CSCE 156 – Computer Science II

Lab 7.0 - SQL I

Prior to Lab

1. Review this laboratory handout prior to lab.
2. Create a MySQL account by logging in here: https://cse-apps.unl.edu/amu/login
3. Change the account password using the following directions at: http://cse.unl.edu/faq-section/unix-linux#node-302
4. Review the supplemental SQL Cheat Sheet for the Album Database
5. This is a long lab but it can be completed if you prepare properly. Review the following materials:
   - Information About Databases and Tables
     http://dev.mysql.com/doc/refman/5.6/en/getting-information.html
   - Connecting to MySQL from the command line:
     http://dev.mysql.com/doc/refman/5.6/en/connecting-disconnecting.html
   - Retrieving data
     http://www.w3schools.com/sql/sql_select.asp
   - Conditional clause
     http://www.w3schools.com/sql/sql_where.asp
   - Inserting data
     http://www.w3schools.com/sql/sql_insert.asp
   - Deleting data
     http://www.w3schools.com/sql/sql_delete.asp

- Updating data
  http://www.w3schools.com/sql/sql_update.asp
- `count()`
  http://www.w3schools.com/sql/sql_func_count.asp
- `max()`
  http://www.w3schools.com/sql/sql_func_max.asp
- `min()`
  http://www.w3schools.com/sql/sql_func_min.asp
- Joining tables inner join
  http://www.w3schools.com/sql/sql_join_inner.asp
- left join
  http://www.w3schools.com/sql/sql_join_left.asp
- right join
  http://www.w3schools.com/sql/sql_join_right.asp

Lab Objectives & Topics

Following the lab, you should be able to:

- Connect to a database and execute queries
- Perform basic Create, retrieve, update, and delete (CRUD) operations
- Understand more complex queries using Joins and Aggregate functions

Peer Programming Pair-Up

To encourage collaboration and a team environment, labs will be structured in a *pair programming* setup. At the start of each lab, you will be randomly paired up with another student (conflicts such as absences will be dealt with by the lab instructor). One of you will be designated the *driver* and the other the *navigator*.

The navigator will be responsible for reading the instructions and telling the driver what to do next. The driver will be in charge of the keyboard and workstation. Both driver and navigator are responsible for suggesting fixes and solutions together. Neither the navigator nor the driver is "in charge." Beyond your immediate pairing, you are encouraged to help and interact and with other pairs in the lab.

Each week you should alternate: if you were a driver last week, be a navigator next, etc. Resolve any issues (you were both drivers last week) within your pair. Ask the lab

instructor to resolve issues only when you cannot come to a consensus.

Because of the peer programming setup of labs, it is absolutely essential that you complete any pre-lab activities and familiarize yourself with the handouts prior to coming to lab. Failure to do so will negatively impact your ability to collaborate and work with others which may mean that you will not be able to complete the lab.

Getting Started

Material for this lab is available for download on the course website.

Querying a Database

You will be connecting to a remote MySQL database server on CSE and executing several queries. The queries you will be performing involve a database that contains data about various music albums, songs and the artists involved. The database structure is illustrated in the ER (Entity-Relation) diagram in Figure 1.

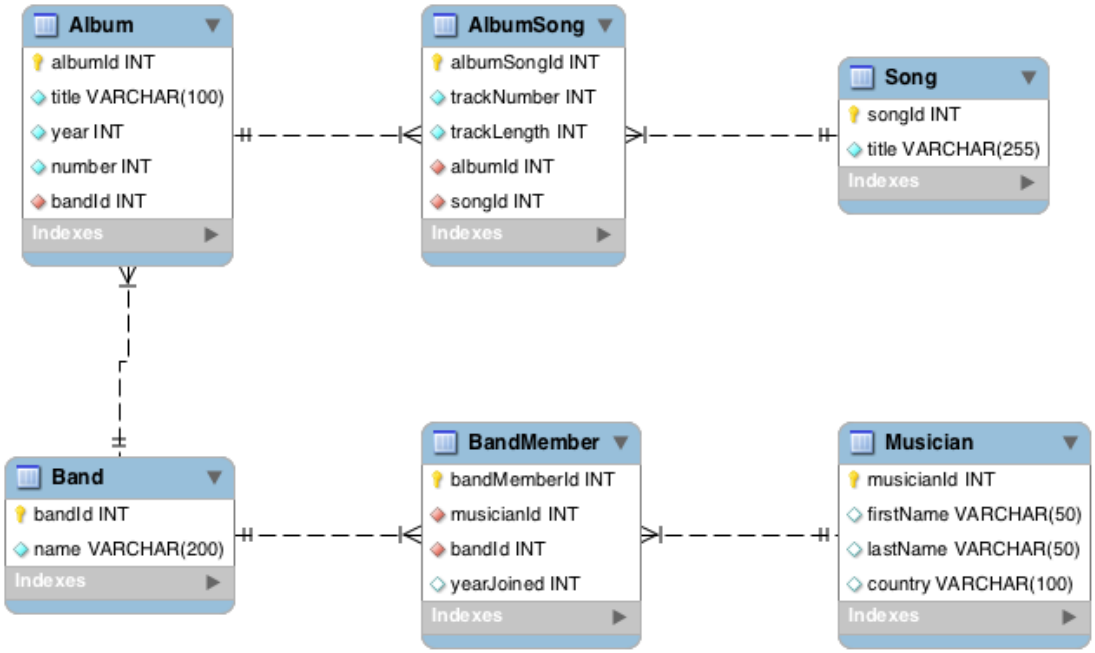

Figure 1: Albums Database

Importing the Database

You will need to "install" the Albums database and data into your own database on CSE. Note: database in this sense is just a collection of related tables; on CSE you only have access to one actual database–the database named after your CSE login. To import the Albums database, you can either a) simply run the `albums.sql` script (you may need to add a `use cselogin;` first) in MySQL Workbench; or b) from the command line:

1. Make sure the `albums.sql` DDL file (Data Description Language) is on your Z drive.
2. From the command line (via PuTTY), execute the following:

   ```
   mysql -u username -p username < albums.sql
   ```

   where `username` is replaced with your CSE login. Enter your MySQL password. This redirects the contents of the `albums.sql` file (a collection of SQL commands) to the mysql command line interface, creating all the tables and inserting all the data necessary.

Executing Queries

You may use any interface to your MySQL database that you wish, but we recommend that you use MySQL Workbench. You can download and install it from here: https://www.mysql.com/products/workbench/. Otherwise, it is available on the CSE lab computers.

1. Launch MySQL Workbench
2. From the quick launch menu select "Open Connection to Start Querying"
3. Enter the host name (cse.unl.edu), username (your cse login) and enter your sql password; click "OK"
4. You can now enter queries and execute them (follow the menu options)

Execute the queries in the worksheet and demonstrate them to a lab instructor. Instead of writing the answers by hand, you may simply type them in the worksheet provided.

SQL Supplemental Cheat Sheet

For your benefit, we have created a supplemental SQL cheat sheet that you may reference. It contains many of the major types of queries along with a practical application using the Album database.