**Department of Computer Science and Engineering**

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| **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**

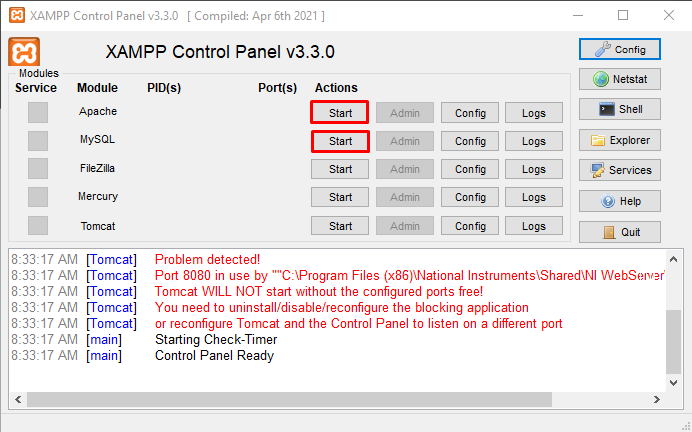
**Activity List for Part A**

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

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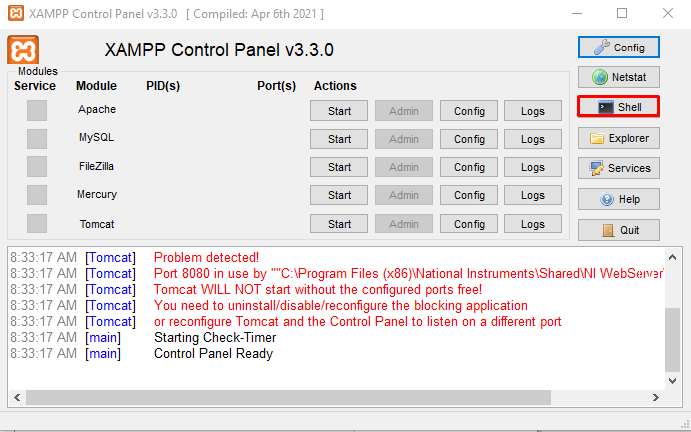
**Step 2:** Install XAMPP according to the installation guide.

**Step 3:** Open XAMPP control panel after installation.

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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**

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**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:**

* + 1. 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

);

show tables;

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?

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,submission\_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**](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);

Alter table ***Lab\_Grades*** drop column ***Project\_title***;

Now let’s delete the column Project\_title

* How will you change the name of a column from submission\_date to sub\_date? **[Google it!]**

ALTER TABLE student\_lab\_grades

-> CHANGE adding\_new\_column addingNewColumn int;

**Task 2: Updating Wrong Data:**

Update ***Lab\_Grades*** set **Major** = ‘CSE’ where name= ‘Arafat’;

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

Update ***Lab\_Grades*** set ***Name***=’Naheed’, ***Project\_marks*** =16 where ***Std\_ID*** = ‘s004’ ;

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

* 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 from ***Lab\_Grades*** where ***Days\_present*** < 8 ;

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

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

Drop table ***table\_name;***

Drop database ***dbname;***

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

**Task 5: Retrieving Data from Table:**

* What is [**select \* from Lab\_grades;]** command used for?

Select ***Std\_ID, Name, Project\_marks*** from ***Lab\_Grades***;

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

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 distinct ***Major*** from ***Lab\_Grades***;

Select ***Major*** from ***Lab\_Grades***;

Select ***\**** from ***Lab\_Grades*** order by***Name***;

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

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

Select ***\**** from ***Lab\_Grades*** order by***Name*** desc, ***Submission\_date*** asc;

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

Select ***Name,Project\_marks*** from ***Lab\_Grades*** where ***Major***=’CSE’;

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

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

Select ***Name,Project\_marks*** from ***Lab\_Grades*** where ***Project\_marks*** between 17 and 19;

Select ***\**** from ***Lab\_Grades*** where ***Major*** in (‘CSE’, ‘CS’);

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

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

* 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?

Select ***\**** from ***Lab\_Grades*** where ***Name*** like ‘a%’;

Retrieve the details of students whose name start with ‘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.