E-Commerce Application Report

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1. User Documentation

Overview

The application is a console-based E-Commerce system that enables users to register, log in, and perform actions based on their role (Buyer, Seller, or Admin). It provides a role-specific menu, allowing Buyers to browse products, Sellers to manage their product listings, and Admins to manage users and monitor the system.

Classes and Their Responsibilities

1. **Main**
    - Entry point for the application.
    - Handles user interactions through a menu-driven interface.
    - Delegates operations to relevant services (UserService, ProductService).
2. **User**
    - Represents a generic user with attributes like username, email, and password.
    - Subclasses:
        - **Buyer**: For browsing and searching products.
        - **Seller**: Manages product-related operations (add, update, delete).
        - **Admin**: Manages users and reviews all system data.
3. **Product**
    - Represents products with attributes like name, price, quantity, and seller ID.
4. **UserService**
    - Handles user-related operations such as registration, login, and user role validation.
5. **ProductService**
    - Handles product-related operations such as CRUD functionality and browsing.

How to Use

1. Start the application by running the Main class.
2. Use the menu to:

    - Register as a Buyer, Seller, or Admin.
    - Log in with your credentials.
3. Based on your role, access specific functionalities:
    - **Buyers**: Browse and search products.
    - **Sellers**: Add, update, delete, and view their products.
    - **Admins**: Manage users, view system-wide data.

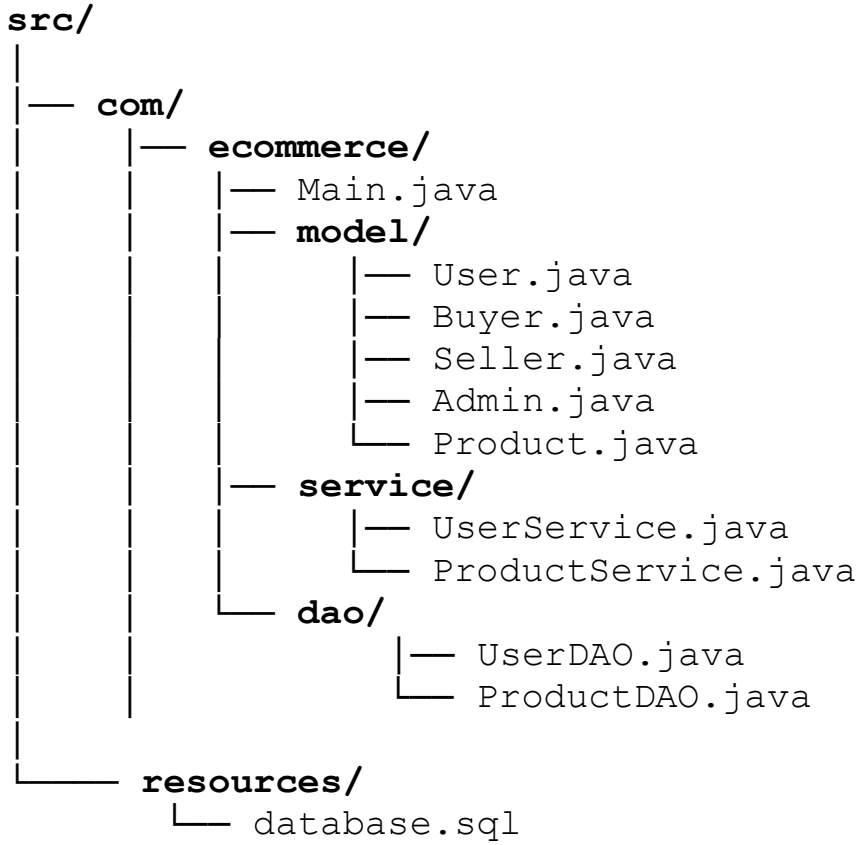
Class Diagram

The following is the association between the main classes (use the provided uploaded diagrams if applicable for the visual representation):

- **Main** interacts with **UserService** and **ProductService**.
- **User** subclasses into **Buyer**, **Seller**, and **Admin**.
- **ProductService** manages **Product** operations.
- **UserService** handles user-related data and operations.

2. Development Documentation

Source Code Directory Structure



Build Process

1. **Dependencies**
    - Maven is used to manage dependencies. Add the following to pom.xml:

```
<dependencies>
    <dependency>
        <groupId>org.postgresql</groupId>
        <artifactId>postgresql</artifactId>
        <version>42.3.6</version>
    </dependency>
    <dependency>
        <groupId>org.mindrot</groupId>
        <artifactId>jbcrypt</artifactId>
        <version>0.4</version>
    </dependency>
```

```
</dependencies>
```

2. **Compilation**

- Use Maven to build the project:

```
mvn clean package.
```

3. **Database Setup**

- Create a PostgreSQL database using the `resources/database.sql` file. Example schema:

```
CREATE TABLE users (
    id SERIAL PRIMARY KEY,
    username VARCHAR(255) NOT NULL,
    email VARCHAR(255) UNIQUE NOT NULL,
    password VARCHAR(255) NOT NULL,
    role VARCHAR(50) NOT NULL
);

CREATE TABLE products (
    id SERIAL PRIMARY KEY,
    name VARCHAR(255) NOT NULL,
    price DECIMAL(10, 2) NOT NULL,
    quantity INT NOT NULL,
    seller_id INT REFERENCES users(id)
);
```

4. **Development Standards**

    - Follow Java naming conventions for classes and methods
    - Use meaningful variable names and consistent indentation.
    - Separate concerns by ensuring that DAO, Service, and Model layers are distinct.

Setting Up Development Environment

1. Install **Java JDK** (version 13).
2. Install **PostgreSQL** and create the required database.
3. Clone the repository:

```
git clone <repository_url>

cd <repository_directory>
```

Configure the application.properties file:

```
db.url=jdbc:postgresql://localhost:5432/<database>

db.username=<db_username>

db.password=<db_password>
```

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3. Deployment Documentation

Installation Steps

1. **Install Prerequisites**
    - Install Java (13).
    - Install PostgreSQL.
2. **Database Configuration**
    - Use the provided SQL script (resources/database.sql) to set up the database.
3. **Run the Application**
    - Compile and run using Maven:

      ```
      -bash-
      mvn clean install
      java -jar target/ecommerce-application.jar
      ```

4. **Accessing the Application**
    - Interact with the console-based interface by running the Main class.

Environment Requirements

- **Operating System**: Windows, macOS, or Linux.
- **Java Runtime**: JRE 13.
- **Database**: PostgreSQL.