Android and SQLite

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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](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, null);
  • WHAT ARE ALL OF THESE NULLS?
<table>
<thead>
<tr>
<th><strong>query</strong>**(tablename, null, null, null, null, null, null, null, null)**</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>String tablename</strong></td>
</tr>
<tr>
<td><strong>String[] columnNames</strong></td>
</tr>
<tr>
<td><strong>String whereClause</strong></td>
</tr>
<tr>
<td><strong>String[] selectionArgs</strong></td>
</tr>
<tr>
<td><strong>String[] groupBy</strong></td>
</tr>
<tr>
<td><strong>String[] having</strong></td>
</tr>
<tr>
<td><strong>String[] orderBy</strong></td>
</tr>
</tbody>
</table>
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