# **Project Title:**

Online Shopping Cart using Array List in Java

## 1. Core Feature Implementation:

Online Shopping Cart is a Java-based desktop application for simulating e-commerce shopping features. It provides

- Core Functionalities Product Management: Add, update, delete, and search for products using ID, name, or category.
- Cart Management: Add products to the cart, remove items, update quantities, and calculate total cost.
- Checkout Module: Simulates a basic checkout process and generates an order summary.
- User Interface: Built using Java Swing for user interaction.

## 2. Error Handling and Robustness

**Try-Catch Blocks:** Applied to all socket, stream, and UI operations.

Connection Timeout Handling: Graceful exit when client disconnects.

- Input Validation: Prevents blank or malformed messages.
- Thread-Safety: Shared resources synchronized where needed.

## 3. Integration of Components

The system follows a modular design with the integration of:

Core Feature Implementation:

The Online Shopping Cart is a Java-based desktop application for simulating e-commerce shopping features.

# 4. Event Handling and Processing

- Java ActionListener for button click events (e.g., add to cart, checkout).
- Real-time UI updates on cart and product list.
- Feedback dialogs for successful and failed actions (e.g., "Product Added", "Out of Stock")

## 5. Data Validation

- Format checks for numeric inputs like quantity and price.
- Null checks for product name or category fields.
- Prevents duplicate product entries using ID-based validation.

## 6. Code Quality and Innovative Features

Modular Code: Proper separation of models, views, and controllers.

Reusable Methods: Utility functions for formatting prices, generating unique product IDs.

#### **Innovative Add-ons:**

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Discount calculation for bulk orders.

Dynamic sorting by price or name.

Search filter using keywords.

## 7. Project Documentation

The documentation includes:

- System Overview
- Use Case Diagrams
- \* Class Diagrams
- Technology Stack
- Installation Instructions
- Test Cases & Results
- Limitations and Future Enhancements

# ONLINE SHOPPING CART USING ARRAY LIST IN JAVA (I.) Entity Relationship (ER) Diagram

### **Entities:**

Product (productID, name, category, price, stockQty)

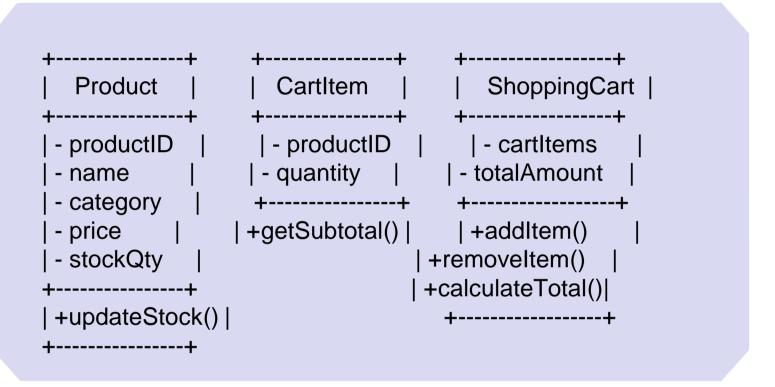
CartItem (productID, quantity)

#### Relationships:

A Cart can contain many CartItems (1:N).

A CartItem refers to one Product (N:1).

### (IL) Class Diagram



## (III) Java Code Structure

## Packages:

model: Product, CartItem classes.

controller: ShoppingCart class for business logic.

ui: Java Swing classes for GUI.

utils: Helper functions for formatting and validation.

### (V.) Code Snippets

Issuing a Book (Java):

```
public void addItem(Product product, int quantity) {
   for (CartItem item : cartItems) {
      if (item.getProduct().getId().equals(product.getId())) {
        item.increaseQuantity(quantity);
        return;
      }
   }
   cartItems.add(new CartItem(product, quantity));
}
```

### (VI.) GUI Screenshots (Descriptions)

Main Menu: Options to browse products, view cart, and checkout.

Product List: Displays available products with filter/search option.

Shopping Cart View: Shows cart contents, allows updates and checkout.

### (VII.) Future Enhancements

Database Integration for persistent cart history.

User Login and Authentication.

Payment Gateway Simulation.

Inventory Management with Supplier Module.

Web-based version using JSP/Servlets or Spring Boot.