Student Management System - SQL Project

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Project Overview

This Student Management System project uses SQL to manage student details, courses, and results. It highlights how to design normalized tables, use foreign keys, and execute practical SQL queries to fetch and manage data.

ER Diagram (Text Representation)

```
[Students] --------< [Courses] >-------- [Results]
    |                    |                    |
student_id          course_id (FK)       student_id (FK)
name                student_name         course_id (FK)
age                 duration             marks
gender                                   grade
```

Table Creation SQL

```sql
CREATE TABLE Students (
    student_id INT PRIMARY KEY,
    name VARCHAR(100),
    age INT,
    gender VARCHAR(10)
);

CREATE TABLE Courses (
    course_id INT PRIMARY KEY,
    course_name VARCHAR(100),
    duration VARCHAR(50)
);

CREATE TABLE Results (
    result_id INT PRIMARY KEY,
    student_id INT,
    course_id INT,
```

```
    marks INT,
    grade VARCHAR(2),
    FOREIGN KEY (student_id) REFERENCES Students(student_id),
    FOREIGN KEY (course_id) REFERENCES Courses(course_id)
);
```

Sample SQL Queries

```sql
-- List of all students with their courses and marks
SELECT s.name, c.course_name, r.marks
FROM Results r
JOIN Students s ON r.student_id = s.student_id
JOIN Courses c ON r.course_id = c.course_id;

-- Students who scored above 75 marks
SELECT s.name, r.marks
FROM Results r
JOIN Students s ON r.student_id = s.student_id
WHERE r.marks > 75;

-- Average marks in each course
SELECT c.course_name, AVG(r.marks) AS avg_marks
FROM Results r
JOIN Courses c ON r.course_id = c.course_id
GROUP BY c.course_name;
```

Conclusion

This project shows how a simple student management system can be built using SQL with proper relationships, normalization, and useful queries. It can be used in schools, colleges or institutions to track academic progress efficiently.