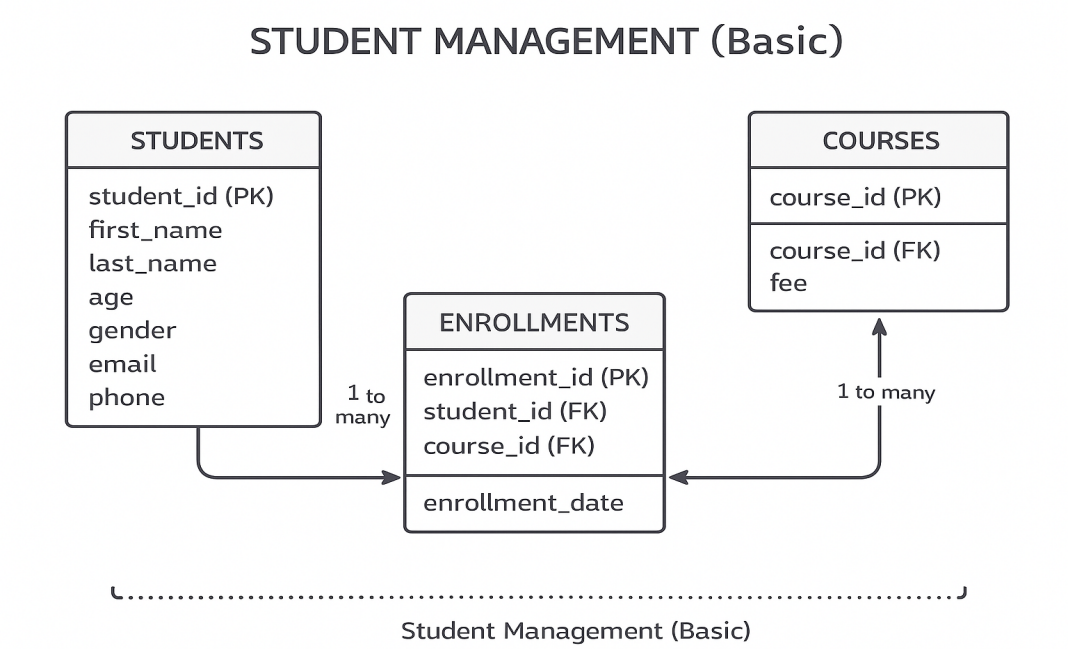
Student Management System – MySQL Project



1. Project Overview
The Student Management System (SMS) is a basic SQL-based project designed to store and manage student details, course information, and student enrollments. The system uses relational database concepts, primary keys, and foreign keys to ensure data integrity.

2. Objectives
• Store student information
• Store course details
• Manage enrollments between students and courses
• Maintain relationships using primary & foreign keys
• Retrieve student-course reports using SQL queries

3. System Requirements
Database: MySQL
Version: MySQL 5.7+ / 8+
Tools: MySQL Workbench / phpMyAdmin / CLI

4. Database Design
The system contains three core entities:
1■■ students – stores student personal information
2■■ courses – stores course details
3■■ enrollments – bridge table linking students ↔ courses

5. ER Diagram Description
One student can enroll in multiple courses.
One course can be taken by multiple students.
Relationship: Many-to-Many using enrollments table.

6. Table Structures (DDL)

students Table

```
CREATE TABLE students (
  student_id INT AUTO_INCREMENT PRIMARY KEY,
  first_name VARCHAR(50),
  last_name VARCHAR(50),
  age INT,
  gender VARCHAR(10),
  email VARCHAR(100),
  phone VARCHAR(15)
);
```

courses Table

```
CREATE TABLE courses (
  course_id INT AUTO_INCREMENT PRIMARY KEY,
  course_name VARCHAR(100),
  fee DECIMAL(10,2)
);
```

enrollments Table

```
CREATE TABLE enrollments (
  enrollment_id INT AUTO_INCREMENT PRIMARY KEY,
  student_id INT,
  course_id INT,
  enrollment_date DATE,
  FOREIGN KEY (student_id) REFERENCES students(student_id),
  FOREIGN KEY (course_id) REFERENCES courses(course_id)
);
```

7. Sample Data (DML)

```
INSERT INTO students ...
INSERT INTO courses ...
INSERT INTO enrollments ...
```

8. CRUD Operations

SELECT, INSERT, UPDATE, DELETE queries included.

9. Reports

- Count students in each course
- Students enrolled in a specific course

10. Conclusion

This SQL project demonstrates core database functionalities using MySQL including CRUD, JOINs, foreign keys, and reporting.