Green University of Bangladesh
Department of Computer Science and Engineering (CSE)

Faculty of Sciences and Engineering
Semester: (Fall, Year:2024), B.Sc. in CSE (Day)

Lab Report NO: 01
Course Title: Database System Lab
Course Code: CSE 210 Section:231(D1)

Lab Experiment Name: Implementation of Integrity Constraints in MySQL

Student Details

Name		ID
1.	Promod Chandra Das	231002005

Lab Date : 23-09-2024
Submission Date : 29-09-2024
Course Teacher's Name : Fatema-Tuj- Johora

Lab Report Status

Marks: …… **Signature:.....**
Comments:..... **Date:.....**

❖ TITLE OF THE LAB REPORT EXPERIMENT

Implementation of Integrity Constraints in MySQL

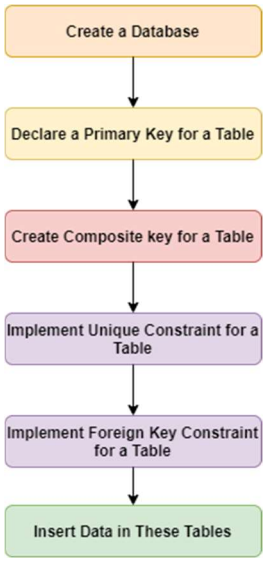
❖ OBJECTIVES

To Declare Primary Key

- To Create Composite Key
- To Implement Unique Constraint
- To Implement Foreign Key Constraint

❖ PROBLEM ANALYSIS

In the previous lab, we have already created databases, and tables and used them. In this lab, we have to declare the primary key, create the composite key, and implement unique and foreign key constraints. For these purposes, we have to create a database first. You can also use a database that has already been created in the previous lab. Then, we have to create a table with a primary key. In the next, we have to create composite keys and implement unique and foreign key constraints for a table. Finally, we have to insert tuples in the tables. Workflow of this



lab is as in the figure 1.

❖ IMPLEMENTATION

- Database Creation

To crate a database, we have to write command like " CREATE DATABASE [Database_Name]".

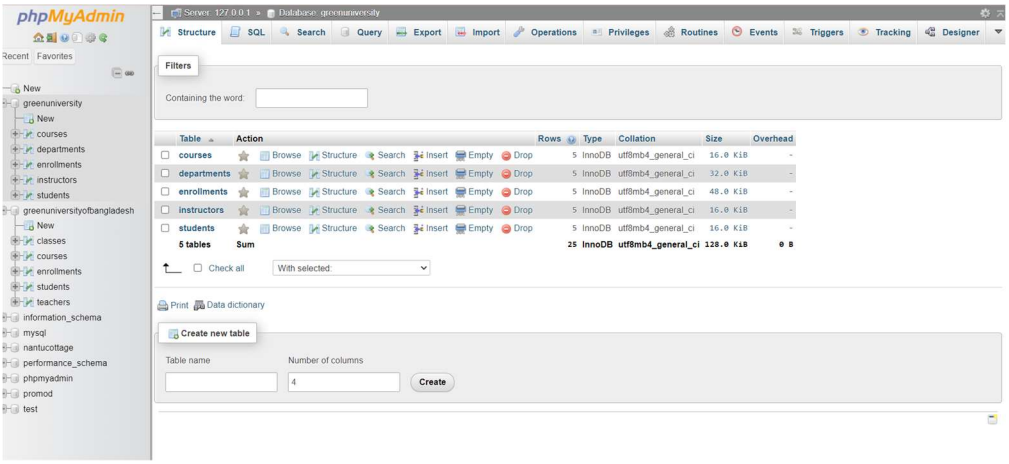


Figure 2: Session in Localhost

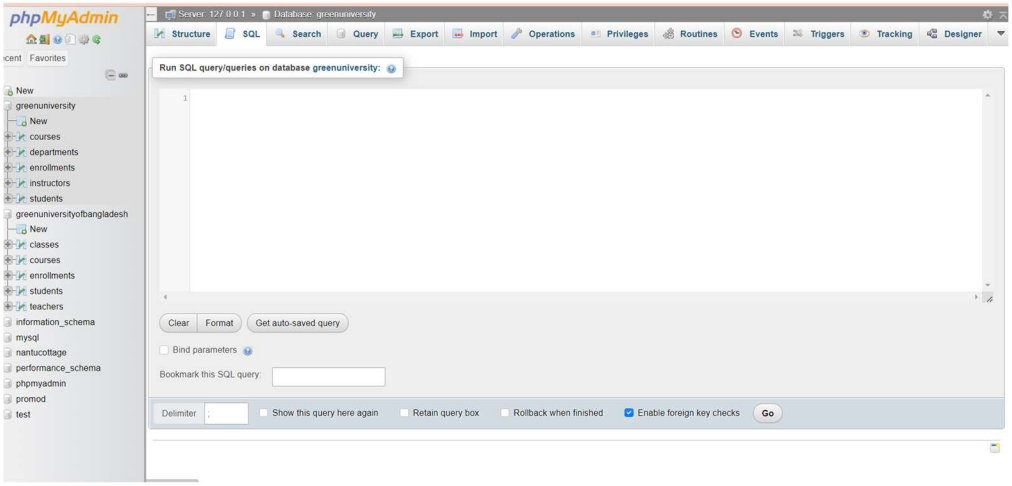


Figure 3: Space for Editing Commands

- Declaration of Primary Key

Now, to create a table named "**Players**" in database **lab3** with attributes like **player_no (int), player_name (varchar), league_no (char)** where **player_no** would be the **Primary key**,

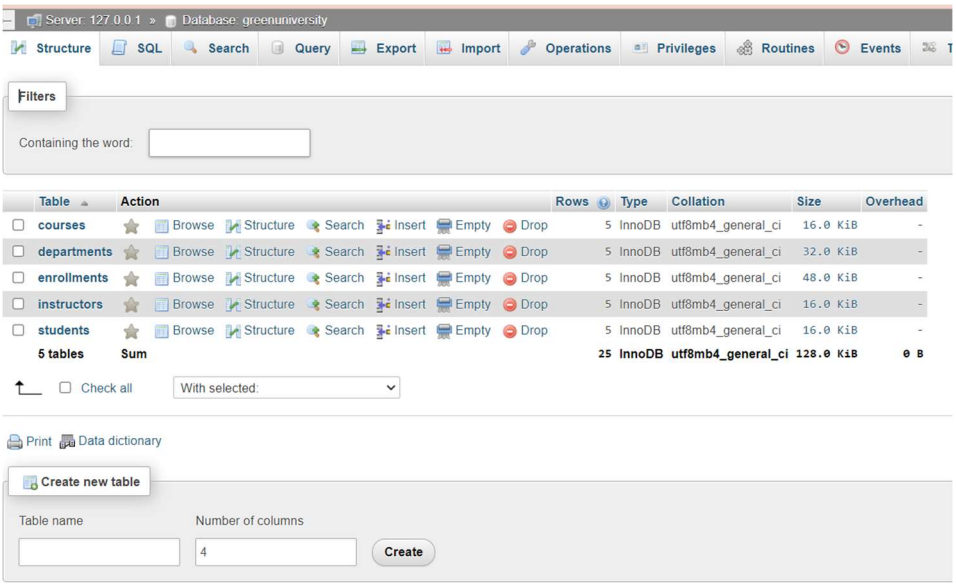


Figure 4: Description of Table

- **Submit as a report**

Lab Report(1=Create a database with including 5 tables, Inserted 5 data, Maintain PK and FK)

Answer to the q no:

Database Structure

Tables and Attributes

1. **Students**
   - student_id (PK) - INT
   - first_name - VARCHAR(50)
   - last_name - VARCHAR(50)
   - email - VARCHAR(100)
2. **Courses**
   - course_id (PK) - INT
   - course_name - VARCHAR(100)
   - credits - INT
3. **Instructors**
   - instructor_id (PK) - INT
   - first_name - VARCHAR(50)
   - last_name - VARCHAR(50)
   - email - VARCHAR(100)
4. **Enrollments**

- enrollment_id (PK) - INT
- student_id (FK) - INT
- course_id (FK) - INT
- grade - VARCHAR(2)

5. **Departments**
   - department_id (PK) - INT
   - department_name - VARCHAR(100)
   - head_instructor_id (FK) - INT

Relationships

- Enrollments links Students and Courses through foreign keys.
- Departments connects to Instructors via the head instructor's ID.

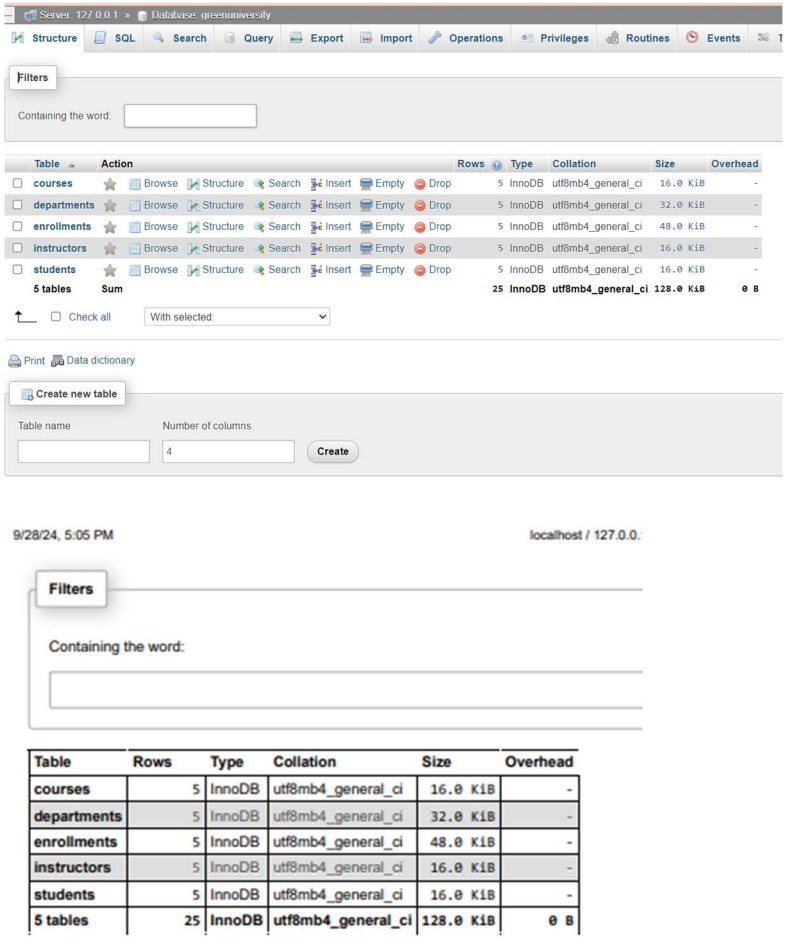
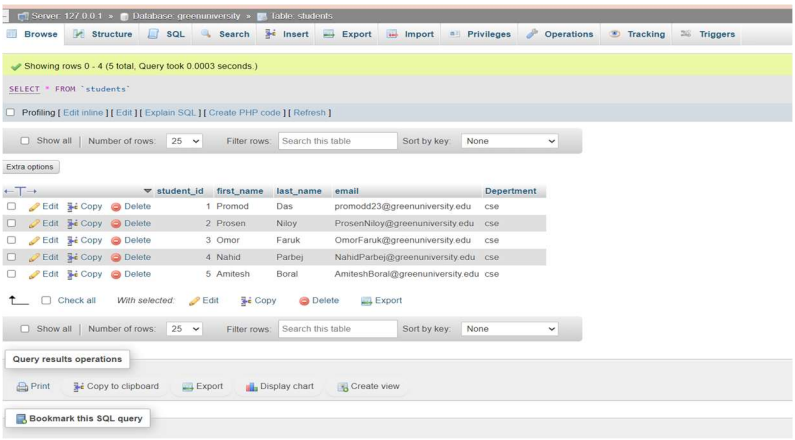


Table	Rows	Type	Collation	Size	Overhead
courses	5	InnoDB	utf8mb4_general_ci	16.0 KiB	-
departments	5	InnoDB	utf8mb4_general_ci	32.0 KiB	-
enrollments	5	InnoDB	utf8mb4_general_ci	48.0 KiB	-
instructors	5	InnoDB	utf8mb4_general_ci	16.0 KiB	-
students	5	InnoDB	utf8mb4_general_ci	16.0 KiB	-
5 tables	25	InnoDB	utf8mb4_general_ci	128.0 KiB	0 B

Figure 05 : Description of Table (01)

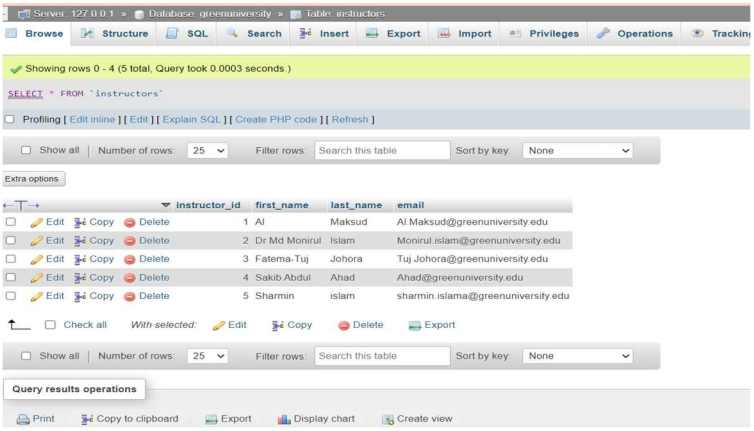


Showing rows 0 - 4 (5 total, Query took 0.0004 seconds.)

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

student_id	first_name	last_name	email	Depertment
1	Promod	Das	promodd23@greenuniversity.edu	cse
2	Prosen	Niloy	ProsenNiloy@greenuniversity.edu	cse
3	Omor	Faruk	OmorFaruk@greenuniversity.edu	cse
4	Nahid	Parbej	NahidParbej@greenuniversity.edu	cse
5	Amitesh	Boral	AmiteshBoral@greenuniversity.edu	cse

Figure 06 : Description Student of Table (02)



Showing rows 0 - 4 (5 total, Query took 0.0003 seconds.)

```
SELECT * FROM `instructors`
```

instructor_id	first_name	last_name	email
1	Al	Maksud	Al.Maksud@greenuniversity.edu
2	Dr Md Monirul	Islam	Monirul.islam@greenuniversity.edu
3	Fatema-Tuj	Johora	Tuj.Johora@greenuniversity.edu
4	Sakib Abdul	Ahad	Ahad@greenuniversity.edu
5	Sharmin	islam	sharmin.islama@greenuniversity.edu

Figure 07 : Description instructors of Table (03)

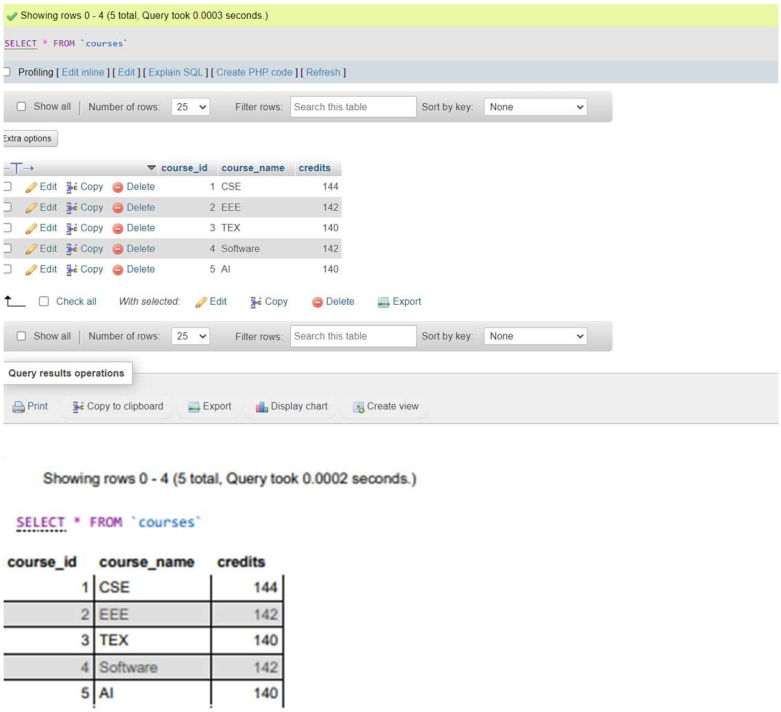


Figure 08: Description Courses of Table (04)

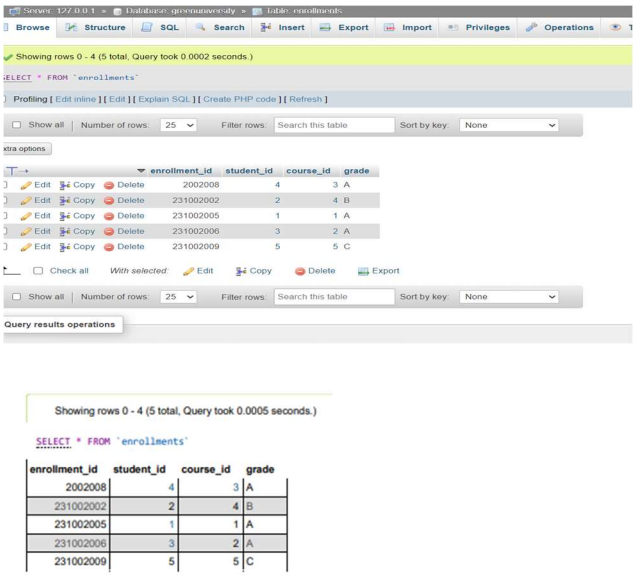
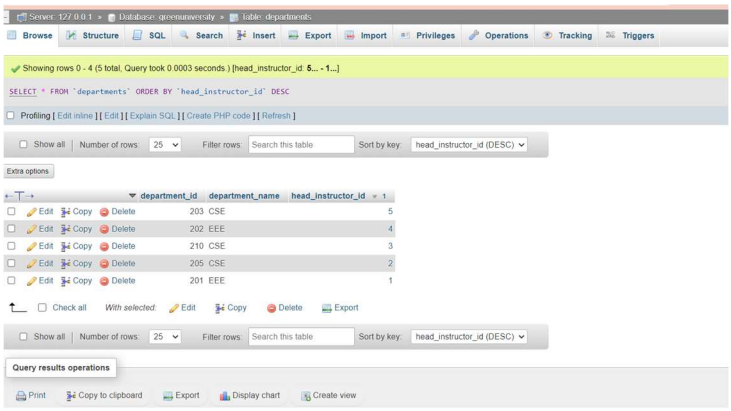


Figure 09: Description enrollments of Table (05)

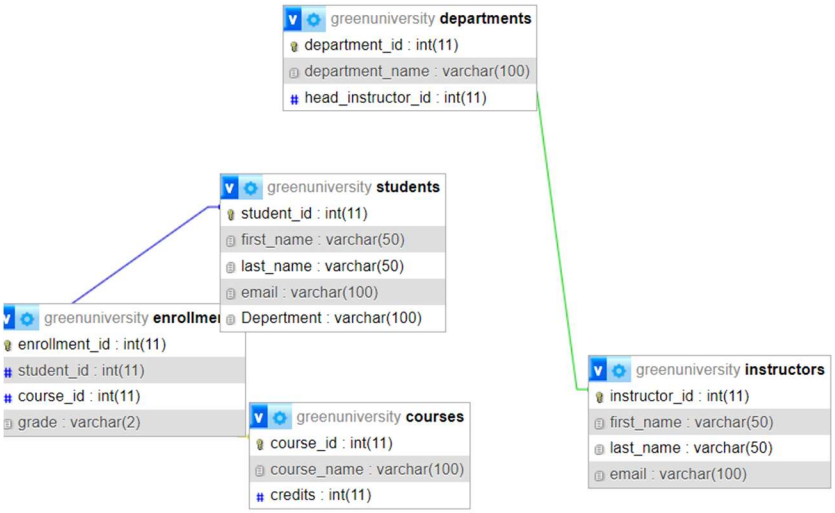


Showing rows 0 - 4 (5 total, Query took 0.0004 seconds.) [head_instructor_id: 5... - 1...]

```
SELECT * FROM `departments` ORDER BY `head_instructor_id` DESC
```

department_id	department_name	head_instructor_id	1
203	CSE	5	
202	EEE	4	
210	CSE	3	
205	CSE	2	
201	EEE	1	

Figure 10: Description Depertment of Table (05)



❖ ANALYSIS AND DISCUSSION

Integrity constraints in MySQL ensure data accuracy and consistency within relational databases. Key types include primary keys (unique identifiers), foreign keys (maintaining relationships), unique constraints (preventing duplicates), not null constraints (ensuring data presence), and check constraints (enforcing specific conditions). Implementing these constraints during table creation helps maintain data integrity, reduces errors, and supports reliable relationships between tables. Effective use of integrity constraints is essential for robust database design and performance.