

Octave SQLITE Toolkit 0.1.0

SQLITE functions for GNU Octave.

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To download a copy of the GNU Octave SQLITE package, please visit <https://gnu-octave.github.io/octave-sqlite/>.

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1 Installing and loading

The toolkit must be installed and then loaded to be used.

It can be installed in GNU Octave directly from the website, or can be installed in an off-line mode via a downloaded tarball.

The toolkit has a dependency on the SQLITE library (<https://www.sqlite.org/>), so it must be installed in order to successfully install the toolkit.

The toolkit must be then be loaded once per each GNU Octave session in order to use its functionality.

1.1 Online Direct install

With an internet connection available, the octave sqlite package can be installed from the octave-sqlite website using the following command within GNU Octave:

```
pkg install https://github.com/gnu-octave/octave-sqlite/releases/download/v0.1.0/octave-sqlite-0.1.0.tar.gz
```

On Octave 7.2 and later, the package can be installed using the following command within GNU Octave:

```
pkg install -forge sqlite
```

The latest released version of the toolkit will be downloaded and installed.

1.2 Off-line install

With the toolkit package already downloaded, and in the current directory when running GNU Octave, the package can be installed using the following command within GNU Octave:

```
pkg install octave-sqlite-0.1.0.tar.gz
```

1.3 Loading

Regardless of the method of installing the toolkit, in order to use its functions, the toolkit must be loaded using the pkg load command:

```
pkg load sqlite
```

The toolkit must be loaded on each GNU Octave session.

2 Basic Usage Overview

2.1 Connection to a sqlite database

Connection to the database is done using the sqlite function.

Example

```
db = sqlite('testdb.db')

db =
  sqlite with properties
    Database: testdb.db
    IsReadOnly: 0
    AutoCommit: on
```

2.2 Read a table

To quickly read data from a table, use the sqlread function

Example

```
data = sqlread(db, "TestTable")
```

2.3 Close the database

To close the database, use the close function

Example

```
close(db)
```

3 Function Reference

The functions currently available in the toolkit are described below;

3.1 SQLITE connection

3.1.1 @octave_sqlite/close

`close (db)`

Close a sqlite connection

Close the previously opened sqlite connection *db*.

Inputs

db A previously created octave_sqlite object

Outputs

None

See also: sqlite, isopen.

3.1.2 @octave_sqlite/isopen

`yesno = isopen (db)`

Check if a sqlite connection is open

Return true if the sqlite connection is open, otherwise return false.

Inputs

db A previously opened sqlite database.

Outputs

yesno Boolean for if the database is still open.

See also: sqlite, close.

3.1.3 @octave_sqlite/sqlfind

`data = sqlfind (db, pattern)`

`data = sqlfind (db, pattern, propertyname, propertyvalue ...)`

Find information about table types in a database.

Inputs

db currently open sqlite database.

pattern Name or pattern to match table in database. Use " to match match all tables.

propertyname, propertyvalue

property name/value pairs where known properties are:

Catalog catalog value to match

Schema schema value to match

Note: currently the property values are not used in the filter process.

Outputs

data a table containing the query result. Table columns are 'Catalog', 'Schema', 'Table', 'Columns', 'Type'.

Examples

Show all tables in the database.

```
# create sql connection to an existing database
db = sqlite("mytest.db");
# list all tables
data = sqlfind(db, '');
```

Show information about TestTable

```
# create sql connection
db = sqlite("mytest.db");
# list matching tables
data = sqlfind(db, 'TestTable');
```

See also: `sqlite`.

3.1.4 sqlite

```
db = sqlite (filename)
db = sqlite (filename, mode)
```

Create a sqlite database connection

Inputs

filename Filename of the sqlite database

mode mode for the sqlite access 'readonly', 'connect' (default), 'create'.

Outputs

db a opened SQLITE database as a octave_sqlite object

Object Properties

The octave_sqlite object has the following properties:

Database The name of the opened database file (readonly)

IsOpen Boolean field for if the database is currently open (readonly)

IsReadOnly Boolean field for if the database was opened in readonly mode. (readonly)

AutoCommit String flag field for whether database is in auto commit mode. "on" (default) or "off".

Examples

Open a sqlite database, failing if it does not exist.

```
db = sqlite("mytest.db");
```

Open a sqlite database, creating it if it does not exist.

```
db = sqlite("mytest.db", "create");
```

3.2 Importing Data

3.2.1 @octave_sqlite/fetch

```
data = fetch (db, sqlquery)
data = fetch (db, sqlquery, propertyname, propertyvalue ...)
```

Run a SQL query on a sqlite database

Return rows of data after running a SQL query on a sqlite database.

Inputs

db currently open sqlite database.

sqlquery String containing a valid select SQL query.

propertyname, propertyvalue

property name/value pairs where known properties are:

MaxRows Integer value of max number of rows in the query

VariableNamingRule

String value 'preserve' (default) or 'modify' to flag renaming of variable names (currently ignored)

RowFilter dbrowfilter object to filter results

Outputs

data a table containing the query result.

Examples

Select all rows of data from a database tables

```
# create sql connection
db = sqlite("mytest.db");
data = fetch(db, 'SELECT * FROM TestTable');
```

Select 5 rows of data from a database tables

```
# create sql connection
db = sqlite("mytest.db");
data = fetch(db, 'SELECT * FROM TestTable', "MaxRows", 5);
```

See also: `sqlite`, `sqlread`.

3.2.2 @octave_sqlite/sqlread

`data = sqlread (db, tablename)`

`data = sqlread (db, tablename, propertyname, propertyvalue ...)`

Read rows of data from a table

Return rows of data from table *tablename* in a sqlite database. This function is the equivalent of running `SELECT * FROM table`.

Inputs

db currently open sqlite database.

tablename Name of a table with the database.

propertyname, propertyvalue

property name/value pairs where known properties are:

MaxRows Integer value of max number of rows in the query

VariableNamingRule

String value 'preserve' (default) or 'modify' to flag renaming of variable names (currently ignored)

RowFilter dbrowfilter object to filter results

Outputs

data a table containing the query result.

Examples

Select all rows of data from a database table

```
# create sql connection to an existing database
db = sqlite("mytest.db");
data = sqlread(db, 'TestTable');
```

Select 5 rows of data from a database table

```
# create sql connection
db = sqlite("mytest.db");
data = sqlread(db, 'TestTable', "MaxRows", 5);
```

See also: `sqlite`, `fetch`.

3.3 Exporting Data

3.3.1 @octave_sqlite/sqlwrite

`sqlwrite (db, tablename, data)`

`sqlwrite (db, tablename, data, columntypes)`

`sqlwrite (db, tablename, data, propertyname, propertyvalue ...)`

Insert rows of data into a table.

Insert rows of data into a sqlite database table. If the table does not exist it will be created, using the `ColumnType` property if available otherwise, the type of input data will be used to determine field types.

Inputs

- db* Previously created octave_sqlite object
- tablename* Name of table to write data to
- data* Table containing data to write to the database. Variables names are expected to match the database.
- columnntypes* Optional cell array of same size as data used if table must be created. The column types may also be passed in using the *propertyname*, *propertyvalue* syntax.
- propertyname*, *propertyvalue*
property name/value pairs where known properties are:
ColumnType
Optional cell array of same size as the data that may be used if the table is created as part of the write operation.

Outputs

None

Examples

Create a database table and insert a row

```
# create sql connection
db = sqlite("mytest.db", "create");
# create table (if it does not exist) and then insert 2 rows
t = dbtable([1;2],['Name1';'Name2'], 'VariableNames', {'Id','Name'});
# insert table data
sqlwrite(db, "Test", t, 'ColumnType', {'numeric', 'text'});
```

See also: `sqlite`, `execute`.

3.4 Database Operations

3.4.1 @octave_sqlite/commit

`commit (db)`

Commit changes to a database

Commit pending transactions of sqlite connection that has AutoCommit = off set.

Inputs

db Previously created octave_sqlite object

Outputs

None

Examples

Create a database table turn off autocommit and insert a row and commit

```
# create sql connection
```

```

db = sqlite("mytest.db");
# create table
execute(db, 'CREATE TABLE Test (Id INTEGER PRIMARY KEY AUTOINCREMENT, Name TEXT)');
# turn off auto commit
db.AutoCommit = "off";
execute(db, 'INSERT INTO Test (Name) VALUES ("Line1")');
# commit the insert
commit(db);

```

See also: `sqlite`, `rollback`.

3.4.2 @octave_sqlite/execute

`execute (db, sqlquery)`

Execute a SQL statement on a sqlite database

Execute non select SQL query *sqlquery* on a sqlite database.

Inputs

db Previously created octave_sqlite object

sqlquery A valid non selecting SQL query string

Inputs

None

Examples

Create a database table and insert a row

```

# create sql connection
db = sqlite("mytest.db", "create");
# create table and then insert a row
execute(db, 'CREATE TABLE Test (Id INTEGER PRIMARY KEY AUTOINCREMENT, Name TEXT)');
execute(db, 'INSERT INTO Test (Name) VALUES ("Line1")');

```

See also: `sqlite`, `fetch`.

3.4.3 @octave_sqlite/rollback

`rollback (db)`

Rollback changes to a database

Rollback pending transactions of sqlite connection that has AutoCommit = off set.

Inputs

db Previously created octave_sqlite object

Outputs

None

Examples

Create a database table and insert a row, then roll back the insert

```
# create sql connection
db = sqlite("mytest.db");
# create table
execute(db, 'CREATE TABLE Test (Id INTEGER PRIMARY KEY AUTOINCREMENT, Name TEXT)');
# turn off auto commit
db.AutoCommit = "off";
execute(db, 'INSERT INTO Test (Name) VALUES ("Line1")');
# roll back the insert
rollback(db);
```

See also: `sqlite`, `commit`.

3.4.4 @octave_sqlite/sqlupdate

```
sqlupdate (db, tablename, data, filter)
sqlupdate (db, tablename, data, filter, propertyname, propertyvalue
...)
```

Update rows of data into a table.

Update rows of data into a sqlite database table based on the input filter.

Inputs

db Previously created octave_sqlite object

tablename Name of table to write data to

data Table containing data to write to the database. Variables names are expected to match the database.

filter A Filter object or cell array of filter objects used to determine which rows of the table to update.

propertyname, propertyvalue
property name/value pairs where known properties are:

Catalog	An optional database catalog name.
Schema	An optional database schema name.

Outputs

None

Examples

Create a database table and insert a row

```
# create sql connection
db = sqlite("mytest.db", "create");
# create table (if it does not exist) and then insert 2 rows
t = dbtable([1;2],['Name1';'Name2'], 'VariableNames', {'Id','Name'});
# insert table data
sqlwrite(db, "Test", t, 'ColumnType', {'numeric', 'text'});
# make a filter to select what to update
```

```

rf = dbrowfilter({'Id'});
rf = rf.Id > 1;
# update name where Id > 1
t = dbtable(['Name3'], 'VariableNames', {'Name'});
sqlupdate(db, "Test", t, rf);

```

See also: `sqlite`, `execute`.

3.5 Support Functions

3.5.1 dbrowfilter

```

rowfilt = dbrowfilter(C)
rowfilt = dbrowfilter(T)

```

Create an unconstrained dbrowfilter object with columns names.

Inputs

C A column name, cell array of column names.
T A table to use for column names.

Outputs

rowfilt a dbrowfilter object

Object Properties

Object properties are the names of the columns on creation of the filter.

Constraints can be set on a specific field of the filter by setting a comparison value for the variable name.

Examples

```

# create a dbrowfilter with 2 columns
rf = dbrowfilter({'Column1', 'Column2'});
# add a constraint for Column1 > 10
rfc = rf.Column1 > 10

```

See also: `dbtable`.

3.5.2 dbtable

```

table = dbtable()
table = dbtable (var1, ... varn)
table = dbtable (... propertyname, propertyvalue)

```

Create a table of data

`dbtable` is a basic implementation of a table type to avoid dependencies on other packages.

Inputs

var1 ... *varn*

Variables or data to be used as the column data of the table. When the input is a variable, the variable name will be used as the column name, otherwise the columns will be `Var1` ... `VarN`.

propertyname, propertyvalue

Property name/value pairs, where known property names are:

VariableNames

A cell string matching the number of input columns with the name to use for the

DimensionNames

A cell string matching of length 2 for using as dimension access. If not specified it will be "Rows" and "Variables".

Outputs

table a dbtable object

Object Properties

A dbtable object has the following properties:

Properties A table properties struct.

The table struct includes fields:

Description

Text table description

DimensionNames

Cell array of Row and Variable dimension names

VariableNames

Cell array of variable (column) names

UserData User data value

Examples

Directly create a 2 column table from input of each column

```
t = dbtable([0;1;3], [2;4;6]);
```

Directly create a 2 column table from input of each column, and specify variable names

```
t = dbtable([0;1;3], [2;4;6], "VariableNames", {'Variable1', 'Variable2'});
```

Create a 2 column table from 2 variables V1, V2

```
V1 = [0;1;3];
V2 = [2;4;6];
t = dbtable(V1, V2);
```

See also: readdbtable, struct2dbtable.

3.5.3 readdbtable

```
t = readdbtable(filename)
```

Create a dbtable from a file

Currently, this is using a very simplistic approach to read data from a CSV formatted file only.

Inputs

filename Filename for file containing tabular data

Outputs

t a dbtable of the read data

3.5.4 struct2dbtable

t = **struct2dbtable** (*astruct*)

Create a dbtable from a struct

This function uses the field names and data of the fields to create a table representation of the struct.

Each fieldname will be a variable in the table. The data for each variable will be the data of the fieldname, and is expected to be a uniform size for all fields in the struct.

Inputs

astruct A struct with same number of elements in each field

Outputs

t a dbtable of the *astruct* data

Appendix A GNU General Public License

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