PEER LEARNING DOCUMENT: DATA MODELING

MY PEERS:

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MY SOLUTION:

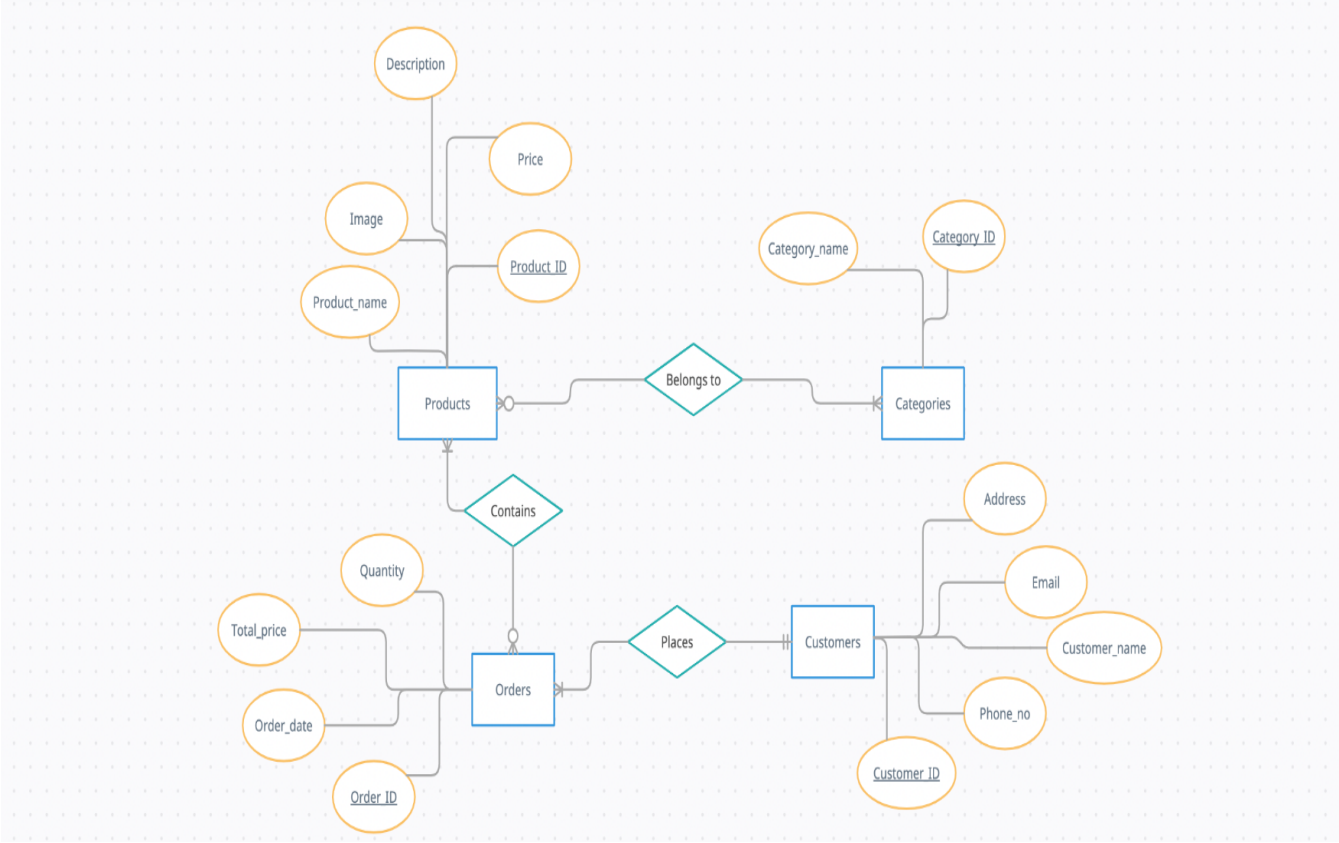
Question 1:Design a data model for a simple e-commerce system (duration: 1.5-2 hours).

Instructions:

1. Identify the entities in an e-commerce system, including products, categories, customers, and orders.
2. Determine the attributes for each entity, such as product name, price, customer name, order date, etc.
3. Identify the relationships between entities, such as a product can belong to multiple categories and a customer can place multiple orders.
4. Determine the primary keys for each entity, such as product ID for products, customer ID for customers, etc.
5. Create an ER diagram to visually represent the data model.
6. Write a brief description of the data model, including its purpose, entities, relationships, and any assumptions or constraints.

SOLUTION:

ER DIAGRAM:



DESCRIPTION:

This data model represents a simple e-commerce system that sells products to customers. The system contains four entities: products, categories, customers, and orders. Products have attributes such as product id, name, description, price, and image. Categories have attributes such as name and category id. Customers have attributes such as

customer id, name, email, phone number, and address. Orders have attributes such as order id, order date, total price, quantity.

PURPOSE:

The aim of the ER model presented above is to establish a data model for an uncomplicated e-commerce system. The model depicts the diverse entities, attributes, and relationships that exist within the system, including products, categories, customers, and orders.

The ER model functions as a well-defined and organized portrayal of the data necessary for constructing and maintaining an e-commerce system. It serves as a foundational plan for designing and building the system, ensuring that all crucial data is recorded and organized suitably.

Entities:

Products: A product that can be sold on the e-commerce system.

Categories: A category that a product can belong to.

Customers: A customer who can place orders on the e-commerce system.

Orders: A record of an order placed by a customer that contains information about the products, quantities, and total price.

Attributes:

Products: ID, name, description, price, image.
Categories: ID, name.
Customers: ID, name, email, phone number, address.
Orders: ID, order date, total price, quantity.

Relationships:

The data model permits a many-to-many relationship between products and categories, indicating that a product can belong to multiple categories and vice versa. Additionally, the model specifies a one-to-many relationship between customers and orders, with a customer able to place multiple orders but an order being assigned to only one customer.

The model also permits a many-to-many relationship between orders and products, meaning that an order can contain multiple products and a product can be part of multiple orders. The ER diagram is a visual representation of the relationships between the entities, with arrows indicating the direction of the relationships. The 'Contains' junction permits a many-to-many

relationship between orders and products. The 'Belongs to' junction allows for a many-to-many relationship between categories and products. Lastly, the 'Places' junction enables a many-to-many relationship between orders and customers.

Assumptions:

The data model considers the possibility of each product being associated with multiple categories, each customer placing several orders, and each order containing multiple products. The primary keys for each entity are identified by product, category, and customer ID, as well as order ID.

Constraints:

Primary Keys (Entity Integrity)

Products: product ID
Categories: category ID
Customers: customer ID
Orders: order ID

Foreign Keys (Referential Integrity)

Belongs to (Intersection Table between Products and Categories):
Composite Key (Product ID, Category ID)
Contains(Intersection Table between Products and Orders):

Composite Key (Product ID, Order ID)
Places(Relationship between Customers and Orders):
Foreign Key (Customer ID migrates from Customer table to Order table)

Akshay's approach and lav's approach for solving the above data modeling problem was similar to that of mine the assumptions made by them are nearly similar .

But there are differences in considering the entities the entities that i have considered are slightly different than that of others .

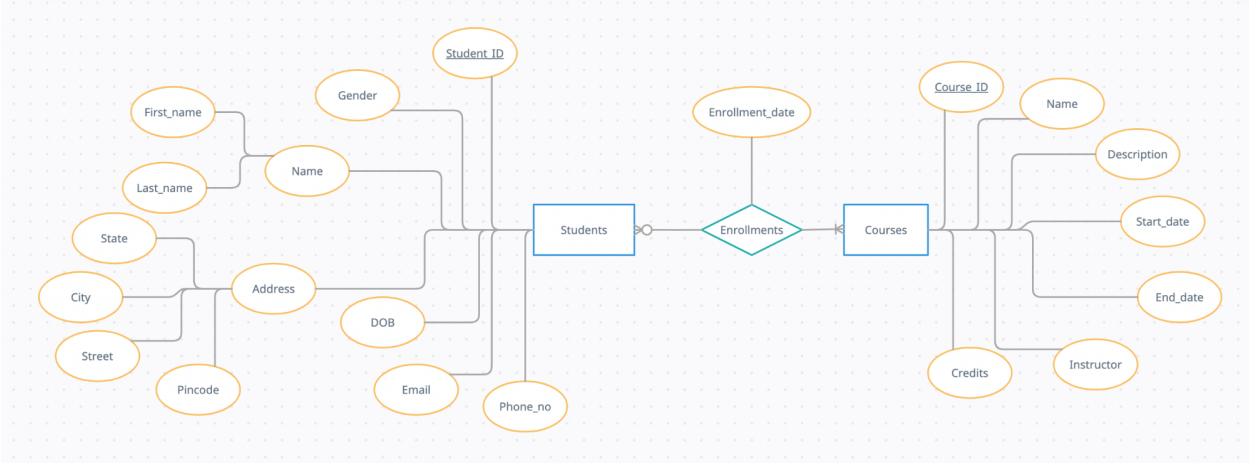
Question 2: Design a data model for a student enrollment system (duration: 1.5-2 hours).

Instructions:

1. Identify the entities in a student enrollment system, including students, courses, and enrollments.

2. Determine the attributes for each entity, such as student name, course name, enrollment date, etc.
3. Identify the relationships between entities, such as a student can enroll in multiple courses and a course can have multiple students.
4. Determine the primary keys for each entity, such as student ID for students, course ID for courses, etc.
5. Create an ER diagram to visually represent the data model.
6. Write a brief description of the data model, including its purpose, entities, relationships, and any assumptions or constraints.

Solution:



Description:

The objective of this data model is to portray a student enrollment system in which students can enroll in multiple courses, and courses can accommodate multiple students. The model encompasses two entities: students and courses, as well as a relationship named enrollments.

Each entity has distinct attributes. The students entity includes student_id, gender, name, address, dob, email, and phone number, while the courses entity comprises course_id, name, course description, start date, end date, instructor, and credits.

The enrollments entity represents the connection between students and courses and encompasses attributes such as enrollment date. The primary keys for this model are student ID and course ID. The model is designed to effectively capture the relevant data needed to manage a student enrollment system.

Purpose:

The purpose of the above data model is to facilitate the management of a student enrollment system by storing and organizing information related to students, courses, and enrollments. The model provides a structured framework for storing data associated with these entities, including their attributes and relationships.

This model can be utilized to keep track of a student's course enrollment history, identify which students are currently registered in a specific course, and track when enrollments were made. The data model is particularly useful for

educational institutions, such as schools and universities, as it streamlines the management of student enrollment and course registration processes.

In addition, the model can be utilized to generate reports, analyze enrollment trends, and make informed decisions concerning course offerings and student performance. Overall, this data model is an effective tool for managing student enrollment systems and maximizing institutional efficiency.

Entities:

Students: This entity represents the students who enroll in courses. Its attributes include student ID, name, email, address, gender, dob and phone number.

Courses: This entity represents the courses that students can enroll in. Its attributes may include course ID, name, description, instructor, start date, end date and credits.

Attributes:

Students: student ID, name, email, address, gender, dob and phone number

Courses: course ID, name, description, instructor, start end, end date and credit

Relationships:
A student can enroll in multiple courses.
A course can have multiple students.
The ER diagram visually represents the relationships between the entities, with arrows indicating the direction of the relationships. The ‘Enrollments’ is a junction that allows for a many-to-many relationship between students and courses.

Assumptions:
This data model assumes that a student can enroll in multiple courses and a course can have multiple students. It also assumes that each enrollment is unique and can be identified by a composite key referencing student id and course id.

Constraints:

Primary Keys (Entity Integrity)

Student: student ID
Course: course ID

Foreign Keys (Referential Integrity)

Enrollments(Intersection Table between Students and Courses):
Composite Key (student ID, course ID)

Akshay's approach and lav's approach for solving the above data modeling problem was similar to that of mine the assumptions made by them are nearly similar.

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