Lab #2: Implementation of SQL Data Definition Language (DDL) Operations

1. **Objectives**

• To understand the purpose and usage of Data Definition Language (DDL) in SQL.

• To learn how to create and manage databases using SQL commands.

• To implement SQL DDL operations such as create, alter, describe, and drop.

2. **Theory**

Data Definition Language (DDL) is a subset of SQL used to define and manage database structures.

It deals with creating, modifying, and deleting database objects such as databases, tables, and schemas.

Key Concepts

• CREATE – Used to create a database or table.

• ALTER – Used to modify an existing table structure.

• DROP – Used to permanently delete a table or database.

• DESCRIBE – Displays structure of a table (columns and data types).

• Data Types – Define the type of data stored in each attribute (int, varchar, date, etc.).

• Table Schema – Logical structure defining attributes and their types.

DDL does not manipulate data; it defines the structure in which data will be stored.

3**. Problem Description**

Create a simple college course registration database consisting of 3 tables:

1. student
2. course
3. enrollment

4. Logical Design (Conceptual)

student table

- student_id (int)
- name (varchar)
- email (varchar)
- department (varchar)

course table

- course_code (varchar)
- course_name (varchar)
- credit (int)

enrollment table

- enrollment_id (int)
- student_id (int)
- course_code (varchar)
- semester (varchar)

(Primary and foreign keys only conceptual, not implemented. It will be covered in upcoming labs.)

5. SQL DDL Commands

Step 1: Create database

```
create database collegedb;
use collegedb;
```

Step 2: Create tables

```
create table student (
    student_id int,
    name varchar(50),
    email varchar(100),
    department varchar(50)
);

create table course (
    course_code varchar(10),
    course_name varchar(100),
    credit int
);

create table enrollment (
    enrollment_id int,
    student_id int,
    course_code varchar(10),
    semester varchar(10)
```

);

Step 3: Describe tables

describe student;

describe course;

describe enrollment;

Step 4: Alter table operations

-- Add new attribute

alter table student add phone varchar(15);

-- Modify data type

alter table course modify credit tinyint;

-- Rename column

alter table enrollment change semester sem varchar(10);

Step 5: Drop table (optional)

drop table enrollment;

6. Tasks

• Create the database “collegedb”.

• Create 3 tables using given structures.

• Perform alter operations.

• insert some data to the tables.

• Display table structures.

• Identify which attributes could become primary and foreign keys (conceptual only).

7. Observation Table

Students should record:

• Commands executed

• Output of describe commands

• Table structures before & after alteration

8. Conclusion

In this lab, we practiced SQL DDL operations to define and modify database structures.

We created tables, viewed their structures, and performed structural changes using ALTER statements.

This lab provides the foundation for understanding how database schemas are designed and prepared for data insertion.

Future labs will extend this by introducing primary keys, foreign keys, and relational constraints.