Department of Computer Science and Engineering

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

Lab 01

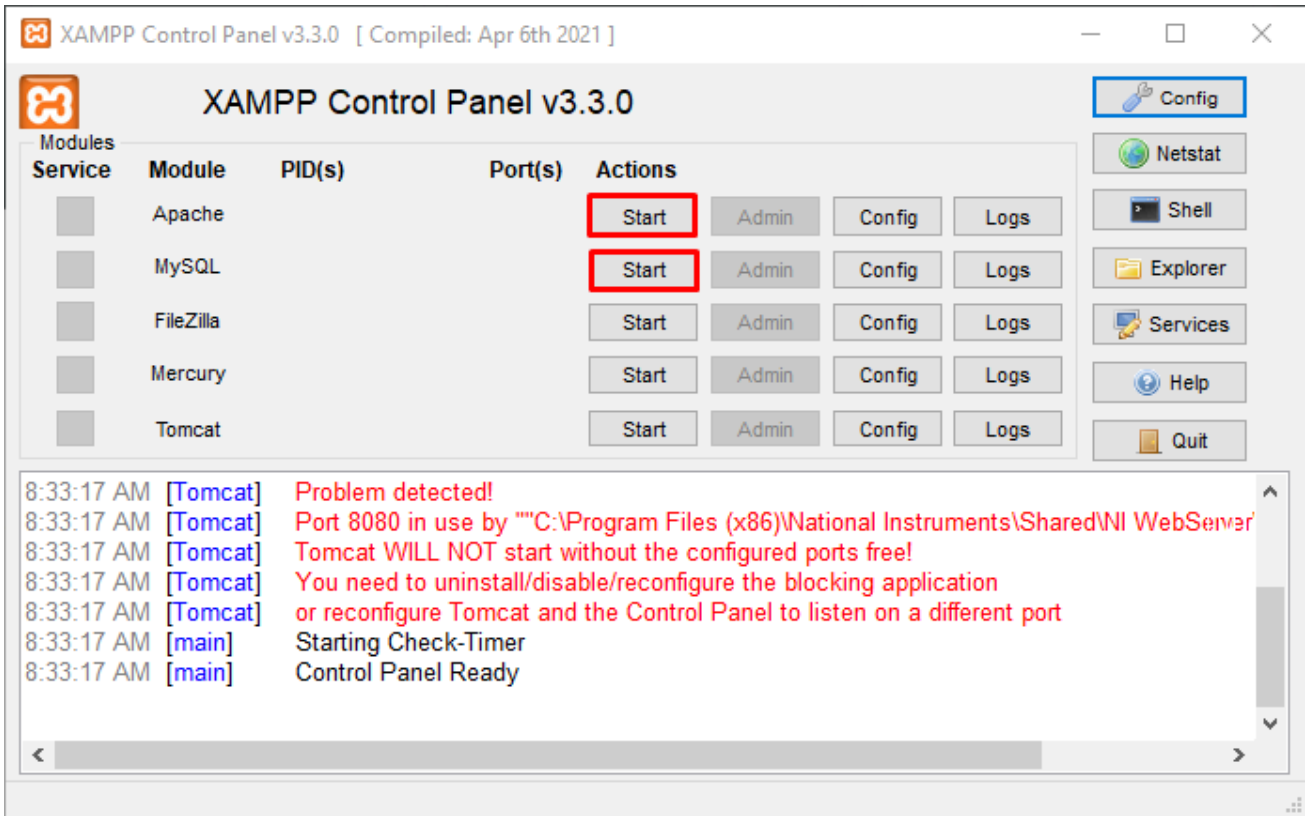
Part A: Setting Up and Connecting to the MySQL Server

Activity List for Part A

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

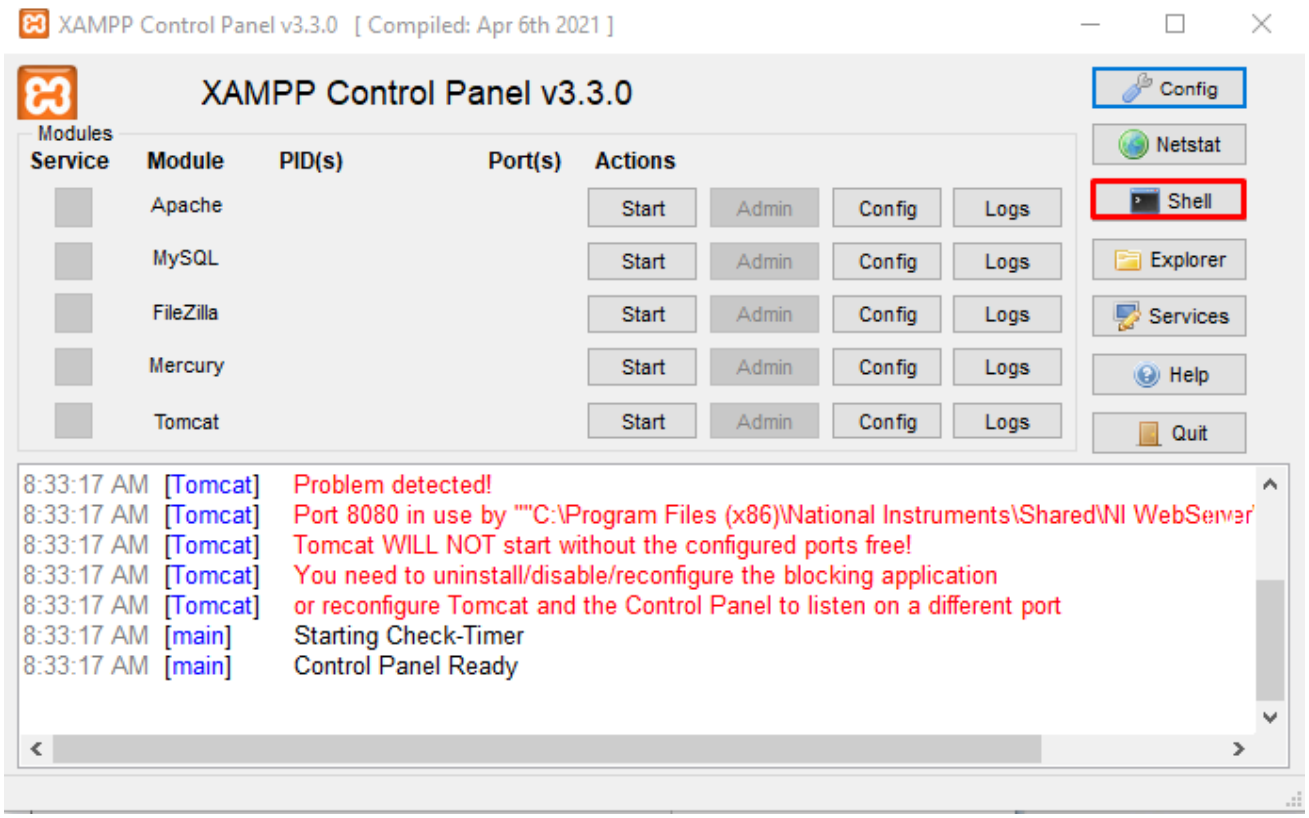
Step 2: Install XAMPP according to the installation guide.

Step 3: Open the XAMPP control panel after installation.



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

Step 4: Click on the "shell" button on the 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. Sometimes, you might need to change the variables as per requirement.**
- **All new queries should be typed in the 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 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 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 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

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

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 Table_Name
(std_id,name,major, section,
days_present,project_marks,cgpa,
submission_date) values
('s001','Abir','CS','1',10, 18.5,
3.91,'2018-09-15');
```

```
INSERT INTO Table_Name values
('s001','Abir','CS','1', 10, 18.5,
3.91,'2018-09-15');
```

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 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 DB_Name;
```

Task 5: Retrieving Data from Table:

- What is the [**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 "in" keyword in the above query? In the where clause, you can write the same command using the "or" and "=" operators. 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.