

# 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

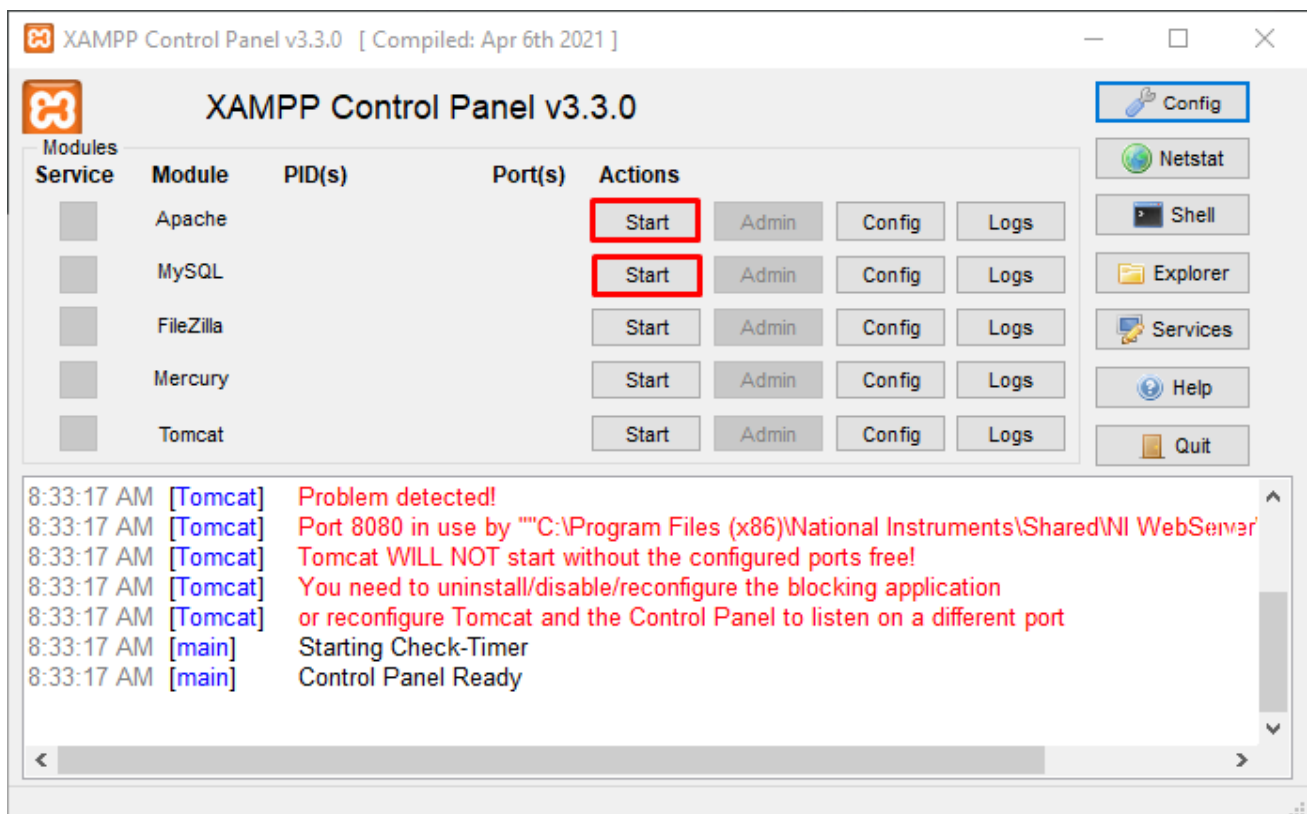
#### Activity List for Part A

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



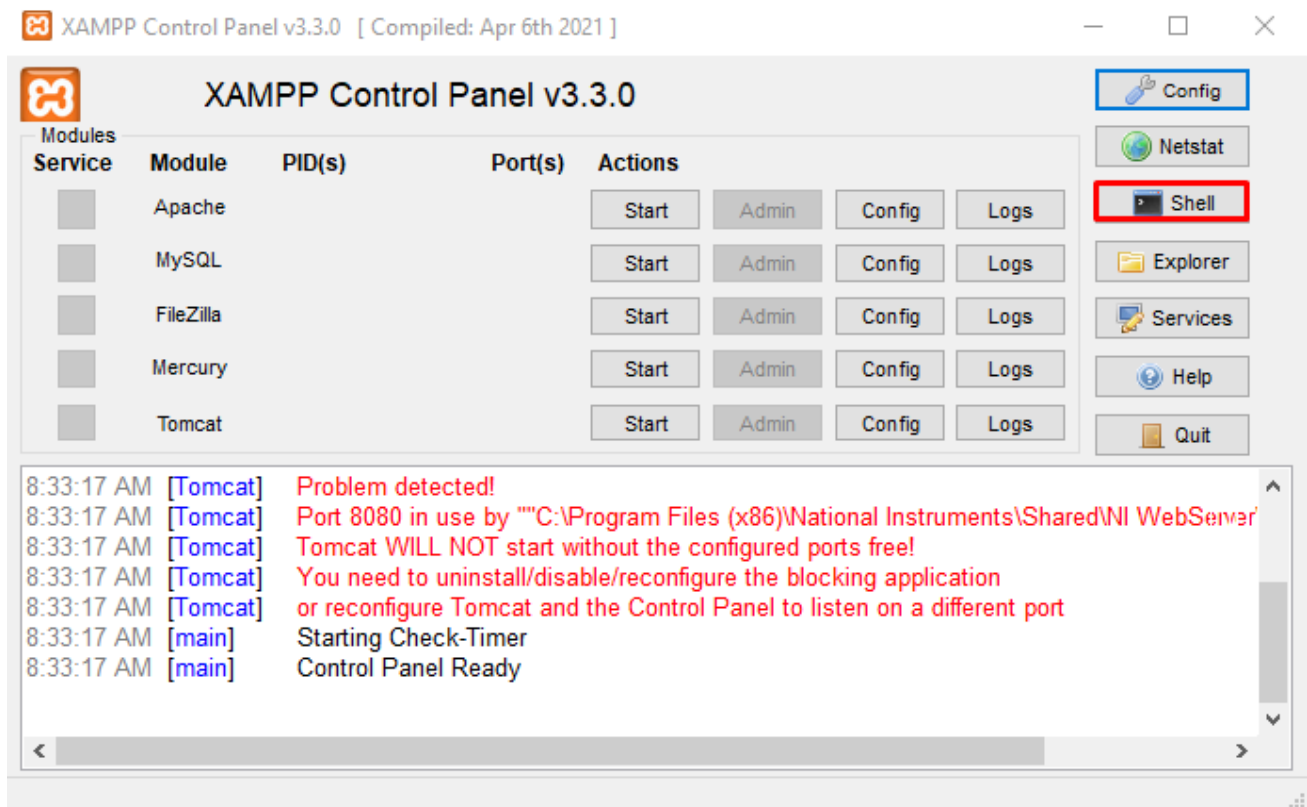
**Step 2:** Install XAMPP according to the installation guide.

**Step 3:** Open 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;
```

<b>std_id</b>	<b>name</b>	<b>major</b>	<b>section</b>	<b>days_present</b>	<b>project_marks</b>	<b>cgpa</b>	<b>submission_date</b>
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/1XGp65Cd1KR6u6K61EraK6FpQrfAt5ZnonwvQvuW/GK2U>

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