Simple Ecommerce System

Problem Statement:

Design a data model for a simple e-commerce system

Instructions:

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

Description:

The Data model is to represent a simple e-commerce system that allows customers to browse and purchase products. The model includes entities such as products, categories, customers, and orders, along with their attributes and relationships.

Purpose:

This data model provides a comprehensive view of the entities involved in a simple e-commerce system and the relationships between them. It allows for efficient management of products, categories, customers, and orders, making it easier to track sales, manage inventory. The model includes entities such as products, categories, customers, and orders, along with their attributes and relationships between them.

Entities:

Products: This entity represents the products available for purchase in the e-commerce system. The attributes of this entity include product ID, name, description, price, image, and inventory quantity.

Categories: This entity represents the categories that the products can belong to. Each product can belong to multiple categories, and each category can have multiple products. The attributes of this entity include category ID and name.

Customers: This entity represents the customers of the e-commerce system. The attributes of this entity include customer ID, name, email address, phone number, and shipping address.

Orders: This entity represents the orders placed by customers in the e-commerce system. Each order can have multiple products, and each product can appear in multiple orders. The attributes of this entity include order ID, order date, total price, and order status.

Relationships:

- Products can belong to multiple categories, and each category can have multiple products. This is a **many-to-many** relationship, which is represented by a junction table that connects the products and categories entities.

- Each customer can place multiple orders, but each order can only belong to one customer. This is a **one-to-many** relationship, which is represented by a foreign key in the orders entity that references the customer entity.

- Each order can contain multiple products, and each product can appear in multiple orders. This is a **many-to-many** relationship, which is represented by a junction table that connects the orders and products entities.

Constraints

Primary Keys (Entity Integrity):

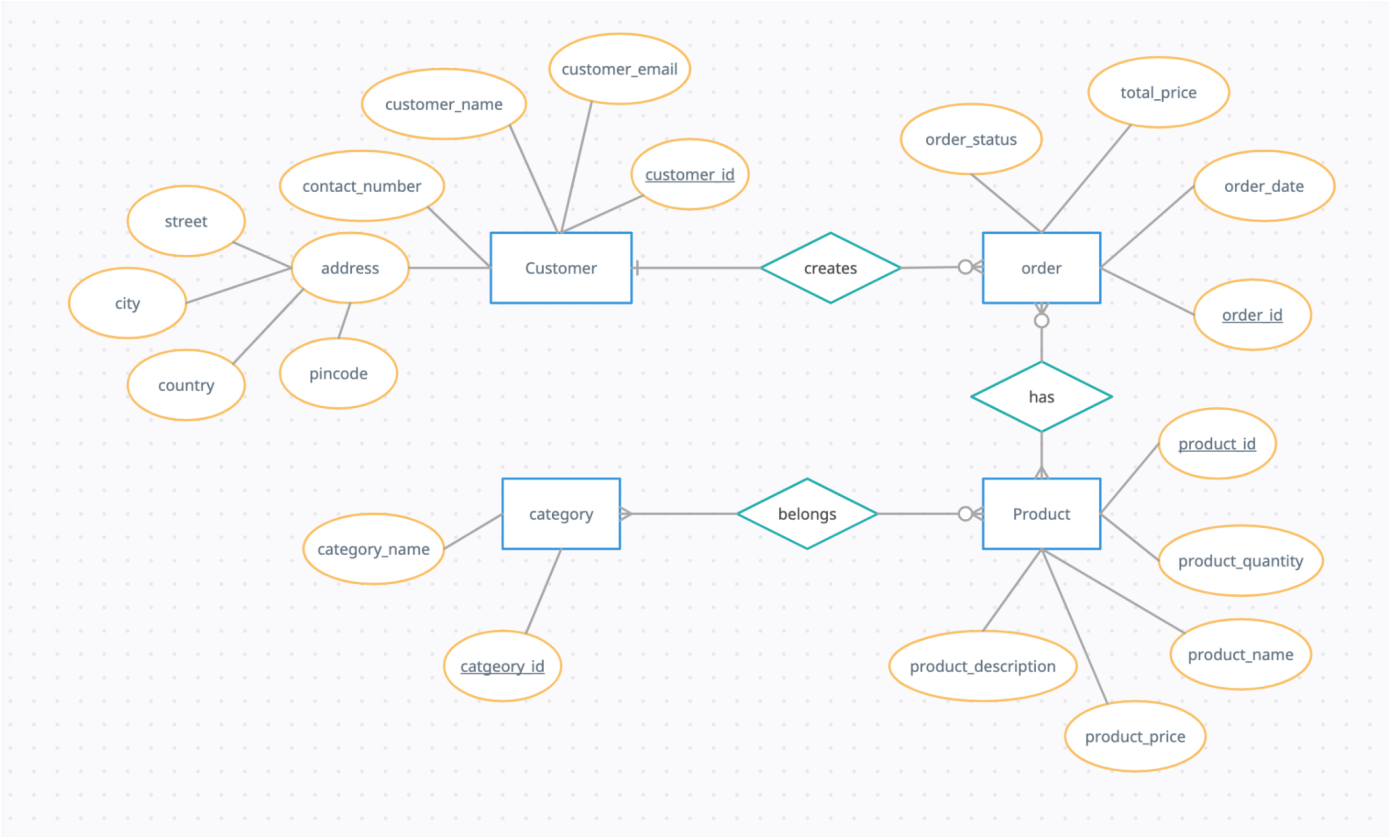
- Product ID is the primary key for the products entity.
- Category ID is the primary key for the categories entity.
- Customer ID is the primary key for the customers entity.
- Order ID is the primary key for the orders entity.
- Order Id and Product Id are composite key for Intersection table between order table and products table.
- Product Id and Category Id is the composite key between category table and product table.

Foreign Keys (Referential Integrity):

- Customer_id id the foreign key in the order table as there is one to many relation between customers and orders.

- Order Id and Product Id are both foreign keys for Intersection table between order table and products table.
- Product Id and Category Id are both foreign keys for Intersection table between category table and product table.

ER Diagram:



Assumptions

- Each Order has at least one product.
- Each order can have only one status at a time, such as "pending", "shipped", or "delivered".
- The prices of the products do not change over time, and the prices.

Student Enrollment System

Description:

This data model is to store information about students, courses, and enrollments in a student enrollment system. The entities in this system include students, courses, and enrollment entities serving as an intersection table between the student and course entities. Each of these entities have its attributes which represent some information about the students, courses and enrollments.

Purpose

The purpose of a student enrollment system data model is to provide a structured representation of the various entities and their relationships involved in the process of enrolling students into an educational institution. This data model helps in organizing, storing, and manipulating information related to students, courses, enrollments. Overall, a well-designed student enrollment system data model can help educational institutions manage their enrollment processes more efficiently, provide better services to students, and make more informed decisions about their educational programs.

Entities

Student: This entity represents the Students of the enrollment system. The attributes of this entity include student ID, name, email address, phone number, address and Date of birth.

Course: This entity represents the courses of the enrollment system. The attributes of this entity include course ID, course name, credits, start date and end date.

Relationships

The relationships between the entities are as follows:

- A student can enroll in multiple courses and each course can have multiple students. So there is many-to-many relationship between them.

Constraints:

Primary keys (Entity Integrity):

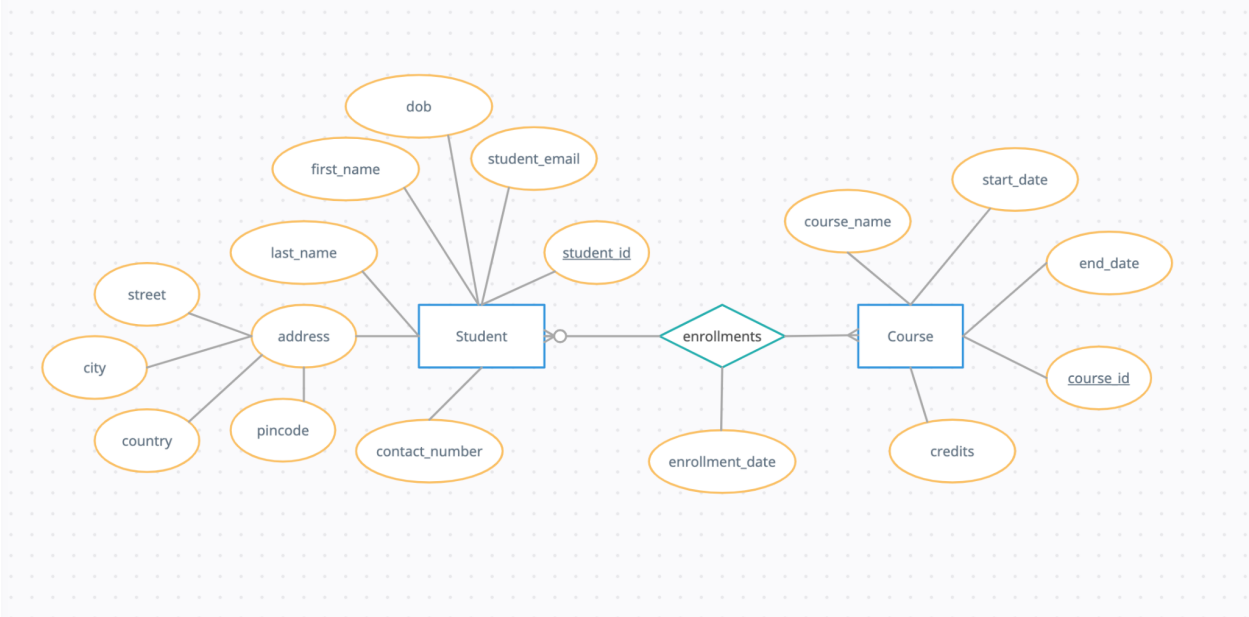
- Student_id is the primary key of student table.

- Course_id is the primary key of course table.
- Student_id and Course_id both act as composite key in intersection table between students and courses table.

Foreign Keys (Referential Integrity):

- Student_id and Course_id both are the foreign keys in the intersection table between students and courses table.

ER Diagram



Assumptions:

- Student can enroll multiple courses and course have many students enrolled
- Additionally, this data model does not include any additional attributes associated with the enrollment entity, such as grades or attendance records. And Each enrollment record has an associated enrollment date.