Department of Computer Science and Engineering

Course Code: CSE370	Credits: 1.5
Course Name: Database Systems	Semester: Spring 2024

Lab 01

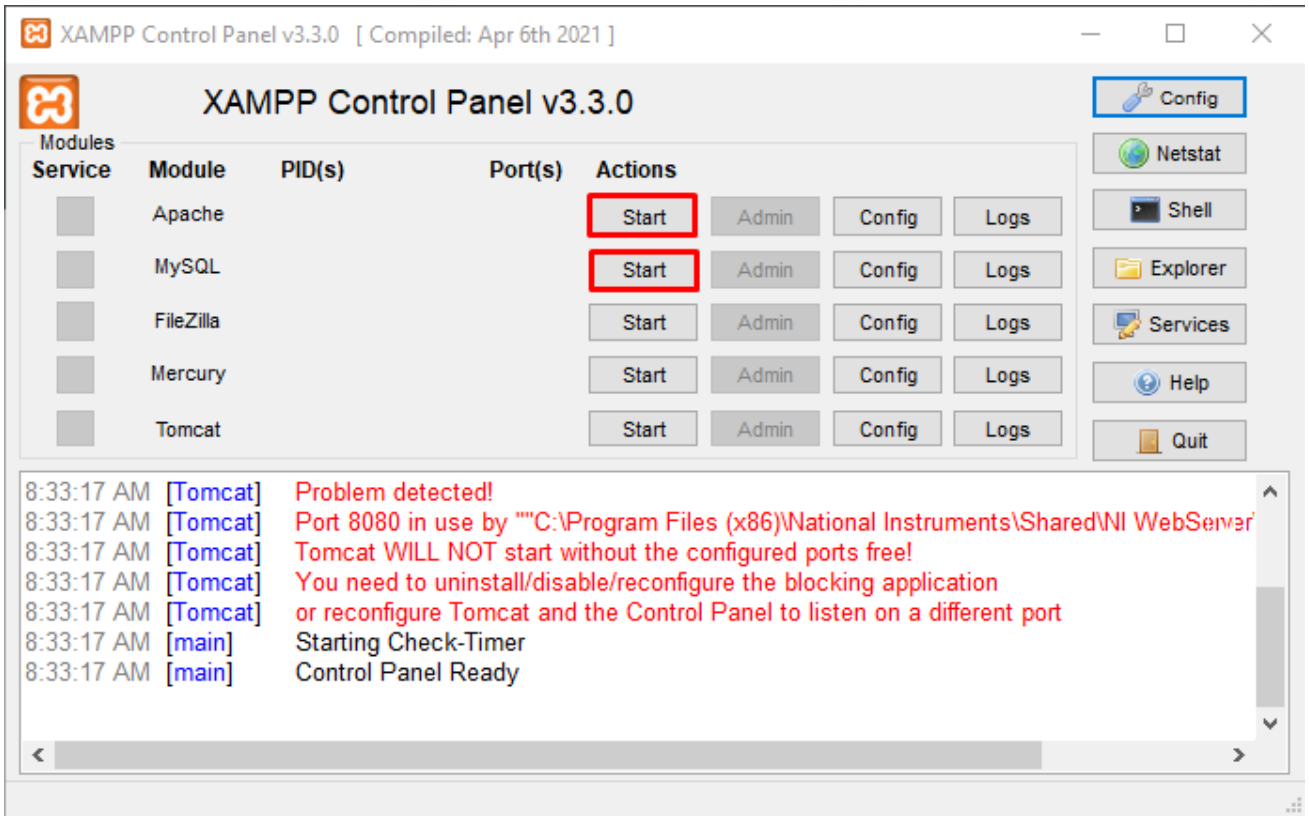
Part A : Setting Up and Connecting to the MySQL Server

Activity List for Part A

Step 1: Go to https://www.apachefriends.org/index.html and download XAMPP for your OS.

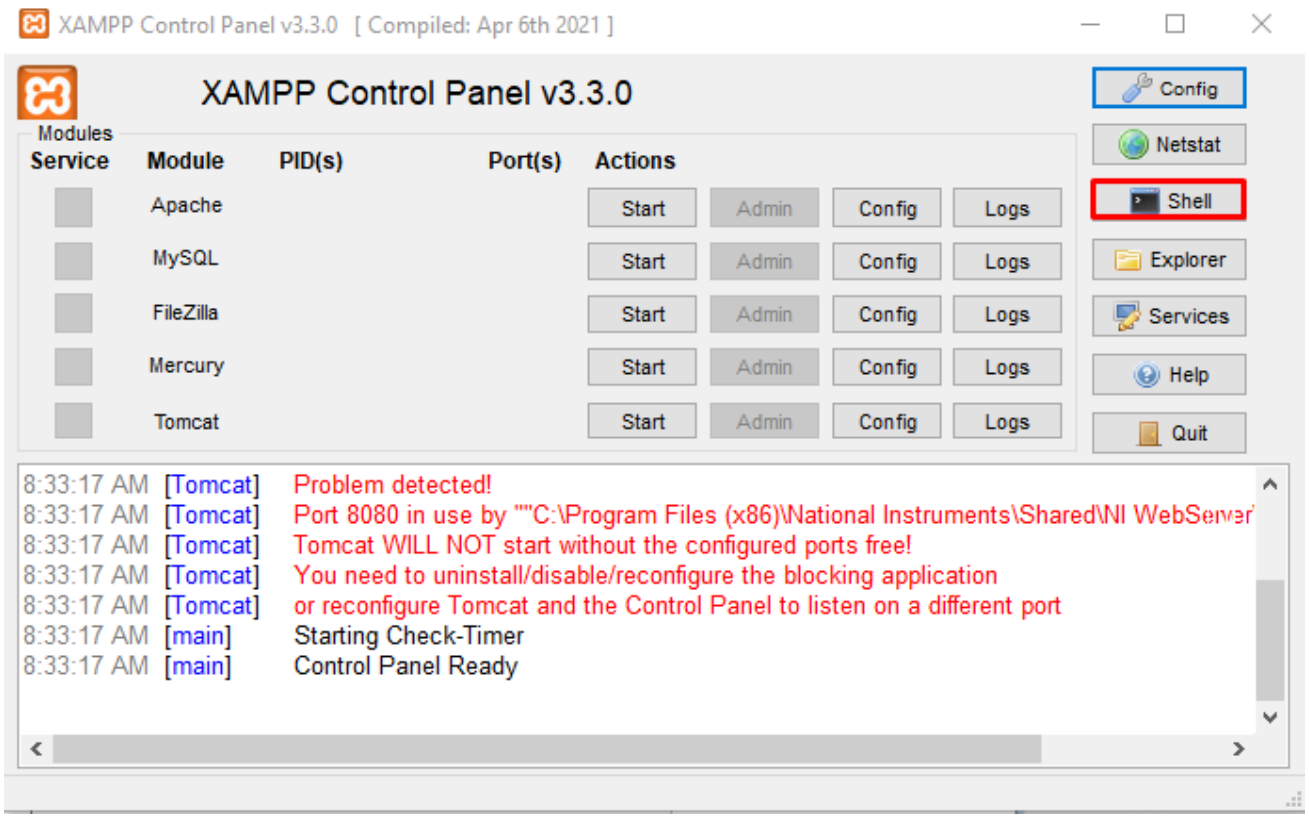
Step 2: Install XAMPP according to the installation guide.

Step 3: Open XAMPP control panel after installation.



Open the control panel and click on the start buttons (highlighted in red) beside Apache and MySQL.

Step 4: Click on the "shell" button on right of the window



Step 5: Connect to the MySQL server

After clicking on the shell, you should see a black window. Type in the following command:

mysql -u root -p

When you are asked for a password, don't type anything just press enter. The default password for xampp is an empty string.

Part B : An Introduction to MySQL Queries

Syntax error in a query might cause the mysql> prompt not to appear after executing the query.

Solutions:

i. Typing one of the following may solve the problem

1. ');
2. `);
3. `;
4. ';
5. Or log out with ctrl+c and log in again

Activity List for Part B

- **All commands are shown in the red boxes .**
- **In the green box write the response you see after entering each query. Also write the query for cases where you had to make changes.**
- **The part of the query in bold italic are variables, the rest are keywords. In some cases you might need to change the variables as per requirement.**
- **All new queries should be typed in command window after mysql>**

A Server can have multiple databases, for example, a movie database and a car rental database. So how can you view the list of all databases?

```
show databases;
```

If you want to start a new project you should create your own database. After creating check if the new database is in the list now.

```
create database Your_DB_name ;
```

Before storing or manipulating any data, you HAVE to select the database you want to work on. All new command will take effect in selected database.

```
use Your_DB_name ;
```

All data are stored in tables. Each table will represent 1 entity, for example students_info, the column of the table will be attributes of the students(e.g. student_id, name, department, cgpa, grad_date) and each row will have information about 1 single student. Each attribute has a pre-defined data type such as int, char etc.

```
create table Lab_grades
(
    std_id char(4),
    name varchar(30),
    major char(3),
    section char(1),
    days_present int,
    project_marks double,
    cgpa decimal(3,2),
    submission_date date
);
```

You can have many tables in database, e.g student_info, teacher_info, course_info etc. So how to view the list of all tables?

```
show tables;
```

You might want to check the structure of a table e.g. what columns are there, what are the data types etc.

```
describe Your_table_name;
```

Std_ID	Name	Major	section	Days_present	Project_marks	CGPA	Submission_date
s001	Abir	CS	1	10	18.5	3.91	2018-09-15
s002	Nafis	CSE	1	12	20	3.86	2018-08-15
s003	Tasneem	CS	1	8	18	3.57	2018-09-18
s004	Nahid	ECE	2	7	16.5	3.25	2018-08-20
s005	Arafat	CS	2	11	20	4.0	2018-09-13
s006	Tasneem	CSE	1	12	17.5	3.7	2018-08-15
s007	Muhtadi	ECE	1	10	19	3.67	2018-09-16
S008	Farhana	CSE	2	6	15	2.67	2018-08-16
s009	Naima	CSE	2	12	20	3.7	2018-08-14

Now you want to insert the data above in the table you created. There are two commands: a long version and a shorter one! Insert all the data above in the table.

```
Insert into Your_table_name
(std_id,name,major, section,
days_present,project_marks,cgpa,su
bmission_date) values
('s001','Abir','CS','1',10, 18.5,
3.91,'2018-09-15') ;
```

```
Insert into Your_table_name values
('s001','Abir','CS','1', 10, 18.5,
3.91,'2018-09-15') ;
```

Link for Table Data : https://docs.google.com/document/d/1XGp65Cd1KR6u6K61EraK6FpQrfAt5ZnonwvQvuWGK2U

So now you want to view all the data you inserted? For that we will use the select query. More on that later!

Select * from ***Your_table_name*** ;

Part C : SQL Alter, Update, Delete & Basic Select Queries

Task 1: Modifying Columns of a Table:

Add column project_title in the table

Alter table ***Lab_Grades*** add ***Project_title*** char(10);

The data type for Project_title should be varchar(50)

Alter table ***Lab_Grades*** modify column ***Project_title*** varchar(50);

Now let's delete the column Project_title

Alter table ***Lab_Grades*** drop column ***Project_title***;

- How will you change the name of a column from submission_date to sub_date? **[Google it!]**

Task 2: Updating Wrong Data:

Oops! Arafat's major is actually CSE, so update the value in the table

Update ***Lab_Grades*** set **Major** = 'CSE' where name= 'Arafat';

Nahid's name is misspelled and also his project marks should be updated to 16.

Update ***Lab_Grades*** set ***Name***='Naheed', ***Project_marks*** =16 where ***Std_ID*** = 's004' ;

- What will happen if the where clause is not included in the update query, e.g . if you typed Update Lab_Grades set Major = 'CSE';? **[Don't try it now, just write the answer]**

Task 3: Deleting Data:

Naima dropped out of the course. So, delete her data from the table.

Delete from ***Lab_Grades*** where ***Name***= 'Naima';

- What would have happened if there was another student named Naima?

Delete the data of everyone who was less than 8 days present.

Delete from ***Lab_Grades*** where ***Days_present*** < 8 ;

Task 4: Deleting Table or Database [DO NOT TRY NOW]:

So now if you want to delete a table or database you need the following commands

Drop table ***table_name;***

Drop database ***dbname;***

Task 5: Retrieving Data from Table:

- What is [**select * from Lab_grades;]** command used for?

Let's say you want to retrieve only the student id, name and project marks.

Select ***Std_ID, Name, Project_marks*** from ***Lab_Grades***;

Retrieve the name and total marks of students out of 25 (project + attendance)

Select ***Name, Project_marks+Days_present*5/12*** as ***Total_marks*** from ***Lab_Grades***;

- The "as" keyword in the above query is known as an alias. Check out what happens if you remove the "as Total_marks" portion from the above command. State the difference below.

- Try the command below, and state what the Upper() and Lower() functions mean.

Select Upper(***Name), Lower(Name)*** from ***Lab_Grades***;

- Try the two commands below. What is the difference and why is the distinct keyword used?

Select ***Major*** from ***Lab_Grades***;

Select distinct ***Major*** from ***Lab_Grades***;

Now you want to view all the details sorted by name. You can use the order by keyword

Select * from ***Lab_Grades*** order by ***Name***;

- Was it sorted in ascending or descending order? How can you sort in the opposite order?[Hint: check next command]

Sort all details according to name and then by submission date. There are two students named Tasneem, observe what happens.

Select * from ***Lab_Grades*** order by ***Name*** desc, ***Submission_date*** asc;

Now, you want to view the name and project marks for only CSE students.

Select ***Name,Project_marks*** from ***Lab_Grades*** where ***Major***='CSE' ;

- Retrieve the names, days present and marks of students whose project marks are greater than 17

Retrieve the name and marks of students whose marks is between 17 and 19

Select ***Name,Project_marks*** from ***Lab_Grades*** where ***Project_marks*** between 17 and 19 ;

Retrieve the details of students who are majoring in either CS or CSE

Select * from ***Lab_Grades*** where ***Major*** in ('CSE', 'CS');

- What is the use of the "in" keyword in the above query? You can write the same command using an "or" and "=" operators in the where clause. Try to figure it out!

Retrieve the details of the students who submitted their project in August and whose marks is greater than 18

Select * from ***Lab_Grades*** where Project_marks>18 and ***Submission_date*** between '2018-08-01' and '2018-08-31';

- How can you find the students whose Submission_date is not in August?

Retrieve the details of students whose name start with 'a'

Select * from ***Lab_Grades*** where ***Name*** like 'a%';

Retrieve the details of students whose name contains at least 2 a's

Select * from ***Lab_Grades*** where ***Name*** like '%a%a%';

- Try the following command and explain what happens : Select * from ***Lab_Grades*** where ***Name*** like 'a___'; ***[There are 3 underscores]***

Task 6: Basic Select Quiz

Go to https://sqlzoo.net/wiki/SELECT_Quiz and answer the Quiz to test your knowledge of basic select queries.