whitetableShadegray
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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()`.

1.2.1.52 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	1 whitetableShadegray
<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	1 whitetableShadegray
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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()`.

1.2.1.53 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	1 whitetableShadegray
<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	1 whitetableShadegray
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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 `ReadDataSlab2()`, and `ReadDataSlabN()`.

1.2.1.54 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	1 whitetableShadegray
<i>data</i>	Pointer to store the output unsigned 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	1 whitetableShadegray
---------------	-----------------------------	-----------------------

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()`.

1.2.1.55 `int Write5 ( mat_t * mat, matvar_t * matvar, int compress )`

Parameters

<i>mat</i>	MAT file pointer	1 whitetableShadegray
<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	1 whitetableShadegray
---	------------	-----------------------

References `matvar_t::class_type`, `COMPRESSION_NONE`, `COMPRESSION_ZLIB`, `sparse_t::data`, `matvar_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_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()`.

1.2.1.56 `int WriteCellArrayField ( mat_t * mat, matvar_t * matvar )`

Parameters

<i>mat</i>	MAT file pointer	1 whitetableShadegray
<i>matvar</i>	pointer to the mat variable	

Return values

0	on success	1 whitetableShadegray
---	------------	-----------------------

References `mat_t::byteswap`, `matvar_t::class_type`, `sparse_t::data`, `matvar_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()`.

1.2.1.57 int WriteCellArrayFieldInfo (mat_t * *mat*, matvar_t * *matvar*)**Parameters**

<i>mat</i>	MAT file pointer	1 whitetableShadegray
<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()`.

1.2.1.58 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	1 whitetableShadegray
<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()`.

1.2.1.59 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	1 whitetableShadegray
---------------	--	-----------------------

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	1 whitetableShadegray
<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()`.

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

Parameters

<i>mat</i>	MAT file pointer	1 whitetableShadegray
<i>matvar</i>	pointer to the mat variable	

Returns

number of bytes written to the MAT file

References `matvar_t::class_type`, `sparse_t::data`, `matvar_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()`.

1.2.1.61 `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	1 whitetableShadegray
<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()`.

1.2.1.62 `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	1 whitetableShadegray
<i>matvar</i>	pointer to the mat variable	

Returns

number of bytes written to the MAT file

References `matvar_t::class_type`, `sparse_t::data`, `matvar_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()`.

1.2.1.63 `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	1 whitetableShadegray
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should return the number of bytes written, but currently returns 0

Parameters

<i>mat</i>	MAT file pointer	1 whitetableShadegray
<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()`.

1.2.1.64 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	1 whitetableShadegray
<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()`.

1.2.1.65 void WriteInfo5 (mat_t * mat, matvar_t * matvar)**Parameters**

<i>mat</i>	MAT file pointer	1 whitetableShadegray
<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()`.

1.2.1.66 int WriteStructField (mat_t * mat, matvar_t * matvar)**Parameters**

<i>mat</i>	MAT file pointer	1 whitetableShadegray
<i>matvar</i>	pointer to the mat variable	

Return values

0	on success	1 whitetableShadegray
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References `mat_t::byteswap`, `matvar_t::class_type`, `sparse_t::data`, `matvar_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_VarAlloc(), 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_VarAlloc(), 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_VarAlloc(), 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_VarAlloc(), 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_VarAlloc(), 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_VarReadDataLinear()`, `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]`. $0 \leq k \leq \text{nzmax}$

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().

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