"Heaven's Light is Our Guide"

Rajshahi University of Engineering & Technology

Rajshahi, Bangladesh

Department of Electrical & Computer Engineering (ECE)

Course Code: ECE 2216

Course Title: Data Base Systems Sessional

Experiment No. 01

Experiment Name: Database Management with MySQL: DDL and DML Operations

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Submitted To

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Experiment Name: Database Management with MySQL: DDL and DML Operations.

Theory:
MySQL is a popular, open-source relational database management system. It stores data in separate tables rather than putting all the data in one big storeroom. The database structure is organized into physical files optimized for speed. The logical data model, with objects such as data tables, views, rows, and columns, offers a flexible programming environment. You set up rules governing the relationships between different data fields, such as one to one, one to many, unique, required, or optional, and "pointers" between different tables. The database enforces these rules so that with a well-designed database your application never sees data that's inconsistent, duplicated, orphaned, out of date, or missing.

Data Definition Language (DDL):
DDL commands are used for creating and managing databases and tables, such as:

CREATE, TRUNCATE, ALTER, RENAME, DROP, etc.

Data Manipulation Language (DML):
DML commands manipulate the data within tables, such as adding, modifying, or deleting record, such as:

INSERT, DELETE, WHERE, SELECT, UPDATE, MODIFY, SET, UPDATE, DELETE etc.

Problems:

1. Create a database and a table for storing student information.
2. Modify the table by changing a column's name and data type.
3. Add a new column to the table and set values based on conditions.
4. Delete records where student marks are below a specified threshold.

Tool: XAMPP control panel

Task 1: Create database & table
SQL:

```
>CREATE DATABASE Students;
>USE Student;
>CREATE TABLE Students ( Roll INT, Name VARCHAR(50), Major VARCHAR(50), Obtaine…
>INSERT INTO Students (Roll, Name, Major, Obtained_Marks) VALUES (40, 'Rakib', …
>SELECT * FROM `students`
>
```

Output:

Roll	Name	Major	Obtained_Marks
40	Rakib	Computer Science	65
41	Rifat	Computer Science	23
42	Rashid	Computer Science	15
43	Rahim	Electrical Engineering	45

Task 2: Change Column Name and Data Type

SQL:

```
>SELECT * FROM `students`
>ALTER TABLE Students CHANGE COLUMN Major Subject VARCHAR(50);
>ALTER TABLE Students MODIFY Obtained_Marks DOUBLE;
>
```

Output:

	#	Name	Type	C
☐	1	Roll	int(11)	
☐	2	Name	varchar(50)	u
☐	3	Subject	varchar(50)	u
☐	4	Obtained_Marks	double	

Task 3: Add a New Column and Set Values Based on Condition

SQL:

```
>ALTER TABLE Students ADD Log VARCHAR(30);
>UPDATE Students SET Log = 'Not Applicable' WHERE Obtained_Marks < 50;
>UPDATE Students SET Log = 'Applicable' WHERE Obtained_Marks >= 50;
>
```

Output:

Roll	Name	Subject	Obtained_Marks	Log
40	Rakib	Computer Science	65	Applicable
41	Rifat	Computer Science	23	Not Applicable
42	Rashid	Computer Science	15	Not Applicable
43	Rahim	Electrical Engineering	45	Not Applicable

Task 4: Delete Student Records Where Marks Are Below 50
SQL:

```
>DELETE FROM Students WHERE Obtained Marks < 30;
```

Output:

Roll	Name	Subject	Obtained_Marks	Log
40	Rakib	Computer Science	65	Applicable
43	Rahim	Electrical Engineering	45	Not Applicable

Discussion:
Essential MySQL operations, such as creating and editing tables and managing data, were covered in this lab. We worked on modifying records, changing data types, and renaming columns. Used TRUNCATE TABLE Students to remove all records from a table while maintaining its structure, and DROP TABLE Students to erase the table and all of its contents entirely. A table can be swiftly emptied with TRUNCATE, but it can be completely removed with DROP.

References

[1] MySQL Documentation, MySQL Reference Manual, [online]. Available: https://dev.mysql.com/doc/. Accessed: September 2024.