

```

class Product {
    private String name;
    private double price;
    private int quantity;

    public Product(String name, double price, int quantity) {
        this.name = name;
        this.price = price;
        this.quantity = quantity;
    }

    public String getName() {
        return name;
    }

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

    public double getPrice() {
        return price;
    }

    public void setPrice(double price) {
        this.price = price;
    }

    public int getQuantity() {
        return quantity;
    }

    public void setQuantity(int quantity) {
        this.quantity = quantity;
    }
}

class ShoppingCart {
    private Product[] cart;
    private int itemCount;

    public ShoppingCart(int capacity) {
        cart = new Product[capacity];
        itemCount = 0;
    }

    public void addProduct(Product product) {
        if (itemCount < cart.length) {
            cart[itemCount] = product;
            itemCount++;
            System.out.println(product.getName() + " added to the cart.");
        } else {
            System.out.println("Cart is full. Cannot add more items.");
        }
    }

    public void removeProduct(String productName) {
        boolean found = false;
        for (int i = 0; i < itemCount; i++) {
            if (cart[i] != null && cart[i].getName().equals(productName)) {
                System.out.println(productName + " removed from the
cart.");
            }
        }
    }
}

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        cart[i] = null;
        found = true;
        break;
    }
}
if (!found) {
    System.out.println("Product not found in the cart.");
}
}

public double calculateTotalCost() {
    if (itemCount == 0) {
        System.out.println("Cart is empty. Total cost is $0.0");
        return 0.0;
    }

    double totalCost = 0.0;
    for (int i = 0; i < itemCount; i++) {
        if (cart[i] != null) {
            totalCost += cart[i].getPrice() * cart[i].getQuantity();
        }
    }
    return totalCost;
}

public void printCartDetails() {
    System.out.println("Cart Details:");
    for (int i = 0; i < itemCount; i++) {
        if (cart[i] != null) {
            Product product = cart[i];
            System.out.println("Product: " + product.getName());
            System.out.println("Price: $" + product.getPrice());
            System.out.println("Quantity: " + product.getQuantity());
            System.out.println("-----");
        }
    }
}
}

}

public class Shopping {
    public static void main(String[] args) {
        ShoppingCart cart = new ShoppingCart(5);

        Product product1 = new Product("Item 1", 10.0, 2);
        Product product2 = new Product("Item 2", 20.0, 1);
        Product product3 = new Product("Item 3", 15.0, 3);

        cart.addProduct(product1);
        cart.addProduct(product2);
        cart.addProduct(product3);

        cart.printCartDetails();

        System.out.println("Total Cost: $" + cart.calculateTotalCost());

        cart.removeProduct("Item 2");
        cart.removeProduct("Item 4"); // Non-existent product
        cart.printCartDetails();
    }
}

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        System.out.println("Total Cost after removal: $" +
    cart.calculateTotalCost());
    }
}
```

Output

```
Item 1 added to the cart.
Item 2 added to the cart.
Item 3 added to the cart.
Cart Details:
Product: Item 1
Price: $10.0
Quantity: 2
-----
Product: Item 2
Price: $20.0
Quantity: 1
-----
Product: Item 3
Price: $15.0
Quantity: 3
-----
Total Cost: $85.0
Item 2 removed from the cart.
Product not found in the cart.
Cart Details:
Product: Item 1
Price: $10.0
Quantity: 2
-----
Product: Item 3
Price: $15.0
Quantity: 3
-----
Total Cost after removal: $65.0
```