School Management System

**Client Need :**

The school requires a simple database system to manage students, teachers, classes, subjects, and grades.  
The system should allow storing, updating, and retrieving data, with support for basic queries and user access control.

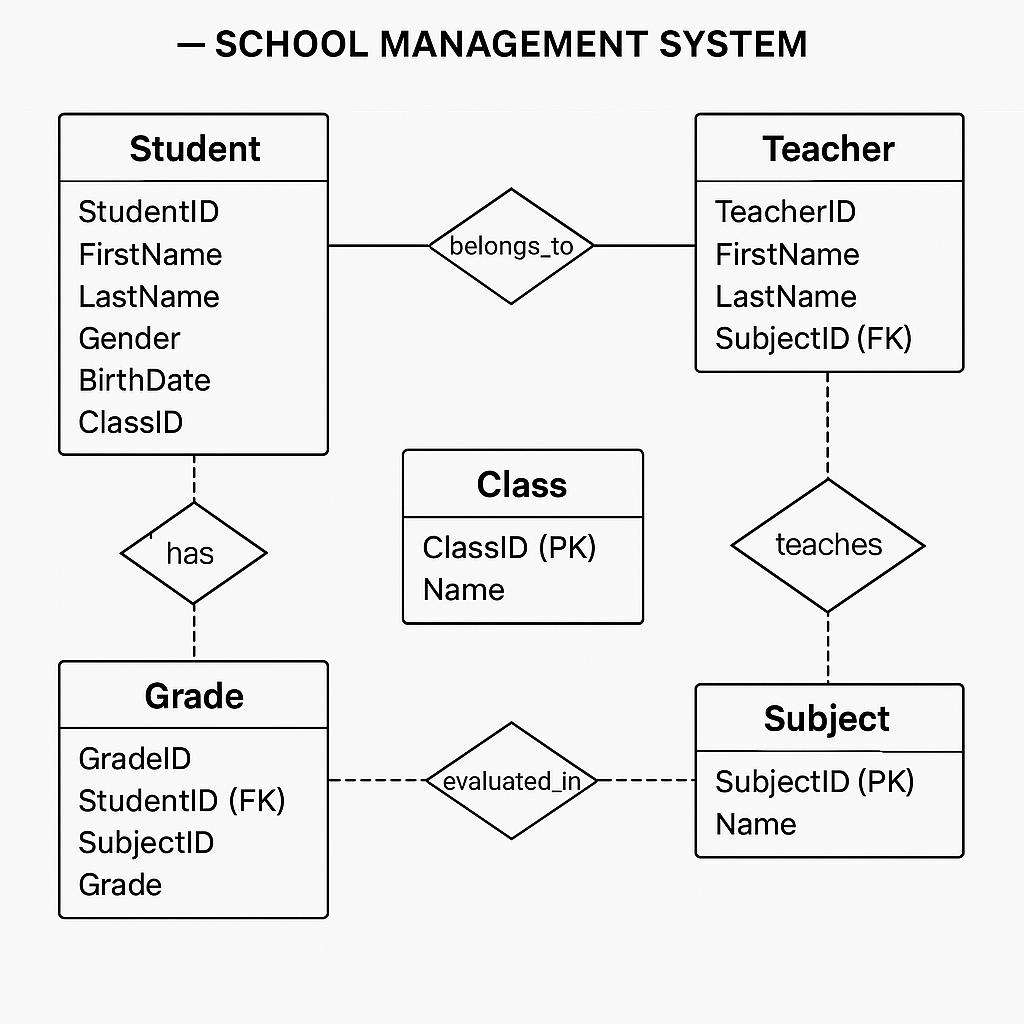
**1. Users**

| **User Type** |  | **Description** |
| --- | --- | --- |
| **Admin** |  | Manages the system: can add/edit students, teachers, classes, subjects, and grades. |
| **Teacher** |  | Can view students and enter grades for the subjects they teach. |
| Student |  | Can view their own grades only . |

**2. Entities**

| **Entity** |  |  | **Description** |
| --- | --- | --- | --- |
| **Student** |  |  | Stores student information such as name, gender, birthdate, and class assignment. |
| **Teacher** |  |  | Stores teacher details and the subject they teach. |
| **Class** |  |  | Represents a school class, students belong to classes. |
| **Subject** |  |  | Represents a subject taught in the school. |
| **Grade** |  |  | Records the grades assigned to students for each subject. |

**3.ERD**



**4.Mapping**

| Entity | Attributes

| Student -> | StudentID (PK), FirstName, LastName, Gender, BirthDate, ClassID (FK)

| Teacher -> | TeacherID (PK), FirstName, LastName, SubjectID (FK)

| Class -> | ClassID (PK), Name

| Subject -> | SubjectID (PK), Name

| Grade -> | GradeID (PK), StudentID (FK), SubjectID (FK), Grade

Primary Keys (PK):

- Classes(ClassID)

- Students(StudentID)

- Teachers(TeacherID)

- Subjects(SubjectID)

- Grades(GradeID)

Foreign Keys (FK):

- Students.ClassID -> Classes.ClassID

- Teachers.SubjectID -> Subjects.SubjectID

- Grades.StudentID -> Students.StudentID

- Grades.SubjectID -> Subjects.SubjectID

- Relationships

1. Student → Class → \*Each student belongs to one class.\* (1 to Many)

2. Teacher → Subject→ \*Each teacher teaches one subject.\* (1 to Many)

3. Student → Grade → \*Each student receives grades in subjects.\* (Many to Many)

4. Subject → Grade→ \*Each grade is associated with a subject.\* (1 to Many)

**5. Normalization**

1NF\*\*

| \*\*Student\*\* | \*\*Teacher\*\* | \*\*Class\*\* | \*\*Subject\*\* | \*\*Grade\*\* |

| StudentID (PK) | TeacherID (PK) | ClassID (PK) | SubjectID (PK) | GradeID (PK) |

| FirstName | FirstName | Name | Name | StudentID (FK) |

| LastName | LastName | | | SubjectID (FK) |

| Gender | SubjectID (FK) | | | Grade |

2NF\*\*

| \*\*Student\_Class\*\* |

|------------------|

| StudentID (FK) |

| ClassID (FK) |

3NF\*\*

| \*\*Teacher\_Subject\*\* |

|--------------------|

| TeacherID (FK) |

| SubjectID (FK) |