**Real-World Scenario: School Management System**

In this scenario, we'll develop an Entity-Relationship (ER) diagram for a School Management System. The system will manage various entities such as students, teachers, courses, and classrooms, and depict their relationships.

# Entities:

1. Student: Contains information about students enrolled in the school.

Attributes: Student ID (Primary Key), Name, Date of Birth, Gender, Grade Level

1. Teacher: Stores details about teachers employed by the school.

Attributes: Teacher ID (Primary Key), Name, Date of Birth, Gender, Subject

1. Course: Represents the courses offered by the school.

Attributes: Course ID (Primary Key), Course Name, Subject, Grade Level

1. Classroom: Contains details about classrooms available in the school.

Attributes: Room Number (Primary Key), Capacity, Location

# Relationships:

1. Enrollment: Relates students to the courses they are enrolled in.

Student ID (Foreign Key) -> Student

Course ID (Foreign Key) -> Course

1. Teaching: Associates teachers with the courses they teach.

Teacher ID (Foreign Key) -> Teacher

Course ID (Foreign Key) -> Course

1. Assignment: Establishes the relationship between teachers and classrooms for teaching assignments.

Teacher ID (Foreign Key) -> Teacher

Room Number (Foreign Key) -> Classroom

**ER Diagram:**

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+------------+ +--------------+ +-----------+

| Student | | Teacher | | Classroom|

+------------+ +--------------+ +-----------+

| Student\_ID | | Teacher\_ID | | Room\_Num |

| Name | | Name | | Capacity |

| DOB | | DOB | | Location |

| Gender | | Gender | +-----------+

| Grade\_lvl | | Subject |

+------------+ +--------------+

| |

| |

| |

+-------------------+ +-----------------+

| Enrollment | | Teaching |

+-------------------+ +-----------------+

| Student\_ID (FK) | | Teacher\_ID (FK) |

| Course\_ID (FK) | | Course\_ID (FK) |

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Assignment

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| Teacher\_ID (FK) | Room\_Num (FK) |

| Course\_ID (FK) | |

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This ER diagram illustrates the relationships between students, teachers, courses, and classrooms in a School Management System. It depicts how students are enrolled in courses, teachers teach courses, and assignments are made for teachers to classrooms.