

CSE 4701, Fall 2023 Project 1

Part 1: Due September 27, 2023 (Wed) 11:59 pm at HuskyCT (50 points)

The goal of Project 1 Part 1 is to help you learn how to create a database instance satisfying “integrity constraints” using the popular open source DBMS, MySQL.

1. Download MySQL DBMS and install it in your local computing environment. You can download MySQL from <http://dev.mysql.com/downloads/mysql/>. Other options are possible.
2. Construct an example database containing the tables which you worked on for Homework 1 Problem 8.18 (pg. 282, 7th Ed) by doing the two steps:
 - (a) Write DDL statements and run them to create table schemas for your database, called Book_Loan_DB. When creating the tables, your definitions must support key constraints and referential integrity constraints. You need to infer primary and foreign keys from the schema.
 - (b) Use INSERT statements to populate the tables with **the sample data that is provided in HuskyCT**. You need to infer the data types for the attributes.

MySQL might wipe out tables for some unknown reasons. Keep a file containing the insert statements so that you can recreate the database easily later if that ever happens.

3. Demonstrate that you have completed the creation (i) by retrieving each individual table from the database and printing (screen capture is allowed), and (ii) by showing appropriate section of the system catalog (e.g., table names such as RELATION, ATTRIBUTE), i.e., how do you know PK and FK are indeed set? Submit a PDF document for (i) and (ii).

Note that MySQL uses tables to store data about relation schemas, i.e., system catalog. For example, information_schema.TABLE_CONSTRAINTS is one of those system catalog tables and you can query these. Try to retrieve its content to see how 3.(i) and 3.(ii) are stored and managed in MySQL.

(Help docs available in subsequent pages)

Report Format: Your report must be a PDF document with your full name as the file name (e.g., JohnDoe.pdf). The first line of your report must include “Your full name, Project 1 Part I” for easy identification for grading purpose.

Late submission penalty, **5% off per day**. **Submission cut-off** is 10/1/2023 (Sun) 11:59 pm.

Various Help Docs and Q&A

MySQL Installation

Q. Which version of MySQL Server should I be installing for this project.

A. Using the latest version of MySQL is advised. Go to this URL. <https://dev.mysql.com/downloads/mysql/> and pick your operating system. Download the latest installer for your operating system and install it. The installation instruction for different operating system would be different. You can find many tutorials over the internet on how to install MySQL Server for your operating system.

For MAC OS installations, these links are helpful.

Installing MySQL on OS X Using Native Packages

<https://dev.mysql.com/doc/mysql-installation-excerpt/8.0/en/macos-installation-pkg.html>

Installing a MySQL Launch Daemon

<https://dev.mysql.com/doc/refman/5.7/en/macos-installation-launchd.html>

Mac OS install and open mysql using terminal

<https://www.javatpoint.com/how-to-install-mysql-on-mac>

MySQL Client Terminal

Q. What MySQL client should I be using? What are the commands?

A. After you have successfully installed MySQL Server on your computer, a CLI (command line interface) client should also come with it. Please open the CLI and start typing MySQL commands in there.

For Windows User, Go to: Start Menu >> MySQL >> MySQL Server >> Command Line Client

For Mac OS, start your terminal window and type the following command

```
/usr/local/mysql/bin/mysql -uroot -p
```

After you enter the root password, you will be given MySQL prompt "mysql>". You can start typing SQL here.

Here are the basic commands:

show databases; → show all the databases in the server

use <database_name>; → select and start using database with name <database_name>. Replace text inside '<>' with real name.

show tables; → show tables inside the database.

select * from <table_name>; → you know what this does.

Project 1 Part 1 Deliverable

Q. What are the deliverables for Project 1 Part 1?

A. After you are done creating a database and creating all the tables, you must check to see if the tables are properly created with correct constraints. There are multiple ways to do this. You can use any of the available ways to do this. Take a screen shot of the proof that shows that the tables are all created with proper columns, and constraints. E.g. all columns are present, all primary keys are in place, and all foreign keys are in place with correct reference to “reference target” tables.

Once table creation is completed, you start inserting all the values. After values are inserted, you can double check the values by selecting the tables. When you see the results, take a screenshot showing values of all the tables. Compile all these screen shots into a word or PDF file and submit this file to HuskyCT. Also please format the file as specified in the original project description file, following the proper order.

Some sample for MYSQL users

To create foreign keys in MYSQL, the engine has to use innodb. For details,
<http://dev.mysql.com/doc/refman/5.1/en/innodb-storage-engine.html>

Examples are given below that create two table schemas, “degree” and “student”, and setting some constraints.

```
/* create degree table */
```

```
create table degree(degree_id int, degree_name text, degree_desc text) engine=innodb;  
alter table degree add primary key(degree_id);
```

```
/* create student table */
```

```
Create table student (ssn int, name text, address text, degree_id int) engine=innodb;  
alter table student add primary key (ssn);
```

```
/* create foreign key constraint */
```

```
alter table student add foreign key (degree_id) references degree(degree_id);
```

```
/* Now to list the attributes of the table */
```

```
desc degree;  
desc student;
```

```
/* This will also show the keys (primary, uniq, multiple etc). Foreign keys will be shown as  
multiple keys */
```

/ To see the referenced tables */*

```
select *  
from information_schema.key_column_usage  
where table_name = 'student';
```

If multiple schemas use same table name, you can add constraint for schema as

```
and table_schema = 'test'
```