

SQLite

November 16, 2017



<http://www.sqlite.org/>
<http://www.sqlite.org/docs.html>

What is it?

SQLite is an in-process library that implements a self-contained, serverless, zero-configuration, transactional SQL database engine. The code for SQLite is in the public domain and is thus free for use for any purpose, commercial or private. SQLite is the most widely deployed database in the world with more applications than we can count, including several high-profile projects.

from <http://www.sqlite.org/>

- What does all that mean?

MySQL/MariaDB vs SQLite Server vs Serverless

- When to use each?

- Strengths of MySQL

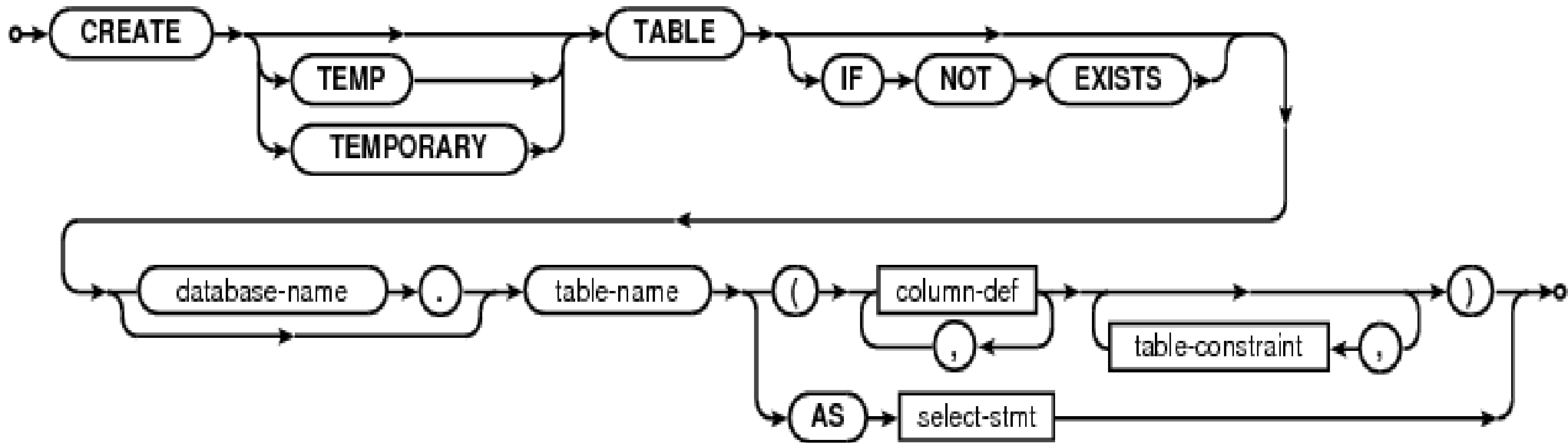
Auto Increment

<http://www.sqlite.org/autoinc.html>

- Strengths of SQLite

SQL

- <http://www.sqlite.org/syntaxdiagrams.html>
- create-table-stmt



- column-def:



Command Line

```
chadd@linux-guec:~> sqlite3 movies.db
```

```
SQLite version 3.8.10.2 2015-05-20 18:17:19
```

```
Enter ".help" for usage hints.
```

```
sqlite> CREATE TABLE Movies  
...> (MovieID INTEGER NOT NULL,  
...> TITLE TEXT(512) NOT NULL,  
...> PRIMARY KEY (MovieID));
```

```
sqlite> INSERT INTO Movies VALUES (null, "Star Wars");
```

```
sqlite> SELECT * FROM Movies;
```

```
1|Star Wars
```

```
sqlite> .quit
```

```
chadd@linux-guec:~> ls -al *.db
```

```
-rw-r--r-- 1 chadd users 2048 Nov 12 19:43 movies.db
```

Command Line

```
chadd@linux-guec:~> sqlite3 movies.db
SQLite version 3.8.10.2 2015-05-20 18:17:19
Enter ".help" for usage hints.
```

```
sqlite> .tables
Movies
```

```
sqlite> .schema Movies
CREATE TABLE Movies
(MovieID INTEGER NOT NULL,
TITLE TEXT(512) NOT NULL,
PRIMARY KEY (MovieID));
```

Not Implemented

- <http://www.sqlite.org/omitted.html>
 - As compared to SQL92 <http://sqlite.org/lang.html>
- Right & Full Outer Join
- Complete Alter Table
- Complete Trigger
- Writing to Views
- Grant & Revoke

Data Types <http://www.sqlite.org/datatype3.html>

- INTEGER (signed, at most 8 bytes)
- REAL (8-byte IEEE floating point)
- TEXT (UTF-8, UTF-16BE or UTF-16LE)
- BLOB
- NULL
- Date & Time
 - no date and time
 - store as
 - TEXT “YYYY-MM-DD HH:MM:SS.SSSS”
 - REAL (number days since noon in Greenwich on November 24, 4714 B.C. proleptic Gregorian calendar)
 - INTEGER (Unix Time: the number of seconds since 1970-01-01 00:00:00 UTC)

Vacuum



http://www.sqlite.org/lang_vacuum.html

- Rebuild entire Database
 - No Server!
 - fragmented database
 - lots of empty space in the database file

PHP!

```
<?php
```

```
$dbh = new PDO
('sqlite:/space/sqlite/chadd/movies.db',
 null, // user
 null // password
);

$stmt = $dbh->prepare(
    "SELECT * From Movies where MovieID = :movieid");

$stmt->bindValue(":movieid", 1);
$stmt->execute();
$row = $stmt->fetch();

print $row[0] . " " . $row['Title'];

$dbh = null;
```

```
?>
```

<http://www.php.net/manual/en/book.sqlite.php>
<http://php.net/manual/en/ref.pdo-sqlite.php>

C/C++ interface

```
#include <sqlite3.h>

sqlite3 *psDB;
sqlite3_stmt *psStmt;

sqlite3_open_v2(..., &psDB, ...);           // open the DB

sqlite3_prepare_v2(..., &psStmt, ...);      // build a Query

sqlite3_bind_int(psStmt, ...);              // set a parameter

while ( sqlite3_step(psStmt) == SQLITE_ROW ) // retrieve one row
{
    sqlite3_column_int(psStmt, ...);         //retrieve one column
    sqlite3_column_text(psStmt, ...);       //retrieve one column

    // do something useful
}

sqlite3_finalize(psStmt);
sqlite3_close(psDB);
```

Java/Android

<https://developer.android.com/reference/android/database/sqlite/package-summary.html>

package

android.database.sqlite

Since: API Level 1

Interfaces

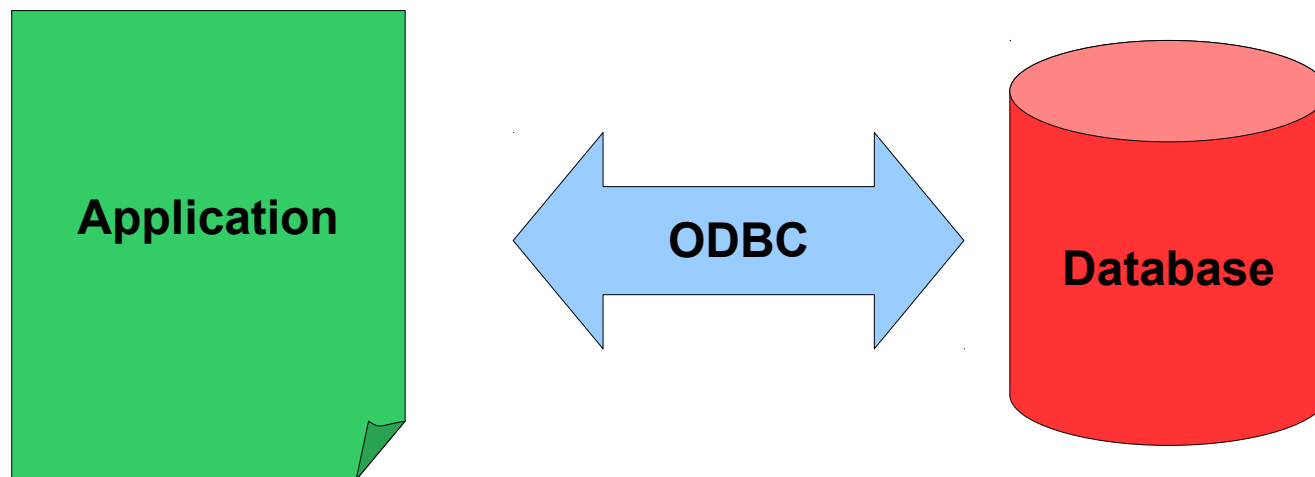
SQLiteCursorDriver	A driver for SQLiteCursors that is used to create them and gets notified by the cursors it creates on significant events in their lifetimes.
SQLiteDatabase.CursorFactory	Used to allow returning sub-classes of Cursor when calling query.
SQLiteTransactionListener	A listener for transaction events.

Classes

SQLiteClosable	An object created from a SQLiteDatabase that can be closed.
SQLiteCursor	A Cursor implementation that exposes results from a query on a SQLiteDatabase .
SQLiteDatabase	Exposes methods to manage a SQLite database.
SQLiteOpenHelper	A helper class to manage database creation and version management.
SQLiteProgram	A base class for compiled SQLite programs.
SQLiteQuery	A SQLite program that represents a query that reads the resulting rows into a CursorWindow.
SQLiteQueryBuilder	This is a convenience class that helps build SQL queries to be sent to SQLiteDatabase objects.
SQLiteStatement	A pre-compiled statement against a SQLiteDatabase that can be reused.

Other DB connection techniques

- Open Database Connectivity
 - ODBC
 - JDBC
 - Each database may have their own set of connectors
 - <http://dev.mysql.com/downloads/connector/odbc/5.1.html>
 - <http://dev.mysql.com/downloads/connector/j/5.1.html>



Type Affinity

- What is the recommended data type for a column?
 - TEXT
 - null, text, blob
 - NUMERIC
 - any of the 5 types
 - INTEGER
 - same as numeric
 - REAL
 - like numeric, but forces ints to floats
 - NONE
 - wildcard