

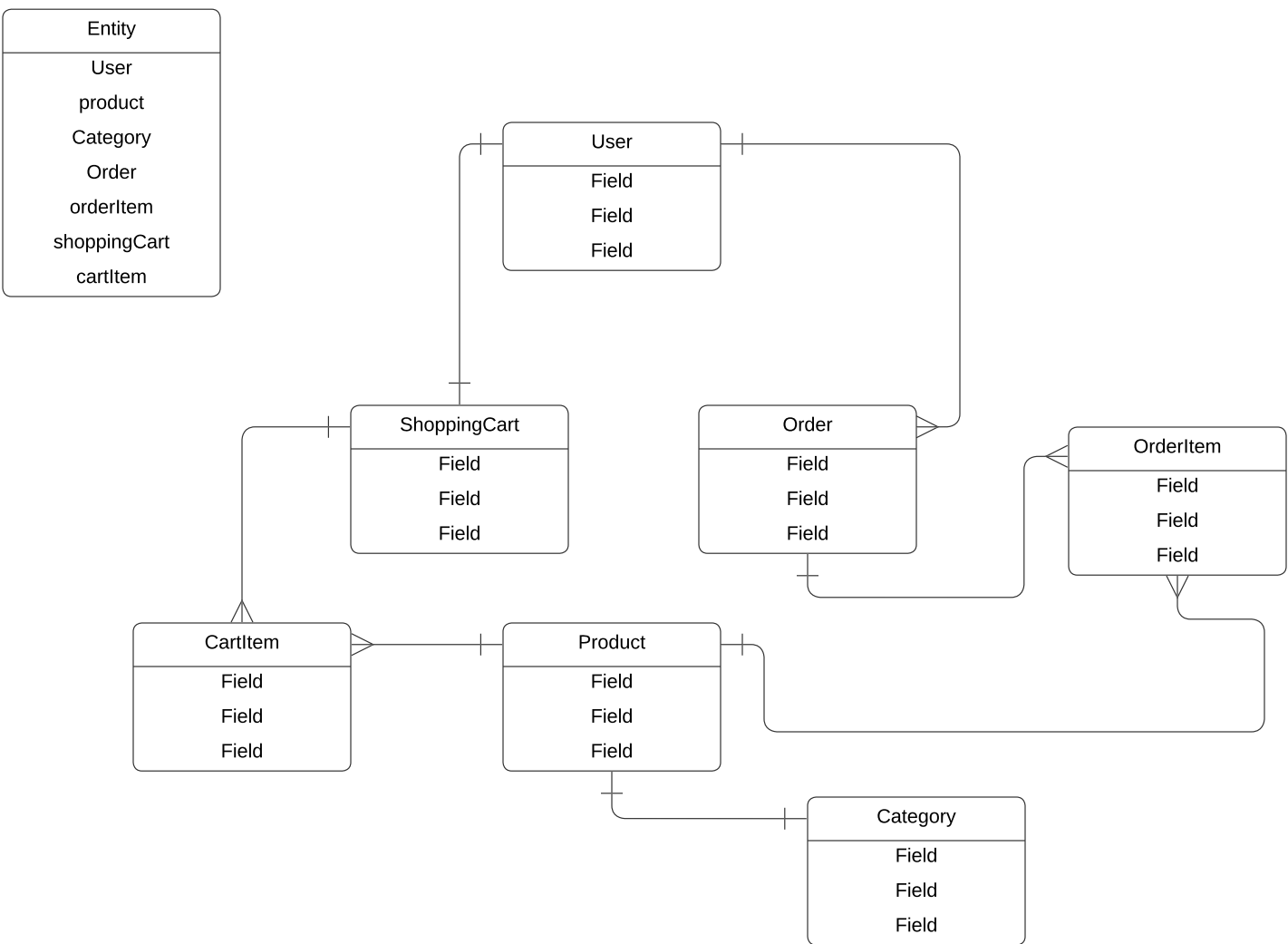
Conceptual Mode

Entities:

User
Product
Category
Order
OrderItem
ShoppingCart
CartItem

Relationships:

A User can place multiple Orders.
A User has one ShoppingCart.
A ShoppingCart contains multiple CartItems.
An Order contains multiple OrderItems.
A Product can belong to one Category.
A Product can be in multiple CartItems and OrderItems.



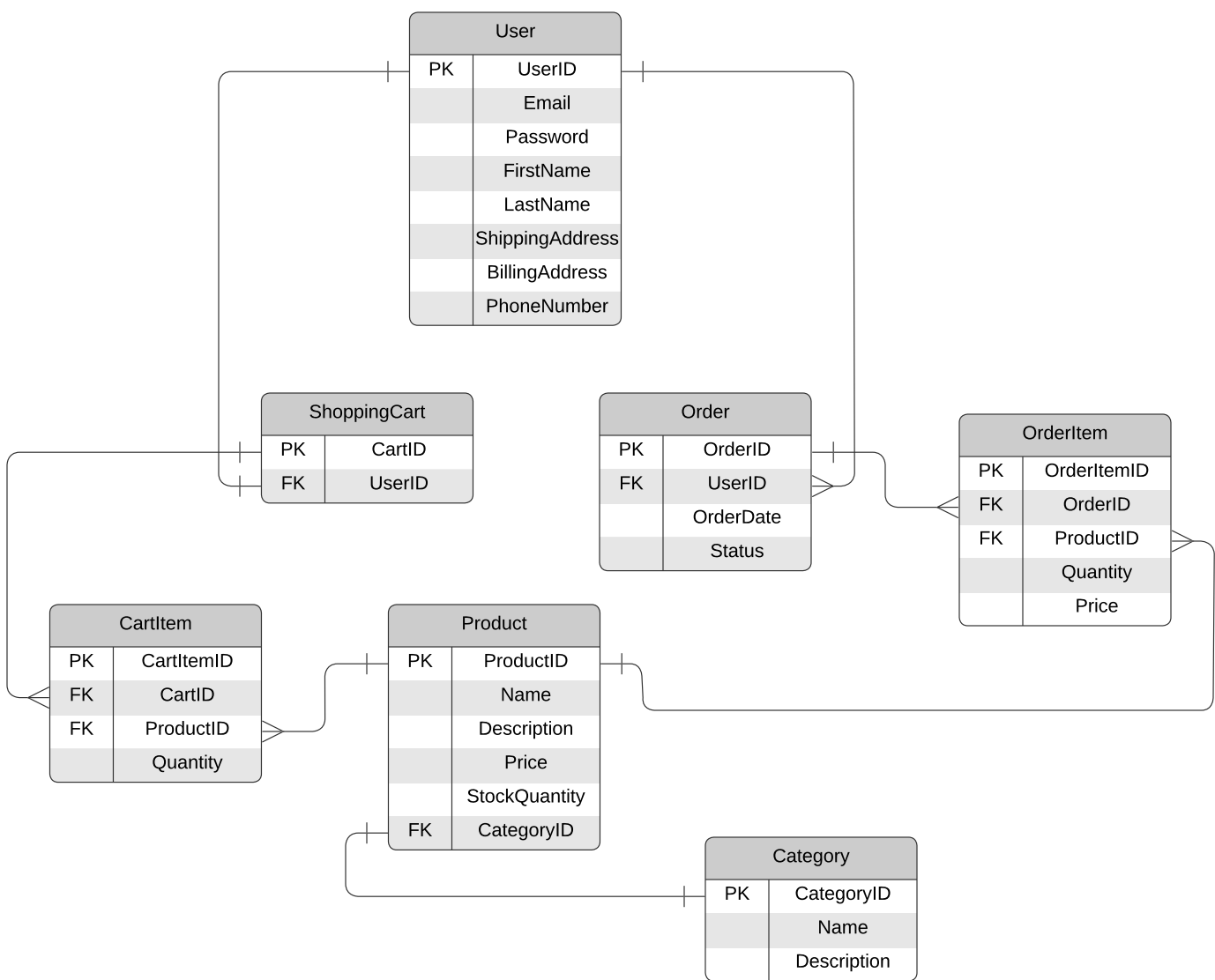
Logical Data model

Entities and Attributes:

User: UserID (PK), Email, Password, FirstName, LastName, ShippingAddress, BillingAddress, PhoneNumber
Product: ProductID (PK), Name, Description, Price, StockQuantity, CategoryID (FK)
Category: CategoryID (PK), Name, Description
Order: OrderID (PK), UserID (FK), OrderDate, Status
OrderItem: OrderItemID (PK), OrderID (FK), ProductID (FK), Quantity, Price
ShoppingCart: CartID (PK), UserID (FK)
CartItem: CartItemID (PK), CartID (FK), ProductID (FK), Quantity

Relationships:

One-to-Many: User to Orders, User to ShoppingCart, ShoppingCart to CartItems, Order to OrderItems, Category to Products
Many-to-One: CartItem to Product, OrderItem to Product



Physical Data Model:

This model is used to design the actual database. It includes tables, columns, data types, indexes, constraints, and foreign keys.

Tables and Columns (Simplified Example):

User:
UserID (int, PK)
Email (varchar)
Password (varchar)
FirstName (varchar)
LastName (varchar)
ShippingAddress (varchar)
BillingAddress (varchar)
PhoneNumber (varchar)

Product:
ProductID (int, PK)
Name (varchar)
Description (text)
Price (decimal)
StockQuantity (int)
CategoryID (int, FK)

Category:
CategoryID (int, PK)
Name (varchar)
Description (text)

Order:
OrderID (int, PK)
UserID (int, FK)
OrderDate (datetime)
Status (varchar)

OrderItem:
OrderItemID (int, PK)
OrderID (int, FK)
ProductID (int, FK)
Quantity (int)
Price (decimal)

ShoppingCart:
CartID (int, PK)
UserID (int, FK)

CartItem:
CartItemID (int, PK)
CartID (int, FK)
ProductID (int, FK)
Quantity (int)

Indexes and Constraints:
Primary keys (PK) and foreign keys (FK) are defined to enforce relationships.
Indexes might be created on frequently searched fields, like Email in the User table.
Constraints for data integrity, like NOT NULL or UNIQUE, are applied where appropriate.

