

rdbxx

1.0.7_02

Generated by Doxygen 1.8.15

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Chapter 1

RDB User's Guide

1.1 Copyright

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Chapter 2

Basic Interface

2.1 Creating RDB objects for reading or writing

The [RDB](#) library allows the user to read or write [RDB](#) formatted data. Users may attach an [RDB](#) object to either a file or a C++ stream. The object may be associated with a file or stream either at the time it is created, via the constructors [RDB::RDB](#), or after the object is created, via the [RDB::open](#) methods.

```
// Open for input, using explicit open mode.
RDB irdb( "input.rdb", ios::in );
// Open for input, using default open mode.
RDB irdb( "input.rdb" );
// Open for input, using a pointer to an istream.
RDB irdb( &cin );
// Open for output. The explicit open mode is required, otherwise
// it will default to open for input.
RDB ordb( "output.rdb", ios::out );
// Create the object with no file or stream specified.
RDB ordb;
// Specify the stream via the RDB::open(ostream) method.
ordb.open( &cout );
// Or, specify the file via the RDB::open(string,ios::openmode) method.
ordb.open( "output.rdb", ios::out );
```

2.2 RDB header and table information

Information about the number of comments, columns, and rows are available using the [RDB::nComments](#), [RDB::nColumns\(\)](#), and [RDB::nRows](#) methods. It is important to note that the first two are trivial queries, but determining the number of rows involves reading the entire table.

```
irdb.open( &cin );
for ( size_t idx = 0; idx < irdb.nColumns(); idx++ ) {
    cout << idx << ": " << irdb.getColumn( idx )->getName( ) << endl;
}
// This could take awhile...
cout << "There are " << irdb.nRows( ) << " rows" << endl;
```

2.3 Accessing comments and columns

An [RDB](#) object allows the user to add comments and columns as well as access existing comments and columns. When an [RDB](#) object is opened for reading, the [RDB](#) header is parsed for comments and columns. Any comment or column

found is placed in the [RDB](#) object. When an [RDB](#) object is opened for writing, no comments or columns are present in the object.

To access an existing comment or column the user may reference the comment or column by index. Comments/Columns are indexed beginning at 0. If the user is requesting an index beyond the range of comments/columns contained in the [RDB](#) object, an `RDBErrNotFound` object is thrown or `RDB::_errno` is set. If the user is adding a comment/column and specifies an index beyond the range contained in the [RDB](#) object, the comment/column is added to the end of the list.

It is important to note that comments are returned as references to the underlying object while columns are returned as pointers to the underlying object. This is to allow columns of different datatypes to be stored in the same [RDB](#) object container.

```
// Foreach column...
for ( size_t idx = 0; idx < irdb.nColumns(); idx++ ) {
    // Print the name and definition.
    cout << irdb.getColumn( idx )->getName( ) << " | "
         << irdb.getColumn( idx )->getDef( ) << endl;
    // Note the use of the '->', pointer dereference, operator.
}
// Set the error handling behavior to throw exceptions.
irdb.setThrow( true );
try {
    // Ask for on comment beyond what we have.
    irdb.getComment( irdb.nComments( ) );
    // NOTE: the use of the '.', dot, operator.
} catch ( RDBErr& rdberr ) {
    // Catch the exception that will be thrown.
    cerr << "This will fail because comment indices start at 0." << endl;
}
// Here we check how many comments there are and then add one to
// the end.
size_t ncomments_before = irdb.nComments( );
irdb.setComment( "Add one comment to the end..." );
if ( ncomments_before != irdb.nComments( ) ) {
    cout << "Now there's one more comment..." << endl;
}
```

It is also possible to access an existing comment/column or add a new comment/column by specifying the comment keyword/column name. Once, again if the comment/column is being added and no matching keyword/name is found, a new comment/column is added to the end of the list. If the comment/column is being returned and not matching keyword/name is found, an `RDBErrNotFound` object is thrown or `RDB::_errno` is set.

```
RDBColumn* col = irdb.getColumn( "x_err" );
```

Comments and columns are stored in [RDBComment](#) and [RDBColumn](#) objects respectively. The [RDB](#) object provides access to the [RDBComment](#) and [RDBColumn](#) objects it contains. For access to the constituent parts of either a comment or a column, the user may use the respective class interfaces.

```
// To access a column name, first get the column then ask it for
// its name...
irdb.getColumn( 3 )->getName( );
// To reset a comment header variable, first get the comment then
// set its value...
irdb.getComment( "foo" ).setValue( "Not bar" );
```

2.4 Table I/O

Table input and output are handled by the [RDB::read](#) and [RDB::write](#) methods. For input, [RDB::read](#) reads one row from the table, parsing it into the [RDB](#) object's columns. It checks to ensure the proper number of columns are found on each row,

2.5 Rewinding tables

With [RDB](#) objects, the user has the possibility of rewinding the [RDB](#) table. The object remembers the location of the first element of the first row or data. At any point, the object may be rewound, with the [RDB::rewind](#) method, to that point. [RDBColumn::rewind](#) is called on all columns associated with the [RDB](#) object.

It is important to note that if the [RDB](#) object was opened with a stream, rather than a filename, the stream must have the ability to seek. Rewinding an [RDB](#) object opened with cin or cout will fail.

2.6 Automatic indexing for column data

2.7 Group columns

[RDB](#) objects use the [RDB::newGroup](#) method to monitor [RDBColumns](#) which have grouping activated. [RDB::newGroup](#) scans the [RDBColumns](#) associated with the object and calls [RDBColumn::newGroup](#) on each column. If any column returns true, [RDB::newGroup](#) returns true.

```
double sum;
int cnt;
string group;
irdb.getColumn( "break" )->setGroup( true );
while ( irdb.read( ) ) {
    if ( irdb.newGroup( ) ) {
        if ( irdb.getColumn( "_NR" )->getDataLong( ) ) {
            // Write out old group's stats...
            cout << "Avg for group " << group << " == " << sum / cnt << endl;
        }
        // Reset accumulators...
        sum = 0.0;
        cnt = 0;
        group = irdb.getColumn( "break" )->getDataString( );
    }

    // Accumulate statistics on other columns...
    sum += irdb.getColumn( "data" )->getDataDouble( );
    cnt++;
}
```

2.8 Creating RDB objects

[RDB](#) objects are created using any of the class constructors, [RDB::RDB\(const string&, const ios::open_mode\)](#), [RDB::RDB\(istream\)](#) or [RDB::RDB\(const RDB&\)](#). The filename constructor doubles as the default constructor for the class. If no filename is specified, an object is created but no stream is attached to it. The [RDB::open\(\)](#) method must be called to attach the object to a stream.

If the filename constructor is used with a filename specified, then the default is to open the file for reading. The user may explicitly set the open mode for output though.

The copy constructor does a shallow copy of the object provided as an argument. The new object is linked to the argument. Modification to the first object's [RDBColumns](#) will show up in the second object's [RDBColumns](#).

2.9 Header and table size

Information about the number of comments, columns, rows are available using the `RDB::nComments()`, `RDB::nColumns()`, or `RDB::nRows()` methods.

2.10 Comment initializers

Various initialization functions are provided to set or add comments to an `RDB`. They methods allow the user to set or add entire `RDBComment` objects, or parts of `RDBComments` such as the keyword or value.

- `RDB::setComment()`
- `RDB::setCommentText()`
- `RDB::setCommentKeyword()`
- `RDB::setCommentValue()`

Each method allows the user to either specify the comment index, thereby replacing the existing `RDBComment`, or to leave out the index, thereby appending a new `RDBComment` to the end of the header.

2.10.1 Examples

Here an entire `RDBComment` object is added to the header.

```
RDBComment comment( "#: comment_variable = comment value" );  
rdb.setComment( comment );
```

Here we overwrite the second comment with a new one.

```
rdb.setComment( comment, 2 );
```

2.11 Comment accessors

Comment accessors allow the user to retrieve all or part of the `RDBComment`. Once again there is a separate method for each part of the `RDBComment`.

- `RDB::getComment()`
- `RDB::getCommentText()`
- `RDB::getCommentKeyword()`
- `RDB::getCommentValue()`

Each method has two signatures. The first signature allows the user to specify which comment to act upon by its index in the header. The second signature allows the user to specify which comment to act upon via keyword. It should be noted that if the comment does not explicitly contain a keyword = value construct no keyword is stored for the comment.

Each signature throws an exception if a comment matching either the index or keyword is not found. For functions specifying the index, an `IndexOutOfRangeException` is thrown. For the functions specifying the keyword, a `KeyNotFoundException` is thrown.

2.12 Column initializers

Various initialization functions are provided to set or add columns to an [RDB](#). They methods allow the user to set or add entire [RDBColumn](#) objects, or parts of RDBColumns such as the name, definition, or value.

- [RDB::setColumn\(\)](#)
- [RDB::setColumnNameDef\(\)](#)
- [RDB::setColumnName\(\)](#)
- [RDB::setColumnDef\(\)](#)
- [RDB::setColumnWidth\(\)](#)
- [RDB::setColumnType\(\)](#)
- [RDB::setColumnJust\(\)](#)
- [RDB::setColumnDesc\(\)](#)
- [RDB::setColumnValue\(\)](#)

Each method allows the user to either specify either the column index or the column name. The user may provide an entire [RDBColumn](#) object, as is the case with the [RDB::setColumn\(\)](#) methods. If the index is out of range or the name is not the name of an existing column, the [RDBColumn](#) object is added to the [RDB](#). Otherwise, the [RDBColumn](#) object replaces the existing object.

Each in turn throws an exception if the column is not found. In the case of columns specified by index, an `IndexOutOfRangeException` is thrown. In the case of columns specified by name, a `KeyNotFoundException` is thrown. The methods which provide a column definition can also throw `BadHeaderException` if the definition is not of the proper form.

2.13 Column accessors

Column accessors allow the user to retrieve all or part of the [RDBColumn](#). Once again there is a separate method for each part of the [RDBColumn](#).

- [RDB::getColumn\(\)](#)
- [RDB::getColumnNameDef\(\)](#)
- [RDB::getColumnName\(\)](#)
- [RDB::getColumnDef\(\)](#)
- [RDB::getColumnWidth\(\)](#)
- [RDB::getColumnType\(\)](#)
- [RDB::getColumnJust\(\)](#)
- [RDB::getColumnDesc\(\)](#)
- [RDB::getColumnValue\(\)](#)

Each method allows the user to either specify either the column index or the column name.

Each in turn throws an exception if the column is not found. In the case of columns specified by index, an `IndexOutOfRangeException` is thrown. In the case of columns specified by name, a `KeyNotFoundException` is thrown.

2.13.1 Examples

Here's a neat trick. You can link input and output tables by sharing RDBColumns. In this example the input is passed to the output. However, after linking the two RDB objects, the user doesn't have to explicitly set the values on the output table. The output will just use the values from the latest read from the input.

```
RDB irdb(&cin);
RDB ordb(&cout);
// This part takes a pointer to the column from input and gives it
// to the output. Now they point at the same RDBColumn...
for ( int i = 0; i < input.nColumns( ); i++ )
    ordb.setColumn( irdb.getColumn( i ) );
ordb.writeHeader( );
// Because the two tables share pointers to the same RDBColumns, a
// call to read sets the values of the data in the output as well
// as the input. So now, a call to write will write the values
// from the read.
while ( irdb.read( ) )
    ordb.write( );
```

Chapter 3

Examples

example1.cc

example2.cc

example3.cc

The following example demonstrates the use of the class [simpleRDBTable](#). Given the following rdb file: hrc-size.cc

The rows of the rdb file can be initialized in the class ChipSize: ChipSize.h

ChipSize.cc ChipSize.cc

An example to invoke the [simpleRDBTable](#) class. testsimple.cc

Chapter 4

Introduction

4.1 Purpose

The [RDB](#) library was created to handle input and output related tasks for [RDB](#) tables. The interface consists of multiple layers. The casual user may use the library through the [RDB](#) object interface exclusively. This interface allows the user to open, close, read from, and write to [RDB](#) tables. The interface handles provides default means of interpreting data types of the columns as well as default data storage management. Examples of basic table manipulations via the [RDB](#) object interface are available.

For some tasks the user may wish to modify the structure of a table or explicitly manage the location and memory allocation of the data. In these cases, the user will need to make use of the [RDBColumn](#) interface in addition to the [RDB](#) interface. Examples of more advance table manipulations using the [RDBColumn](#) interface are also available.

4.2 RDB format

[RDB](#) is an ASCII text format. An [RDB](#) table consists of three distinct elements:

- Comments (Comments are optional)
- Header (The header is mandatory)
- Data (The data are optional, though it would be a trivial table with no data...)

A comment is any line beginning zero or more spaces followed by a sharp sign (#). Characters following the sharp sign are considered to be the body of the comment. Comments may have additional structure within the body. It is possible to have comment variables, also known as header variables. A comment variable is said to exist if the sharp sign is immediately followed by a colon (:). The first word, non-whitespace and non-equal sign (=) characters, following the colon is the comment variable. The value of the comment variable is seperated from the variable by optional space (' ') and tab ('\t') characters and a mandatory equal sign. The variable value is then any text between the equal sign and the newline. It is common to restrict comments to the initial section of the file

The header consists of two lines. The first contains a tab seperated list of column names. Each column name is seperated by a single tab. The second line contains tab seperated column definitions. Definitions consist of an optional numeric value indicating the width, an S(tring), N(umeric), or M(onth) character denoting the type of the data, an optional < or > character indicating left or right justification of data, and an optional text description.

The data consist of tab seperated values, one per column name.

For a more definitive description of the format see <http://hea-www.harvard.edu/MST/simul/software/docs/html/phtml> .

Chapter 5

Specialized Interface

5.1 Data storage

The default behavior of `RDB` object is to allocate space for data storage without pestering the user. When the object is used to read an `RDB` table, it parses the file and creates `RDBComments` for each comment line and `RDBColumn` of the appropriate datatype for each column.

5.1.1 Default data storage

When left to its own devices, an `RDB` object will manage memory usage on its own with no need for intervention from the user. This management essentially consists of allocating `RDBComment` objects and `RDBColumn` objects on demand and deleting them via the destructor.

Likewise, the underlying `RDBColumn` objects used by the `RDB` object handle their own memory needs by default. So, upon creation an `RDBColumn` object allocates a single element for data storage. `RDBColumns` handle the deletion of this data storage element in the call to their destructor.

Copies of the values can be accessed via the `RDB::getValue()` methods or the `RDBColumn::getData()` methods.

5.1.2 Examples

Using the default data storage and the `RDB::getValue()` method.

```
while ( rdbtable.read( ) )  
    cout << "Column 0 value == " << rdbtable.getValue( 0 ) << endl;
```

5.1.3 User-specified data storage

Sometimes the user may want to handle memory for data storage on their own. It is possible to supply the `RDB` object or `RDBColumn` a pointer to memory the user has allocated via the `RDBColumn::mapData()` methods. By doing so the user can avoid calls to `RDBColumn::getData()` or `RDB::getValue()` and simply access the value via the pointer to the storage they provided.

Any memory the user provides via `RDBColumn::mapData()` must be managed, i.e. deleted, by the user.

By providing their own memory for data storage, the user can also make use of `RDB` object's ability to auto-index arrays used for storage.

5.1.4 Examples

With user supplied data storage there's no need to use the `RDB::getValue()` method.

```
double d;
rdbtable.getColumn( 0 )->mapData( d );
while ( rdbtable.read( ) )
    cout << "Column 0 value == " << d << endl;
```

You can also store data from multiple rows.

```
double d_arr[10];
rdbtable.getColumn( 0 )->mapData( d, 10 );
int i = 0;
while ( rdbtable.read( ) ) {
    cout << "Column 0 current value == " << d[i%10] << endl;
    cout << "Column 0 previous value == " << d[(i-1)%10] << endl;
    i++;
}
```

5.1.5 Auto-indexing

When the user supplies arrays of data storage via `RDBColumn::mapData()` `RDB` objects and `RDBColumn` will auto-index the arrays. As data is read or written, the default behavior is to increment the index into the user supplied array for data storage. It is possible then to store multiple rows of data.

`RDB` objects and `RDBColumn` increment the array index until the last element of the array provided by the user is reached. It then loops to the first element and begins over writing data.

It is possible to stop the auto-incrementing by calling the `RDB::autoldx()` method. This temporarily turns off the auto-incrementing behavior until the next read or write.

5.1.6 Examples

In this example we want to store only the lines with negative data. So we use user supplied data storage and the `RDB::autoldx()` method.

```
double* d = new double( rdbtable.nRows( ) );
rdbtable.getColumn( 0 )->mapData( d, rdbtable.nRows( ) );
int i = 0;
while ( rdbtable.read( ) ) {
    if ( 0 <= d[i] ) {
        rdbtable.noAdvance( );
    }
    else
        i++;
}
```

5.2 Stream manipulation

5.2.1 Effects on data storage

If the `RDB` object is attached to a file stream, it is possible to rewind the file to the first line of data. `RDB::rewind()` will move the file pointer back to the first data element. It also resets the array index for user supplied data storage. So, after a call to `RDB::rewind()`, all user supplied data storage will be pointing to the first element in the array.

5.2.2 Limitations

As noted above, `RDB::rewind` only works when the `RDB` object is attached to a stream that allows rewinding. `RDB::rewind()` will fail if the `RDB` is attached to `STDIN` or `STDOUT`.

Chapter 6

Hierarchical Index

6.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

RDB	19
simpleRDBTable< Type >	140
RDBColumn	84
RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >	116
RDBColumnTmpl< long, string, double >	116
RDBComment	131
RDBErr	138

Chapter 7

Class Index

7.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

RDB	Provides interface for manipulating RDB tables	19
RDBColumn	Provides interface for general column related methods	84
RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >	Parameterizes RDBColumn interface for many data types	116
RDBComment	Provides interface for manipulating RDB comments	131
RDBErr	The parent class for all RDB related exceptions	138
simpleRDBTable< Type >	A simple interface to the RDB++ read a row of an rdb table to initialize a class Type	140

Chapter 8

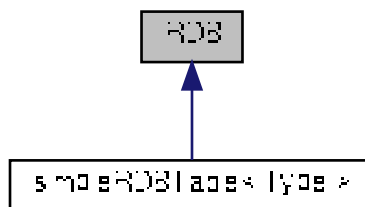
Class Documentation

8.1 RDB Class Reference

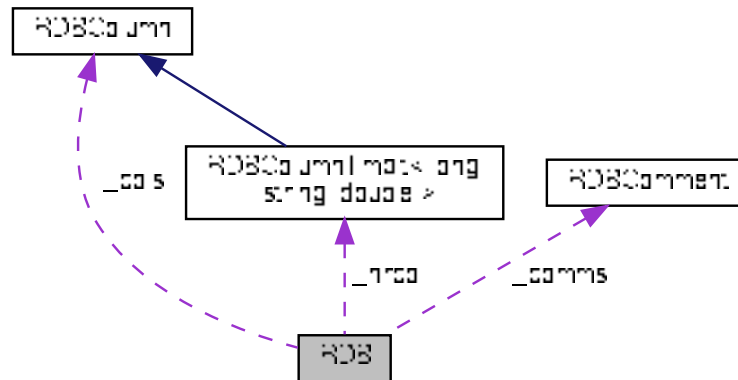
Provides interface for manipulating [RDB](#) tables.

```
#include <RDB.h>
```

Inheritance diagram for RDB:



Collaboration diagram for RDB:



Public Types

Enumerations for read/write/group return status.

- enum [Status](#)
Acceptable column justifications.

Public Member Functions

Constructing and destructing and initializing RDB objects.

- [RDB](#) (const string &name="", ios::openmode mode=ios::in)
Attaches [RDB](#) object to a file.
- [RDB](#) (istream *isptr)
Attaches [RDB](#) object to an istream.
- [RDB](#) (ostream *osptr)
Attaches [RDB](#) object to an ostream.
- [RDB](#) (const [RDB](#) &rdb)
Copies [RDB](#) object.
- [~RDB](#) (void)
Deletes resources allocated by the [RDB](#) object.

I/O related operations.

- void [open](#) (const string &name, ios::openmode mode=ios::in)
Attaches [RDB](#) object to a file.
- void [open](#) (istream *isptr)
Attaches [RDB](#) object to an istream.
- void [open](#) (ostream *osptr)

- *Attaches [RDB](#) object to an ostream.*
- void [open](#) (const [RDB](#) &rdb)
Copies [RDB](#) object.
- void [close](#) (void)
Closes the stream attached to [RDB](#) object.
- int [read](#) (void)
Read a line of data from the istream.
- bool [write](#) (void)
Write a line of data to the ostream.
- bool [rewind](#) (void)
Rewind the stream to the beginning of the first row of data.

Auto-indexing related methods.

- bool [autoldx](#) (void) const
Indicates if auto-indexing is activated.
- void [autoldx](#) (const bool on)
Activates/deactivates auto-indexing.
- void [advancelidx](#) (void)
Increments the indices in the [RDBColumn](#) data elements.

Column group manipulation (break columns)

- void [setGroup](#) (const string &name, bool group=true)
Turn on/off group status for the named column.
- void [setGroup](#) (const int idx, bool group=true)
Turn on/off group status for the indexed column.
- bool [getGroup](#) (const string &name)
Returns group status, true if its a new group, for the named column.
- bool [getGroup](#) (const int idx)
Returns group status, true if its a new group, for the indexed column.
- bool [newGroup](#) (void)
Checks if any column indicates a new group.

Comment accessors.

- void [setComment](#) (const string &comm, const int idx=-1)
Add [RDBComment](#) in header of [RDB](#) object.
- void [setComment](#) ([RDBComment](#) &comm, const int idx=-1)
Add or replace [RDBComment](#) in header of [RDB](#) object.
- void [setComment](#) ([RDBComment](#) &comm, const string &name, const size_t idx=0)
Add or replace [RDBComment](#) in header of [RDB](#) object.
- void [setComment](#) (const [RDB](#) &rdb)
Copy all comments from an existing [RDB](#) object.
- [RDBComment](#) & [getComment](#) (const size_t idx)
Return [RDBComment](#) at given index.
- [RDBComment](#) & [getComment](#) (const string &name, const size_t idx=0)
Return [RDBComment](#) with given keyword.

Column accessors.

- void [setColumn](#) (const string &name, const string &def, const int idx=-1)

- Add an *RDBCColumn* in *RDB* object.
- void *setColumn* (*RDBCColumn* *col, const int idx=-1)
Add or replace *RDBCColumn* in *RDB* object.
- void *setColumn* (*RDBCColumn* *col, const string &name, const size_t idx=0)
Add or replace *RDBCColumn* in *RDB* object.
- void *setColumn* (const *RDB* &rdb)
Copy all columns from an existing *RDB* object.
- *RDBCColumn* * *getColumn* (const size_t idx)
Return pointer to *RDBCColumn* at given index.
- *RDBCColumn* * *getColumn* (const string &name, const size_t idx=0)
Return pointer to *RDBCColumn* with given name.

Column index based accessors.

- void *setName* (const size_t idx, const string &name)
Modify the name of the *RDBCColumn* at idx.
- void *setDef* (const size_t idx, const string &def)
Modify the definition of the *RDBCColumn* at idx.
- void *setWidth* (const size_t idx, const long width)
Modify the width of the *RDBCColumn* at idx.
- void *setType* (const size_t idx, const *RDBCColumn::Type* type)
Modify the type of the *RDBCColumn* at idx.
- void *setJust* (const size_t idx, const *RDBCColumn::Just* just)
Modify the justification of the *RDBCColumn* at idx.
- void *setDesc* (const size_t idx, const string &desc)
Modify the description of the *RDBCColumn* at idx.
- void *mapData* (const size_t idx, double data[], const size_t nelems=1)
Map *RDBCColumn* data to user-supplied memory.
- void *mapData* (const size_t idx, long data[], const size_t nelems=1)
Map *RDBCColumn* data to user-supplied memory.
- void *mapData* (const size_t idx, string data[], const size_t nelems=1)
Map *RDBCColumn* data to user-supplied memory.
- void *setData* (const size_t idx, const double data)
Sets the data value of *RDBCColumn*, converting as necessary.
- void *setData* (const size_t idx, const long data)
Sets the data value of *RDBCColumn*, converting as necessary.
- void *setData* (const size_t idx, const string &data)
Sets the data value of *RDBCColumn*, converting as necessary.
- void *getName* (const size_t idx, string &name) const
Return the name of the *RDBCColumn* at idx.
- void *getDef* (const size_t idx, string &def)
Return the definition of the *RDBCColumn* at idx.
- void *getWidth* (const size_t idx, long &width) const
Return the width of the *RDBCColumn* at idx.
- void *getType* (const size_t idx, *RDBCColumn::Type* &type) const
Return the type of the *RDBCColumn* at idx.
- void *getJust* (const size_t idx, *RDBCColumn::Just* &just) const
Return the just of the *RDBCColumn* at idx.
- void *getDesc* (const size_t idx, string &desc) const
Return the description of the *RDBCColumn* at idx.
- void *getData* (const size_t idx, double &data)
Return the data of the *RDBCColumn* at idx, converting if necessary.
- void *getData* (const size_t idx, long &data)
Return the data of the *RDBCColumn* at idx, converting if necessary.

- void [getData](#) (const size_t idx, string &data)
Return the data of the [RDBColumn](#) at idx, converting if necessary.
- string [getName](#) (const size_t idx) const
Return the name of the [RDBColumn](#) at idx.
- string [getDef](#) (const size_t idx)
Return the definition of the [RDBColumn](#) at idx.
- long [getWidth](#) (const size_t idx) const
Return the width of the [RDBColumn](#) at idx.
- [RDBColumn::Type](#) [getType](#) (const size_t idx) const
Return the type of the [RDBColumn](#) at idx.
- [RDBColumn::Just](#) [getJust](#) (const size_t idx) const
Return the justification of the [RDBColumn](#) at idx.
- string [getDesc](#) (const size_t idx) const
Return the description of the [RDBColumn](#) at idx.
- double [getDataDouble](#) (const size_t idx)
Return the data of the [RDBColumn](#) at idx, converting if necessary.
- long [getDataLong](#) (const size_t idx)
Return the data of the [RDBColumn](#) at idx, converting if necessary.
- string [getDataString](#) (const size_t idx)
Return the data of the [RDBColumn](#) at idx, converting if necessary.

Column name based accessors.

- void [setName](#) (const string &name, const string &newname)
Modify the [RDBColumn](#) name.
- void [setDef](#) (const string &name, const string &def)
Modify the [RDBColumn](#) definition.
- void [setWidth](#) (const string &name, const long width)
Modify the [RDBColumn](#) width.
- void [setType](#) (const string &name, const [RDBColumn::Type](#) type)
Modify the [RDBColumn](#) type.
- void [setJust](#) (const string &name, const [RDBColumn::Just](#) just)
Modify the [RDBColumn](#) justification.
- void [setDesc](#) (const string &name, const string &desc)
Modify the [RDBColumn](#) description.
- void [mapData](#) (const string &name, double data[], const size_t nelems=1)
Map [RDBColumn](#) data to user-supplied memory.
- void [mapData](#) (const string &name, long data[], const size_t nelems=1)
Map [RDBColumn](#) data to user-supplied memory.
- void [mapData](#) (const string &name, string data[], const size_t nelems=1)
Map [RDBColumn](#) data to user-supplied memory.
- void [setData](#) (const string &name, const double data)
Modify the [RDBColumn](#) data, converting if necessary.
- void [setData](#) (const string &name, const long data)
Modify the [RDBColumn](#) data, converting if necessary.
- void [setData](#) (const string &name, const string &data)
Modify the [RDBColumn](#) data, converting if necessary.
- void [getName](#) (const string &name, string &namefound) const
Return the name of the [RDBColumn](#).
- void [getDef](#) (const string &name, string &def)
Return the definition of the [RDBColumn](#).
- void [getWidth](#) (const string &name, long &width) const
Return the width of the [RDBColumn](#).
- void [getType](#) (const string &name, [RDBColumn::Type](#) &type) const

- *Return the type of the [RDBColumn](#).*
 • void [getJust](#) (const string &name, [RDBColumn::Just](#) &just) const
 • *Return the justification of the [RDBColumn](#).*
- void [getDesc](#) (const string &name, string &desc) const
 • *Return the description of the [RDBColumn](#).*
- void [getData](#) (const string &name, double &data)
 • *Return the data of the [RDBColumn](#), converting if necessary.*
- void [getData](#) (const string &name, long &data)
 • *Return the data of the [RDBColumn](#), converting if necessary.*
- void [getData](#) (const string &name, string &data)
 • *Return the data of the [RDBColumn](#), converting if necessary.*
- string [getName](#) (const string &name) const
 • *Return the name of the [RDBColumn](#).*
- string [getDef](#) (const string &name)
 • *Return the definition of the [RDBColumn](#).*
- long [getWidth](#) (const string &name) const
 • *Return the width of the [RDBColumn](#).*
- [RDBColumn::Type](#) [getType](#) (const string &name) const
 • *Return the type of the [RDBColumn](#).*
- [RDBColumn::Just](#) [getJust](#) (const string &name) const
 • *Return the justification of the [RDBColumn](#).*
- string [getDesc](#) (const string &name) const
 • *Return the description of the [RDBColumn](#).*
- double [getDataDouble](#) (const string &name)
 • *Return the data of the [RDBColumn](#), converting if necessary.*
- long [getDataLong](#) (const string &name)
 • *Return the data of the [RDBColumn](#), converting if necessary.*
- string [getDataString](#) (const string &name)
 • *Return the data of the [RDBColumn](#), converting if necessary.*

Table and header statistics.

- size_t [nComments](#) (void) const
 • *Return number of comments in [RDB](#) object.*
- size_t [nColumns](#) (void) const
 • *Return number of columns in [RDB](#) object.*
- size_t [nRows](#) (void)
 • *Return number of rows in [RDB](#) object.*

Protected Member Functions

- void [parseHeader](#) (void)
 • *Parse header, i.e. comments and column names and definitions.*
- vector< string > [parseLine](#) (const string &line) const
 • *Parse fields in a row.*
- size_t [parseLine](#) (bool &newgroup)
 • *Parse fields in a row.*

Protected Attributes

- `string _filename`
Name of RDB file.
- `ios::openmode _mode`
Open mode of the associated stream.
- `istream * _isptr`
Istream attached to data file.
- `ostream * _osptr`
Ostream attached to data file.
- `bool _myisptr`
Indicates if RDB object is responsible for deallocating the istream.
- `bool _myosptr`
Indicates if RDB object is responsible for deallocating the ostream.
- `size_t _rewindto`
Position of beginning of first row of data.
- `size_t _comms`
Number of comments.
- `size_t _ncols`
Number of columns.
- `size_t _nrows`
Number of rows.
- `bool _knowrows`
Indicates if associated file must be scanned to determine number of rows.
- `long _rownum`
Current table row number.
- `long _frownum`
Current file row number.
- `bool _autoidx`
Indicates if RDBColumn data elements should be advanced.
- `bool _firstread`
Indicates if this is the first call to RDB::read.
- `bool _lastread`
Indicates if this is the last call to RDB::read.
- `bool _writehdr`
Indicates if the header has been output.
- `RDBComment * _comms`
Array of RDBComments.
- `RDBColumn ** _cols`
Array of RDBColumns.
- `RDBLongColumn _nrcol`
Hidden column, containing row number.
- `bool * _mycols`
Indicates if RDB object is responsible for deallocating given RDBColumn.
- `string _line`
Line from RDB table.

Friends

Stream insertion and extraction operators.

- `istream & operator>>` (`istream &is`, `RDB &rdb`)
Read table from input stream.
- `ostream & operator<<` (`ostream &os`, `RDB &rdb`)
Write table to output stream.

8.1.1 Detailed Description

Provides interface for manipulating `RDB` tables.

Definition at line 43 of file `RDB.h`.

8.1.2 Member Enumeration Documentation

8.1.2.1 Status

```
enum RDB::Status
```

Acceptable column justifications.

Definition at line 56 of file `RDB.h`.

8.1.3 Constructor & Destructor Documentation

8.1.3.1 `RDB()` [1/4]

```
RDB::RDB (
    const string & name = "",
    ios::openmode mode = ios::in )
```

Attaches `RDB` object to a file.

Parameters

<i>name</i>	the name of the <code>RDB</code> file.
<i>mode</i>	the <code>ios::openmode</code> of the file.

Exceptions

RDBErr	error opening RDB file.
RDBErr	error parsing RDB comment or column name and definition.
RDBErr	error parsing RDB column definition.

Attaches [RDB](#) object's I/O stream to the file. If mode is set to `ios::in`, it calls [RDB::parseHeader\(void\)](#) to read comments, column names, and column definitions.

If no filename is specified, then the [RDB::open\(\)](#) method may be used later to attach a file to the object.

Definition at line 118 of file `RDB.cc`.

8.1.3.2 [RDB\(\)](#) [2/4]

```
RDB::RDB (
    istream * isptr )
```

Attaches [RDB](#) object to an `istream`.

Parameters

<i>isptr</i>	input stream to attach to the RDB object.
--------------	---

Exceptions

RDBErr	error parsing RDB comment or column name and definition.
RDBErr	error parsing RDB column definition.

Attaches the `istream` to the [RDB](#) object. [RDB::parseHeader\(void\)](#) is called to read comments, column names, and column definitions.

Definition at line 164 of file `RDB.cc`.

8.1.3.3 [RDB\(\)](#) [3/4]

```
RDB::RDB (
    ostream * osptr )
```

Attaches [RDB](#) object to an `ostream`.

Parameters

<i>osptr</i>	output stream to attach to the RDB object.
--------------	--

Attaches the ostream to the [RDB](#) object.

Definition at line 199 of file RDB.cc.

8.1.3.4 RDB() [4 / 4]

```
RDB::RDB (
    const RDB & rdb )
```

Copies [RDB](#) object.

Parameters

<i>rdb</i>	copy RDB object.
------------	----------------------------------

Makes a copy of the argument.

Definition at line 234 of file RDB.cc.

8.1.3.5 ~RDB()

```
RDB::~RDB (
    void )
```

Deletes resources allocated by the [RDB](#) object.

Deletes RDBComments and RDBColumns.

Closes only the streams the object opened. User is responsible for closing streams they supply to the object.

Warning

If the user supplies an [RDBColumn](#) object via the [RDB::setColumn\(\)](#) method, the user is responsible for deleting that object.

Definition at line 271 of file RDB.cc.

8.1.4 Member Function Documentation

8.1.4.1 `advanceIdx()`

```
void RDB::advanceIdx (
    void )
```

Increments the indices in the [RDBColumn](#) data elements.

This method advances the auto-indices for all [RDBColumns](#) associated with this object.

Definition at line 857 of file [RDB.cc](#).

8.1.4.2 `autoldx()` [1/2]

```
bool RDB::autoIdx (
    void ) const
```

Indicates if auto-indexing is activated.

Returns

State of the auto-indexing flag for this object.

Definition at line 843 of file [RDB.cc](#).

8.1.4.3 `autoldx()` [2/2]

```
void RDB::autoIdx (
    const bool on )
```

Activates/deactivates auto-indexing.

Parameters

<i>on</i>	sets the auto-indexing behavior for the RDB object and its columns.
-----------	---

Sets [RDBTable::autoldx](#). This effectly turns off the auto-incrementing behavior for a single call to [RDB::read\(void\)](#) or [RDB::write\(void\)](#). For arrays of mapped memory, this will cause one line's data to overwrite the previous line's data.

Warning

`RDB::_autoidx` is set to true after each call to `RDB::read(void)` or `RDB::write(void)`.

Definition at line 830 of file RDB.cc.

8.1.4.4 close()

```
void RDB::close (
    void )
```

Closes the stream attached to `RDB` object.

Closes any streams that the `RDB` object created.

Definition at line 526 of file RDB.cc.

8.1.4.5 getColumn() [1/2]

```
RDBColumn * RDB::getColumn (
    const size_t idx )
```

Return pointer to `RDBColumn` at given index.

Parameters

<code>idx</code>	the index of the <code>RDBColumn</code> .
------------------	---

Exceptions

<code>RDBErr</code>	error if the index is out of range.
---------------------	-------------------------------------

Returns

`RDBColumn` with index equal to `idx`.

`RDBColumns` are indexed in the order in which they appear in the `RDB` file starting with 0. Parameter `idx` must be between 0 and `RDB::nColumns(void)` less one.

Definition at line 1433 of file RDB.cc.

8.1.4.6 `getColumn()` [2/2]

```
RDBColumn * RDB::getColumn (
    const string & name,
    const size_t idx = 0 )
```

Return pointer to [RDBColumn](#) with given name.

Parameters

<i>name</i>	the name of the column.
<i>idx</i>	currently not defined.

Exceptions

<i>RDBErrNotFnd</i>	error if there is no column with matching name.
---------------------	---

Returns

[RDBColumn](#) with matching name.

Definition at line 1458 of file RDB.cc.

8.1.4.7 `getComment()` [1/2]

```
RDBComment & RDB::getComment (
    const size_t idx )
```

Return [RDBComment](#) at given index.

Parameters

<i>idx</i>	the index of the RDBComment .
------------	---

Exceptions

<i>RDBErrNot</i>	error if the index is out of range.
------------------	-------------------------------------

Returns

[RDBComment](#) with index equal to idx.

RDBComments are indexed in the order in which they appear in the [RDB](#) file starting with 0. Parameter idx must be between 0 and `RDB::nComments(void)` less one.

Definition at line 1148 of file RDB.cc.

8.1.4.8 `getComment()` [2/2]

```
RDBComment & RDB::getComment (
    const string & name,
    const size_t idx = 0 )
```

Return [RDBComment](#) with given keyword.

Parameters

<i>name</i>	the name of the comment keyword.
<i>idx</i>	currently not defined.

Exceptions

RDBErr	error if there is no comment with matching keyword.
------------------------	---

Returns

[RDBComment](#) with matching keyword.

Definition at line 1173 of file RDB.cc.

8.1.4.9 `getData()` [1/6]

```
void RDB::getData (
    const size_t idx,
    double & data )
```

Return the data of the [RDBColumn](#) at idx, converting if necessary.

Parameters

<i>idx</i>	index of RDBColumn
<i>data</i>	retrieve data of RDBColumn .

Exceptions

RDBErr	if index is out of range.
------------------------	---------------------------

Exceptions

<i>RDBErr</i>	if data is invalid datatype for RDBColumn .
-------------------------------	---

Definition at line 1933 of file RDB.cc.

8.1.4.10 `getData()` [2/6]

```
void RDB::getData (
    const size_t idx,
    long & data )
```

Return the data of the [RDBColumn](#) at idx, converting if necessary.

Parameters

<i>idx</i>	index of RDBColumn
<i>data</i>	retrieve data of RDBColumn .

Exceptions

<i>RDBErr</i>	if index is out of range.
<i>RDBErr</i>	if data is invalid datatype for RDBColumn .

Definition at line 1961 of file RDB.cc.

8.1.4.11 `getData()` [3/6]

```
void RDB::getData (
    const size_t idx,
    string & data )
```

Return the data of the [RDBColumn](#) at idx, converting if necessary.

Parameters

<i>idx</i>	index of RDBColumn
<i>data</i>	retrieve data of RDBColumn .

Exceptions

RDBErr	if index is out of range.
RDBErr	if data is invalid datatype for RDBColumn .

Definition at line 1989 of file RDB.cc.

8.1.4.12 `getData()` [4/6]

```
void RDB::getData (
    const string & name,
    double & data )
```

Return the data of the [RDBColumn](#), converting if necessary.

Parameters

<i>name</i>	of RDBColumn
<i>data</i>	data of RDBColumn .

Exceptions

RDBErr	if no matching column name is found.
RDBErr	if data is invalid datatype for RDBColumn .

Definition at line 2778 of file RDB.cc.

8.1.4.13 `getData()` [5/6]

```
void RDB::getData (
    const string & name,
    long & data )
```

Return the data of the [RDBColumn](#), converting if necessary.

Parameters

<i>name</i>	of RDBColumn
<i>data</i>	data of RDBColumn .

Exceptions

RDBErr	if no matching column name is found.
RDBErr	if data is invalid datatype for RDBColumn .

Definition at line 2812 of file RDB.cc.

8.1.4.14 `getData()` [6/6]

```
void RDB::getData (
    const string & name,
    string & data )
```

Return the data of the [RDBColumn](#), converting if necessary.

Parameters

<i>name</i>	of RDBColumn
<i>data</i>	data of RDBColumn .

Exceptions

RDBErr	if data is invalid datatype for RDBColumn .
RDBErr	if no matching column name is found.

Definition at line 2846 of file RDB.cc.

8.1.4.15 `getDataDouble()` [1/2]

```
double RDB::getDataDouble (
    const size_t idx )
```

Return the data of the [RDBColumn](#) at idx, converting if necessary.

Parameters

<i>idx</i>	index of RDBColumn
------------	------------------------------------

Exceptions

RDBErr	if index is out of range.
RDBErr	if data is invalid datatype for RDBColumn .

Returns

data of [RDBColumn](#).

Definition at line 2138 of file RDB.cc.

8.1.4.16 `getDataDouble()` [2/2]

```
double RDB::getDataDouble (
    const string & name )
```

Return the data of the [RDBColumn](#), converting if necessary.

Parameters

<i>name</i>	of RDBColumn
-------------	------------------------------

Exceptions

RDBErr	if no matching column name is found.
RDBErr	if data is invalid datatype for RDBColumn .

Returns

data of [RDBColumn](#).

Definition at line 3025 of file RDB.cc.

8.1.4.17 `getDataLong()` [1/2]

```
long RDB::getDataLong (
    const size_t idx )
```

Return the data of the [RDBColumn](#) at idx, converting if necessary.

Parameters

<i>idx</i>	index of RDBColumn
------------	------------------------------------

Exceptions

RDBErr	if index is out of range.
RDBErr	if data is invalid datatype for RDBColumn .

Returns

Data of [RDBColumn](#).

Definition at line 2167 of file RDB.cc.

8.1.4.18 `getDataLong()` [2/2]

```
long RDB::getDataLong (
    const string & name )
```

Return the data of the [RDBColumn](#), converting if necessary.

Parameters

<i>name</i>	of RDBColumn
-------------	------------------------------

Exceptions

RDBErr	if no matching column name is found.
RDBErr	if data is invalid datatype for RDBColumn .

Returns

data of [RDBColumn](#).

Definition at line 3058 of file RDB.cc.

8.1.4.19 `getDataString()` [1/2]

```
string RDB::getDataString (
    const size_t idx )
```

Return the data of the [RDBColumn](#) at *idx*, converting if necessary.

Parameters

<i>idx</i>	index of RDBCColumn
------------	-------------------------------------

Exceptions

RDBErr	if index is out of range.
RDBErr	if data is invalid datatype for RDBCColumn .

Returns

data of [RDBCColumn](#).

Definition at line 2196 of file RDB.cc.

8.1.4.20 [getDataString\(\)](#) [2/2]

```
string RDB::getDataString (  
    const string & name )
```

Return the data of the [RDBCColumn](#), converting if necessary.

Parameters

<i>name</i>	of RDBCColumn
-------------	-------------------------------

Exceptions

RDBErr	if no matching column name is found.
RDBErr	if data is invalid datatype for RDBCColumn .

Returns

data of [RDBCColumn](#).

Definition at line 3091 of file RDB.cc.

8.1.4.21 [getDef\(\)](#) [1/4]

```
void RDB::getDef (  
    const size_t idx,  
    string & def )
```

Return the definition of the [RDBColumn](#) at idx.

Parameters

<i>idx</i>	index of RDBColumn .
<i>def</i>	retrieve definition of RDBColumn .

Exceptions

RDBErr	if index is out of range.
------------------------	---------------------------

Definition at line 1837 of file RDB.cc.

8.1.4.22 getDef() [2/4]

```
string RDB::getDef (
    const size_t idx )
```

Return the definition of the [RDBColumn](#) at idx.

Parameters

<i>idx</i>	index of RDBColumn
------------	------------------------------------

Exceptions

RDBErr	if index is out of range.
------------------------	---------------------------

Returns

definition of [RDBColumn](#).

Definition at line 2037 of file RDB.cc.

8.1.4.23 getDef() [3/4]

```
void RDB::getDef (
    const string & name,
    string & def )
```

Return the definition of the [RDBColumn](#).

Parameters

<i>name</i>	of RDBColumn
<i>def</i>	definition of RDBColumn .

Exceptions

RDBErr	if no matching column name is found.
------------------------	--------------------------------------

Definition at line 2657 of file RDB.cc.

8.1.4.24 `getDef()` [4/4]

```
string RDB::getDef (
    const string & name )
```

Return the definition of the [RDBColumn](#).

Parameters

<i>name</i>	of RDBColumn
-------------	------------------------------

Exceptions

RDBErr	if no matching column name is found.
------------------------	--------------------------------------

Returns

definition of [RDBColumn](#).

Definition at line 2904 of file RDB.cc.

8.1.4.25 `getDesc()` [1/4]

```
void RDB::getDesc (
    const size_t idx,
    string & desc ) const
```

Return the description of the [RDBColumn](#) at idx.

Parameters

<i>idx</i>	index of RDBColumn
<i>desc</i>	retrieve description of RDBColumn .

Exceptions

RDBErr	if index is out of range.
------------------------	---------------------------

Definition at line 1913 of file RDB.cc.

8.1.4.26 getDesc() [2/4]

```
string RDB::getDesc (  
    const size_t idx ) const
```

Return the description of the [RDBColumn](#) at idx.

Parameters

<i>idx</i>	index of RDBColumn
------------	------------------------------------

Exceptions

RDBErr	if index is out of range.
------------------------	---------------------------

Returns

description of [RDBColumn](#).

Definition at line 2117 of file RDB.cc.

8.1.4.27 getDesc() [3/4]

```
void RDB::getDesc (  
    const string & name,  
    string & desc ) const
```

Return the description of the [RDBColumn](#).

Parameters

<i>name</i>	of RDBColumn
<i>desc</i>	description of RDBColumn .

Exceptions

RDBErr	if no matching column name is found.
------------------------	--------------------------------------

Definition at line 2753 of file RDB.cc.

8.1.4.28 `getDesc()` [4/4]

```
string RDB::getDesc (  
    const string & name ) const
```

Return the description of the [RDBColumn](#).

Parameters

<i>name</i>	of RDBColumn
-------------	------------------------------

Exceptions

RDBErr	if no matching column name is found.
------------------------	--------------------------------------

Returns

description of [RDBColumn](#).

Definition at line 3000 of file RDB.cc.

8.1.4.29 `getGroup()` [1/2]

```
bool RDB::getGroup (  
    const string & name )
```

Returns group status, true if its a new group, for the named column.

Parameters

<i>name</i>	the name of the column.
-------------	-------------------------

Exceptions

<i>RDBErrNotFnd</i>	error if there is no column with matching name.
---------------------	---

Returns

Status of the column's group flag.

Definition at line 938 of file RDB.cc.

8.1.4.30 getGroup() [2/2]

```
bool RDB::getGroup (
    const int idx )
```

Returns group status, true if its a new group, for the indexed column.

Parameters

<i>idx</i>	the column index.
------------	-------------------

Exceptions

<i>RDBErr</i>	error if the index is out of range.
---------------	-------------------------------------

Returns

Status of the column's group flag.

Definition at line 967 of file RDB.cc.

8.1.4.31 getJust() [1/4]

```
void RDB::getJust (
    const size_t idx,
    RDBColumn::Just & just ) const
```

Return the just of the [RDBColumn](#) at idx.

Parameters

<i>idx</i>	index of RDBColumn
<i>just</i>	retrieve just of RDBColumn .

Exceptions

RDBErr	if index is out of range.
------------------------	---------------------------

Definition at line 1894 of file RDB.cc.

8.1.4.32 `getJust()` [2/4]

```
RDBColumn::Just RDB::getJust (
    const size_t idx ) const
```

Return the justification of the [RDBColumn](#) at idx.

Parameters

<i>idx</i>	index of RDBColumn
------------	------------------------------------

Exceptions

RDBErr	if index is out of range.
------------------------	---------------------------

Returns

justification of [RDBColumn](#).

Definition at line 2097 of file RDB.cc.

8.1.4.33 `getJust()` [3/4]

```
void RDB::getJust (
    const string & name,
    RDBColumn::Just & just ) const
```

Return the justification of the [RDBColumn](#).

Parameters

<i>name</i>	of RDBColumn
<i>just</i>	justification of RDBColumn .

Exceptions

RDBErr	if no matching column name is found.
------------------------	--------------------------------------

Definition at line 2729 of file RDB.cc.

8.1.4.34 getJust() [4/4]

```
RDBColumn::Just RDB::getJust (
    const string & name ) const
```

Return the justification of the [RDBColumn](#).

Parameters

<i>name</i>	of RDBColumn
-------------	------------------------------

Exceptions

RDBErr	if no matching column name is found.
------------------------	--------------------------------------

Returns

justification of [RDBColumn](#).

Definition at line 2976 of file RDB.cc.

8.1.4.35 getName() [1/4]

```
void RDB::getName (
    const size_t idx,
    string & name ) const
```

Return the name of the [RDBColumn](#) at idx.

Parameters

<i>idx</i>	index of RDBColumn .
<i>name</i>	retrieve name of RDBColumn .

Exceptions

RDBErr	if index is out of range.
------------------------	---------------------------

Definition at line 1818 of file RDB.cc.

8.1.4.36 `getName()` [2/4]

```
string RDB::getName (  
    const size_t idx ) const
```

Return the name of the [RDBColumn](#) at idx.

Parameters

<i>idx</i>	index of RDBColumn
------------	------------------------------------

Exceptions

RDBErr	if index is out of range.
------------------------	---------------------------

Returns

name of [RDBColumn](#).

Definition at line 2017 of file RDB.cc.

8.1.4.37 `getName()` [3/4]

```
void RDB::getName (  
    const string & name,  
    string & nameFound ) const
```

Return the name of the [RDBColumn](#).

Parameters

<i>name</i>	of RDBColumn
<i>namefound</i>	name of RDBColumn if found.

Exceptions

RDBErr	if no matching column name is found.
------------------------	--------------------------------------

Definition at line 2633 of file RDB.cc.

8.1.4.38 `getName()` [4/4]

```
string RDB::getName (  
    const string & name ) const
```

Return the name of the [RDBColumn](#).

Parameters

<i>name</i>	of RDBColumn
-------------	------------------------------

Exceptions

RDBErr	if no matching column name is found.
------------------------	--------------------------------------

Returns

name of [RDBColumn](#).

Definition at line 2880 of file RDB.cc.

8.1.4.39 `getType()` [1/4]

```
void RDB::getType (  
    const size_t idx,  
    RDBColumn::Type & type ) const
```

Return the type of the [RDBColumn](#) at idx.

Parameters

<i>idx</i>	index of RDBColumn .
<i>type</i>	retrieve type of RDBColumn .

Exceptions

RDBErr	if index is out of range.
------------------------	---------------------------

Definition at line 1875 of file RDB.cc.

8.1.4.40 `getType()` [2/4]

```
RDBColumn::Type RDB::getType (  
    const size_t idx ) const
```

Return the type of the [RDBColumn](#) at *idx*.

Parameters

<i>idx</i>	index of RDBColumn
------------	------------------------------------

Exceptions

RDBErr	if index is out of range.
------------------------	---------------------------

Returns

type of [RDBColumn](#).

Definition at line 2077 of file RDB.cc.

8.1.4.41 `getType()` [3/4]

```
void RDB::getType (  
    const string & name,  
    RDBColumn::Type & type ) const
```

Return the type of the [RDBColumn](#).

Parameters

<i>name</i>	of RDBColumn
<i>type</i>	type of RDBColumn .

Exceptions

RDBErr	if no matching column name is found.
------------------------	--------------------------------------

Definition at line 2705 of file RDB.cc.

8.1.4.42 `getType()` [4/4]

```
RDBColumn::Type RDB::getType (  
    const string & name ) const
```

Return the type of the [RDBColumn](#).

Parameters

<i>name</i>	of RDBColumn
-------------	------------------------------

Exceptions

RDBErr	if no matching column name is found.
------------------------	--------------------------------------

Returns

type of [RDBColumn](#).

Definition at line 2952 of file RDB.cc.

8.1.4.43 `getWidth()` [1/4]

```
void RDB::getWidth (  
    const size_t idx,  
    long & width ) const
```

Return the width of the [RDBColumn](#) at idx.

Parameters

<i>idx</i>	index of RDBColumn .
<i>width</i>	retrieve width of RDBColumn .

Exceptions

RDBErr	if index is out of range.
------------------------	---------------------------

Definition at line 1856 of file RDB.cc.

8.1.4.44 `getWidth()` [2/4]

```
long RDB::getWidth (
    const size_t idx ) const
```

Return the width of the [RDBColumn](#) at idx.

Parameters

<i>idx</i>	index of RDBColumn
------------	------------------------------------

Exceptions

RDBErr	if index is out of range.
------------------------	---------------------------

Returns

width of [RDBColumn](#).

Definition at line 2057 of file RDB.cc.

8.1.4.45 `getWidth()` [3/4]

```
void RDB::getWidth (
    const string & name,
    long & width ) const
```

Return the width of the [RDBColumn](#).

Parameters

<i>name</i>	of RDBColumn
<i>width</i>	width of RDBColumn .

Exceptions

RDBErr	if no matching column name is found.
------------------------	--------------------------------------

Definition at line 2681 of file RDB.cc.

8.1.4.46 `getWidth()` [4/4]

```
long RDB::getWidth (
    const string & name ) const
```

Return the width of the [RDBColumn](#).

Parameters

<i>name</i>	of RDBColumn
-------------	------------------------------

Exceptions

RDBErr	if no matching column name is found.
------------------------	--------------------------------------

Returns

width of [RDBColumn](#).

Definition at line 2928 of file RDB.cc.

8.1.4.47 `mapData()` [1/6]

```
void RDB::mapData (
    const size_t idx,
    double data[],
    const size_t nelems = 1 )
```

Map [RDBColumn](#) data to user-supplied memory.

Parameters

<i>idx</i>	index of RDBColumn .
<i>data</i>	user-supplied memory for storing data.
<i>nelems</i>	number of elements in user-supplied data.

Exceptions

RDBErr	if index is out of range.
RDBErr	if data is invalid datatype for RDBColumn .

Definition at line 1650 of file RDB.cc.

8.1.4.48 `mapData()` [2/6]

```
void RDB::mapData (
    const size_t idx,
    long data[],
    const size_t nelems = 1 )
```

Map [RDBColumn](#) data to user-supplied memory.

Parameters

<i>idx</i>	index of RDBColumn .
<i>data</i>	user-supplied memory to stored data.
<i>nelems</i>	number of elems in user-supplied memory.

Exceptions

RDBErr	if index is out of range.
RDBErr	if data is invalid datatype for RDBColumn .

Definition at line 1678 of file RDB.cc.

8.1.4.49 `mapData()` [3/6]

```
void RDB::mapData (
    const size_t idx,
```

```
string data[],  
const size_t nelems = 1 )
```

Map [RDBCColumn](#) data to user-supplied memory.

Parameters

<i>idx</i>	index of RDBColumn .
<i>data</i>	user-supplied memory to store data.
<i>nelems</i>	number of elements in user-supplied data.

Exceptions

RDBErr	if index is out of range.
RDBErr	if data is invalid datatype for RDBColumn .

Definition at line 1707 of file RDB.cc.

8.1.4.50 `mapData()` [4/6]

```
void RDB::mapData (
    const string & name,
    double data[],
    const size_t nelems = 1 )
```

Map RDBColumn data to user-supplied memory.

Parameters

<i>name</i>	of RDBColumn
<i>data</i>	user-supplied memory to store RDBColumn data.
<i>nelems</i>	number of elems in user-supplied memory.

Exceptions

RDBErr	if no matching column name is found.
RDBErr	if data is invalid datatype for RDBColumn .

Definition at line 2426 of file RDB.cc.

8.1.4.51 `mapData()` [5/6]

```
void RDB::mapData (
    const string & name,
```

```
long data[],  
const size_t nelems = 1 )
```

Map RDBColumn data to user-supplied memory.

Parameters

<i>name</i>	of RDBColumn
<i>data</i>	user-supplied memory to store RDBColumn data.
<i>nelems</i>	number of elems in user-supplied memory.

Exceptions

RDBErr	if no matching column name is found.
RDBErr	if data is invalid datatype for RDBColumn .

Definition at line 2462 of file RDB.cc.

8.1.4.52 `mapData()` [6/6]

```
void RDB::mapData (
    const string & name,
    string data[],
    const size_t nelems = 1 )
```

Map RDBColumn data to user-supplied memory.

Parameters

<i>name</i>	of RDBColumn
<i>data</i>	user-supplied memory to store RDBColumn data.
<i>nelems</i>	number of elems in user-supplied memory.

Exceptions

RDBErr	if no matching column name is found.
RDBErr	if data is invalid datatype for RDBColumn .

Definition at line 2499 of file RDB.cc.

8.1.4.53 `nColumns()`

```
size_t RDB::nColumns (
    void ) const
```

Return number of columns in [RDB](#) object.

Returns

Number of columns.

Definition at line 3133 of file RDB.cc.

8.1.4.54 nComments()

```
size_t RDB::nComments (
    void ) const
```

Return number of comments in [RDB](#) object.

Returns

Number of comments.

Definition at line 3120 of file RDB.cc.

8.1.4.55 newGroup()

```
bool RDB::newGroup (
    void )
```

Checks if any column indicates a new group.

Returns

True if any column indicates a new group, false otherwise.

A new group occurs when the data values between consecutive rows change.

Definition at line 989 of file RDB.cc.

8.1.4.56 nRows()

```
size_t RDB::nRows (
    void )
```

Return number of rows in [RDB](#) object.

Returns

Number of rows.

Warning

This method reads through the entire [RDB](#) file to count the number of rows and then attempts to rewind the file to the location at which it began . If the stream attached to the [RDB](#) object is not seekable, this method will fail.

Definition at line 3151 of file RDB.cc.

8.1.4.57 open() [1/4]

```
void RDB::open (
    const string & name,
    ios::openmode mode = ios::in )
```

Attaches [RDB](#) object to a file.

Parameters

<i>name</i>	the name of the RDB file.
<i>mode</i>	the ios::openmode of the file.

Exceptions

RDBErr	error opening RDB file.
RDBErr	error parsing RDB comment or column name and definition.
RDBErr	error parsing RDB column definition.

Attaches [RDB](#) object's I/O stream to the file. If mode is set to ios::in, it calls [RDB::parseHeader\(void\)](#) to read comments, column names, and column definitions.

Warning

This method closes any previously opened streams.

Definition at line 316 of file RDB.cc.

8.1.4.58 `open()` [2/4]

```
void RDB::open (
    istream * isptr )
```

Attaches [RDB](#) object to an istream.

Parameters

<i>isptr</i>	input stream to attach to the RDB object.
--------------	---

Exceptions

RDBErr	error parsing RDB comments or column names and definitions
RDBErr	error parsing RDB column definition.

Attaches the istream to the [RDB](#) object. [RDB::parseHeader\(void\)](#) is called to read comments, column names, and column definitions.

Warning

This method closes any previously opened streams.

Definition at line 400 of file RDB.cc.

8.1.4.59 `open()` [3/4]

```
void RDB::open (
    ostream * osptr )
```

Attaches [RDB](#) object to an ostream.

Parameters

<i>osptr</i>	output stream to attach to the RDB object.
--------------	--

Attaches the ostream to the [RDB](#) object.

Warning

This method closes any previously opened streams.

Definition at line 432 of file RDB.cc.

8.1.4.60 open() [4/4]

```
void RDB::open (
    const RDB & rdb )
```

Copies RDB object.

Parameters

<i>rdb</i>	copy RDB object.
------------	------------------

Warning

This method is currently not implemented.

Definition at line 451 of file RDB.cc.

8.1.4.61 parseHeader()

```
void RDB::parseHeader (
    void ) [protected]
```

Parse header, i.e. comments and column names and definitions.

Parses out comments and column names and definitions from the RDB file header.

This is used by RDB::open().

Definition at line 3185 of file RDB.cc.

8.1.4.62 parseLine() [1/2]

```
vector< string > RDB::parseLine (
    const string & line ) const [protected]
```

Parse fields in a row.

Parameters

<i>line</i>	the line to be split.
-------------	-----------------------

Returns

Vector of tokens, one for each tab delimited field.

Splits the input line on tabs.

Definition at line 3284 of file RDB.cc.

8.1.4.63 parseLine() [2/2]

```
size_t RDB::parseLine (
    bool & newgroup ) [protected]
```

Parse fields in a row.

Returns

number of tokens parsed.

Splits the line on tabs and assigns the tokens to the RDBColumns.

Definition at line 3316 of file RDB.cc.

8.1.4.64 read()

```
int RDB::read (
    void )
```

Read a line of data from the istream.

Exceptions

<i>RDBErr</i>	error if the number of tokens found does not match the number of tokens expected.
<i>RDBErr</i>	error if non-numeric data is found in a numeric column.
<i>RDBErr</i>	error if a floating point number is being assigned to an integer column.

S *

Returns

[RDB::Status](#) indicating if end of file, end of line, or end of group was reached.

Reads, parses, and stores data from the next line in the [RDB](#) file if an input stream has been provided. If [RDB::_autoidx](#) is set, this method will advance the indices in each [RDBColumn](#)'s data pointer before reading and will increment the row number, [RDB::_rownum](#), for the default '_NR' column.

Definition at line 589 of file RDB.cc.

8.1.4.65 [rewind\(\)](#)

```
bool RDB::rewind (
    void )
```

Rewind the stream to the beginning of the first row of data.

Returns

false if the stream associated with this [RDB](#) object cannot be rewound, i.e [seekg\(\)](#) or [seekp\(\)](#) is not defined.

Rewinds the stream associated with this object to the beginning of the first row of data. It also calls [RDBColumn::rewind\(void\)](#) for each [RDBColumn](#). If the user supplied data storage to a particular column, the auto-incrementing index is rewound to point at the first element of the user supplied array.

Warning

If an istream or ostream, like cin or cout, was provided to the object, you only get one chance to read it. You can't rewind, you can't close and reopen.

Definition at line 772 of file RDB.cc.

8.1.4.66 [setColumn\(\)](#) [1/4]

```
void RDB::setColumn (
    const string & name,
    const string & def,
    const int idx = -1 )
```

Add an [RDBColumn](#) in [RDB](#) object.

Parameters

<i>name</i>	of the RDBColumn object
<i>def</i>	definition of the RDBColumn object
<i>idx</i>	position of the column on which to operate.

Columns are numbered as they appear in the [RDB](#) file from left to right starting with 0. If the index is not specified or does not fall within the range of existing columns, an [RDBColumn](#) is created and is appended to the list of columns. The [RDB](#) object handles memory allocation and deletion.

Upon completion, the [RDB](#) object contains a pointer to the [RDBColumn](#) created. Any modifications to the [RDBColumn](#) outside of the [RDB](#) object will be reflected within the [RDB](#) object and vice versa.

Definition at line 1208 of file [RDB.cc](#).

8.1.4.67 [setColumn\(\)](#) [2/4]

```
void RDB::setColumn (
    RDBColumn * col,
    const int idx = -1 )
```

Add or replace [RDBColumn](#) in [RDB](#) object.

Parameters

<i>col</i>	a reference to the RDBColumn object
<i>idx</i>	the position of the column on which to operate.

Columns are numbered as they appear in the [RDB](#) file from left to right starting with 0. If the index is not specified or does not fall within the range of existing columns, the [RDBColumn](#) is appended to the list of columns.

Upon completion, the [RDB](#) object contains a pointer to the [RDBColumn](#) provided. Any modifications to the [RDBColumn](#) outside of the [RDB](#) object will be reflected within the [RDB](#) object and vice versa.

Warning

The user is responsible for freeing the [RDBColumn](#).

Definition at line 1274 of file [RDB.cc](#).

8.1.4.68 [setColumn\(\)](#) [3/4]

```
void RDB::setColumn (
    RDBColumn * col,
    const string & name,
    const size_t idx = 0 )
```

Add of replace [RDBColumn](#) in [RDB](#) object.

Parameters

<i>col</i>	a reference to the RDBColumn object
<i>name</i>	the name of the column in this RDB object.
<i>idx</i>	currently not defined.

If no matching column is found, the column is appended to the list of columns after assigning it a name of 'name'. Otherwise, *col* replaces the existing column.

Upon completion, the [RDB](#) object contains a pointer to the [RDBColumn](#) provided. Any modifications to the [RDBColumn](#) outside of the [RDB](#) object will be reflected within the [RDB](#) object and vice versa.

Warning

The user is responsible for freeing the [RDBColumn](#).

Definition at line 1331 of file RDB.cc.

8.1.4.69 [setColumn\(\)](#) [4 / 4]

```
void RDB::setColumn (
    const RDB & rdb )
```

Copy all columns from an existing [RDB](#) object.

Parameters

<i>rdb</i>	a reference to an RDB object
------------	--

Copies all columns from the argument to this [RDB](#) object. Any columns previously associated with this object are removed.

Warning

The user is responsible for free any [RDBColumns](#) previously allocated and assigned to this [RDB](#) object via the [RDB::setColumn](#) methods.

Definition at line 1368 of file RDB.cc.

8.1.4.70 `setComment()` [1/4]

```
void RDB::setComment (
    const string & comm,
    const int idx = -1 )
```

Add [RDBComment](#) in header of [RDB](#) object.

Parameters

<i>comm</i>	a comment string.
<i>idx</i>	the position of the comment on which to operate.

Comments are numbered as they appear in the [RDB](#) file from top to bottom. If the index is not specified or does not fall within the range of existing comments, the [RDBComment](#) is appended to the list of comments.

Definition at line 1015 of file RDB.cc.

8.1.4.71 `setComment()` [2/4]

```
void RDB::setComment (
    RDBComment & comm,
    const int idx = -1 )
```

Add or replace [RDBComment](#) in header of [RDB](#) object.

Parameters

<i>comm</i>	a reference to the RDBComment object
<i>idx</i>	the position of the comment on which to operate.

Comments are numbered as they appear in the [RDB](#) file from top to bottom. If the index is not specified or does not fall within the range of existing comments, the [RDBComment](#) is appended to the list of comments.

Definition at line 1053 of file RDB.cc.

8.1.4.72 `setComment()` [3/4]

```
void RDB::setComment (
    RDBComment & comm,
    const string & name,
    const size_t idx = 0 )
```

Add or replace [RDBComment](#) in header of [RDB](#) object.

Parameters

<i>comm</i>	a reference to the RDBComment object
<i>name</i>	the name of the comment keyword.
<i>idx</i>	currently not defined.

If no matching comment keyword is found, the comment is appended to the list of comments. Otherwise, comm replaces the existing comment.

Definition at line 1090 of file RDB.cc.

8.1.4.73 `setComment()` [4/4]

```
void RDB::setComment (
    const RDB & rdb )
```

Copy all comments from an existing [RDB](#) object.

Parameters

<i>rdb</i>	a reference to an RDB object
------------	--

Copies all comments from the argument to this [RDB](#) object. Any comments previously associated with this object are removed.

Definition at line 1116 of file RDB.cc.

8.1.4.74 `setData()` [1/6]

```
void RDB::setData (
    const size_t idx,
    const double data )
```

Sets the data value of [RDBColumn](#), converting as necessary.

Parameters

<i>idx</i>	index of RDBColumn .
<i>data</i>	value to assign to RDBColumn data.

Exceptions

RDBErr	if index is out of range.
RDBErr	if data is invalid for RDBColumn .

Definition at line 1735 of file RDB.cc.

8.1.4.75 setData() [2/6]

```
void RDB::setData (
    const size_t idx,
    const long data )
```

Sets the data value of [RDBColumn](#), converting as necessary.

Parameters

<i>idx</i>	index of RDBColumn .
<i>data</i>	value to assign to RDBColumn data.

Exceptions

RDBErr	if index is out of range.
RDBErr	if data is invalid for RDBColumn .

Definition at line 1763 of file RDB.cc.

8.1.4.76 setData() [3/6]

```
void RDB::setData (
    const size_t idx,
    const string & data )
```

Sets the data value of [RDBColumn](#), converting as necessary.

Parameters

<i>idx</i>	index of RDBColumn /
<i>data</i>	value to assign RDBColumn data.

Exceptions

RDBErr	if index is out of range.
RDBErr	if data is invalid for RDBColumn .

Definition at line 1791 of file RDB.cc.

8.1.4.77 setData() [4/6]

```
void RDB::setData (
    const string & name,
    const double data )
```

Modify the [RDBColumn](#) data, converting if necessary.

Parameters

<i>name</i>	of RDBColumn
<i>data</i>	value to assign RDBColumn data.

Exceptions

RDBErr	if no matching column name is found.
RDBErr	if data is invalid datatype for RDBColumn .

Definition at line 2534 of file RDB.cc.

8.1.4.78 setData() [5/6]

```
void RDB::setData (
    const string & name,
    const long data )
```

Modify the [RDBColumn](#) data, converting if necessary.

Parameters

<i>name</i>	of RDBColumn
<i>data</i>	value to assign RDBColumn data.

Exceptions

RDBErr	if no matching column name is found.
RDBErr	if data is invalid datatype for RDBColumn .

Definition at line 2567 of file RDB.cc.

8.1.4.79 setData() [6/6]

```
void RDB::setData (
    const string & name,
    const string & data )
```

Modify the [RDBColumn](#) data, converting if necessary.

Parameters

<i>name</i>	of RDBColumn
<i>data</i>	value to assign RDBColumn data.

Exceptions

RDBErr	if no matching column name is found.
RDBErr	if data is invalid datatype for RDBColumn .

Definition at line 2600 of file RDB.cc.

8.1.4.80 setDef() [1/2]

```
void RDB::setDef (
    const size_t idx,
    const string & def )
```

Modify the definition of the [RDBColumn](#) at idx.

Parameters

<i>idx</i>	index of RDBColumn .
<i>def</i>	RDBColumn definition.

Exceptions

RDBErr	if index is out of range.
RDBErr	if def is invalid RDBColumn definition.

Definition at line 1509 of file RDB.cc.

8.1.4.81 setDef() [2/2]

```
void RDB::setDef (
    const string & name,
    const string & def )
```

Modify the [RDBColumn](#) definition.

Parameters

<i>name</i>	of RDBColumn
<i>def</i>	definition of RDBColumn .

Exceptions

RDBErr	if no matching column name is found.
RDBErr	if def is invalid definition for RDBColumn .

Definition at line 2250 of file RDB.cc.

8.1.4.82 setDesc() [1/2]

```
void RDB::setDesc (
    const size_t idx,
    const string & desc )
```

Modify the description of the [RDBColumn](#) at idx.

Parameters

<i>idx</i>	index of RDBColumn .
<i>desc</i>	RDBColumn description.

Exceptions

RDBErr	if index is out of range.
RDBErr	if desc is invalid RDBColumn description.

Definition at line 1621 of file RDB.cc.

8.1.4.83 `setDesc()` [2/2]

```
void RDB::setDesc (
    const string & name,
    const string & desc )
```

Modify the [RDBColumn](#) description.

Parameters

<i>name</i>	of RDBColumn
<i>desc</i>	description of RDBColumn .

Exceptions

RDBErr	if no matching column name is found.
RDBErr	if desc is invalid description for RDBColumn .

Definition at line 2390 of file RDB.cc.

8.1.4.84 `setGroup()` [1/2]

```
void RDB::setGroup (
    const string & name,
    bool group = true )
```

Turn on/off group status for the named column.

Parameters

<i>group</i>	a bool indicating whether group is on or off.
<i>name</i>	the name of the column in this RDB object.

Exceptions

RDBEr	error if there is no column with matching name.
-----------------------	---

Definition at line 878 of file RDB.cc.

8.1.4.85 `setGroup()` [2/2]

```
void RDB::setGroup (
    const int idx,
    bool group = true )
```

Turn on/off group status for the indexed column.

Parameters

<i>group</i>	a bool indicating whether group is on or off.
<i>idx</i>	the position of the column on which to operate.

Exceptions

<i>RDBErr</i>	error if there is no column with matching name.
-------------------------------	---

Definition at line 911 of file RDB.cc.

8.1.4.86 `setJust()` [1/2]

```
void RDB::setJust (
    const size_t idx,
    const RDBColumn::Just just )
```

Modify the justification of the [RDBColumn](#) at *idx*.

Parameters

<i>idx</i>	index of RDBColumn .
<i>just</i>	RDBColumn justification.

Exceptions

<i>RDBErr</i>	if index is out of range.
<i>RDBErr</i>	if just is invalid RDBColumn justification.

Definition at line 1593 of file RDB.cc.

8.1.4.87 setJust() [2/2]

```
void RDB::setJust (
    const string & name,
    const RDBColumn::Just just )
```

Modify the [RDBColumn](#) justification.

Parameters

<i>name</i>	of RDBColumn
<i>just</i>	justification of RDBColumn .

Exceptions

RDBErr	if no matching column name is found.
RDBErr	if just is invalid justification for RDBColumn .

Definition at line 2355 of file RDB.cc.

8.1.4.88 setName() [1/2]

```
void RDB::setName (
    const size_t idx,
    const string & name )
```

Modify the name of the [RDBColumn](#) at idx.

Parameters

<i>idx</i>	index of RDBColumn .
<i>name</i>	to assign to RDBColumn at idx.

Exceptions

RDBErr	if index is out of range.
------------------------	---------------------------

Definition at line 1488 of file RDB.cc.

8.1.4.89 setName() [2/2]

```
void RDB::setName (
    const string & name,
    const string & newname )
```

Modify the [RDBColumn](#) name.

Parameters

<i>name</i>	of RDBColumn
<i>newname</i>	new name of RDBColumn .

Exceptions

RDBErr	if no matching column name is found.
RDBErr	if newname is invalid name for RDBColumn .

Definition at line 2224 of file RDB.cc.

8.1.4.90 setType() [1/2]

```
void RDB::setType (
    const size_t idx,
    const RDBColumn::Type type )
```

Modify the type of the [RDBColumn](#) at idx.

Parameters

<i>idx</i>	index of RDBColumn .
<i>type</i>	RDBColumn type.

Exceptions

RDBErr	if index is out of range.
RDBErr	if type is invalid RDBColumn type.

Definition at line 1565 of file RDB.cc.

8.1.4.91 setType() [2/2]

```
void RDB::setType (
    const string & name,
    const RDBColumn::Type type )
```

Modify the [RDBColumn](#) type.

Parameters

<i>name</i>	of RDBColumn
<i>type</i>	type of RDBColumn .

Exceptions

RDBErr	if no matching column name is found.
RDBErr	if type is invalid type for RDBColumn .

Definition at line 2320 of file RDB.cc.

8.1.4.92 setWidth() [1/2]

```
void RDB::setWidth (
    const size_t idx,
    const long width )
```

Modify the width of the [RDBColumn](#) at idx.

Parameters

<i>idx</i>	index of RDBColumn .
<i>width</i>	RDBColumn width.

Exceptions

RDBErr	if index is out of range.
RDBErr	if width is invalid RDBColumn width.

Definition at line 1537 of file RDB.cc.

8.1.4.93 `setWidth()` [2/2]

```
void RDB::setWidth (
    const string & name,
    const long width )
```

Modify the [RDBColumn](#) width.

Parameters

<i>name</i>	of RDBColumn
<i>width</i>	width of RDBColumn .

Exceptions

RDBErr	if no matching column name is found.
RDBErr	if width is invalid width for RDBColumn .

Definition at line 2285 of file RDB.cc.

8.1.4.94 `write()`

```
bool RDB::write (
    void )
```

Write a line of data to the ostream.

Returns

false if EOF or if the ostream is bad.

Writes the next line of data to the [RDB](#) file, if an output stream has been provided. If the [RDB](#) header has not been written yet, it outputs the comments, column names and column definitions. If [RDB::_autoidx](#) is set, it will advance the indices in the [RDBColumn](#)'s data pointer before reading and will increment the row number, [RDB::_rownum](#), for the default '_NR' column.

After a successful write, the [RDB::_autoidx](#) flag is set to true.

Definition at line 712 of file RDB.cc.

8.1.5 Friends And Related Function Documentation

8.1.5.1 `operator<<`

```
ostream& operator<< (
    ostream & os,
    RDB & rdb ) [friend]
```

Write table to output stream.

Parameters

<i>os</i>	the output stream.
<i>rdb</i>	the table to print.

Returns

A reference to the output stream

Places the table on the output stream.

Definition at line 76 of file RDB.cc.

8.1.5.2 operator>>

```
istream& operator>> (  
    istream & is,  
    RDB & rdb ) [friend]
```

Read table from input stream.

Parameters

<i>is</i>	the input stream.
<i>rdb</i>	the table to fill.

Returns

A reference to the input stream.

If the stream contains a valid rdbtable fill it... otherwise set ios::failbit.

Definition at line 38 of file RDB.cc.

8.1.6 Member Data Documentation**8.1.6.1 _autoidx**

```
bool RDB::_autoidx [protected]
```

Indicates if [RDBColumn](#) data elements should be advanced.

Definition at line 332 of file RDB.h.

8.1.6.2 `_cols`

```
RDBCColumn** RDB::_cols [protected]
```

Array of RDBCColumns.

Definition at line 343 of file RDB.h.

8.1.6.3 `_comms`

```
RDBComment* RDB::_comms [protected]
```

Array of RDBComments.

Definition at line 341 of file RDB.h.

8.1.6.4 `_filename`

```
string RDB::_filename [protected]
```

Name of [RDB](#) file.

Definition at line 303 of file RDB.h.

8.1.6.5 `_firstread`

```
bool RDB::_firstread [protected]
```

Indicates if this is the first call to [RDB::read](#).

Definition at line 334 of file RDB.h.

8.1.6.6 `_frownum`

```
long RDB::_frownum [protected]
```

Current *file* row number.

Definition at line 329 of file RDB.h.

8.1.6.7 `_isptr`

```
istream* RDB::_isptr [protected]
```

Istream attached to data file.

Definition at line 308 of file RDB.h.

8.1.6.8 `_knowrows`

```
bool RDB::_knowrows [protected]
```

Indicates if associated file must be scanned to determine number of rows.

Definition at line 325 of file RDB.h.

8.1.6.9 `_lastread`

```
bool RDB::_lastread [protected]
```

Indicates if this is the last call to [RDB::read](#).

Definition at line 336 of file RDB.h.

8.1.6.10 `_line`

```
string RDB::_line [protected]
```

Line from [RDB](#) table.

Definition at line 350 of file RDB.h.

8.1.6.11 `_mode`

```
ios::openmode RDB::_mode [protected]
```

Open mode of the associated stream.

Definition at line 305 of file RDB.h.

8.1.6.12 `_mycols`

```
bool* RDB::_mycols [protected]
```

Indicates if [RDB](#) object is responsible for deallocating given [RDBColumn](#).

Definition at line 347 of file RDB.h.

8.1.6.13 `_myisptr`

```
bool RDB::_myisptr [protected]
```

Indicates if [RDB](#) object is responsible for deallocating the istream.

Definition at line 312 of file RDB.h.

8.1.6.14 `_myosptr`

```
bool RDB::_myosptr [protected]
```

Indicates if [RDB](#) object is responsible for deallocating the ostream.

Definition at line 314 of file RDB.h.

8.1.6.15 `_ncols`

```
size_t RDB::_ncols [protected]
```

Number of columns.

Definition at line 321 of file RDB.h.

8.1.6.16 `_ncomms`

```
size_t RDB::_ncomms [protected]
```

Number of comments.

Definition at line 319 of file RDB.h.

8.1.6.17 `_nrcol`

`RDBLongColumn RDB::_nrcol` [protected]

Hidden column, containing row number.

Definition at line 345 of file RDB.h.

8.1.6.18 `_nrows`

`size_t RDB::_nrows` [protected]

Number of rows.

Definition at line 323 of file RDB.h.

8.1.6.19 `_osptr`

`ostream* RDB::_osptr` [protected]

Ostream attached to data file.

Definition at line 310 of file RDB.h.

8.1.6.20 `_rewindto`

`size_t RDB::_rewindto` [protected]

Position of beginning of first row of data.

Definition at line 317 of file RDB.h.

8.1.6.21 `_rownum`

`long RDB::_rownum` [protected]

Current *table* row number.

Definition at line 327 of file RDB.h.

8.1.6.22 `_writehdr`

```
bool RDB::_writehdr [protected]
```

Indicates if the header has been output.

Definition at line 338 of file RDB.h.

The documentation for this class was generated from the following files:

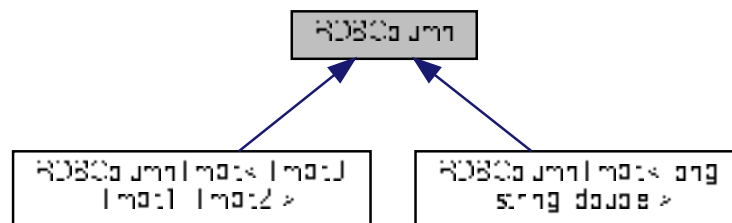
- RDB.h
- RDB.cc

8.2 RDBColumn Class Reference

Provides interface for general column related methods.

```
#include <RDBColumn.h>
```

Inheritance diagram for RDBColumn:



Public Types

Enumerations for column definitions and error conditions.

- enum [Just](#)
Acceptable column justifications.
- enum [Type](#)
Acceptable column types.
- enum [Err](#)
Possible error conditions.
- enum **Status**

Public Member Functions

Constructing, destructing, and initializing RDBColumn objects.

- [RDBColumn](#) (const string &name="", const string &def="")
Assigns name and definition to [RDBColumn](#) object.
- [RDBColumn](#) (const [RDBColumn](#) &col)
Copies [RDBColumn](#) object.
- virtual [~RDBColumn](#) (void)
Deletes resources allocated by [RDBColumn](#) object.
- [RDBColumn](#) & [operator=](#) (const [RDBColumn](#) &col)
Copies [RDBColumn](#) object.
- virtual [RDBColumn](#) & [operator=](#) (const double &data)=0
Assigns data to [RDBColumn](#) object's `_data` member, converting as necessary.
- virtual [RDBColumn](#) & [operator=](#) (const long &data)=0
Assigns data to [RDBColumn](#) object's `_data` member, converting as necessary.
- virtual [RDBColumn](#) & [operator=](#) (const string &data)=0
Assigns data to [RDBColumn](#) object's `_data` member, converting as necessary.

Auto-indexing control methods.

- virtual void [advanceIdx](#) (void)=0
Increments index to the [RDBColumn](#)'s data elements.
- virtual void [rewind](#) (void)=0
Rewinds index to the [RDBColumn](#)'s data elements.

Group information ("break" column) methods.

- virtual void [setGroup](#) (bool group)
Turn on/off group tracking for this column object.
- bool [getGroup](#) (void) const
Returns group status, `RBOG` if at beginning of a group, `REOG` if at end of a group, or `REOL` if in the middle of a group.
- virtual void [setGroupValue](#) (void)=0
Sets the group value to the current data value.
- virtual int [newGroup](#) (void)=0
Returns the group status of this column object.

Data member initializers.

- void [setName](#) (const string &name)
Sets the name.
- void [setDef](#) (const string &def)
Sets the definition.
- void [setWidth](#) (const long width)
Sets the width.
- void [setType](#) (const [RDBColumn::Type](#) type)
Sets the type.
- void [setJust](#) (const [RDBColumn::Just](#) just)
Sets the justification.
- void [setDesc](#) (const string &desc)
Sets the description.
- void [setPrecision](#) (const int precision)
Sets the precision for numeric output and numeric to string conversion.

- void [setThrow](#) (const bool t=true)
Sets the exception throwing behavior.
- void [setErrNo](#) (const int no=0)
Sets the error status.
- virtual bool [setData](#) (const double &data)=0
Sets the data value, converting as necessary.
- virtual bool [setData](#) (const long &data)=0
Sets the data value, converting as necessary.
- virtual bool [setData](#) (const string &data)=0
Sets the data value, converting as necessary.

Methods to map RDBColumn's data to user-supplied memory.

- virtual void [mapData](#) (double data[], const size_t nelems=1)
Maps data to user-supplied memory, if possible.
- virtual void [mapData](#) (long data[], const size_t nelems=1)
Maps data to user-supplied memory, if possible.
- virtual void [mapData](#) (string data[], const size_t nelems=1)
Maps data to user-supplied memory, if possible.

Data member accessors.

- string [getName](#) (void) const
Returns the name.
- string [getDef](#) (void)
Returns the definition.
- long [getWidth](#) (void) const
Returns the width.
- [RDBColumn::Type](#) [getType](#) (void) const
Returns the type.
- [RDBColumn::Just](#) [getJust](#) (void) const
Returns the justification.
- string [getDesc](#) (void) const
Returns the description.
- int [getPrecision](#) (void) const
Returns the precision.
- bool [getThrow](#) (void) const
Returns the state of the exception throwing behavior.
- char * [getErr](#) (void) const
Returns a brief description of the error condition.
- int [getErrNo](#) (void) const
Returns the error status.
- virtual void * [getData](#) (void)=0
Returns a pointer to the current data element.
- virtual bool [getData](#) (double &data)=0
Returns the value of the current data element, converting if necessary.
- virtual bool [getData](#) (long &data)=0
Returns the value of the current data element, converting if necessary.
- virtual bool [getData](#) (string &data)=0
Returns the value of the current data element, converting if necessary.
- virtual double [getDataDouble](#) (void)=0
Returns the value of the current data element, converting if necessary.
- virtual long [getDataLong](#) (void)=0
Returns the value of the current data element, converting if necessary.
- virtual string [getDataString](#) (void)=0
Returns the value of the current data element, converting if necessary.

Protected Member Functions

- void [convert](#) (const double &idata, double &odata)
Used to converted data based on user requests.
- void [convert](#) (const double &idata, long &odata)
Used to converted data based on user requests.
- void [convert](#) (const double &idata, string &odata)
Used to converted data based on user requests.
- void [convert](#) (const long &idata, double &odata)
Used to converted data based on user requests.
- void [convert](#) (const long &idata, long &odata)
Used to converted data based on user requests.
- void [convert](#) (const long &idata, string &odata)
Used to converted data based on user requests.
- void [convert](#) (const string &idata, double &odata)
Used to converted data based on user requests.
- void [convert](#) (const string &idata, long &odata)
Used to converted data based on user requests.
- void [convert](#) (const string &idata, string &odata)
Used to converted data based on user requests.
- virtual istream & [read](#) (istream &is)=0
Called by the stream insertion operator.
- virtual istream & [extract](#) (istream &is, double &data)
Overridden in the subclass of this datatype.
- virtual istream & [extract](#) (istream &is, long &data)
Overridden in the subclass of this datatype.
- virtual istream & [extract](#) (istream &is, string &data)
Overridden in the subclass of this datatype.
- virtual ostream & [write](#) (ostream &os) const =0
Called by the stream extraction operator.
- virtual ostream & [insert](#) (ostream &os, double &data) const
Overridden in the subclass of this datatype.
- virtual ostream & [insert](#) (ostream &os, long &data) const
Overridden in the subclass of this datatype.
- virtual ostream & [insert](#) (ostream &os, string &data) const
Overridden in the subclass of this datatype.

Protected Attributes

- string [_name](#)
Name.
- string [_def](#)
Definition.
- long [_width](#)
Width.
- [RDBColumn::Type](#) [_type](#)
Data type.

- [RDBColumn::Just_just](#)
Justification.
- [string _desc](#)
Description.
- [bool _changed](#)
Indicates state for the definition field.
- [bool _throw](#)
State of the exception throwing behavior.
- [int _errno](#)
Error state.
- [int _precision](#)
Precision used for stream output or numeric to string conversion.
- [stringstream _strstrm](#)
Used for numeric to string conversion.
- [bool _group](#)
This is a group column.
- [bool _initgroup](#)
Group been initialized.

Friends

Stream insertion and extraction operators.

- [istream & operator>>](#) (istream &is, [RDBColumn](#) &col)
Read column from input stream.
- [istream & operator>>](#) (istream &is, [RDBColumn](#) *col)
Read column from input stream.
- [ostream & operator<<](#) (ostream &os, const [RDBColumn](#) &col)
Write column to output stream.
- [ostream & operator<<](#) (ostream &os, const [RDBColumn](#) *col)
Write column to output stream.

8.2.1 Detailed Description

Provides interface for general column related methods.

Definition at line 43 of file [RDBColumn.h](#).

8.2.2 Member Enumeration Documentation

8.2.2.1 Err

```
enum RDBColumn::Err
```

Possible error conditions.

Definition at line 64 of file RDBColumn.h.

8.2.2.2 Just

```
enum RDBColumn::Just
```

Acceptable column justifications.

Definition at line 60 of file RDBColumn.h.

8.2.2.3 Type

```
enum RDBColumn::Type
```

Acceptable column types.

Definition at line 62 of file RDBColumn.h.

8.2.3 Constructor & Destructor Documentation

8.2.3.1 RDBColumn() [1/2]

```
RDBColumn::RDBColumn (
    const string & name = "",
    const string & def = "" )
```

Assigns name and definition to [RDBColumn](#) object.

Parameters

<i>name</i>	the column name.
<i>def</i>	the column definition.

Initializes the [RDBColumn](#) name and definition. Sets the exception throwing behavior to true.

Definition at line 136 of file RDBColumn.cc.

8.2.3.2 RDBColumn() [2/2]

```
RDBColumn::RDBColumn (
    const RDBColumn & col )
```

Copies [RDBColumn](#) object.

Parameters

<i>col</i>	the RDBColumn object to copy.
------------	---

Copies the argument.

Definition at line 165 of file RDBColumn.cc.

8.2.3.3 ~RDBColumn()

```
RDBColumn::~RDBColumn (
    void ) [virtual]
```

Deletes resources allocated by [RDBColumn](#) object.

Nothing to do.

Definition at line 180 of file RDBColumn.cc.

8.2.4 Member Function Documentation

8.2.4.1 advanceIdx()

```
virtual void RDBColumn::advanceIdx (
    void ) [pure virtual]
```

Increments index to the [RDBColumn](#)'s data elements.

Implemented in [RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >](#), and [RDBColumnTmpl< long, string, double >](#).

8.2.4.2 `convert()` [1/9]

```
void RDBColumn::convert (
    const double & idata,
    double & odata ) [protected]
```

Used to converted data based on user requests.

Parameters

<i>idata</i>	input data.
<i>odata</i>	output data.

Handles the trivial conversion for double to double for child classes.

Definition at line 647 of file RDBColumn.cc.

8.2.4.3 `convert()` [2/9]

```
void RDBColumn::convert (
    const double & idata,
    long & odata ) [protected]
```

Used to converted data based on user requests.

Parameters

<i>idata</i>	input data.
<i>odata</i>	output data.

Handles the trivial conversion for double to long for child classes.

Definition at line 664 of file RDBColumn.cc.

8.2.4.4 `convert()` [3/9]

```
void RDBColumn::convert (
    const double & idata,
    string & odata ) [protected]
```

Used to converted data based on user requests.

Parameters

<i>idata</i>	input data.
<i>odata</i>	output data.

Handles the non-trivial conversion for double to string for child classes.

Warning

This is slow. Like dirt. Don't do it often.

Definition at line 684 of file RDBColumn.cc.

8.2.4.5 convert() [4/9]

```
void RDBColumn::convert (
    const long & idata,
    double & odata ) [protected]
```

Used to converted data based on user requests.

Parameters

<i>idata</i>	input data.
<i>odata</i>	output data.

Handles the trivial conversion for long to double for child classes.

Definition at line 705 of file RDBColumn.cc.

8.2.4.6 convert() [5/9]

```
void RDBColumn::convert (
    const long & idata,
    long & odata ) [protected]
```

Used to converted data based on user requests.

Parameters

<i>idata</i>	input data.
<i>odata</i>	output data.

Handles the trivial conversion for long to long for child classes.

Definition at line 722 of file RDBColumn.cc.

8.2.4.7 `convert()` [6/9]

```
void RDBColumn::convert (
    const long & idata,
    string & odata ) [protected]
```

Used to converted data based on user requests.

Parameters

<i>idata</i>	input data.
<i>odata</i>	output data.

Handles the non-trivial conversion for long to string for child classes.

Warning

This is slow. Like dirt. Don't do it often.

Definition at line 741 of file RDBColumn.cc.

8.2.4.8 `convert()` [7/9]

```
void RDBColumn::convert (
    const string & idata,
    double & odata ) [protected]
```

Used to converted data based on user requests.

Parameters

<i>idata</i>	input data.
<i>odata</i>	output data.

Exceptions

<i>RDBErr</i>	error if <i>idata</i> is non-numeric.
-------------------------------	---------------------------------------

Handles the non-trivial conversion for string to double for child classes.

Definition at line 764 of file RDBColumn.cc.

8.2.4.9 `convert()` [8/9]

```
void RDBColumn::convert (
    const string & idata,
    long & odata ) [protected]
```

Used to converted data based on user requests.

Parameters

<i>idata</i>	input data.
<i>odata</i>	output data.

Exceptions

<i>RDBErr</i>	error if <i>idata</i> is non-numeric.
<i>RDBErr</i>	error if <i>idata</i> represents a floating point number and precision is lost converting to integer number.

Handles the non-trivial conversion for string to long for child classes.

Definition at line 796 of file RDBColumn.cc.

8.2.4.10 `convert()` [9/9]

```
void RDBColumn::convert (
    const string & idata,
    string & odata ) [protected]
```

Used to converted data based on user requests.

Parameters

<i>idata</i>	input data.
<i>odata</i>	output data.

Handles the trivial conversion for string to string for child classes.

Definition at line 848 of file RDBColumn.cc.

8.2.4.11 `extract()` [1/3]

```
istream & RDBColumn::extract (
    istream & is,
    double & data ) [protected], [virtual]
```

Overridden in the subclass of this datatype.

Parameters

<i>is</i>	input string.
<i>data</i>	double data.

Returns

istream the input stream.

Extracts a double from the input stream.

Definition at line 867 of file RDBColumn.cc.

8.2.4.12 `extract()` [2/3]

```
istream & RDBColumn::extract (
    istream & is,
    long & data ) [protected], [virtual]
```

Overridden in the subclass of this datatype.

Parameters

<i>is</i>	input string.
<i>data</i>	long data.

Returns

istream the input stream.

Extracts a long from the input stream.

Definition at line 891 of file RDBColumn.cc.

8.2.4.13 `extract()` [3/3]

```
istream & RDBColumn::extract (
    istream & is,
    string & data ) [protected], [virtual]
```

Overridden in the subclass of this datatype.

Parameters

<i>is</i>	input string.
<i>data</i>	string data.

Returns

istream the input stream.

Extracts a string from the input stream. Extraction stops at the first tab or newline character.

Definition at line 917 of file RDBColumn.cc.

8.2.4.14 `getData()` [1/4]

```
virtual void* RDBColumn::getData (
    void ) [pure virtual]
```

Returns a pointer to the current data element.

Implemented in [RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >](#), and [RDBColumnTmpl< long, string, double >](#).

8.2.4.15 `getData()` [2/4]

```
virtual bool RDBColumn::getData (
    double & data ) [pure virtual]
```

Returns the value of the current data element, converting if necessary.

Implemented in [RDBColumnTmpl< long, string, double >](#).

8.2.4.16 `getData()` [3/4]

```
virtual bool RDBColumn::getData (
    long & data ) [pure virtual]
```

Returns the value of the current data element, converting if necessary.

Implemented in [RDBColumnTmpl< long, string, double >](#).

8.2.4.17 `getData()` [4/4]

```
virtual bool RDBColumn::getData (
    string & data ) [pure virtual]
```

Returns the value of the current data element, converting if necessary.

Implemented in [RDBColumnTmpl< long, string, double >](#).

8.2.4.18 `getDataDouble()`

```
virtual double RDBColumn::getDataDouble (
    void ) [pure virtual]
```

Returns the value of the current data element, converting if necessary.

Implemented in [RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >](#), and [RDBColumnTmpl< long, string, double >](#).

8.2.4.19 `getDataLong()`

```
virtual long RDBColumn::getDataLong (
    void ) [pure virtual]
```

Returns the value of the current data element, converting if necessary.

Implemented in [RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >](#), and [RDBColumnTmpl< long, string, double >](#).

8.2.4.20 `getDataString()`

```
virtual string RDBColumn::getDataString (
    void ) [pure virtual]
```

Returns the value of the current data element, converting if necessary.

Implemented in [RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >](#), and [RDBColumnTmpl< long, string, double >](#).

8.2.4.21 `getDef()`

```
string RDBColumn::getDef (
    void )
```

Returns the definition.

Returns the [RDBColumn](#) definition, reconstructing it from its constituent parts if any of them have changed.

Definition at line 498 of file `RDBColumn.cc`.

8.2.4.22 `getDesc()`

```
string RDBColumn::getDesc (
    void ) const
```

Returns the description.

Returns the [RDBColumn](#) description.

Definition at line 579 of file `RDBColumn.cc`.

8.2.4.23 `getErr()`

```
char * RDBColumn::getErr (
    void ) const
```

Returns a brief description of the error condition.

Returns a string describing the [RDBColumn](#) error flag.

Definition at line 618 of file `RDBColumn.cc`.

8.2.4.24 getErrNo()

```
int RDBColumn::getErrNo (
    void ) const
```

Returns the error status.

Returns the [RDBColumn](#) error flag.

Definition at line 631 of file RDBColumn.cc.

8.2.4.25 getGroup()

```
bool RDBColumn::getGroup (
    void ) const
```

Returns group status, RBOG if at beginning of a group, REOG if at ned of a group, or REOL if in the middle of a group.

Returns

Whether or not this is a group column.

Definition at line 232 of file RDBColumn.cc.

8.2.4.26 getJust()

```
RDBColumn::Just RDBColumn::getJust (
    void ) const
```

Returns the justification.

Returns the [RDBColumn](#) justification.

Definition at line 566 of file RDBColumn.cc.

8.2.4.27 getName()

```
string RDBColumn::getName (
    void ) const
```

Returns the name.

Returns the [RDBColumn](#) name.

Definition at line 484 of file RDBColumn.cc.

8.2.4.28 `getPrecision()`

```
int RDBColumn::getPrecision (
    void ) const
```

Returns the precision.

Returns the [RDBColumn](#) precision used for stream output.

Definition at line 592 of file `RDBColumn.cc`.

8.2.4.29 `getThrow()`

```
bool RDBColumn::getThrow (
    void ) const
```

Returns the state of the exception throwing behavior.

Returns the [RDBColumn](#) exception throwing flag.

Definition at line 605 of file `RDBColumn.cc`.

8.2.4.30 `getType()`

```
RDBColumn::Type RDBColumn::getType (
    void ) const
```

Returns the type.

Returns the [RDBColumn](#) type.

Definition at line 553 of file `RDBColumn.cc`.

8.2.4.31 `getWidth()`

```
long RDBColumn::getWidth (
    void ) const
```

Returns the width.

Returns the [RDBColumn](#) width.

Definition at line 540 of file `RDBColumn.cc`.

8.2.4.32 `insert()` [1/3]

```
ostream & RDBColumn::insert (
    ostream & os,
    double & data ) const [protected], [virtual]
```

Overridden in the subclass of this datatype.

Parameters

<i>os</i>	output string.
<i>data</i>	double data.

Returns

ostream the output stream.

Inserts a double into the output stream.

Definition at line 953 of file RDBColumn.cc.

8.2.4.33 insert() [2/3]

```
ostream & RDBColumn::insert (  
    ostream & os,  
    long & data ) const [protected], [virtual]
```

Overridden in the subclass of this datatype.

Parameters

<i>os</i>	output string.
<i>data</i>	double data.

Returns

ostream the output stream.

Inserts a long into the output stream.

Definition at line 972 of file RDBColumn.cc.

8.2.4.34 insert() [3/3]

```
ostream & RDBColumn::insert (  
    ostream & os,  
    string & data ) const [protected], [virtual]
```

Overridden in the subclass of this datatype.

Parameters

<i>os</i>	output string.
<i>data</i>	double data.

Returns

ostream the output stream.

Inserts a string into the output stream.

Definition at line 991 of file RDBColumn.cc.

8.2.4.35 mapData() [1/3]

```
void RDBColumn::mapData (  
    double data[],  
    const size_t nelems = 1 ) [virtual]
```

Maps data to user-supplied memory, if possible.

Definition at line 448 of file RDBColumn.cc.

8.2.4.36 mapData() [2/3]

```
void RDBColumn::mapData (  
    long data[],  
    const size_t nelems = 1 ) [virtual]
```

Maps data to user-supplied memory, if possible.

Reimplemented in [RDBColumnTpl< long, string, double >](#).

Definition at line 459 of file RDBColumn.cc.

8.2.4.37 mapData() [3/3]

```
void RDBColumn::mapData (  
    string data[],  
    const size_t nelems = 1 ) [virtual]
```

Maps data to user-supplied memory, if possible.

Definition at line 470 of file RDBColumn.cc.

8.2.4.38 newGroup()

```
virtual int RDBColumn::newGroup (
    void ) [pure virtual]
```

Returns the group status of this column object.

Implemented in [RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >](#), and [RDBColumnTmpl< long, string, double >](#).

8.2.4.39 operator=() [1/4]

```
RDBColumn & RDBColumn::operator= (
    const RDBColumn & col )
```

Copies [RDBColumn](#) object.

Parameters

<i>col</i>	the RDBColumn object to copy.
------------	---

Definition at line 191 of file RDBColumn.cc.

8.2.4.40 operator=() [2/4]

```
virtual RDBColumn& RDBColumn::operator= (
    const double & data ) [pure virtual]
```

Assigns data to [RDBColumn](#) object's `_data` member, converting as necessary.

Implemented in [RDBColumnTmpl< long, string, double >](#).

8.2.4.41 operator=() [3/4]

```
virtual RDBColumn& RDBColumn::operator= (
    const long & data ) [pure virtual]
```

Assigns data to [RDBColumn](#) object's `_data` member, converting as necessary.

Implemented in [RDBColumnTmpl< long, string, double >](#).

8.2.4.42 `operator=()` [4/4]

```
virtual RDBColumn& RDBColumn::operator= (  
    const string & data ) [pure virtual]
```

Assigns data to [RDBColumn](#) object's `_data` member, converting as necessary.

Implemented in [RDBColumnTmpl< long, string, double >](#).

8.2.4.43 `read()`

```
virtual istream& RDBColumn::read (  
    istream & is ) [protected], [pure virtual]
```

Called by the stream insertion operator.

Implemented in [RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >](#), and [RDBColumnTmpl< long, string, double >](#).

8.2.4.44 `rewind()`

```
virtual void RDBColumn::rewind (  
    void ) [pure virtual]
```

Rewinds index to the [RDBColumn](#)'s data elements.

Implemented in [RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >](#), and [RDBColumnTmpl< long, string, double >](#).

8.2.4.45 `setData()` [1/3]

```
virtual bool RDBColumn::setData (  
    const double & data ) [pure virtual]
```

Sets the data value, converting as necessary.

Implemented in [RDBColumnTmpl< long, string, double >](#).

8.2.4.46 setData() [2/3]

```
virtual bool RDBColumn::setData (
    const long & data ) [pure virtual]
```

Sets the data value, converting as necessary.

Implemented in [RDBColumnTpl< long, string, double >](#).

8.2.4.47 setData() [3/3]

```
virtual bool RDBColumn::setData (
    const string & data ) [pure virtual]
```

Sets the data value, converting as necessary.

Implemented in [RDBColumnTpl< long, string, double >](#).

8.2.4.48 setDef()

```
void RDBColumn::setDef (
    const string & def )
```

Sets the definition.

Parameters

<i>def</i>	the RDBColumn definition to use.
------------	--

Exceptions

<i>RDBErrColFmt</i>	error if the definition is an unrecognized format.
---------------------	--

Sets the [RDBColumn](#) definition, as well as the width, type, justification, and description.

Definition at line 266 of file RDBColumn.cc.

8.2.4.49 setDesc()

```
void RDBColumn::setDesc (
    const string & desc )
```

Sets the description.

Parameters

<i>desc</i>	is the column documentation.
-------------	------------------------------

Sets the [RDBColumn](#) description.

Definition at line 391 of file RDBColumn.cc.

8.2.4.50 setErrNo()

```
void RDBColumn::setErrNo (
    const int no = 0 )
```

Sets the error status.

Parameters

<i>no</i>	Sets the RDBColumn error status.
-----------	--

Definition at line 438 of file RDBColumn.cc.

8.2.4.51 setGroup()

```
void RDBColumn::setGroup (
    bool group ) [virtual]
```

Turn on/off group tracking for this column object.

Parameters

<i>group</i>	incidcates whether or not this is a group column.
--------------	---

Reimplemented in [RDBColumnTpl< Tmpl0, Tmpl1, Tmpl2 >](#), and [RDBColumnTpl< long, string, double >](#).

Definition at line 219 of file RDBColumn.cc.

8.2.4.52 setGroupValue()

```
virtual void RDBColumn::setGroupValue (
    void ) [pure virtual]
```

Sets the group value to the current data value.

Implemented in [RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >](#), and [RDBColumnTmpl< long, string, double >](#).

8.2.4.53 setJust()

```
void RDBColumn::setJust (
    const RDBColumn::Just just )
```

Sets the justification.

Parameters

<i>just</i>	the justification of the data when printing.
-------------	--

Possible values are '<' for left justification and '>' for right justification. Default is for months and strings to be left justified and numeric data to be right justified.

Definition at line 375 of file RDBColumn.cc.

8.2.4.54 setName()

```
void RDBColumn::setName (
    const string & name )
```

Sets the name.

Parameters

<i>name</i>	the RDBColumn name to use.
-------------	--

Sets the [RDBColumn](#) name.

Definition at line 247 of file RDBColumn.cc.

8.2.4.55 setPrecision()

```
void RDBColumn::setPrecision (
    const int precision )
```

Sets the precision for numeric output and numeric to string conversion.

Parameters

<i>precision</i>	Sets the RDBColumn precision which controls the output precision of floating point data.
------------------	--

Definition at line 408 of file RDBColumn.cc.

8.2.4.56 setThrow()

```
void RDBColumn::setThrow (
    const bool t = true )
```

Sets the exception throwing behavior.

Parameters

<i>t</i>	state of the exception throwing behavior.
----------	---

Sets the [RDBColumn](#) exception throwing behavior.

Definition at line 423 of file RDBColumn.cc.

8.2.4.57 setType()

```
void RDBColumn::setType (
    const RDBColumn::Type type )
```

Sets the type.

Parameters

<i>type</i>	of the RDBColumn .
-------------	------------------------------------

Possible values are 'M' for month, 'N' for numeric, 'S' for string. String is the default type.

Definition at line 357 of file RDBColumn.cc.

8.2.4.58 setWidth()

```
void RDBColumn::setWidth (
    const long width )
```

Sets the width.

Parameters

<i>width</i>	the width of the RDBColumn .
--------------	--

The width has no effect on the storage or printing of the data. The [RDB](#) docs indicate that it is used only by the ptbl command.

Definition at line 340 of file RDBColumn.cc.

8.2.4.59 write()

```
virtual ostream& RDBColumn::write (  
    ostream & os ) const [protected], [pure virtual]
```

Called by the stream extraction operator.

Implemented in [RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >](#), and [RDBColumnTmpl< long, string, double >](#).

8.2.5 Friends And Related Function Documentation**8.2.5.1 operator<< [1/2]**

```
ostream& operator<< (  
    ostream & os,  
    const RDBColumn & col ) [friend]
```

Write column to output stream.

Parameters

<i>os</i>	output stream.
<i>col</i>	RDBColumn to fill.

Returns

A reference to the output stream.

Writes one data element from this object.

Definition at line 100 of file RDBColumn.cc.

8.2.5.2 operator<< [2/2]

```
ostream& operator<< (  
    ostream & os,  
    const RDBColumn * col ) [friend]
```

Write column to output stream.

Parameters

<i>os</i>	output stream.
<i>col</i>	RDBColumn to fill.

Returns

A reference to the output stream.

Writes one data element from this object.

Definition at line 119 of file RDBColumn.cc.

8.2.5.3 operator>> [1/2]

```
istream& operator>> (  
    istream & is,  
    RDBColumn & col ) [friend]
```

Read column from input stream.

Parameters

<i>is</i>	input stream.
<i>col</i>	RDBColumn to fill.

Returns

A reference to the input stream.

Reads one data element into this object.

Definition at line 38 of file RDBColumn.cc.

8.2.5.4 operator>> [2/2]

```
istream& operator>> (  
    istream & is,  
    RDBColumn * col ) [friend]
```

Read column from input stream.

Parameters

<i>is</i>	input stream.
<i>col</i>	RDBColumn to fill.

Returns

A reference to the input stream.

Reads one data element into this object.

Definition at line 69 of file RDBColumn.cc.

8.2.6 Member Data Documentation

8.2.6.1 _changed

```
bool RDBColumn::_changed [protected]
```

Indicates state for the definition field.

Definition at line 237 of file RDBColumn.h.

8.2.6.2 _def

```
string RDBColumn::_def [protected]
```

Definition.

Definition at line 227 of file RDBColumn.h.

8.2.6.3 `_desc`

```
string RDBColumn::_desc [protected]
```

Description.

Definition at line 235 of file RDBColumn.h.

8.2.6.4 `_errno`

```
int RDBColumn::_errno [protected]
```

Error state.

Definition at line 242 of file RDBColumn.h.

8.2.6.5 `_group`

```
bool RDBColumn::_group [protected]
```

This is a group column.

Definition at line 248 of file RDBColumn.h.

8.2.6.6 `_initgroup`

```
bool RDBColumn::_initgroup [protected]
```

Group been initialized.

Definition at line 250 of file RDBColumn.h.

8.2.6.7 `_just`

```
RDBColumn::Just RDBColumn::_just [protected]
```

Justification.

Definition at line 233 of file RDBColumn.h.

8.2.6.8 `_name`

```
string RDBColumn::_name [protected]
```

Name.

Definition at line 225 of file RDBColumn.h.

8.2.6.9 `_precision`

```
int RDBColumn::_precision [protected]
```

Precision used for stream output or numeric to string conversion.

Definition at line 244 of file RDBColumn.h.

8.2.6.10 `_strstm`

```
stringstream RDBColumn::_strstm [protected]
```

Used for numeric to string conversion.

Definition at line 246 of file RDBColumn.h.

8.2.6.11 `_throw`

```
bool RDBColumn::_throw [protected]
```

State of the exception throwing behavior.

Definition at line 240 of file RDBColumn.h.

8.2.6.12 `_type`

```
RDBColumn::Type RDBColumn::_type [protected]
```

Data type.

Definition at line 231 of file RDBColumn.h.

8.2.6.13 `_width`

```
long RDBColumn::_width [protected]
```

Width.

Definition at line 229 of file RDBColumn.h.

The documentation for this class was generated from the following files:

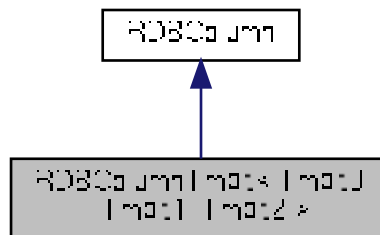
- RDBColumn.h
- RDBColumn.cc

8.3 RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 > Class Template Reference

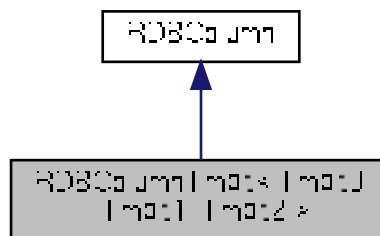
Parameterizes [RDBColumn](#) interface for many data types.

```
#include <RDBColumnTmpl.h>
```

Inheritance diagram for RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >:



Collaboration diagram for RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >:



Public Member Functions

Constructing, destructing, and initializing RDB columns.

- [RDBColumnTmpl](#) (const string &name="", const string &def="")
Assigns name and definition.
- [RDBColumnTmpl](#) (const [RDBColumnTmpl](#)< Tmpl0, Tmpl1, Tmpl2 > &rdbcolumntmpl)
Copies [RDBColumnTmpl](#) object.
- [~RDBColumnTmpl](#) (void)
Deletes resources allocated by [RDBColumnTmpl](#) object.
- [RDBColumn](#) & [operator=](#) (const [RDBColumnTmpl](#)< Tmpl0, Tmpl1, Tmpl2 > &rdbcolumntmpl)
Copies [RDBColumnTmpl](#) object.
- virtual [RDBColumn](#) & [operator=](#) (const Tmpl0 &data)
Assigns data to [RDBColumn](#) object's `_data` member, converting as necessary.
- virtual [RDBColumn](#) & [operator=](#) (const Tmpl1 &data)
Assigns data to [RDBColumn](#) object's `_data` member, converting as necessary.
- virtual [RDBColumn](#) & [operator=](#) (const Tmpl2 &data)
Assigns data to [RDBColumn](#) object's `_data` member, converting as necessary.

Auto-indexing control methods.

- virtual void [advanceIdx](#) (void)
Increments index to the [RDBColumn](#)'s data elements.
- virtual void [rewind](#) (void)
Rewinds index to the [RDBColumn](#)'s data elements.

Group information ("break" column) methods.

- virtual void [setGroup](#) (bool group)
- virtual void [setGroupValue](#) (void)
Sets the group value to the current data value.
- virtual int [newGroup](#) (void)
Returns the group status of this column object.

Data member initializers.

- virtual bool [setData](#) (const Tmpl0 &data)
Sets the data value, converting as necessary.
- virtual bool [setData](#) (const Tmpl1 &data)
Sets the data value, converting as necessary.
- virtual bool [setData](#) (const Tmpl2 &data)
Sets the data value, converting as necessary.

Methods to map RDBColumn's data to user-supplied memory.

- virtual void [mapData](#) (Tmpl0 data[], const size_t nelems)
Maps data to user-supplied memory.

Data member accessors.

- void * [getData](#) (void)
Returns a pointer to the current data element.

- virtual bool [getData](#) (Tmpl0 &data)
Returns the value of the current data element, converting if necessary.
- virtual bool [getData](#) (Tmpl1 &data)
Returns the value of the current data element, converting if necessary.
- virtual bool [getData](#) (Tmpl2 &data)
Returns the value of the current data element, converting if necessary.
- virtual double [getDataDouble](#) (void)
Returns the value of the current data element, converting if necessary.
- virtual long [getDataLong](#) (void)
Returns the value of the current data element, converting if necessary.
- virtual string [getDataString](#) (void)
Returns the value of the current data element, converting if necessary.

Protected Member Functions

- virtual istream & [read](#) (istream &is)
Called by the stream insertion operator.
- virtual ostream & [write](#) (ostream &os) const
Called by the stream extraction operator.
- void [cleanup](#) (void)
Deletes resources allocated by [RDBColumnTmpl](#) object.

Protected Attributes

- Tmpl0 * [_data](#)
Pointer to the data managed by object.
- size_t [_idx](#)
Index into the data.
- size_t [_nelems](#)
Number of elements of data.
- bool [_mine](#)
Indicates that [RDBColumnTmpl](#) is responsible for deallocating the data.
- Tmpl0 [_groupvalue](#)
Current group value.

Additional Inherited Members

8.3.1 Detailed Description

```
template<class Tmpl0, class Tmpl1, class Tmpl2>
class RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >
```

Parameterizes [RDBColumn](#) interface for many data types.

Definition at line 38 of file [RDBColumnTmpl.h](#).

8.3.2 Constructor & Destructor Documentation

8.3.2.1 RDBColumnTmpl() [1/2]

```
template<class Tmpl0 , class Tmpl1 , class Tmpl2 >
RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >::RDBColumnTmpl (
    const string & name = "",
    const string & def = "" )
```

Assigns name and definition.

Parameters

<i>name</i>	the column name.
<i>def</i>	the column definition.

Allocates space for a single data element of type Tmpl1.

Definition at line 37 of file RDBColumnTmpl.cc.

8.3.2.2 RDBColumnTmpl() [2/2]

```
template<class Tmpl0, class Tmpl1, class Tmpl2>
RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >::RDBColumnTmpl (
    const RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 > & rdbcolumntmpl )
```

Copies [RDBColumnTmpl](#) object.

Parameters

<i>rdbcolumntmpl</i>	col the RDBColumn object to copy.
----------------------	---

Makes a shallow copy of the argument. The two [RDBColumn](#) objects share data elements.

Definition at line 58 of file RDBColumnTmpl.cc.

8.3.2.3 ~RDBColumnTmpl()

```
template<class Tmpl0 , class Tmpl1 , class Tmpl2 >
RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >::~~RDBColumnTmpl (
    void )
```

Deletes resources allocated by [RDBColumnTplt](#) object.

Responsible for freeing data element memory allocated by the [RDBColumn](#) object.

Definition at line 76 of file RDBColumnTplt.cc.

8.3.3 Member Function Documentation

8.3.3.1 advanceIdx()

```
template<class Tmpl0 , class Tmpl1 , class Tmpl2 >
void RDBColumnTplt< Tmpl0, Tmpl1, Tmpl2 >::advanceIdx (
    void ) [virtual]
```

Increments index to the [RDBColumn](#)'s data elements.

Advances the automatic index for the data elements by one.

Implements [RDBColumn](#).

Definition at line 212 of file RDBColumnTplt.cc.

8.3.3.2 cleanup()

```
template<class Tmpl0 , class Tmpl1 , class Tmpl2 >
void RDBColumnTplt< Tmpl0, Tmpl1, Tmpl2 >::cleanup (
    void ) [protected]
```

Deletes resources allocated by [RDBColumnTplt](#) object.

Frees memory allocated by this object.

Definition at line 710 of file RDBColumnTplt.cc.

8.3.3.3 `getData()` [1/4]

```
template<class Tmpl0 , class Tmpl1 , class Tmpl2 >
void * RDBColumnTplt< Tmpl0, Tmpl1, Tmpl2 >::getData (
    void ) [virtual]
```

Returns a pointer to the current data element.

Returns

Pointer to the current data element.

This method returns a pointer to the current data element. Modifications to the data returned are evident within this object.

Implements [RDBColumn](#).

Definition at line 466 of file RDBColumnTplt.cc.

8.3.3.4 `getData()` [2/4]

```
template<class Tmpl0, class Tmpl1 , class Tmpl2 >
bool RDBColumnTplt< Tmpl0, Tmpl1, Tmpl2 >::getData (
    Tmpl0 & data ) [virtual]
```

Returns the value of the current data element, converting if necessary.

Parameters

<i>data</i>	assigned the value of the current data element in this object.
-------------	--

Returns

True if the conversion was successful, false otherwise.

Assigns the value of the current [RDBColumn](#) data element to the argument.

Definition at line 484 of file RDBColumnTplt.cc.

8.3.3.5 `getData()` [3/4]

```
template<class Tmpl0, class Tmpl1, class Tmpl2 >
bool RDBColumnTplt< Tmpl0, Tmpl1, Tmpl2 >::getData (
    Tmpl1 & data ) [virtual]
```

Returns the value of the current data element, converting if necessary.

Parameters

<i>data</i>	assigned the value of the current data element in this object.
-------------	--

Exceptions

<i>RDBErr</i>	error if the user attempts to convert a string column with non-numeric data to a numeric arguemnt.
<i>RDBErr</i>	error if the user attempts to convert a string column representing a floating point number to an integer argument.

Returns

True if the conversion was successful, false otherwise.

Assigns the value of the current [RDBColumn](#) data element to the argument.

Definition at line 517 of file RDBColumnTplt.cc.

8.3.3.6 `getData()` [4/4]

```
template<class Tmpl0, class Tmpl1, class Tmpl2>
bool RDBColumnTplt< Tmpl0, Tmpl1, Tmpl2 >::getData (
    Tmpl2 & data ) [virtual]
```

Returns the value of the current data element, converting if necessary.

Parameters

<i>data</i>	assigned the value of the current data element in this object.
-------------	--

Exceptions

<i>RDBErr</i>	error if the user attempts to convert a string column with non-numeric data to a numeric arguemnt.
<i>RDBErr</i>	error if the user attempts to convert a string column representing a floating point number to an integer argument.

Returns

True if the conversion was successful, false otherwise.

Assigns the value of the current [RDBColumn](#) data element to the argument.

Definition at line 550 of file RDBColumnTplt.cc.

8.3.3.7 getDataDouble()

```
template<class Tmpl0 , class Tmpl1 , class Tmpl2 >
double RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >::getDataDouble (
    void ) [virtual]
```

Returns the value of the current data element, converting if necessary.

Exceptions

<i>RDBErr</i>	error if the user attempts to convert a string column with non-numeric data to a numeric arguemnt.
-------------------------------	--

Returns

The data element as a double.

Implements [RDBColumn](#).

Definition at line 578 of file RDBColumnTmpl.cc.

8.3.3.8 getDataLong()

```
template<class Tmpl0 , class Tmpl1 , class Tmpl2 >
long RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >::getDataLong (
    void ) [virtual]
```

Returns the value of the current data element, converting if necessary.

Exceptions

<i>RDBErr</i>	error if the user attempts to convert a string column with non-numeric data to a numeric arguemnt.
<i>RDBErr</i>	error if the user attempts to convert a string column representing a floating point number to an integer argument.

Returns

The data element as a long.

Implements [RDBColumn](#).

Definition at line 608 of file RDBColumnTmpl.cc.

8.3.3.9 getDataString()

```
template<class Tmplt0 , class Tmplt1 , class Tmplt2 >
string RDBColumnTmplt< Tmplt0, Tmplt1, Tmplt2 >::getDataString (
    void ) [virtual]
```

Returns the value of the current data element, converting if necessary.

Returns

The data element as a string.

Implements [RDBColumn](#).

Definition at line 635 of file RDBColumnTmplt.cc.

8.3.3.10 mapData()

```
template<class Tmplt0, class Tmplt1 , class Tmplt2 >
void RDBColumnTmplt< Tmplt0, Tmplt1, Tmplt2 >::mapData (
    Tmplt0 data[],
    const size_t nelems ) [virtual]
```

Maps data to user-supplied memory.

Parameters

<i>data</i>	pointer to a data element of type Tmplt0.
<i>nelems</i>	number of data elements in the array pointed to by data.

This method associates user allocated memory pointed to by data with this [RDBColumn](#) object. The user is responsible for freeing the memory pointed to by data after the [RDBColumn](#) is destroyed.

Definition at line 440 of file RDBColumnTmplt.cc.

8.3.3.11 newGroup()

```
template<class Tmplt0 , class Tmplt1 , class Tmplt2 >
int RDBColumnTmplt< Tmplt0, Tmplt1, Tmplt2 >::newGroup (
    void ) [virtual]
```

Returns the group status of this column object.

Returns

True if the data element is in a new group.

Implements [RDBColumn](#).

Definition at line 285 of file RDBColumnTmpl.cc.

8.3.3.12 operator=() [1/4]

```
template<class Tmpl0, class Tmpl1, class Tmpl2>
RDBColumn & RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >::operator= (
    const RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 > & col )
```

Copies [RDBColumnTmpl](#) object.

Parameters

<i>col</i>	the RDBColumn object to copy.
------------	---

Makes a shallow copy of the argument. The two [RDBColumn](#) objects share data elements.

Definition at line 93 of file RDBColumnTmpl.cc.

8.3.3.13 operator=() [2/4]

```
template<class Tmpl0, class Tmpl1, class Tmpl2>
RDBColumn & RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >::operator= (
    const Tmpl0 & data ) [virtual]
```

Assigns data to [RDBColumn](#) object's `_data` member, converting as necessary.

Parameters

<i>data</i>	Assigns the value to the current RDBColumn data element.
-------------	--

Definition at line 124 of file RDBColumnTmpl.cc.

8.3.3.14 operator=() [3/4]

```
template<class Tmpl0, class Tmpl1, class Tmpl2>
```

```
RDBColumn & RDBColumnTplt< Tmplt0, Tmplt1, Tmplt2 >::operator= (
    const Tmplt1 & data ) [virtual]
```

Assigns data to [RDBColumn](#) object's `_data` member, converting as necessary.

Parameters

<i>data</i>	
-------------	--

Exceptions

RDBErr	error if the user attempts to convert non-numeric string data to a numeric column.
RDBErr	error if the user attempts to convert string data representing a floating point number to an integer column.

Assigns the value to the current [RDBColumn](#) data element.

Definition at line 155 of file `RDBColumnTplt.cc`.

8.3.3.15 operator=() [4/4]

```
template<class Tmplt0, class Tmplt1, class Tmplt2>
RDBColumn & RDBColumnTplt< Tmplt0, Tmplt1, Tmplt2 >::operator= (
    const Tmplt2 & data ) [virtual]
```

Assigns data to [RDBColumn](#) object's `_data` member, converting as necessary.

Parameters

<i>data</i>	
-------------	--

Exceptions

RDBErr	error if the user attempts to convert non-numeric string data to a numeric column.
RDBErr	error if the user attempts to convert string data representing a floating point number to an integer column.

Assigns the value to the current [RDBColumn](#) data element.

Definition at line 186 of file `RDBColumnTplt.cc`.

8.3.3.16 read()

```
template<class Tmplt0 , class Tmplt1 , class Tmplt2 >
istream & RDBColumnTplt< Tmplt0, Tmplt1, Tmplt2 >::read (
    istream & is ) [protected], [virtual]
```

Called by the stream insertion operator.

Parameters

<i>is</i>	input stream.
-----------	---------------

Returns

The input stream.

Called by the [RDBColumn](#) stream extraction operator.

Implements [RDBColumn](#).

Definition at line 666 of file RDBColumnTplt.cc.

8.3.3.17 rewind()

```
template<class Tmpl0 , class Tmpl1 , class Tmpl2 >
void RDBColumnTplt< Tmpl0, Tmpl1, Tmpl2 >::rewind (
    void ) [virtual]
```

Rewinds index to the [RDBColumn](#)'s data elements.

Rewinds the automatic index for the data elements to the first element.

Implements [RDBColumn](#).

Definition at line 228 of file RDBColumnTplt.cc.

8.3.3.18 setData() [1/3]

```
template<class Tmpl0, class Tmpl1 , class Tmpl2 >
bool RDBColumnTplt< Tmpl0, Tmpl1, Tmpl2 >::setData (
    const Tmpl0 & data ) [virtual]
```

Sets the data value, converting as necessary.

Parameters

<i>data</i>	
-------------	--

Returns

True upon successful conversion, false otherwise.

Assigns the value to the current [RDBColumn](#) data element.

Definition at line 343 of file RDBColumnTplt.cc.

8.3.3.19 setData() [2/3]

```
template<class Tmpl0, class Tmpl1, class Tmpl2 >
bool RDBColumnTplt< Tmpl0, Tmpl1, Tmpl2 >::setData (
    const Tmpl1 & data ) [virtual]
```

Sets the data value, converting as necessary.

Parameters

<i>data</i>	
-------------	--

Exceptions

RDBErr	error if the user attempts to convert non-numeric string data to a numeric column.
RDBErr	error if the user attempts to convert string data representing a floating point number to an integer column.

Returns

True upon successful conversion, false otherwise.

Assigns the value to the current [RDBColumn](#) data element.

Definition at line 376 of file RDBColumnTplt.cc.

8.3.3.20 setData() [3/3]

```
template<class Tmpl0, class Tmpl1, class Tmpl2>
bool RDBColumnTplt< Tmpl0, Tmpl1, Tmpl2 >::setData (
    const Tmpl2 & data ) [virtual]
```

Sets the data value, converting as necessary.

Parameters

<i>data</i>	
-------------	--

Exceptions

RDBErr	error if the user attempts to convert non-numeric string data to a numeric column.
RDBErr	error if the user attempts to convert string data representing a floating point number to an integer column.

Returns

True upon successful conversion, false otherwise.

Assigns the value to the current [RDBColumn](#) data element.

Definition at line 409 of file RDBColumnTplt.cc.

8.3.3.21 setGroup()

```
template<class Tmpl0 , class Tmpl1 , class Tmpl2 >
void RDBColumnTplt< Tmpl0, Tmpl1, Tmpl2 >::setGroup (
    bool group ) [virtual]
```

Parameters

<i>group</i>	indicates whether or not this is a group column.
--------------	--

Reimplemented from [RDBColumn](#).

Definition at line 242 of file RDBColumnTplt.cc.

8.3.3.22 setGroupValue()

```
template<class Tmpl0 , class Tmpl1 , class Tmpl2 >
void RDBColumnTplt< Tmpl0, Tmpl1, Tmpl2 >::setGroupValue (
    void ) [virtual]
```

Sets the group value to the current data value.

Sets the group for this object to the current data element.

Implements [RDBColumn](#).

Definition at line 268 of file RDBColumnTplt.cc.

8.3.3.23 write()

```
template<class Tmpl0 , class Tmpl1 , class Tmpl2 >
ostream & RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >::write (
    ostream & os ) const [protected], [virtual]
```

Called by the stream extraction operator.

Parameters

<i>os</i>	output stream.
-----------	----------------

Returns

The output stream.

Called by the [RDBColumn](#) stream insertion operator.

Implements [RDBColumn](#).

Definition at line 696 of file RDBColumnTmpl.cc.

8.3.4 Member Data Documentation

8.3.4.1 _data

```
template<class Tmpl0, class Tmpl1, class Tmpl2>
Tmpl0* RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >::_data [protected]
```

Pointer to the data managed by object.

Definition at line 120 of file RDBColumnTmpl.h.

8.3.4.2 _groupvalue

```
template<class Tmpl0, class Tmpl1, class Tmpl2>
Tmpl0 RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >::_groupvalue [protected]
```

Current group value.

Definition at line 129 of file RDBColumnTmpl.h.

8.3.4.3 `_idx`

```
template<class Tmpl0, class Tmpl1, class Tmpl2>
size_t RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >::_idx [protected]
```

Index into the data.

Definition at line 122 of file RDBColumnTmpl.h.

8.3.4.4 `_mine`

```
template<class Tmpl0, class Tmpl1, class Tmpl2>
bool RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >::_mine [protected]
```

Indicates that `RDBColumnTmpl` is responsible for deallocating the data.

Definition at line 126 of file RDBColumnTmpl.h.

8.3.4.5 `_nelems`

```
template<class Tmpl0, class Tmpl1, class Tmpl2>
size_t RDBColumnTmpl< Tmpl0, Tmpl1, Tmpl2 >::_nelems [protected]
```

Number of elements of data.

Definition at line 124 of file RDBColumnTmpl.h.

The documentation for this class was generated from the following files:

- RDBColumnTmpl.h
- RDBColumnTmpl.cc

8.4 RDBComment Class Reference

Provides interface for manipulating `RDB` comments.

```
#include <RDBComment.h>
```

Public Member Functions

Constructing, destructing, and initializing RDBComment objects.

- [RDBComment](#) (const string &comment="")
Parses comment string for [RDB](#) comment structure.
- [RDBComment](#) (const [RDBComment](#) &rdbcomment)
Copy [RDBComment](#) object.
- [~RDBComment](#) (void)
Destructor has nothing to do.
- const [RDBComment](#) & [operator=](#) (const [RDBComment](#) &rdbcomment)
Copy [RDBComment](#) object.
- const [RDBComment](#) & [operator=](#) (const string &rdbcomment)
Copy string to [RDBComment](#) object.

Data member initializers.

- void [setComment](#) (const string &comment)
Parses comment string for [RDB](#) comment elements.
- void [setCommentText](#) (const string &comment)
Parses string for [RDB](#) comment elements.
- void [setKeyword](#) (const string &keyword)
Set just the comment keyword.
- void [setValue](#) (const string &value)
Set just the comment value.

Data member accessors.

- string [getComment](#) (void) const
Return the full comment.
- string [getCommentText](#) (void) const
Return the full comment text.
- string [getKeyword](#) (void) const
Return the keyword, if any.
- string [getValue](#) (void) const
Return the keyword's value, if any.

Friends

Stream insertion and extraction operators.

- istream & [operator>>](#) (istream &is, [RDBComment](#) &rdbcomment)
Read comment from input stream.
- ostream & [operator<<](#) (ostream &os, const [RDBComment](#) &rdbcomment)
Write comment to output stream.

8.4.1 Detailed Description

Provides interface for manipulating [RDB](#) comments.

Definition at line 35 of file [RDBComment.h](#).

8.4.2 Constructor & Destructor Documentation

8.4.2.1 RDBComment() [1/2]

```
RDBComment::RDBComment (
    const string & comment = "" )
```

Parses comment string for [RDB](#) comment structure.

Parameters

<i>comment</i>	the comment string.
----------------	---------------------

Assigns the string comment to the [RDBComment](#)'s data member. Parses for keyword=value pairs.

Definition at line 102 of file RDBComment.cc.

8.4.2.2 RDBComment() [2/2]

```
RDBComment::RDBComment (
    const RDBComment & rdbcomment )
```

Copy [RDBComment](#) object.

Parameters

<i>rdbcomment</i>	a reference to the RDBComment to copy.
-------------------	--

Copies the [RDBComment](#) into this object.

Definition at line 125 of file RDBComment.cc.

8.4.2.3 ~RDBComment()

```
RDBComment::~~RDBComment (
    void )
```

Destructor has nothing to do.

Nothing to do.

Definition at line 137 of file RDBComment.cc.

8.4.3 Member Function Documentation

8.4.3.1 `getComment()`

```
string RDBComment::getComment (
    void ) const
```

Return the full comment.

Returns

The comment string.

Definition at line 324 of file RDBComment.cc.

8.4.3.2 `getCommentText()`

```
string RDBComment::getCommentText (
    void ) const
```

Return the full comment text.

Returns

The comment string.

Definition at line 346 of file RDBComment.cc.

8.4.3.3 `getKeyword()`

```
string RDBComment::getKeyword (
    void ) const
```

Return the keyword, if any.

Returns

The keyword half of a keyword=value pair.

Definition at line 359 of file RDBComment.cc.

8.4.3.4 `getValue()`

```
string RDBComment::getValue (
    void ) const
```

Return the keyword's value, if any.

Returns

The value half of a keyword=value pair.

Definition at line 372 of file RDBComment.cc.

8.4.3.5 `operator=()` [1/2]

```
const RDBComment & RDBComment::operator= (
    const RDBComment & rdbcomment )
```

Copy [RDBComment](#) object.

Parameters

<i>rdbcomment</i>	a reference to the RDBComment to copy.
-------------------	--

Returns

A reference to this.

Definition at line 150 of file RDBComment.cc.

8.4.3.6 `operator=()` [2/2]

```
const RDBComment & RDBComment::operator= (
    const string & comment )
```

Copy string to [RDBComment](#) object.

Parameters

<i>comment</i>	a string comment to copy.
----------------	---------------------------

Returns

A reference to this.

Definition at line 172 of file RDBComment.cc.

8.4.3.7 setComment()

```
void RDBComment::setComment (
    const string & comment )
```

Parses comment string for [RDB](#) comment elements.

Parameters

<i>comment</i>	Strips leading '#' character if present. If next character is ':', then it searches for a keyword=value pair.
----------------	---

Definition at line 190 of file RDBComment.cc.

8.4.3.8 setCommentText()

```
void RDBComment::setCommentText (
    const string & comment )
```

Parses string for [RDB](#) comment elements.

Parameters

<i>comment</i>	Strips leading '#' character if present. If next character is ':', then it searches for a keyword=value pair.
----------------	---

Definition at line 222 of file RDBComment.cc.

8.4.3.9 setKeyword()

```
void RDBComment::setKeyword (
    const string & keyword )
```

Set just the comment keyword.

Parameters

<i>keyword</i>	the keyword part of a keyword=value pair.
----------------	---

Updates just the keyword half of a keyword=value pair.

Definition at line 278 of file RDBComment.cc.

8.4.3.10 setValue()

```
void RDBComment::setValue (
    const string & value )
```

Set just the comment value.

Parameters

<i>value</i>	the value part of a keyword=value pair.
--------------	---

Updates just the value half of a keyword=value pair.

Definition at line 302 of file RDBComment.cc.

8.4.4 Friends And Related Function Documentation**8.4.4.1 operator<<**

```
ostream& operator<< (
    ostream & os,
    const RDBComment & rdbcomment ) [friend]
```

Write comment to output stream.

Parameters

<i>os</i>	the output stream.
<i>rdbcomment</i>	the comment to print.

Returns

A reference to the output stream

Places the comment on the output stream. Appends a '#' character if its a plain comment or a "#:" string if its a keyword/value comment.

Definition at line 73 of file RDBComment.cc.

8.4.4.2 operator>>

```
istream& operator>> (
    istream & is,
    RDBComment & rdbcomment ) [friend]
```

Read comment from input stream.

Parameters

<i>is</i>	the input stream.
<i>rdbcomment</i>	the comment to fill.

Returns

A reference to the input stream.

If the line is an [RDB](#) comment line, i.e. it starts with a '#', then fill the comment. Otherwise, set ios::failbit.

Definition at line 38 of file RDBComment.cc.

The documentation for this class was generated from the following files:

- RDBComment.h
- RDBComment.cc

8.5 RDBErr Class Reference

The parent class for all [RDB](#) related exceptions.

```
#include <RDBErr.h>
```

Inherits Exception.

Public Member Functions

- [RDBErr](#) (const string &msg)
Constructor.
- [RDBErr](#) ()
Constructor.
- [~RDBErr](#) () throw ()
Destructor.

8.5.1 Detailed Description

The parent class for all [RDB](#) related exceptions.

Definition at line 33 of file RDBErr.h.

8.5.2 Constructor & Destructor Documentation

8.5.2.1 RDBErr() [1/2]

```
RDBErr::RDBErr (  
    const string & msg )
```

Constructor.

Definition at line 27 of file RDBErr.cc.

8.5.2.2 RDBErr() [2/2]

```
RDBErr::RDBErr ( )
```

Constructor.

Definition at line 29 of file RDBErr.cc.

8.5.2.3 ~RDBErr()

```
RDBErr::~~RDBErr ( ) throw ( )
```

Destructor.

Definition at line 31 of file RDBErr.cc.

The documentation for this class was generated from the following files:

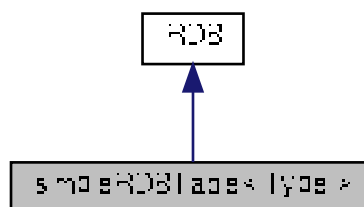
- RDBErr.h
- RDBErr.cc

8.6 simpleRDBTable< Type > Class Template Reference

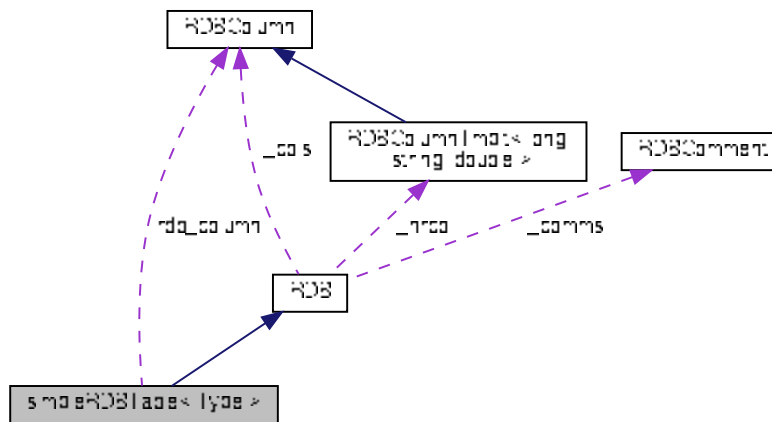
A simple interface to the RDB++ read a row of an rdb table to initialize a class Type.

```
#include <simpleRDBTable.h>
```

Inheritance diagram for simpleRDBTable< Type >:



Collaboration diagram for simpleRDBTable< Type >:



Public Member Functions

- Type * [readRow](#) ()
Read a row of the [RDB](#) table.

Static Public Member Functions

- static void [getData](#) (RDBColumn *rdbcol, string &val)
Given an [RDBColumn](#), get a string value.
- static void [getData](#) (RDBColumn *rdbcol, int &val)
Given an [RDBColumn](#), get an integer value.
- static void [getData](#) (RDBColumn *rdbcol, long &val)
Given an [RDBColumn](#), get a long value.
- static void [getData](#) (RDBColumn *rdbcol, double &val)
Given an [RDBColumn](#), get a double value.

Additional Inherited Members

8.6.1 Detailed Description

```
template<class Type>
class simpleRDBTable< Type >
```

A simple interface to the RDB++ read a row of an rdb table to initialize a class Type.

The class Type must have a constructor with the following prototype:

```
Type( const char* header[], RDBColumn** rdb_column )
```

Definition at line 48 of file simpleRDBTable.h.

8.6.2 Member Function Documentation

8.6.2.1 `getData()` [1/4]

```
template<class Type >
void simpleRDBTable< Type >::getData (
    RDBColumn * rdbcol,
    string & val ) [static]
```

Given an [RDBColumn](#), get a string value.

Definition at line 86 of file simpleRDBTable.cc.

8.6.2.2 `getData()` [2/4]

```
template<class Type >
void simpleRDBTable< Type >::getData (
    RDBColumn * rdbcol,
    int & val ) [static]
```

Given an [RDBColumn](#), get an integer value.

Definition at line 98 of file simpleRDBTable.cc.

8.6.2.3 `getData()` [3/4]

```
template<class Type >
void simpleRDBTable< Type >::getData (
    RDBColumn * rdbcol,
    long & val ) [static]
```

Given an [RDBColumn](#), get a long value.

Definition at line 122 of file simpleRDBTable.cc.

8.6.2.4 `getData()` [4/4]

```
template<class Type >
void simpleRDBTable< Type >::getData (
    RDBColumn * rdbcol,
    double & val ) [static]
```

Given an [RDBColumn](#), get a double value.

Definition at line 145 of file simpleRDBTable.cc.

8.6.2.5 `readRow()`

```
template<class Type >
Type * simpleRDBTable< Type >::readRow ( )
```

Read a row of the [RDB](#) table.

Definition at line 191 of file simpleRDBTable.cc.

The documentation for this class was generated from the following files:

- simpleRDBTable.h
- simpleRDBTable.cc

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