Heaven's Light is Our Guide

Rajshahi University of Engineering & Technology

Department of Electrical & Computer Engineering

Course Code: **ECE 2216**

Course Title: **Database Systems Sessional**

Experiment No.: **01**

Date of Submission: 23.09.2024

Submitted to

Oishi Jyoti

Assistant Professor

Dept. of ECE, RUET

Submitted by

Name: Arifur Rahman

Roll: 2110045

Session: 2021 - 22

Experiment No. 01

Experiment Name: Student Database Management and Conditional Logging in MySQL.

Theory:

In modern database management systems, efficient handling of structured data is essential for various real-world applications. This experiment focuses on the basic operations of database management, including the creation, modification, deletion, and conditional updating of records within a relational database using MySQL in a XAMPP environment. The experiment leverages SQL (Structured Query Language) commands to manipulate student data in a structured table format.

Problem Statement:

1. Create a database containing following information for 10 students: (roll, name, semester, major/favorite subject, obtained marks)
    a. Create database and table
    b. Change a specific column name
    c. Delete the student's information whose marks are below 30.
    d. Add a new column named as log. set the value applicable and not applicable for the condition. (< 30)

Software Used:

1. Xampp Control Panel
2. MySQL

Task 1:

Code:

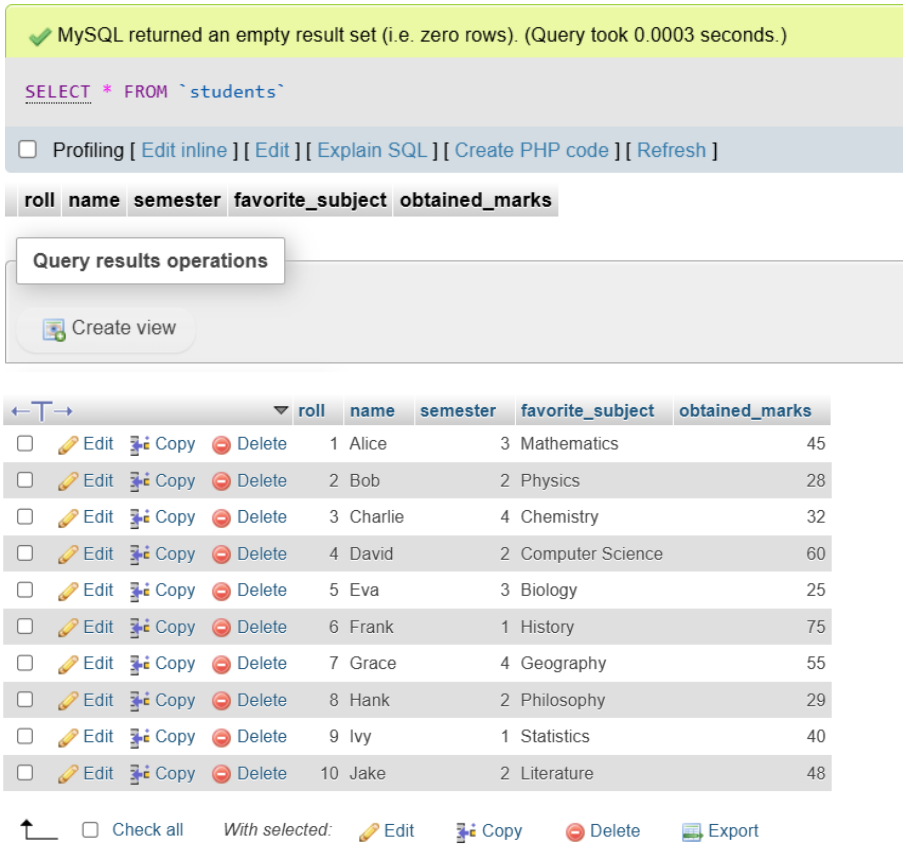
(Creating database and table)

```
1 CREATE DATABASE student_db;
```

```sql
USE student_db;

CREATE TABLE students (
    roll INT PRIMARY KEY,
    name VARCHAR(100),
    semester INT,
    favorite_subject VARCHAR(50),
    obtained_marks INT
);

```

```sql
INSERT INTO students (roll, name, semester, major, obtained_marks)
VALUES
(1, 'Alice', 3, 'Mathematics', 45),
(2, 'Bob', 2, 'Physics', 28),
(3, 'Charlie', 4, 'Chemistry', 32),
(4, 'David', 2, 'Computer Science', 60),
(5, 'Eva', 3, 'Biology', 25),
(6, 'Frank', 1, 'History', 75),
(7, 'Grace', 4, 'Geography', 55),
(8, 'Hank', 2, 'Philosophy', 29),
(9, 'Ivy', 1, 'Statistics', 40),
(10, 'Jake', 2, 'Literature', 48);

```

Output:



MySQL returned an empty result set (i.e. zero rows). (Query took 0.0003 seconds.)

```
SELECT * FROM `students`
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Query results operations

Create view

	roll	name	semester	favorite_subject	obtained_marks
Edit Copy Delete	1	Alice	3	Mathematics	45
Edit Copy Delete	2	Bob	2	Physics	28
Edit Copy Delete	3	Charlie	4	Chemistry	32
Edit Copy Delete	4	David	2	Computer Science	60
Edit Copy Delete	5	Eva	3	Biology	25
Edit Copy Delete	6	Frank	1	History	75
Edit Copy Delete	7	Grace	4	Geography	55
Edit Copy Delete	8	Hank	2	Philosophy	29
Edit Copy Delete	9	Ivy	1	Statistics	40
Edit Copy Delete	10	Jake	2	Literature	48

Check all With selected: Edit Copy Delete Export

Task 2:

Code:

(Changing a specific column name)

Run SQL query/queries on database student_db:

```
1 ALTER TABLE students CHANGE favorite_subject major VARCHAR(50);
2
```

Output:

Extra options

	roll	name	semester	major	obtained_marks
Edit Copy Delete	1	Alice	3	Mathematics	45
Edit Copy Delete	2	Bob	2	Physics	28

Task 3:

Code:

(Deleting Students Information with Marks Below 30)

Run SQL query/queries on table student_db.students:

```
1 DELETE FROM students WHERE obtained_marks < 30;
2
```

Output:

3 rows deleted. (Query took 0.0013 seconds.)

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

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

Task 4:

Code:

(Add a New Column and Set Values Based on Condition)

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

```

```sql
UPDATE students
SET log =
    CASE
        WHEN obtained_marks < 30 THEN 'Applicable'
        ELSE 'Not Applicable'
    END;

```

Output:

	roll	name	semester	major	obtained_marks	log
Edit Copy Delete	1	Alice	3	Mathematics	45	Not Applicable
Edit Copy Delete	3	Charlie	4	Chemistry	32	Not Applicable
Edit Copy Delete	4	David	2	Computer Science	60	Not Applicable
Edit Copy Delete	6	Frank	1	History	75	Not Applicable
Edit Copy Delete	7	Grace	4	Geography	55	Not Applicable
Edit Copy Delete	9	Ivy	1	Statistics	40	Not Applicable
Edit Copy Delete	10	Jake	2	Literature	48	Not Applicable

Discussion:

This experiment focused on key database operations using MySQL in XAMPP. We created a "**student_db**" and a "students" table, then renamed a column ("**favorite_subject**" to "**major**"), demonstrating how to manage schema changes. Conditional deletion was applied to remove students with marks below 30, ensuring data relevance. A new "log" column was added and updated based on the semester using conditional logic. Overall, the experiment highlighted essential database tasks, including creation, modification, and conditional data management, enhancing flexibility and accuracy.

References:

1. R. Elmasri and S. B. Navathe, *Fundamentals of Database Systems*, 7th ed. Boston, MA, USA: Pearson, 2016.
2. C. J. Date, *An Introduction to Database Systems*, 8th ed. Boston, MA, USA: Addison-Wesley, 2003.
3. A. Silberschatz, H. Korth, and S. Sudarshan, *Database System Concepts*, 6th ed. New York, NY, USA: McGraw-Hill, 2010.
4. Apache Friends, "XAMPP for Windows," [Online]. Available: https://www.apachefriends.org/index.html . [Accessed: Sep. 23, 2024].