

E-commerce Database Design

1. Domain

E-commerce System

2. Entities and Relationships

Entities:

- Customer (places orders)
- Product (sold in the store)
- Orders (placed by customers)
- OrderDetails (line items of each order)
- Category (each product belongs to a category)

Relationships:

- One Customer → Many Orders
- One Order → Many OrderDetails
- One Product → Many OrderDetails
- One Category → Many Products

3. SQL CREATE TABLE Statements

```
CREATE TABLE Customer (  
    CustomerID INT PRIMARY KEY,  
    Name VARCHAR(100),  
    Email VARCHAR(100) UNIQUE,  
    Phone VARCHAR(15),  
    Address VARCHAR(255)  
);  
  
CREATE TABLE Category (  
    CategoryID INT PRIMARY KEY,  
    CategoryName VARCHAR(100) NOT NULL  
);  
  
CREATE TABLE Product (  
    ProductID INT PRIMARY KEY,  
    ProductName VARCHAR(100) NOT NULL,  
    Price DECIMAL(10,2) NOT NULL,  
    Stock INT NOT NULL,  
    CategoryID INT,  
    FOREIGN KEY (CategoryID) REFERENCES Category(CategoryID)  
);  
  
CREATE TABLE Orders (  
    OrderID INT PRIMARY KEY,  
    OrderDate DATE NOT NULL,  
    CustomerID INT,  
    FOREIGN KEY (CustomerID) REFERENCES Customer(CustomerID)  
);  
  
CREATE TABLE OrderDetails (  
    OrderDetailID INT PRIMARY KEY,  
    OrderID INT,  
    ProductID INT,  
    Quantity INT NOT NULL,  
    FOREIGN KEY (OrderID) REFERENCES Orders(OrderID),  
    FOREIGN KEY (ProductID) REFERENCES Product(ProductID)  
);
```

4. Keys

Primary Keys:

- Customer(CustomerID)

- Category(CategoryID)
- Product(ProductID)
- Orders(OrderID)
- OrderDetails(OrderDetailID)

Foreign Keys:

- Product.CategoryID → Category.CategoryID
- Orders.CustomerID → Customer.CustomerID
- OrderDetails.OrderID → Orders.OrderID
- OrderDetails.ProductID → Product.ProductID