***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.*

*analyze a business scenario and create an ER diagram.*

*Business Scenario:*

*A university wants to manage its students, courses, and registrations. The requirements are:*

*Students have a unique ID, name, email, and phone number.*

*Courses have a unique ID, name, description, and credits.*

*Students can register for multiple courses.*

*Courses can have multiple students registered.*

*Each registration has a unique ID, registration date, and grade.*

*ER Diagram:*

*MarkDown*

*+----------------------------+ 1:N +-----------------------------+*

*| Student |---------------| Registration |*

*+----------------------------+ +-----------------------------+*

*| - Student ID (PK) | | - Registration ID (PK) |*

*| - Name | | - Student ID (FK) |*

*| - Email | | - Course ID (FK) |*

*| - Phone Number | | - Registration Date |*

*+---------------------------+ | - Grade |*

*+-----------------------------+*

*+-----------------------------+*

*| Course |*

*+-----------------------------+*

*| - Course ID (PK) |*

*| - Name |*

*| - Description |*

*| - Credits |*

*+-----------------------------+*

***Entities:***

*Student*

*Course*

*Registration*

***Attributes:***

***Student:***

*Student ID (Primary Key)*

*Name*

*Email*

*Phone Number*

***Course:***

*Course ID (Primary Key)*

*Name*

*Description*

*Credits*

***Registration:***

*Registration ID (Primary Key)*

*Student ID (Foreign Key)*

*Course ID (Foreign Key)*

*Registration Date*

*Grade*

***Relationships:***

*A student can register for multiple courses (One-to-Many).*

*A course can have multiple students registered (One-to-Many).*

*A registration is associated with one student and one course (Many-to-One).*

***Cardinality****:*

*Student-Registration: 1:N*

*Course-Registration: 1:N*

***Normalization:***

1. *The ER diagram is normalized up to the third normal form (3NF) since:*
2. *First Normal Form (1NF): Each table has a primary key and no repeating groups.*
3. *Second Normal Form (2NF): Each non-key attribute depends on the entire primary key.*
4. *Third Normal Form (3NF): If a table is in 2NF, and a non-key attribute depends on another non-key attribute, then it should be moved to a separate table.*