```java
class Product {
    protected int productId;
    protected String name;
    protected float price;

    public Product(int productId, String name, float price) {
        this.productId = Math.abs(productId);
        this.name = name;
        this.price = Math.abs(price);
    }

    public int getProductId() {
        return productId;
    }

    public void setProductId(int productId) {
        this.productId = Math.abs(productId);
    }

    public String getName() {
        return name;
    }

    public void setName(String name) {
        this.name = name;
    }

    public float getPrice() {
        return price;
    }

    public void setPrice(float price) {
        this.price = Math.abs(price);
    }
}

```

```java
class ElectronicProduct extends Product{
    private String brand;
    private int warrantyPeriod;

    public ElectronicProduct(int productId, String name, float price, String brand, int warrantyPeriod) {
        super(productId, name, price);
        this.brand = brand;
        this.warrantyPeriod = Math.abs(warrantyPeriod);
    }

    public String getBrand() {
        return brand;
    }
    public void setBrand(String brand) {
        this.brand = brand;
    }

    public int getWarrantyPeriod() {
        return warrantyPeriod;
    }

    public void setWarrantyPeriod(int warrantyPeriod) {
        this.warrantyPeriod = Math.abs(warrantyPeriod);
    }
}
```

```java
class ClothingProduct extends Product{
    private String size;
    private String fabric;

    public ClothingProduct(int productId, String name, float price, String size, String fabric) {
        super(productId, name, price);
        this.size = size;
        this.fabric = fabric;
    }

    public String getSize() {
        return size;
    }

    public void setSize(String size) {
        this.size = size;
    }

    public String getFabric() {
        return fabric;
    }

    public void setFabric(String fabric) {
        this.fabric = fabric;
    }
}

```

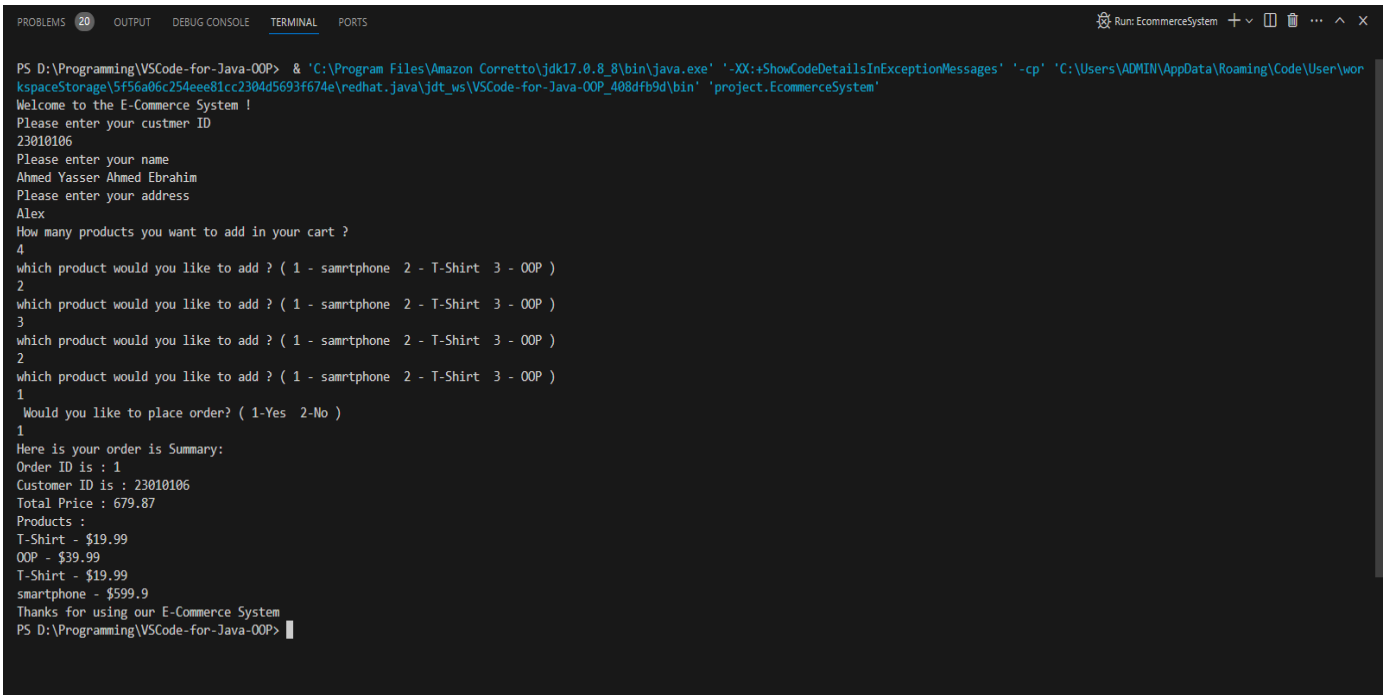
```java
class BookProduct extends Product{
    private String author;
    private String publisher;

    public BookProduct(int productId, String name, float price, String author, String publisher) {
        super(productId, name, price);
        this.author = author;
        this.publisher = publisher;
    }

    public String getAuthor() {
        return author;
    }

    public void setAuthor(String author) {
        this.author = author;
    }

    public String getPublisher() {
        return publisher;
    }

    public void setPublisher(String publisher) {
        this.publisher = publisher;
    }
}
```

```java
package project;
import java.util.Scanner;

class Customer {
    private int customerId;
    private String name;
    private String address;

    public Customer(int customerId, String name, String address) {
        this.customerId = Math.abs(customerId);
        this.name = name;
        this.address = address;
    }

    public int getCustomerId() {
        return customerId;
    }

    public void setCustomerId(int customerId) {
        this.customerId = Math.abs(customerId);
    }

    public String getName() {
        return name;
    }

    public void setName(String name) {
        this.name = name;
    }

    public String getAddress() {
        return address;
    }

    public void setAddress(String address) {
        this.address = address;
    }
}
```

```java
class Cart {
    private int customerId;
    private int nProducts;
    private Product[] products;

    public Cart(int customerId, int nProducts) {
        this.customerId = Math.abs(customerId);
        this.nProducts = Math.abs(nProducts);
        this.products = new Product[nProducts];
    }

    public int getCustomerId() {
        return customerId;
    }

    public void setCustomerId(int customerId) {
        this.customerId = Math.abs(customerId);
    }

    public int getNProducts() {
        return nProducts;
    }

    public void setNProducts(int nProducts) {
        this.nProducts = Math.abs(nProducts);
    }

    public Product[] getProducts() {
        return products;
    }

    public void setProducts(Product[] products){
        this.products = products;
    }

    public void addProduct(Product product , int index) {
        if (index >=0 && index <= nProducts) {
            products[index] = product;
        } else {
            System.out.println("Cart is full !");
        }
    }

    public void removeProduct(int index) {
        if (index >= 0 && index < nProducts) {
            products[index] = null;
        }
    }


    public float calculatePrice() {
        float total = 0;
        for (Product product : products) {
            if(product != null){
            total += product.getPrice();
            }
        }
        return total;
    }

    public Order placeOrder() {
        return new Order(customerId, products, calculatePrice());
    }

}

```

```java
class Order {
    private int customerId;
    private int orderId;
    private Product[] products;
    private float totalPrice;

    public Order(int customerId, Product[] products, float totalPrice) {
        this.customerId = Math.abs(customerId);
        this.orderId = Math.abs(orderId);
        this.products = products;
        this.totalPrice = calculateTotalPrice();
    }

    public int getCustomerId() {
        return customerId;
    }

    public void setCustomerId(int customerId) {
        this.customerId = Math.abs(customerId);
    }

    public int getOrderId() {
        return orderId;
    }

    public void setOrderId(int orderId) {
        this.orderId = Math.abs(orderId);
    }

    public Product[] getProducts(){
        return products;
    }

    public void setProducts(Product[] products){
        this.products = products;
    }

    public float getTotalPrice(){
        return totalPrice;
    }

    public void setTotalPrice(float totalPrice){
        this.totalPrice = Math.abs(totalPrice);
    }

    public void printOrderInfo() {
        System.out.println("Order ID is : " + orderId);
        System.out.println("Customer ID is : " + customerId);
        System.out.println("Total Price : " + totalPrice);
        System.out.println("Products :");
        for (Product product : products) {
            if(product != null){
            System.out.println(product.getName() + " - $" + product.getPrice());
            }
        }
    }
    private float calculateTotalPrice() {
        float total = 0;
        for (Product product : products) {
            if(product != null){
            total += product.getPrice();
            }
        }
        return total;
    }
}
```

```java
public class EcommerceSystem{
    public static void main(String[] args) {
        Scanner in = new Scanner (System.in);
        ElectronicProduct electronicProduct = new ElectronicProduct(1,"smartphone", 599.9f, "Samsung", 1);
        ClothingProduct clothingProduct = new ClothingProduct(2, "T-Shirt", 19.99f, "Medium", "Cotton");
        BookProduct bookProduct = new BookProduct(3, "OOP", 39.99f, "O-Reilly", "X Publications");
        System.out.println("Welcome to the E-Commerce System !");
        System.out.println("Please enter your custmer ID");
        int customerId = in.nextInt();
        in.nextLine();
        System.out.println("Please enter your name");
        String name = in.nextLine();
        System.out.println("Please enter your address");
        String address = in.nextLine();
        Customer customer = new Customer(customerId, name, address);
        System.out.println("How many products you want to add in your cart ?");
        int nProducts = in.nextInt();
        Cart cart = new Cart(customer.getCustomerId(), nProducts);
        for(int i=0; i<nProducts; i++){
            System.out.println("which product would you like to add ? ( 1 - samrtphone  2 - T-Shirt  3 - OOP )");
            int product = in.nextInt();
            switch (product) {
                case 1:
                    cart.addProduct(electronicProduct ,i);
                    break;
                case 2:
                    cart.addProduct(clothingProduct ,i);
                    break;
                case 3:
                    cart.addProduct(bookProduct ,i);
                    break;
                default:
                    System.out.println("Invalid product type.");
                    i-=1;
            }
        }
        boolean flag = true;
        while (flag) {
        System.out.println(" Would you like to place order? ( 1-Yes  2-No )");
        int input = in.nextInt();
            switch (input) {
                case 1:

                    Order order = cart.placeOrder();
                    System.out.println("Here is your order is Summary: ");
                    order.printOrderInfo();
                    System.out.println("Thanks for using our E-Commerce System");
                    flag = false;
                    break;
                case 2:
                    System.out.println("Would you like to remove from the cart ? ( 1-Yes  2-No )");
                    int choise = in.nextInt();
                    if(choise==1){
                        System.out.println("Enter product is Id ");
                        int productId = in.nextInt();
                        cart.removeProduct((productId-1));

                    }
                    else if (choise==2){
                        System.out.println("Thanks for using our E-Commerce System");
                        flag = false;
                    }
            }
        }
    }
}
```


PROBLEMS 20
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
Run: EcommerceSystem
PS D:\Programming\VSCode-for-Java-OOP> & 'C:\Program Files\Amazon Corretto\jdk17.0.8_8\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\ADMIN\AppData\Roaming\Code\User\workspaceStorage\5f56a06c254eee81cc2304d5693f674e\redhat.java\jdt_ws\VSCode-for-Java-OOP_408dfb9d\bin' 'project.EcommerceSystem'
Welcome to the E-Commerce System !
Please enter your custmer ID
23010106
Please enter your name
Ahmed Yasser Ahmed Ebrahim
Please enter your address
Alex
How many products you want to add in your cart ?
4
which product would you like to add ? (1 - samrtphone 2 - T-Shirt 3 - OOP)
2
which product would you like to add ? (1 - samrtphone 2 - T-Shirt 3 - OOP)
3
which product would you like to add ? (1 - samrtphone 2 - T-Shirt 3 - OOP)
2
which product would you like to add ? (1 - samrtphone 2 - T-Shirt 3 - OOP)
1
Would you like to place order? (1-Yes 2-No)
1
Here is your order is Summary:
Order ID is : 1
Customer ID is : 23010106
Total Price : 679.87
Products :
T-Shirt - $19.99
OOP - $39.99
T-Shirt - $19.99
smartphone - $599.9
Thanks for using our E-Commerce System
PS D:\Programming\VSCode-for-Java-OOP>