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Group A: Introduction to Databases
Assignment 3

Aim: Study the SQLite database and its uses. Also elaborate on building and installing of SQLite.

What is SQLite?

SQLite is an in-process library that implements a self-contained, serverless, zero-configuration, transactional SQL database engine. It is a database, which is zero-configured, which means like other databases you do not need to configure it in your system.

SQLite engine is not a standalone process like other databases, you can link it statically or dynamically as per your requirement with your application. SQLite accesses its storage files directly.

Why SQLite?

- SQLite does not require a separate server process or system to operate(serverless).
- SQLite comes with zero-configuration, which means no setup or administrationneeded.
- A complete SQLite database is stored in a single cross-platform diskfile.
- SQLite is very small and light weight, less than 400KiB fully configured or lessthan 250KiB with optional featuresomitted.
- SQLite is self-contained, which means no externaldependencies.
- SQLite transactions are fully ACID-compliant, allowing safe access from multiple processes orthreads.
- SQLite supports most of the query language features found in SQL92 (SQL2)standard.
- SQLite is written in ANSI-C and provides simple and easy-to-useAPI.
- SQLite is available on UNIX (Linux, Mac OS-X, Android, iOS) and Windows (Win32, WinCE,WinRT).

SQLite A Brief History

- 2000 - D. Richard Hipp designed SQLite for the purpose of no administrationrequired for operating aprogram.
- 2000 - In August, SQLite 1.0 released with GNU DatabaseManager.
- 2011 - Hipp announced to add UNQl interface to SQLite DB and to developUNQLite (Document orienteddatabase).

SQLite Limitations

There are few unsupported features of SQL92 in SQLite which are listed in the following table.

Sr.No.	Feature & Description
1	**RIGHT OUTER JOIN**
	Only LEFT OUTER JOIN is implemented.
2	**FULL OUTER JOIN** Only LEFT OUTER JOIN is implemented.
3	**ALTER TABLE** The RENAME TABLE and ADD COLUMN variants of the ALTER TABLE command are supported. The DROP COLUMN, ALTER COLUMN, ADD CONSTRAINT are not supported.
4	**Trigger support** FOR EACH ROW triggers are supported but not FOR EACH STATEMENT triggers.
5	**VIEWs** VIEWs in SQLite are read-only. You may not execute a DELETE, INSERT, or UPDATE statement on a view.
6	**GRANT and REVOKE** The only access permissions that can be applied are the normal file access permissions of the underlying operating system.

SQLite Commands

The standard SQLite commands to interact with relational databases are similar to SQL. They are CREATE, SELECT, INSERT, UPDATE, DELETE and DROP. These commands can be classified into groups based on their operational nature−

DDL - Data Definition Language

Sr.No.	Command & Description
1	**CREATE** Creates a new table, a view of a table, or other object in database.
2	**ALTER** Modifies an existing database object, such as a table.
3	**DROP** Deletes an entire table, a view of a table or other object in the database.

DML - Data Manipulation Language

Command	Description
INSERT	Creates a record
UPDATE	Modifies records
DELETE	Deletes records

DQL - Data Query Language

Sr.No.	Command &Description
1	**SELECT** Retrieves certain records from one or more tables

SQLite - Installation

SQLite is famous for its great feature zero-configuration, which means no complex setup or administration is needed. This chapter will take you through the process of setting up SQLite on Windows, Linux and Mac OS X.

Install SQLite on Windows

- **Step 1** − Go to SQLite download page, and download precompiled binariesfrom Windowssection.
- **Step 2** − Download sqlite-shell-win32-*.zip and sqlite-dll-win32-*.zip zippedfiles.
- **Step 3** − Create a folder C:\>sqlite and unzip above two zipped files in this folder,which will give you sqlite3.def, sqlite3.dll and sqlite3.exefiles.
- **Step 4** − Add C:\>sqlite in your PATH environment variable and finally go to the command prompt and issue sqlite3 command, which should display the followingresult.

```
C:\>sqlite3
SQLite version 3.7.15.2 2013-01-09 11:53:05
Enter ".help" for instructions
Enter SQL statements terminated with a ";"
sqlite>
```

Install SQLite on Linux

Today, almost all the flavours of Linux OS are being shipped with SQLite. So you just issue the following command to check if you already have SQLite installed on your machine.

```
$sqlite3
SQLite version 3.7.15.2 2013-01-09 11:53:05
Enter ".help" for instructions
Enter SQL statements terminated with a ";"
sqlite>
```

If you do not see the above result, then it means you do not have SQLite installed on your Linux machine. Following are the following steps to install SQLite −

- **Step 1** − Go toSQLite download pageand download sqlite-autoconf-*.tar.gz from source codesection.
- **Step 2** − Run the following command−

```
$tar xvfz sqlite-autoconf-3071502.tar.gz
$cd sqlite-autoconf-3071502
$./configure --prefix = /usr/local
$make
$make install
```

The above command will end with SQLite installation on your Linux machine. Which you can verify as explained above.

Finally, you have SQLite command prompt where you can issue SQLite commands for your exercises.

Conclusion:-

We have studied the SQLite database and its uses.