**SQL Queries**

**1. Database Creation**

sql

CREATE DATABASE Student Management;

* **Purpose**: Creates a new database named Student Management to store student-related data.

**2. Table Creation**

sql

CREATE TABLE Students (

StudentID INT AUTO\_INCREMENT PRIMARY KEY,

Name VARCHAR(50) NOT NULL,

Gender VARCHAR(1) NOT NULL,

Age INT NOT NULL,

Grade VARCHAR(10) NOT NULL,

MathScore INT NOT NULL,

ScienceScore INT NOT NULL,

EnglishScore INT NOT NULL

);

* **Purpose**: Creates a table named Students with fields to store student details such as StudentID, Name, Gender, Age, Grade, and scores in Math, Science, and English.

**3. Insert Data**

sql

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

('John Doe', 'M', 16, 'A', 85, 90, 88),

('Jane Smith', 'F', 15, 'B', 78, 82, 80),

('Alice Johnson', 'F', 17, 'A', 92, 88, 91),

('Bob Brown', 'M', 16, 'C', 65, 70, 68),

('Charlie Davis', 'M', 15, 'B', 80, 75, 82),

('Diana Evans', 'F', 16, 'A', 95, 89, 93),

('Ethan Harris', 'M', 17, 'B', 77, 81, 79),

('Fiona Clark', 'F', 15, 'C', 60, 65, 62),

('George Lewis', 'M', 16, 'A', 88, 92, 90),

('Hannah Walker', 'F', 17, 'B', 82, 85, 80);

* **Purpose**: Populates the Students table with sample data for 10 students, including their names, genders, ages, grades, and scores in Math, Science, and English.

**4. Task 1: Display All Students**

sql

SELECT \* FROM Students;

* **Purpose**: Retrieves and displays all records from the Students table to provide an overview of the data.

**5. Task 2: Calculate Average Scores for Each Subject**

sql

SELECT

AVG(MathScore) AS AvgMathScore,

AVG(ScienceScore) AS AvgScienceScore,

AVG(EnglishScore) AS AvgEnglishScore

FROM Students;

* **Purpose**: Calculates the average scores for Math, Science, and English across all students to understand subject-wise performance.

**6. Task 3: Find the Student(s) with the Highest Total Score**

sql

SELECT

Name,

(MathScore + ScienceScore + EnglishScore) AS TotalScore

FROM Students

ORDER BY TotalScore DESC

LIMIT 1;

* **Purpose**: Identifies the top-performing student(s) based on the total score across all subjects.

**7. Task 4: Count the Number of Students in Each Grade**

sql

SELECT

Grade,

COUNT(\*) AS NumberOfStudents

FROM Students

GROUP BY Grade;

* **Purpose**: Counts the number of students in each grade to observe grade distribution.

**8. Task 5: Find the Average Score for Male and Female Students**

sql

SELECT

Gender,

AVG(MathScore) AS AvgMathScore,

AVG(ScienceScore) AS AvgScienceScore,

AVG(EnglishScore) AS AvgEnglishScore

FROM Students

GROUP BY Gender;

* **Purpose**: Compares the average scores of male and female students in Math, Science, and English to analyze performance by gender.

**9. Task 6: Identify Students with Math Scores Above 80**

Sql

SELECT

Name,

MathScore

FROM Students

WHERE MathScore > 80;

* **Purpose**: Highlights students who scored above 80 in Math to identify high achievers in the subject.

**10. Task 7: Update the Grade of a Student**

sql

UPDATE Students

SET Grade = 'A+'

WHERE StudentID = 3;

* **Purpose**: Updates the grade of a specific student (e.g., StudentID = 3) to reflect changes or corrections.

**Documentation**

**Purpose of Each Query**

1. **Database and Table Creation**: Establishes the structure for storing student data.
2. **Data Insertion**: Populates the table with sample data for analysis.
3. **Task Queries**: Perform specific analyses to derive insights from the data, such as identifying top performers, calculating averages, and comparing performance by gender.

**Observations and Insights**

1. **Subject-wise Performance**:
   * The average scores for Math, Science, and English provide a baseline for understanding overall performance in each subject.
   * For example, if the average Math score is lower than Science and English, it may indicate a need for additional focus on Math.
2. **Top Performers**:
   * The student with the highest total score can be recognized for their achievement.
   * For example, Diana Evans has the highest total score (95 + 89 + 93 = 277).
3. **Grade Distribution**:
   * The number of students in each grade helps identify trends, such as whether most students are achieving higher grades (e.g., 'A' or 'B') or struggling (e.g., 'C').
4. **Gender-based Performance**:
   * Comparing average scores by gender can reveal any disparities in performance. For example, if female students have higher average scores in Science, it may indicate a trend worth exploring.
5. **High Achievers in Math**:
   * Identifying students with Math scores above 80 helps recognize those who excel in the subject and may benefit from advanced opportunities.
6. **Data Corrections**:
   * Updating a student's grade ensures the data remains accurate and reflects any changes in performance.

**Insights from Sample Data**

* **Average Scores**:
  + Math: 80.2
  + Science: 81.7
  + English: 81.3
  + Observation: Science has the highest average score, while Math has the lowest.
* **Top Performer**:
  + Diana Evans with a total score of 277.
* **Grade Distribution**:
  + Grade A: 4 students
  + Grade B: 4 students
  + Grade C: 2 students
  + Observation: Most students are in Grades A and B, indicating good overall performance.
* **Gender-based Performance**:
  + Female students have slightly higher average scores in Math and English, while male students perform better in Science.
* **High Achievers in Math**:
  + Diana Evans (95), Alice Johnson (92), George Lewis (88), and John Doe (85).