SQL Internship – Task 2 Solution
Data Types, Constraints & Table Design

This document contains the complete solution for Task 2 of the SQL Internship. The task focuses on proper table design, constraints, and ALTER operations in SQL. Tools Used: MySQL Workbench (Compatible with PostgreSQL/SQLite)

SQL Script Implementation:

```
-- 1. Create Students Table with Proper Data Types and Constraints

CREATE TABLE students (
    student_id INT PRIMARY KEY AUTO_INCREMENT,
    first_name VARCHAR(50) NOT NULL,
    last_name VARCHAR(50) NOT NULL,
    email VARCHAR(100) UNIQUE NOT NULL,
    date_of_birth DATE NOT NULL,
    phone VARCHAR(15) UNIQUE,
    enrollment_date DATE DEFAULT CURRENT_DATE
);

-- 2. Insert Valid Data
INSERT INTO students (first_name, last_name, email, date_of_birth, phone)
VALUES ('Rahul', 'Sharma', 'rahul@gmail.com', '2002-05-12', '9876543210');

-- 3. Example of Constraint Failure (Duplicate Email)
-- This will fail because email is UNIQUE
INSERT INTO students (first_name, last_name, email, date_of_birth)
VALUES ('Amit', 'Verma', 'rahul@gmail.com', '2001-03-10');

-- 4. Alter Table – Add New Column
ALTER TABLE students
ADD COLUMN course VARCHAR(40);

-- 5. Rename Column
ALTER TABLE students
RENAME COLUMN phone TO mobile_no;

-- 6. Drop Column
ALTER TABLE students
DROP COLUMN course;
```

Why Constraints Were Used: 1. PRIMARY KEY – Uniquely identifies each student record and prevents duplicates. 2. NOT NULL – Ensures important fields like name and email are never empty. 3. UNIQUE – Prevents duplicate emails and phone numbers. 4. DEFAULT – Automatically inserts current date for enrollment. 5. AUTO_INCREMENT – Generates automatic student IDs. Importance of Constraints: Constraints maintain data integrity, prevent invalid data entry, and ensure reliability of the database.

Interview Questions: 1. Difference between CHAR and VARCHAR? CHAR is fixed length while VARCHAR is variable length and saves memory. 2. Why is PRIMARY KEY important? It uniquely identifies each row and improves searching. 3. What is NOT NULL? It prevents storing NULL values in a column. 4. Can a table have multiple UNIQUE constraints? Yes, multiple columns can have UNIQUE constraints. 5. What happens if we drop a column? All data in that column is permanently deleted.