Introduction to Android SQLite & ListView

CS 436 Software Development on Mobile

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SQLite

SQLite
History

- SQlite is an open source embedded database. The original implementation was designed by D. Richard Hipp.
- Hipp was designing software used on board guided missile systems and thus had limited resources to work with.
- The resulting design goals of SQLite were to allow the program to be operated without a database installation or administration.

Owens, Michael (2006). The Definitive Guide to SQLite. Apress. doi:10.1007/978-1-4302-0172-4_1. ISBN 978-1-59059-673-9.
http://en.wikipedia.org/wiki/SQLite#cite_note-1

SQLite
Advantages

- **Portable** - uses only ANSI-standard C and VFS, file format is cross platform (little vs big endian, 32 vs 64 bit)
- **Reliable** – has 100% test coverage, open source code and bug database, transactions are ACID even if power fails
- **Small** – 300 kb library, runs in 16kb stack and 100kb heap

http://www.sqlite.org/about.html
http://www.sqlite.org/testing.html
http://www.sqlite.org/selfcontained.html

SQLite
Disadvantages

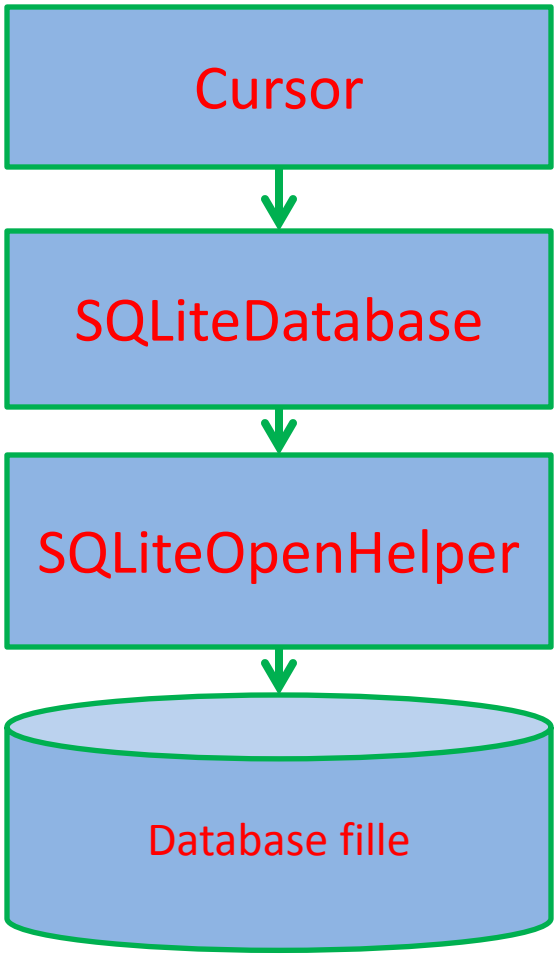
- **High concurrency** – reader/writer locks on the entire file
- **Huge datasets** – DB file can't exceed file system limit or 2TB
- **Access control** – there isn't any

(http://www.sqlite.org/different.html)

SQLite

-Create SQL open helper class
-Create new table
-Open table read / write
-Add data
-Execute raw query
-Using cursor class

SQLite
Android implement



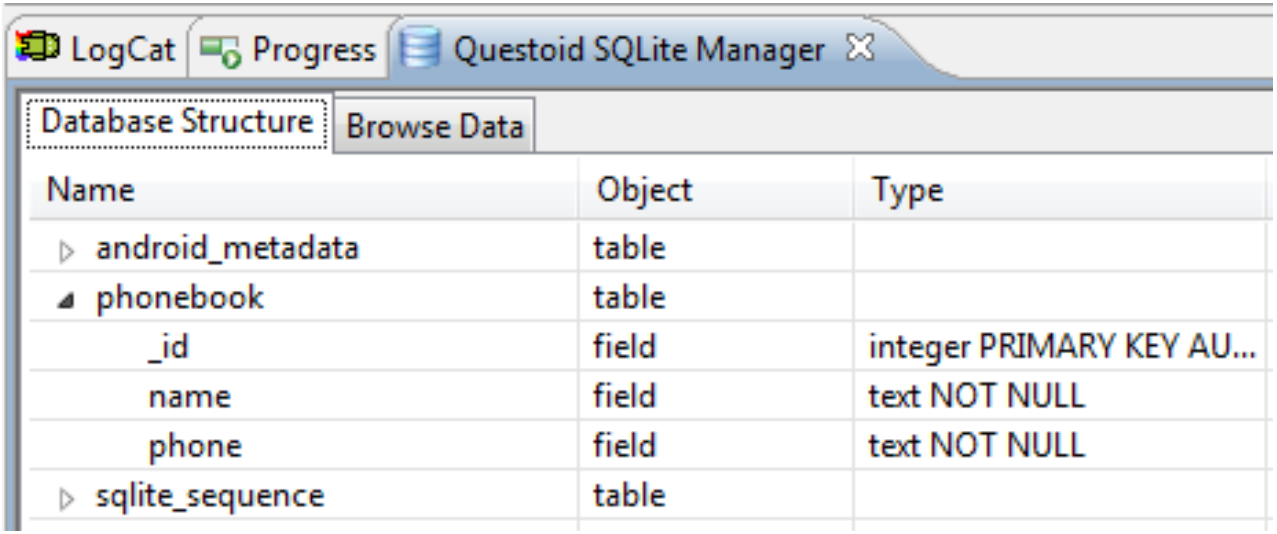
Record set

Read , Write ,SQL execute and SQL Query

Initiate database
Create / Alter Tables

/data/data/<PackageName>/databases/dbfile.db

Create Database



1)Create dbhelper class extends SQLiteOpenHelper
2)Create table

```
public class dbhelper extends SQLiteOpenHelper {
                private static final String DATABASE_NAME = "phonebook.db";
                private static final int DATABASE_VERSION = 1;

                // Table name
                public static final String TABLE = "phonebook";

                // Columns
                public static final String NAME = "name";
                public static final String PHONE = "phone";

                public dbhelper(Context context) {
                                super(context, DATABASE_NAME, null, DATABASE_VERSION);
                }

                @Override
                public void onCreate(SQLiteDatabase db) {
                                String sql = "create table " + TABLE + "( " + BaseColumns._ID
                                                + " integer primary key autoincrement, " + NAME + " text
not null, "
                                                + PHONE + " text not null);";
                                Log.d("EventsData", "onCreate: " + sql);
                                db.execSQL(sql);
                }

                @Override
                public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {
                }
}
```

Activity Class

1) Open database

```
dbhelper phonebookdb;
 phonebookdb=new dbhelper(this);
```

2) Insert new data

```
SQLiteDatabase db = phonebookdb.getWritableDatabase();
ContentValues values = new ContentValues();
values.put(phonebookdb.NAME, xxxxxxxx);
values.put(phonebookdb.PHONE,xxxxxxxxx);
db.insert(phonebookdb.TABLE, null, values);
```

Activity Class

2) Insert new data using raw query

```
SQLiteDatabase db = phonebookdb.getWritableDatabase();

db.execSQL("INSERT INTO phonebook (name, phone) VALUES
('hello world', '123456');");
```

Activity Class

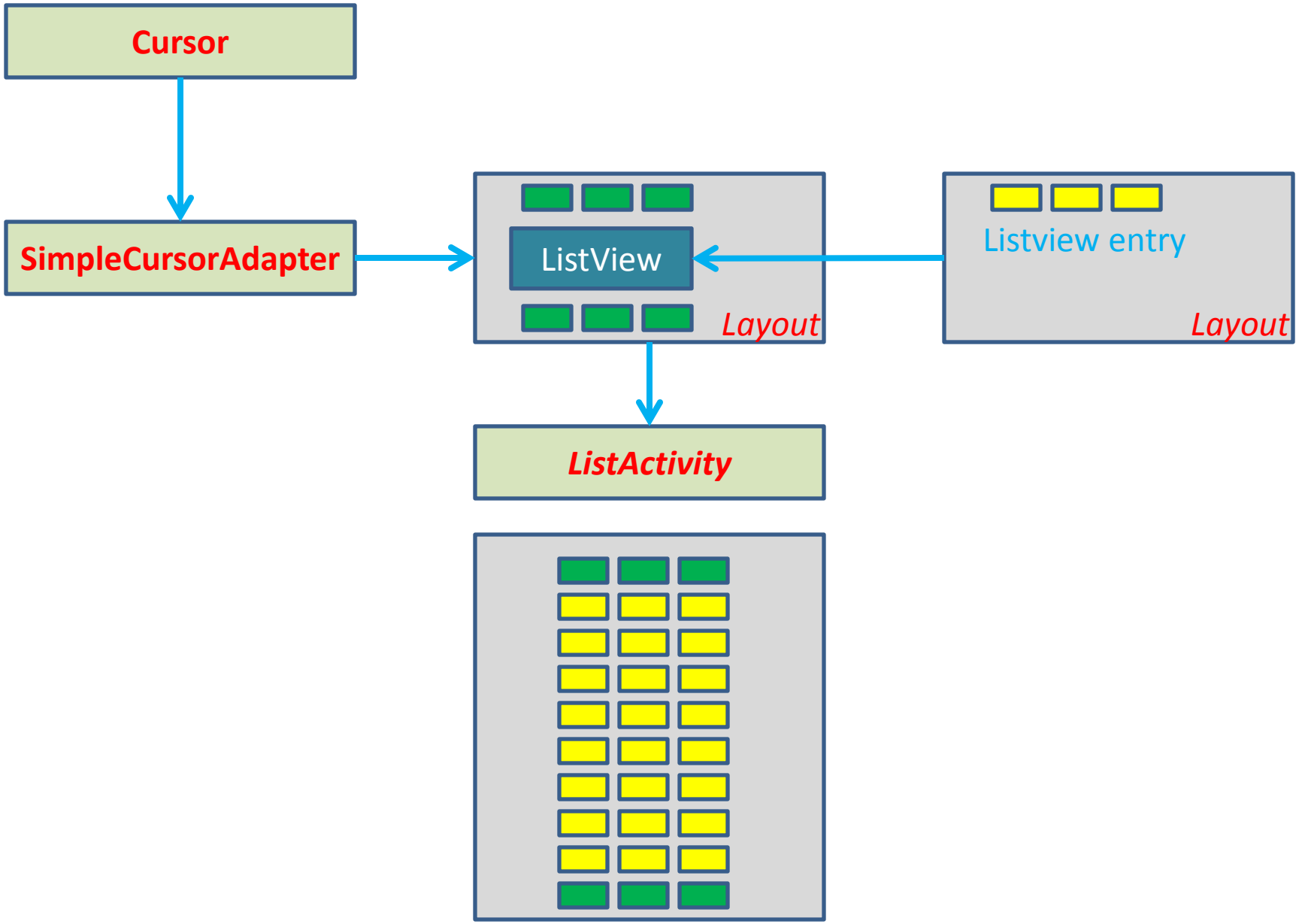
- Query data

```
SQLiteDatabase db =phonebookdb.getReadableDatabase();
 Cursor cursor = db.rawQuery("select * from phonebook order by name", null);
 startManagingCursor(cursor);
```

- Loop for all record

```
 while (cursor.moveToNext()) {
    Log.d("Database", cursor.getString(1)+ " -> "+ cursor.getString(2));
    }
```

ListView


Cursor
SimpleCursorAdapter
ListView
Layout
Listview entry
Layout
ListActivity

Thank you ☺