**Student Management System Project Documentation**

**Objective**

The project focuses on providing practical experience in SQL database creation, data manipulation, and analysis using student performance data.

**1. Database Setup**

**1.1 Purpose of Queries**

* **Create Database**: To establish the environment for storing and managing student data.
* **Create Table**: To define the structure of the student data, including primary key and fields for various attributes.

**Queries**

* Create Database:

CREATE DATABASE StudentManagement;

* Create Table:
* CREATE TABLE Students (
* StudentID INT AUTO\_INCREMENT PRIMARY KEY,
* Name VARCHAR(50),
* Gender VARCHAR(1),
* Age INT,
* Grade VARCHAR(10),
* MathScore INT,
* ScienceScore INT,
* EnglishScore INT

);

**Observations**

* The StudentID field ensures uniqueness for each student.
* Fields like Name and Grade allow for character data, while scores are represented as integers.

**2. Data Insertion**

**2.1 Purpose of Queries**

To populate the database with sample student data for analysis and testing.

**Query**

INSERT INTO Students (Name, Gender, Age, Grade, MathScore, ScienceScore, EnglishScore)

VALUES

('Alice', 'F', 16, 'A', 90, 85, 88),

('Bob', 'M', 17, 'B', 70, 75, 65),

('Charlie', 'M', 16, 'A', 85, 90, 80),

('Diana', 'F', 15, 'C', 60, 70, 55),

('Ethan', 'M', 16, 'B', 80, 78, 88),

('Fiona', 'F', 15, 'A', 95, 92, 94),

('George', 'M', 17, 'C', 50, 60, 55),

('Hannah', 'F', 16, 'B', 82, 76, 81),

('Ian', 'M', 15, 'A', 88, 89, 90),

('Jane', 'F', 17, 'B', 76, 85, 79);

**Observations**

* Data includes a mix of genders, grades, and scores for comprehensive analysis.

**3. Tasks to Perform**

**3.1 Display All Students**

**Purpose**: To get an overview of the stored data.

**Query**:

SELECT \* FROM Students;

**Observation**: Provides a complete view of all student records.

**3.2 Calculate Average Scores for Each Subject**

**Purpose**: To analyze subject-wise performance.

**Query**:

SELECT

AVG(MathScore) AS AverageMathScore,

AVG(ScienceScore) AS AverageScienceScore,

AVG(EnglishScore) AS AverageEnglishScore

FROM Students;

**Observation**: Shows the average performance in Math, Science, and English.

**3.3 Find Top Performer(s)**

**Purpose**: To identify the student(s) with the highest total score.

**Query**:

SELECT \*,

(MathScore + ScienceScore + EnglishScore) AS TotalScore

FROM Students

ORDER BY TotalScore DESC

LIMIT 1;

**Observation**: Highlights the top performer based on cumulative scores.

**3.4 Count Students in Each Grade**

**Purpose**: To observe the distribution of students across grades.

**Query**:

SELECT Grade, COUNT(\*) AS StudentCount

FROM Students

GROUP BY Grade;

**Observation**: Reveals the number of students in each grade category.

**3.5 Average Score by Gender**

**Purpose**: To compare performance between male and female students.

**Query**:

SELECT Gender,

AVG(MathScore) AS AverageMathScore,

AVG(ScienceScore) AS AverageScienceScore,

AVG(EnglishScore) AS AverageEnglishScore

FROM Students

GROUP BY Gender;

**Observation**: Provides insights into gender-based performance.

**3.6 Students with Math Score Above 80**

**Purpose**: To identify high achievers in Math.

**Query**:

SELECT \*

FROM Students

WHERE MathScore > 80;

**Observation**: Lists students excelling in Math.

**3.7 Update Grade for a Specific Student**

**Purpose**: To make corrections or changes to a student’s grade.

**Query**:

UPDATE Students

SET Grade = 'NewGrade'

WHERE StudentID = student\_id\_value;

**Observation**: Allows updates to reflect accurate grade information.

**Deliverables**

* **SQL Queries**: Listed above for each task.
* **Insights**:
  + Average scores indicate general performance trends.
  + Top performers and high achievers in Math can be highlighted.
  + Grade and gender distributions provide demographic insights.
* **Tools Used**: MySQL Workbench or equivalent SQL tools.

**Conclusion**

This project provided hands-on experience with SQL operations such as creating tables, inserting data, and querying. It demonstrated the ability to analyze data and make data-driven decisions, essential skills for real-world database management.