Database Design Document: E-Commerce

Introduction

The E-Commerce database is designed to support an online shopping platform, managing users, user sessions, product categories, products, shopping carts, cart products, shipping details, and orders. The database structure comprises nine tables, each serving a distinct purpose in facilitating efficient data storage and retrieval.

Tables

1. **User Table**
    - **Columns:**
        - **id** (Primary Key)
        - **userName**
        - **fullName**
        - **emailId**
        - **phoneNo**
        - **password**
        - **isActive**
        - **createdTs**
        - **updatedTs**
    - **Purpose:** Stores information about registered users, including credentials and contact details.
2. **User Session Table**
    - **Columns:**
        - **id** (Primary Key)
        - **userId** (Foreign Key referencing User Table)
        - **sessionToken**
        - **isActive**
        - **createdTs**
        - **updatedTs**
    - **Purpose:** Manages user sessions, allowing secure interaction with the application.
3. **Category Table**
    - **Columns:**
        - **id** (Primary Key)
        - **name**
        - **description**
        - **isActive**
        - **createdTs**

        - **updatedTs**
    - **Purpose:** Defines product categories, facilitating organization and classification.
4. **Product Table**
    - **Columns:**
        - **id** (Primary Key)
        - **name**
        - **description**
        - **price**
        - **quantityInStock**
        - **image**
        - **categoryId** (Foreign Key referencing Category Table)
        - **isActive**
        - **createdTs**
        - **updatedTs**
    - **Purpose:** Represents individual products, including price, stock quantity, and associated category.
5. **Cart Table**
    - **Columns:**
        - **id** (Primary Key)
        - **userId** (Foreign Key referencing User Table)
        - **orderTotalPrice**
        - **isActive**
        - **createdTs**
        - **updatedTs**
    - **Purpose:** Manages shopping carts created by users, tracking the total price of items in the cart.
6. **Cart Products Table**
    - **Columns:**
        - **id** (Primary Key)
        - **cartId** (Foreign Key referencing Cart Table)
        - **productId** (Foreign Key referencing Product Table)
        - **productPrice**
        - **unitsInCart**
        - **isActive**
        - **createdTs**
        - **updatedTs**
    - **Purpose:** Records products added to each cart, including price and quantity.
7. **Order Table**
    - **Columns:**
        - **id** (Primary Key)
        - **userId** (Foreign Key referencing User Table)
        - **orderTotalPrice**
        - **shippingDetailsId** (Foreign Key referencing Shipping Details Table)
        - **orderStatus**

        - **isActive**
        - **createdTs**
        - **updatedTs**
    - **Purpose:** Tracks orders, including user details, order total, shipping information, and status.
8. **Order Products Table**
    - **Columns:**
        - **id** (Primary Key)
        - **orderId** (Foreign Key referencing Order Table)
        - **productId** (Foreign Key referencing Product Table)
        - **productPrice**
        - **unitsPurchased**
        - **isActive**
        - **createdTs**
        - **updatedTs**
    - **Purpose:** Records individual products associated with specific orders, including price and quantity.
9. **Shipping Details Table**
    - **Columns:**
        - **id** (Primary Key)
        - **shippingAddress**
        - **emailId**
        - **phoneNo**
        - **isActive**
        - **createdTs**
        - **updatedTs**
    - **Purpose:** Stores information about shipping details for processing orders.

Note : The columns **isActive**, **createdTs** and **updatedTs** should have default value set while creating the table such that **isActive** should have default value set to 1, **createdTs** and **updatedTs** should have default values set to current timestamp.

Relationships

- **User and User Session:** One-to-Many (A user can have multiple active sessions)
- **Product, Category:** Each product belongs to one category.
- **Cart and Cart Products:** One-to-Many (A cart can have multiple products)
- **User and Cart:** A user can have at most one active shopping cart at a time.
- **User, Order, and Shipping Details:** One-to-Many (A user can place multiple orders with different shipping details)
- **Order and Order Products:** One-to-Many (An order can have multiple products)

Conclusion

The database structure is designed to efficiently manage user data, product details, shopping carts, and orders. The relationships between tables allow for a structured and organized representation of the e-commerce platform. The use of foreign keys helps maintain data integrity, ensuring accurate and consistent representation throughout the database. The tables collectively form a robust foundation for the E-Commerce application, supporting its functionalities seamlessly.