Online Shopping Application - Database Design

# Database Design

Based on the project requirements, the following tables are proposed:

* 1. Users
     + UserID (Primary Key)
     + Name
     + Email (Unique)
     + Password
     + Address
     + Phone
     + Role (User/Admin)
  2. Products
     + ProductID (Primary Key)
     + Name
     + Description
     + Price
     + Stock
     + CategoryID (Foreign Key)
     + ImageURL
  3. Categories
     + CategoryID (Primary Key)
     + CategoryName
  4. Orders
     + OrderID (Primary Key)
     + UserID (Foreign Key)
     + OrderDate
     + TotalAmount
     + Status (Pending/Shipped/Delivered)
  5. OrderDetails
     + OrderDetailID (Primary Key)
     + OrderID (Foreign Key)
     + ProductID (Foreign Key)
     + Quantity
     + Subtotal
  6. Cart
     + CartID (Primary Key)
     + UserID (Foreign Key)
     + ProductID (Foreign Key)
     + Quantity

# ER Diagram

The ER diagram visually represents the relationships between the entities. The main entities include Users, Products,

Categories, Orders, OrderDetails, and Cart. Attributes and primary keys are defined for each.

(The diagram will be included as a visual representation.)

# Normalization

Normalization ensures that the database is structured efficiently:

* 1. First Normal Form (1NF)
     + Ensure that all attributes contain atomic values.
     + Example: Splitting full names into FirstName and LastName.
  2. Second Normal Form (2NF)
     + Remove partial dependencies; all non-key attributes are dependent on the entire primary key.
     + Example: Separate order details into an OrderDetails table to remove duplication.
  3. Third Normal Form (3NF)
     + Remove transitive dependencies; non-key attributes should not depend on other non-key attributes.

- Example: Store categories in a separate table to eliminate redundant data in the Products table.