CS 33007 Introduction to Database System Design, Spring 2019

Homework1

Total Points: 100

Deadline: Feb. 3rd, Sunday, 11:59PM

1.

(a) Draw a schema diagram for this this database schema. [***15 points***]

Branch (branch_name, branch_city, assets)
customer (customer_name, customer_street, customer_city)
loan (loan number, branch_name, amount)
borrower (customer_name, loan_number)
account (account_number, branch_name, balance)
depositor (customer_name, account_number)

(b) Considering the schema above, write relational expressions for following sentences [***12 points***]

i. Find all loan numbers with a loan value greater than $10,000.
ii. Find the names of all depositors who have an account with a value greater than $6,000.
iii. Find the names of all depositors who have an account with a value greater than $6,000 at the "Uptown" branch.

2.

(a) List superkeys and candidate keys of the following relation schemas of hospital database, [***13 points***]

Doctors (DoctorID, email, Name, MailingAddress, Salary)

Patient (PatientID, SSN, name, address)

VisitingRecords(PatientID, DoctorID, dateOfVisit)

(b) Write a relational expression to find names of the patients who have seen the doctor with ID = 43457

…….

Install XAMPP:

XAMPP is a Cross Platform for Apache HTTP server, MariaDB (open source version of MySQL), PHP and Perl. Download link: https://www.apachefriends.org/index.html

***** Note: Steps I have shown here are from Windows computer. If you are a Mac/Linux user, please try to understand the material. It won't be different to do the same on your machine. You can see me if you have any questions.**

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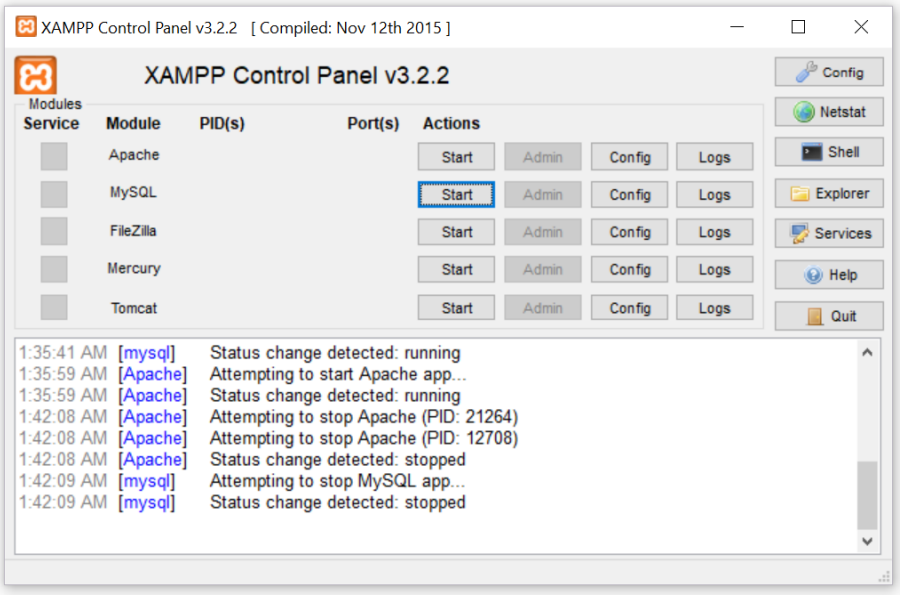
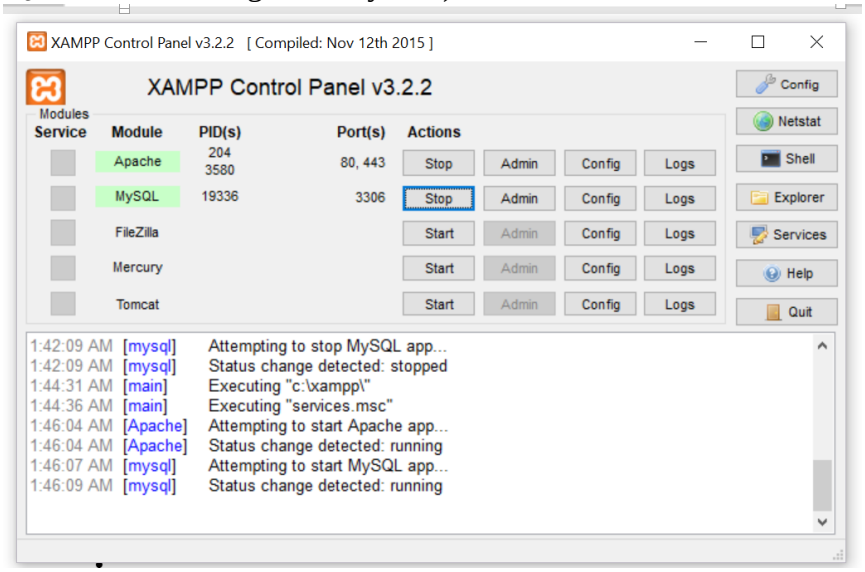
3. Test XAMPP [15 points]

3.1 Running phpMyAdmin

- Run your XAMPP from your program menu

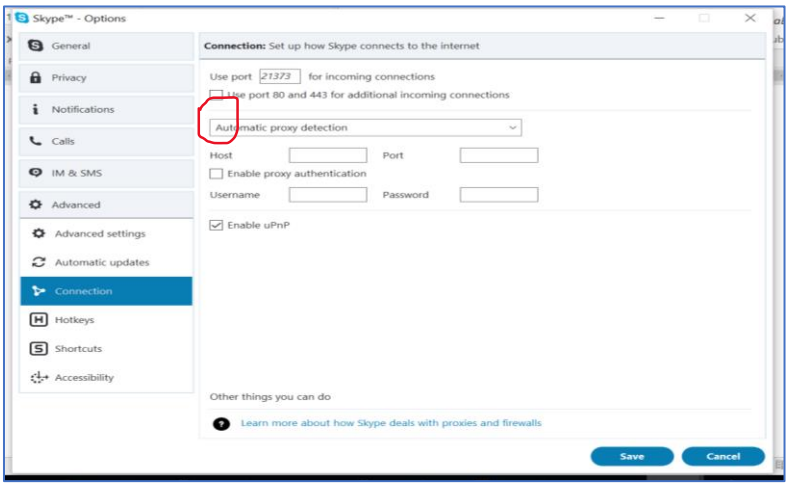


- Click on start for Apache and MySQL (Apache server provides you HTML interface to access MySQL database management System)

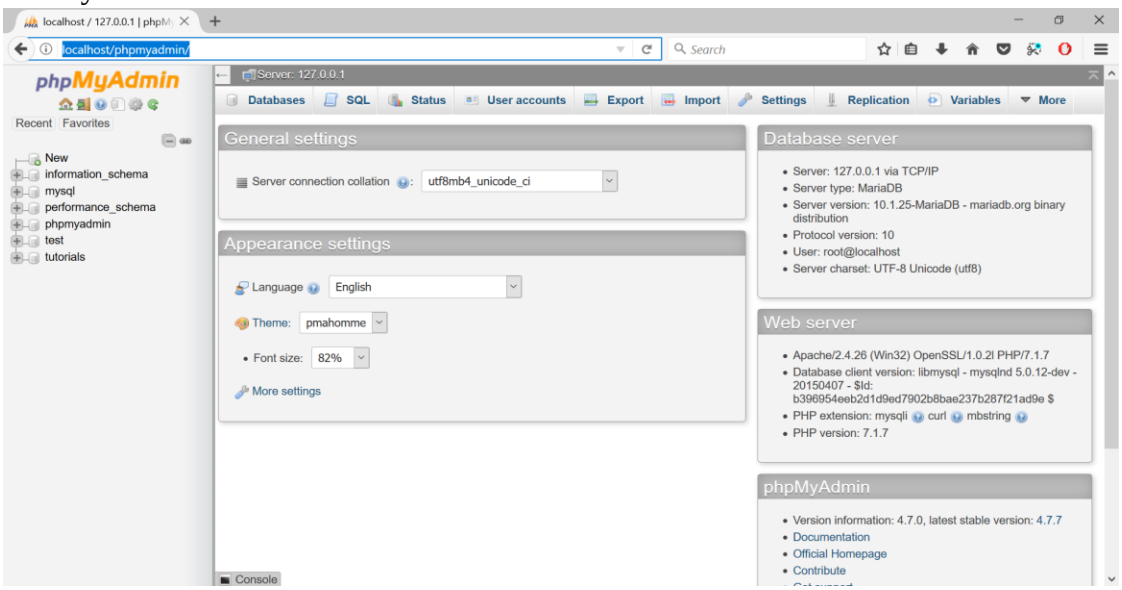


- If you have Skype running, then second step will be unsuccessful. Because the port 443 Apache trying to use already used by Skype. Please close skype or do following then

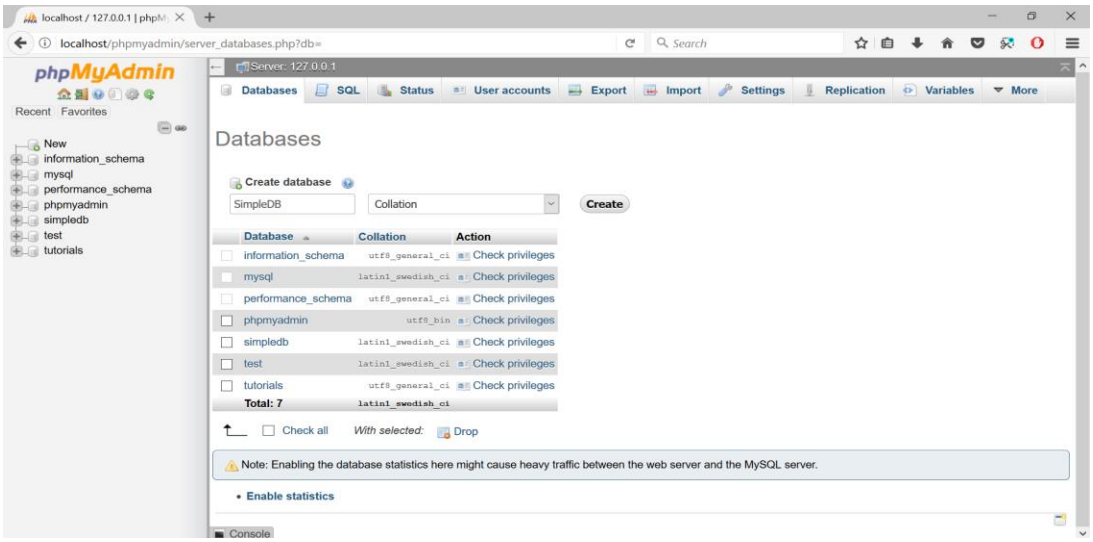
perform step 2 again. In Skype, go to option ->Advanced->connection, then uncheck “Use port 80 and 443 for additional incoming connections”. Alternatively you can change port number for apache from config-> services and port setting from XAMPP window.



- Now open your browser and go to http://localhost/phpmyadmin/ . This will load following interface. This window is password less for local machine but you will require password when you will access XAMPP in CS server.



- Left of the window showing list of databases already you have. You can now create new database clicking “New”, give database name and click on create. Don’t worry about collation.



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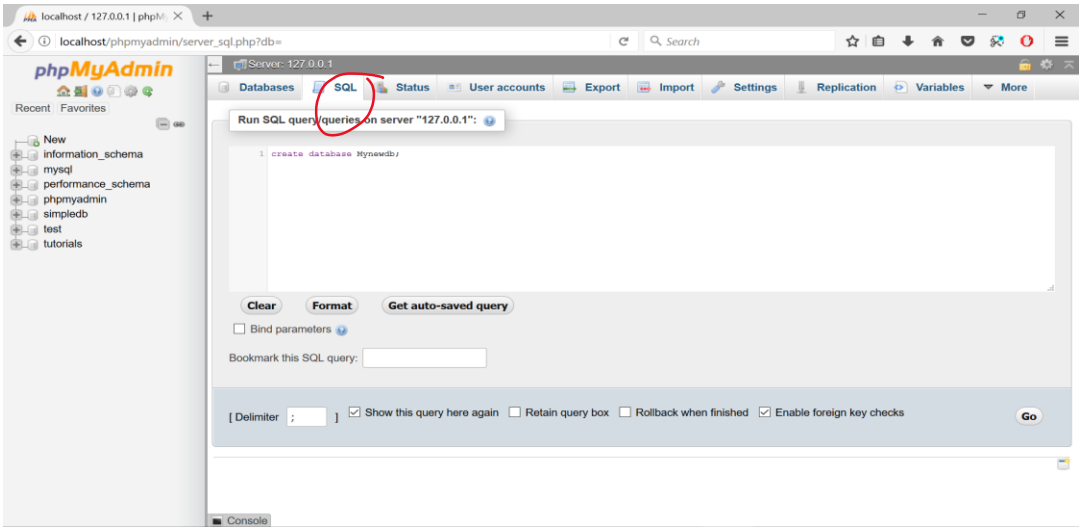
- Now click on SQL: In this box, you can write query to create another database- "create database Mynewdb;". The command "drop database simpleDB;" will delete database simpleDB from the Database Management System. To run the query, click on Go button.



**** Submit a screenshot like this last figure.**

Test Sample Queries in SQL window of phpmyadmin

- Create a database: "create database testDB;"
- Click on the database name "testDB" from left menu, this is to select database in the DBMS. You are now in the selected database, you can run any DML/DDL query on this database.
- Let's now create instructor table in testDB as follow:

    create table *instructor(*

ID char(20),
name varchar(20),
dept_name varchar(20),
salary numeric(8,2),
primary key(ID)
);

- Now insert a record in the table:

  insert into instructor values("1002", "John", "CS",100000);

- Following command will show all records in the instructor table (now it has only one record). **(Submit output of this query)**

  Select * from instructor;

4. Load complete university database: [15 points]

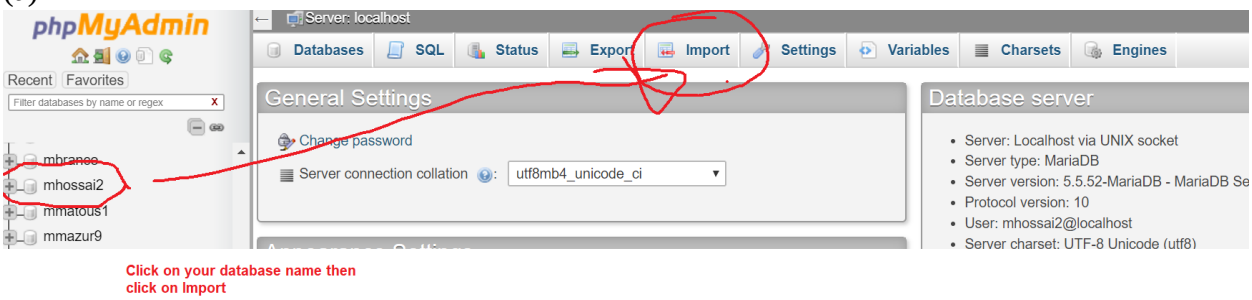
- create another database called "university" using following query:

  Create database university;

- download *.sql files given
- open these files one by one with Wordpad/notepad/notepad++ . You will see they are nothing but containing set of queries for creating/droping tables. Inserting one by one rows in different tables.
- You can run these queries in .sql file altogether as follows:

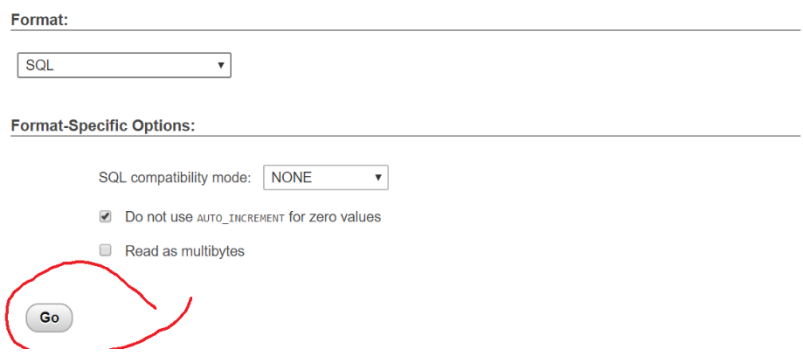
1. Select university database in phpmyadmin (just click on the database)
2. Import DDL for creating all tables. Import "DDL.sql "for first time creating tables or if you already have, want fresh tables, import "DDL+drop.sql" file.

(a)

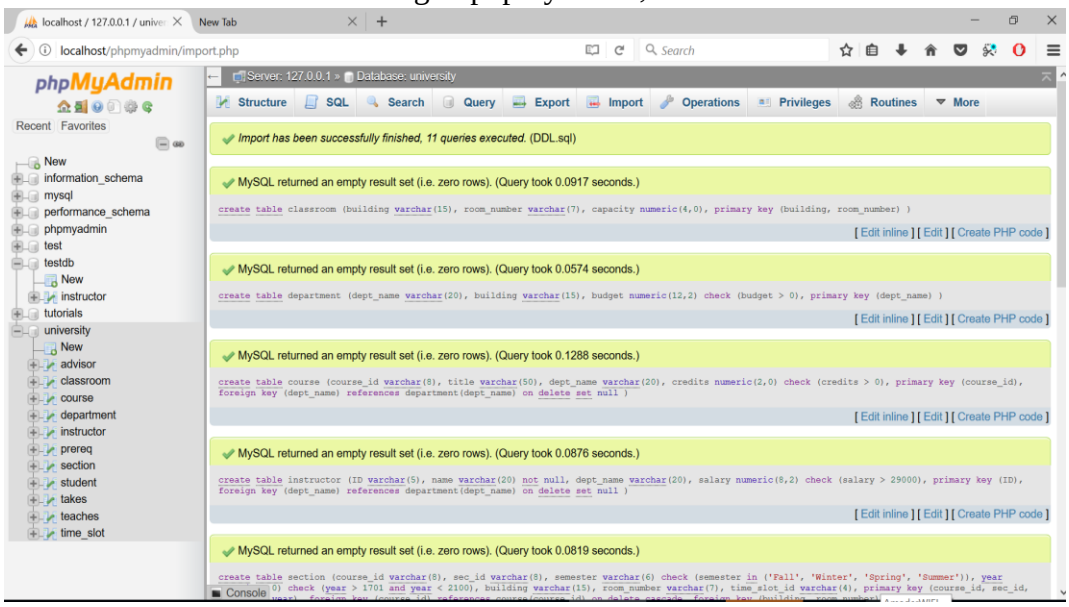


(b)

(c) Click on Go



3. In step 2 to you have created all tables for university database schema. Succesfull execution should show following in phpmyadmin,



4. Now same way import "smallRelationsInsertFile.sql" for inserting small set of data or " largeRelationsInsertFile.sql" for large set of data.

Submit the last screenshot after importing the smallRelationsInsertFile.sql file.

5. Execute Queries on university database **[15 points]**

Execute following queries and submit the screenshots of the outputs. Remember, queries must be executed under a database. So, please select the database first, just by clicking on it.

i. Find ID, name and monthly salary of instructor:
select *ID, name, salary/12 as monthly* **from** *instructor;*

ii. Find all instructors in Comp. Sci. department
select *name* **from** *instructor w***here** *dept_name* = *'*Comp. Sci.';

iii. Find all instructors in Comp. Sci. dept with salary > 80000
select *name* **from** *instructor* **where** *dept_name* = *'*Comp. Sci.' **and** *salary* > 80000

iv. Find the names of all instructors whose name includes the substring "dar".
sel**ect** *name* **from** *instructor* **where** *name* **like** '%dar%'

v. List names of all instructors in ascending order,
select distinct *name* **from** *instructor* **order by** *name*

6. Exercises on university database: Submit SQl queries for following statements. [15 points]

1. Find the names of courses in Computer science department which have 3 credits
2. For the student with ID 12345 (or any other value), show all course_id and title of all courses registered for by the student.
3. Find the names of all students who have taken any Comp. Sci. course ever (there should be no duplicate names)
4. Display the IDs of all instructors who have never taught a couse.