

# Android and SQLite

Gloria Hedlund

*Teaching Fellow*

*CS76 – Building Mobile Applications*

*Harvard Extension School*

# SQLite

- SQL = Structured Query Language
- Available on every Android device
- Automatically managed by the Android platform
- Requires only a little memory at runtime (approx 250 Kbyte)

# Datatypes

- Text (String)
- Integer (long)
- Real (double)
- SQLite does not verify that the type written to each column is of the defined type
- <http://www.sqlite.org/datatype3.html>

# android.database.sqlite

- SQLiteOpenHelper class
  - onCreate() creates a new database
  - onUpgrade() updates database schema
- SQLiteDatabase class
  - insert(), update(), delete()
  - execSQL() – execute SQL directly
  - rawQuery() – parameter is SQL statement
  - query() – parameters specify the SQL query



# SQL statements

- To create a table
  - CREATE TABLE *table* (*col1* type, *col2* type, ...);
- To insert into a table
  - INSERT INTO *table* (*col1*, *col2*..) VALUES (*val1*, *val2*..);
- To update a table
  - UPDATE *table* SET *col2* = *newVal2* WHERE *col1* = *val1*;
- To delete from a table
  - DELETE FROM *table* WHERE *col1* = *val1*;

# Demo Time

- MyRecordCollection
  - Simple app for record (as in vinyl/LP) collectors
- Check out the source code
  - <https://www.cs76.net/Sections>

# Data Retrieval

- Create a String [] of result\_columns for the columns of data you want to retrieve
  - String[] cols = new String[] { *\_id*, *first\_col*, ... *nth\_col* };
- Create a cursor object to retrieve results of a query
  - Cursor cursor = this.db.query(*table*, *cols*, null, null, null, null, null);
  - WHAT ARE ALL OF THESE NULLS?

**query**(*tablename*, null, null, null, null, null, null)

String tablename	The table name
String[] columnNames	List of which table columns to return. Null returns all.
String whereClause	Filter for data selection. Null selects all data.
String[] selectionArgs	If there are ?s in the whereClause this is where you put the values
String[] groupBy	Filter for grouping rows. Null means no grouping
String[] having	Filter for the groups. Null means no filter.
String[] orderBy	Table column used to sort the data. Null means no sorting.

# Data Retrieval cont.

- A query() returns a Cursor object
- getCount()
  - number of elements returned in Cursor
- moveToFirst(), moveToNext()
  - Move between rows in the Cursor
- getColumnIndexOrThrow(String)
  - Gets column index for a passed column name

# Displaying Data

- `List<Object>`
  - Create a list of your stored objects
- `ArrayAdapter<Object>`
  - Bind each object to an item layout
- `LayoutInflater`
  - Instantiates an item layout file into View objects
- `ViewHolder`
  - Class that will keep references to layout ids for faster performance / efficiency

# Command line Access

- adb command located in sdk/platform-tools
- Run command: adb shell OR ./adb shell (Mac)
  - (your device or emulator must be running)
- Go to the data directory: cd /data/data
- Go to your (app) package: cd *package name*
- Go to databases: cd databases
  - (you need to have created a database)
- Connect to your database: sqlite3 *databasename.db*

# Command line sqlite

- `sqlite> .help`
- `.databases`
- `.tables`
  - filter - `.tables my` gives all tables with “my” in name
- `select * from tablename;`
- `delete from tablename where key = value;`
- `.exit` or `.quit`