Android – Database Access

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CSC 331-631
Fall, 2013

Saving Application Data

Options

- Save key-value pairs (simple data types) in shared preferences file
- Save arbitrary files in Android's filesystem
- Save data to a SQL database

`http://developer.android.com/training/basics/data-storage/index.html`

Saving Data in SQL Databases

1. Define a schema: specification of how the database is organized
   ⇒ tables to be created/used, structure of each table, etc.
2. Specify a contract class: definitions global to the database, inner classes for each table
   ⇒ `public final` Java class containing the schema specifications
3. Extend the `SQLiteOpenHelper` class: to manage database creation, version management, etc.
   ⇒ Use this object in your Activities to get and put data into your database

`http://developer.android.com/training/basics/data-storage/databases.html`

Databases and Schemas I

- Database: organized body of related information
  E.g. bank accounts, university student database, Facebook?
- Database management system (DBMS): software facilitating the creation, querying, update, and administration of an electronic database
  E.g. Oracle, Microsoft SQL, IBM DB2, Sybase, PostgreSQL, MySQL
- Relational data model:
  - table: collection of relational data (relations)
  - columns: data attributes
  - rows: tuples of attributes

Examples

Students

ID	Name	Birthday	GPA
9886	Holly	1/1/94	2.9
1234	Eddie	7/4/93	3.1
1564	John	3/22/95	3.2

Courses

CRN	Title
12134	CSC 101 - Overview of CS
43243	CSC 111 - Intro to CS
65342	MTH 113 - Multivariate Calc
14564	REL 100 - World religions

Enroll

ID	CRN
9886	12134
9886	65342
1234	43243
1234	14564
1234	65342
1564	12134

Databases and Schemas III

Schema

- *Student (ID integer, Name string, Birthday date, GPA float)*
- *Course (CRN integer, Title string)*
- *Enroll (ID integer, CRN integer)*

Instances

- { {9886, Holly, 1/1/94, 2.9}, {1234, Eddie, 7/4/93, 3.1 }, ... }
- { {12134, CSC 101-Overview of CS}, ...}
- { {9886,12134},{9886, 65342}, ...}

Basic MySQL I

- Create a database:

```
mysql> create database myDB;
```

- Use a database

```
mysql> use myDB;
```

- Create Student table

```
mysql> create table student(id int, name
varchar(40), birthday date, gpa float);
```

- Insert data

```
mysql> insert into student values(9886,
'Holly', '1992-01-01', 2.9);
```

Basic MySQL II

- Creating queries

```
mysql> select * from student;
mysql> select gpa from student;
mysql> select * from student where gpa >=
3;
```

- Update a table

```
mysql> update student set gpa = '3.1' where
name = 'Holly';
```

Contract Class

- `public final` class containing schema specification

`SQLLiteOpenHelper` class

- Extend the `SQLLiteOpenHelper` class