Uzma Hamid

CSCE 310 - Project 2 - Online Shopping System

Design Document: Online Shopping System Database

The online shopping system is a client-server system that facilitates buying and selling of products by multiple users. The system comprises a desktop-based client application for listing products for sale and buying products, and a web-based interface for searching products by price range. The data is stored in an online Redis database, and CRUD operations are performed through a data adapter.

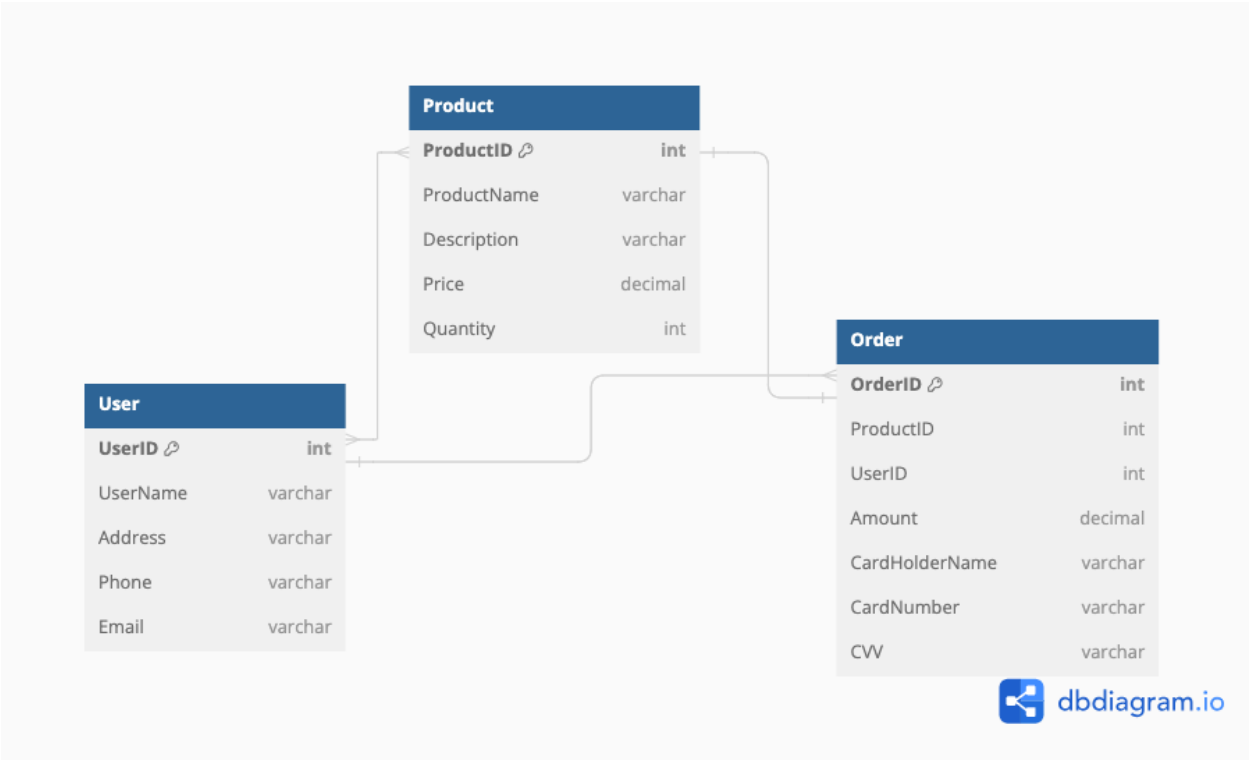
1. **Database Schema:**
    - User Entity:
        - UserID (Primary Key)
        - Username
        - Password
        - Email
        - UserType (buyer/seller)
    - Product Entity:
        - ProductID (Primary Key)
        - ProductName
        - Description
        - Price
        - SellerID (Foreign Key referencing UserID in User table)
        - DateListed
    - Order Entity:
        - OrderID (Primary Key)
        - ProductID (Foreign Key referencing ProductID in Product table)
        - UserID (Foreign Key referencing UserID in User table)
        - Amount
        - CardHolder
        - CardNumber
        - CVV
        - OrderDate
2. **Database Tables and Relationships:**
    - The Users entity stores information about users registered in the system.
    - The Product entity stores information about products listed for sale, with a foreign key referencing the SellerID to establish a relationship between users and their listed products.
    - The Order entity tracks information about orders placed by users. Through foreign key relationships, each order is linked to a specific product (ProductID) and a specific user (UserID), establishing the association between the ordered products and the users who placed them.

3. **Data Adapter:**
    - A data adapter is implemented to perform CRUD (Create(Add), Read(View), Update, Delete) operations on the User, Product and Order entities in the Redis database.
    - The data adapter provides methods to:
        - Create a new user/product
        - Retrieve user/product information
        - Update user/product details
        - Delete user/product records
4. **Web Server:**
    - A web server is implemented to handle product search functionality.
    - The server listens for HTTP requests with RESTful templates (/product/search?minprice=0&maxprice=100) for searching products by price range.
    - Upon receiving a request, the server queries the Redis database for products within the specified price range and generates an HTML page containing the list of matching products.
5. **Integration:**
    - The web server has access to the online Redis database used for storing user and product data.
    - The data adapter is utilized by both the desktop client application and the web server to perform CRUD operations on the database.

ERD:

This diagram illustrates the relationships between your entities:

- Each User can place multiple Orders. 1-N
- Each Order is associated with one User and one Product. 1-1
- Each Product can be included in multiple Orders. N-N


Product
ProductID int
ProductName varchar
Description varchar
Price decimal
Quantity int
User
UserID int
UserName varchar
Address varchar
Phone varchar
Email varchar
Order
OrderID int
ProductID int
UserID int
Amount decimal
CardHolderName varchar
CardNumber varchar
CVV varchar
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