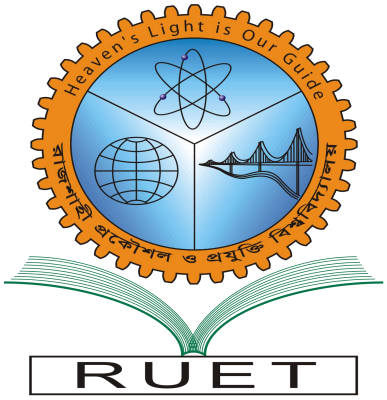
Heaven's Light is Our Guide

Rajshahi University of Engineering & Technology



Department of Electrical & Computer Engineering

Course Code: ECE 2216

Course Title: Data Base Systems Sessional

Lab Report-1

Topic: Database Creation with DDL & DML Operations.

Submitted to:

Oishi Jyoti
Assistant Professor,
Dept. of ECE, RUET

Submitted By:

Md Tariful Islam
Roll: 2110036
Year: 2nd year (Even)

1.1 Problem Statement:

We have to develop a database system to store information about students and perform various SQL operations such as creating a table, modifying columns, adding new columns based on conditions, and deleting records that meet specific criteria. These operations will help in learning both Data Definition Language (DDL) and Data Manipulation Language (DML) concepts in SQL.

1.2 Objectives:

To learn and implement basic SQL commands involving DDL and DML operations.

To create a structured database for storing student information.

To modify database structure using DDL (e.g., altering columns and adding new columns).

To manipulate data using DML (e.g., updating records and deleting data based on conditions).

1.3 Theory:

SQL is divided into two major categories:

1.3.1 Data Definition Language (DDL): It deals with the structure of the database, such as creating, modifying, and deleting database objects like tables and columns.

Common DDL operations include:

CREATE: To create new tables or databases.

ALTER: To modify existing table structures (e.g., changing column names or data types).

DROP: To delete tables or databases.

1.3.2 Data Manipulation Language (DML): It focuses on managing the data within the database.

Common DML operations include:

INSERT: To add new records to a table.

UPDATE: To modify existing records in a table.

DELETE: To remove records from a table.

By using both DDL and DML operations, a complete understanding of managing databases can be achieved. DDL commands define the structure, while DML commands handle the actual data manipulation.

1.4 Attributes:

We will create a table with the following attributes for each student:

1. **Roll**: The student's roll number.
2. **Name**: The student's name.
3. **Semester**: The current semester of the student.
4. **Major_subject**: The major subject of the student.
5. **Obtained_mark**: The marks obtained by the student in an exam.

1.5 Used Software:

Database Management System (DBMS): MySQL (via XAMPP)

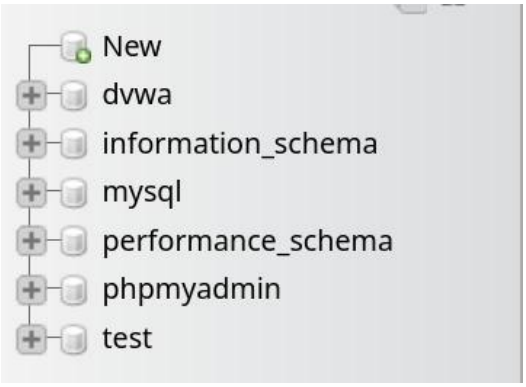
IDE/Editor: phpMyAdmin (provided by XAMPP for managing databases)

Operating System: Linux

1.6 Queries and Outputs:

1.6.0 Initial State:

Description: We found here some default databases.



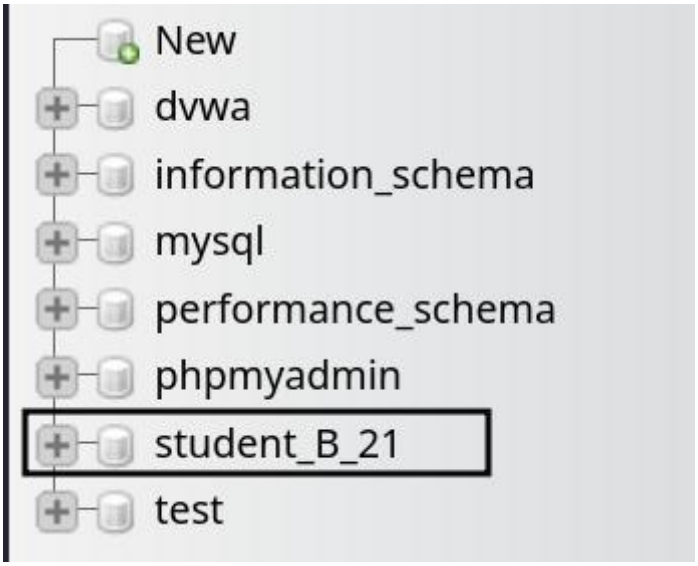
1.6.1 Database Creation :

Query: ‘CREATE‘ query was used here.

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0232 seconds.)

```
CREATE DATABASE student_B_21;
```

Changed Effect:



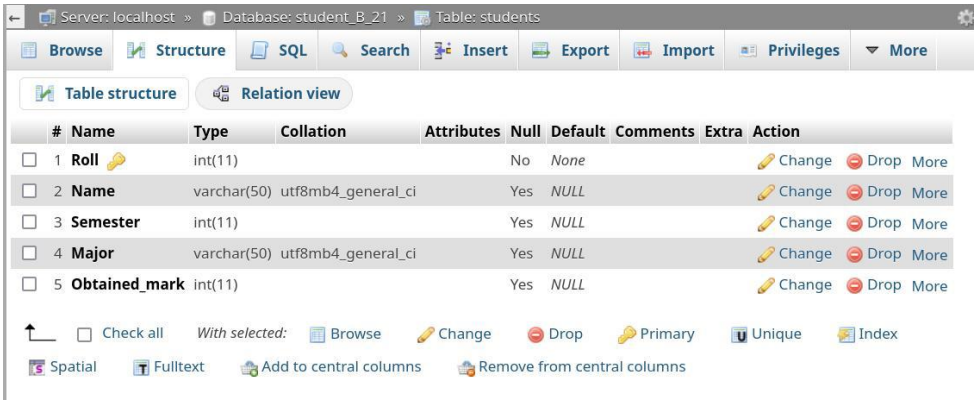
1.6.2 Table Creation :

Query: ‘CREATE‘ query was again used here.

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0028 seconds.)

```
CREATE TABLE students ( Roll INT PRIMARY KEY, Name VARCHAR(50), Semester INT, Major
VARCHAR(50), Obtained_mark INT );
```

Changed Effect:



1.6.3 Insert data in the Table:

Query: We insert 10 data with the following query.

Show query box

10 rows inserted. (Query took 0.0483 seconds.)

```
INSERT INTO students (Roll, Name, Semester, Major, Obtained_mark) VALUES (1,
'Tariful', 3, 'Computer Engineering', 45), (2, 'Faez', 2, 'Electrical
Engineering', 50), (3, 'Tahsin', 1, 'Mathematics', 28), (4, 'Trisha', 4,
'Physics', 33), (5, 'Mohona', 2, 'Mechanical Engineering', 25), (6, 'Nayeem',
3, 'Computer Science', 55), (7, 'Rafiu', 1, 'Electrical Engineering', 22), (8,
'Orpa', 4, 'Mathematics', 38), (9, 'Rokshana', 2, 'Physics', 42), (10, 'Oliur',
```

[Edit inline] [Edit] [Create PHP cod

Changed Effect:

	Roll	Name	Semester	Major	Obtained_mark
Edit Copy Delete	1	Tariful	3	Computer Engineering	45
Edit Copy Delete	2	Faez	2	Electrical Engineering	50
Edit Copy Delete	3	Tahsin	1	Mathematics	28
Edit Copy Delete	4	Trisha	4	Physics	33
Edit Copy Delete	5	Mohona	2	Mechanical Engineering	25
Edit Copy Delete	6	Nayeem	3	Computer Science	55
Edit Copy Delete	7	Rafiu	1	Electrical Engineering	22
Edit Copy Delete	8	Orpa	4	Mathematics	38
Edit Copy Delete	9	Rokshana	2	Physics	42
Edit Copy Delete	10	Oliur	3	Mechanical Engineering	30

Check all *With selected:* Edit Copy Delete Export

1.6.4 Changing a Column Name and Data type:

Query:

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0007 seconds.)

```
ALTER TABLE students CHANGE COLUMN Major Major_Subject VARCHAR(100);
```

Changed Effect:

	Roll	Name	Semester	Major_Subject	Obtained_mark
Edit Copy Delete	1	Tariful	3	Computer Engineering	45
Edit Copy Delete	2	Faez	2	Electrical Engineering	50
Edit Copy Delete	3	Tahsin	1	Mathematics	28
Edit Copy Delete	4	Trisha	4	Physics	33
Edit Copy Delete	5	Mohona	2	Mechanical Engineering	25
Edit Copy Delete	6	Nayeem	3	Computer Science	55
Edit Copy Delete	7	Rafiu	1	Electrical Engineering	22
Edit Copy Delete	8	Orpa	4	Mathematics	38
Edit Copy Delete	9	Rokshana	2	Physics	42
Edit Copy Delete	10	Oliur	3	Mechanical Engineering	30

1.6.5 Adding a New Column:

Query:

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0021 seconds.)

```
ALTER TABLE students ADD COLUMN log VARCHAR(20);
```

Changed Effect:

	Roll	Name	Semester	Major_Subject	Obtained_mark	log
Edit Copy Delete	1	Tariful	3	Computer Engineering	45	NULL
Edit Copy Delete	2	Faez	2	Electrical Engineering	50	NULL
Edit Copy Delete	3	Tahsin	1	Mathematics	28	NULL
Edit Copy Delete	4	Trisha	4	Physics	33	NULL
Edit Copy Delete	5	Mohona	2	Mechanical Engineering	25	NULL
Edit Copy Delete	6	Nayeem	3	Computer Science	55	NULL
Edit Copy Delete	7	Rafiu	1	Electrical Engineering	22	NULL
Edit Copy Delete	8	Orpa	4	Mathematics	38	NULL
Edit Copy Delete	9	Rokshana	2	Physics	42	NULL
Edit Copy Delete	10	Oliur	3	Mechanical Engineering	30	NULL

1.6.6 Updating Column Value Based on Condition:

Query:

10 rows affected. (Query took 0.0006 seconds.)

```
UPDATE students SET log = CASE WHEN Obtained_mark > 30 THEN
'Applicable' ELSE 'Not applicable' END;
```

[Edit inline] [Edit] [Create PHP code]

Changed Effect:

	Roll	Name	Semester	Major_Subject	Obtained_mark	log
Edit Copy Delete	1	Tariful	3	Computer Engineering	45	Applicable
Edit Copy Delete	2	Faez	2	Electrical Engineering	50	Applicable
Edit Copy Delete	3	Tahsin	1	Mathematics	28	Not applicable
Edit Copy Delete	4	Trisha	4	Physics	33	Applicable
Edit Copy Delete	5	Mohona	2	Mechanical Engineering	25	Not applicable
Edit Copy Delete	6	Nayeem	3	Computer Science	55	Applicable
Edit Copy Delete	7	Rafiu	1	Electrical Engineering	22	Not applicable
Edit Copy Delete	8	Orpa	4	Mathematics	38	Applicable
Edit Copy Delete	9	Rokshana	2	Physics	42	Applicable
Edit Copy Delete	10	Oliur	3	Mechanical Engineering	30	Not applicable

1.6.7 Delete the student info on condition:

Query:

Show query box

3 rows deleted. (Query took 0.1104 seconds.)

```
DELETE FROM students WHERE Obtained_mark < 30;
```

Changed Effect:

	Roll	Name	Semester	Major_Subject	Obtained_mark	log
Edit Copy Delete	1	Tariful	3	Computer Engineering	45	Applicable
Edit Copy Delete	2	Faez	2	Electrical Engineering	50	Applicable
Edit Copy Delete	4	Trisha	4	Physics	33	Applicable
Edit Copy Delete	6	Nayeem	3	Computer Science	55	Applicable
Edit Copy Delete	8	Orpa	4	Mathematics	38	Applicable
Edit Copy Delete	9	Rokshana	2	Physics	42	Applicable
Edit Copy Delete	10	Oliur	3	Mechanical Engineering	30	Not applicable

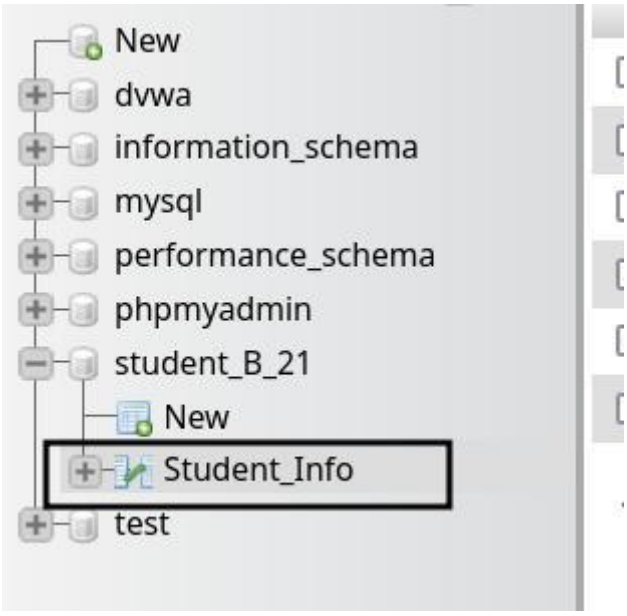
Check all *With selected:* Edit Copy Delete Export

1.6.8 Rename the Table Name:

Query:

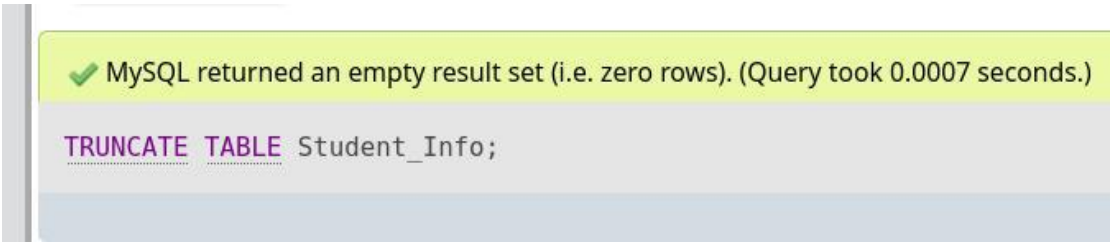
```
1 RENAME TABLE students to Student_Info;
```

Changed Effect:

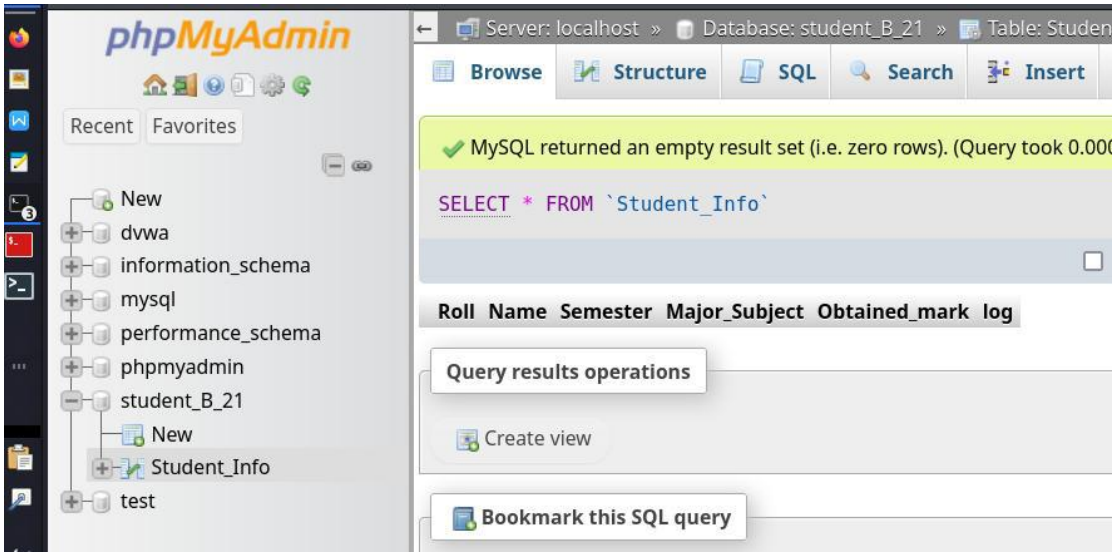


1.6.9 Truncate Operation:

Query:

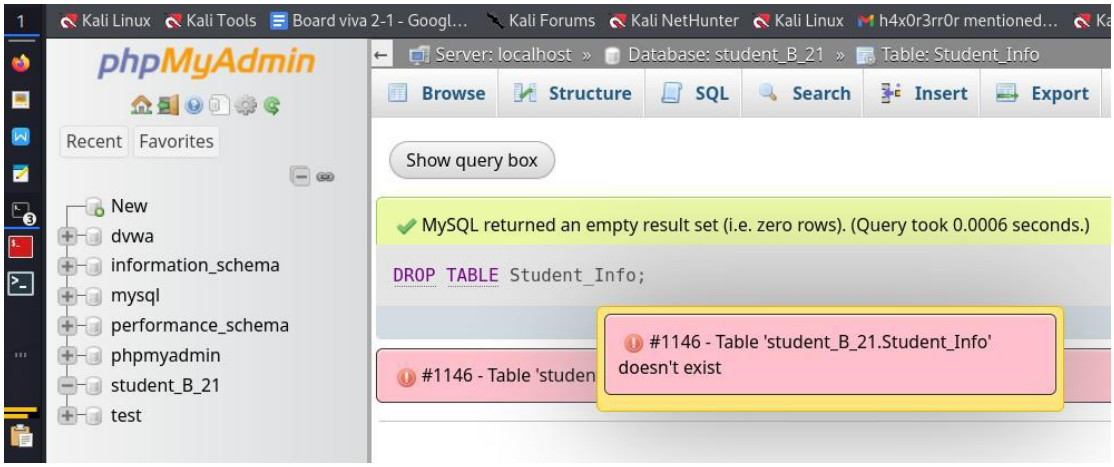


Changed Effect:



1.6.10 Truncate Operation:

Query & Changed Effect:



1.7 Discussion:

We have learned that **Data Definition Language (DDL)** and **Data Manipulation Language (DML)** are crucial components of SQL for database management. **DDL** commands, such as CREATE, ALTER, and DROP, help us define and modify the database schema, including tables and their structures. **DML** commands, including INSERT, UPDATE, and DELETE, enable us to manage and manipulate the data within those structures. Understanding and applying both DDL and DML commands are essential skills for effectively designing and maintaining databases, ensuring that the database schema and its data are both accurate and well-organized.

1.8 References:

[1] C. J. Date, **An Introduction to Database Systems**, 8th ed. Boston, MA, USA: Addison-Wesley, 2003.

[2] MySQL Documentation, "MySQL 8.0 Reference Manual," Oracle Corporation. [Online]. Available: https://dev.mysql.com/doc/. [Accessed: Sep. 16, 2024].