Assignment 1:-Analyze a given business scenario and create an ER diagram that includes entities, relationships, attributes, and cardinality. Ensure that the diagram reflects proper normalization up to the third normal form.

Solution:-

Bussiness Scenario:-

A school wants to design a database to manage its students, teachers, classes, and grades. Each student can enroll in multiple classes, and each class can have multiple students enrolled. Each teacher can teach multiple classes, and each class is taught by a single teacher. Additionally, each student receives multiple grades in each class they are enrolled in.

Entities:

Student:
Attributes: StudentID (Primary Key), Name, DateOfBirth, GradeLevel, etc.

Teacher:
Attributes: TeacherID (Primary Key), Name, Subject, etc.

Class:
Attributes: ClassID (Primary Key), ClassName, TeacherID (Foreign Key), RoomNumber, etc.

Grade:
Attributes: GradeID (Primary Key), StudentID (Foreign Key), ClassID (Foreign Key), GradeValue, DateRecorded, etc.

Relationships:

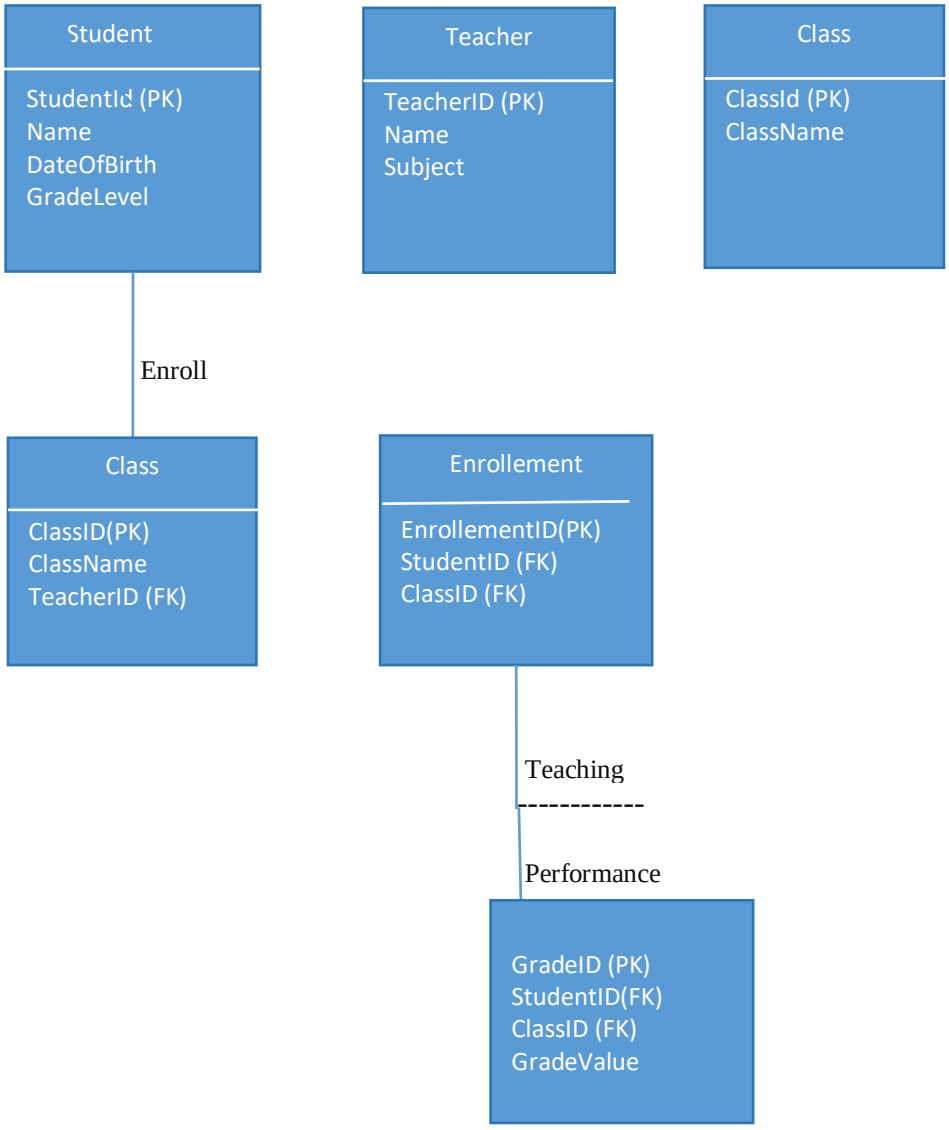
Enrollment:
Connects Student and Class entities.
Many-to-Many relationship.
Attributes: None.
Cardinality: Each student can enroll in many classes, and each class can have many students enrolled.

Teaching:
Connects Teacher and Class entities.
One-to-Many relationship.
Attributes: None.
Cardinality: Each teacher can teach many classes, but each class is taught by only one teacher.

Performance:
Connects Student and Grade entities.
One-to-Many relationship.

Attributes: None.
Cardinality: Each student can have many grades, but each grade is associated with only one student.

ER-Diagram:-



Normalization:

Student: The StudentID is the primary key, and all other attributes depend on it. It's already in 3NF.
Teacher: The TeacherID is the primary key, and all other attributes depend on it. It's already in 3NF.
Class: The ClassID is the primary key, and all other attributes depend on it. It's already in 3NF.

Grade: The GradeID is the primary key, and all other attributes depend on it. It's already in 3NF.