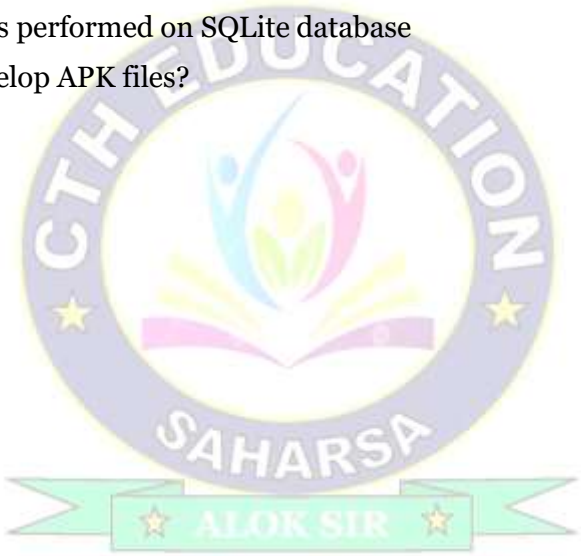
Unit – 05: Mobile Computing

- Storing the data persistently –
- Data Storage Options: preferences, Internal Storage, External Storage, Content Provider.
- The SQLite database,
- Database operations -Insert, Delete, Update, Fetch.
- Publishing android applications,
- Deploying APK files.

Questions to be discussed:

1. What do you mean by data persistent?
2. Explain different data storage options in an android.
3. What is SQLite database? Discuss its advantage & disadvantage.
4. Discuss various operations performed on SQLite database
5. What is APK? How to develop APK files?



Storing the data persistently:

- Persistent storage is any data storage device that retains data after power to that device is shut off.
- It is also sometimes referred to as non-volatile storage.
- Android provides several options for you to save persistent application data.
- Your data storage options are the following:
  1. Shared Preferences
  2. Internal Storage
  3. External Storage
  4. Content provider
  5. SQLite Databases

Shared Preferences:

- Store private primitive data in key-value pairs.
- The Shared Preferences class provides a general framework that allows you to save and retrieve persistent key-value pairs of primitive data types.
- You can use Shared Preferences to save any primitive data: boolean, floats, int, long, and string.

Internal Storage:

- Store private data on the device memory.
- You can save files directly on the device's internal storage.
- By default, files saved to the internal storage are private to your application and other applications cannot access them (nor can the user).
- When the user uninstalls your application, these files are removed.

External Storage:

- Store public data on the shared external storage.
- External storage is used to store application data, such as SD card.
- In general there are two types of External Storage:
  1. Primary External Storage
  2. Secondary External Storage

Primary External Storage:

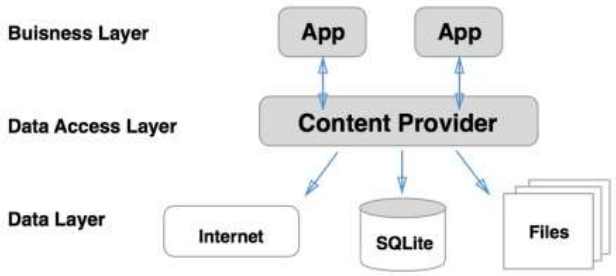
- It is in-built shared storage which is “accessible by the user by plugging in a USB cable.
- Example: When we say 4GB, 32 GB.

Secondary External Storage:

- It is type of storage which is removed from the android if required.
- It is also known as removable storage. Example: SD Card

Content provider:

- A content provider component supplies data from one application to others on request.
- Such requests are handled by the methods of the Content Resolver class.
- A content provider can use different ways to store its data and the data can be stored in a database, in files, or even over a network.
- Sometimes it is required to share data across applications then content providers become very useful.

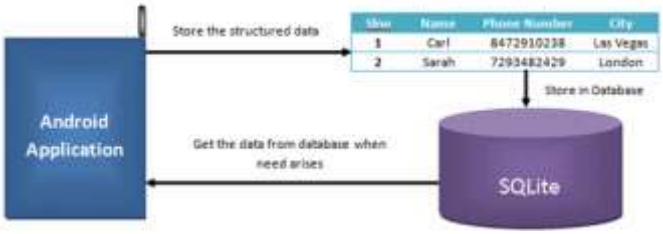


What is database?

- It is an organized collection of structured information or data that stored electronically in computer.
- A database is usually controlled and managed by database management system (DBMS).
- Most commonly used database is SQL.
- SQLite database is used in android.

Android SQLite Database:

- SQLite is an open source relational database.
- It is lighter version of SQL.
- Android comes with built-in SQLite database implementation.
- To access this database, you do not need to establish any kind of connections like JDBC, ODBC etc.
- Main components of SQLite is:
  - Table structure (Rows and columns).
  - Types of data (int, float, char, double, Boolean etc).
  - Constraints (Primary and secondary key).
  - Queries (Select, Insert, Update and Delete).



SQLite Advantages

- Lightweight
- Better Performance
- No Installation Needed
- Portable

SQLite Disadvantages

- SQLite is used to handle low to medium traffic HTTP requests.
- Database size is restricted to 2GB in most cases.

Insert, Read, Delete & Update operation in SQLite:

- Android provides different ways to store data locally so using SQLite is one of the way to store data.
- For managing all the operations related to the database, an helper class has been given and is called SQLiteOpenHelper.
- It automatically manages the creation and update of the database.
- Android OS has its own implementation to perform CRUD operations.
  1. Create
  2. Read
  3. Update
  4. Delete

What is APK?

- APK stand for Android Application Package.
- It is a package file format used by android OS for distribution and installation of mobile app.
- It is similar to executable file .exe in windows operating system.
- The extension of APK file is .apk.
- It is installed on android operating system.

Publishing Android Application:

- Android application publishing is a process that makes your Android applications available to users.
- Infect, publishing is the last phase of the Android application development process.
- Once you developed and fully tested your Android Application, you can start selling or distributing free using Google Play Store.
- You can also release your applications by sending them directly to users or by letting users download them from your own website.