**Exercise 1: Inventory Management System**

**Product.java**

**Code:**

package inventory;

public class Product {

    private int productId;

    private String productName;

    private int quantity;

    private double price;

    public Product(int productId, String productName, int quantity, double price) {

        this.productId = productId;

        this.productName = productName;

        this.quantity = quantity;

        this.price = price;

    }

    public int getProductId() {

        return productId;

    }

    public void setQuantity(int quantity) {

        this.quantity = quantity;

    }

    public void setPrice(double price) {

        this.price = price;

    }

    public String toString() {

        return "ID: " + productId + ", Name: " + productName + ", Qty: " + quantity + ", Price: " + price;

    }

}

**InventoryManager.java**

**Code:**

package inventory;

import java.util.HashMap;

public class InventoryManager {

    private HashMap<Integer, Product> inventory;

    public InventoryManager() {

        inventory = new HashMap<>();

    }

    public void addProduct(Product product) {

        inventory.put(product.getProductId(), product);

        System.out.println("Product added.");

    }

    public void updateProduct(int productId, int newQuantity, double newPrice) {

        Product product = inventory.get(productId);

        if (product != null) {

            product.setQuantity(newQuantity);

            product.setPrice(newPrice);

            System.out.println("Product updated.");

        } else {

            System.out.println("Product not found.");

        }

    }

    public void deleteProduct(int productId) {

        if (inventory.remove(productId) != null) {

            System.out.println("Product deleted.");

        } else {

            System.out.println("Product not found.");

        }

    }

    public void displayAll() {

        for (Product product : inventory.values()) {

            System.out.println(product);

        }

    }

}

**Main.java**

**Code:**

package inventory;

public class Main {

    public static void main(String[] args) {

        InventoryManager manager = new InventoryManager();

        Product p1 = new Product(101, "Mouse", 50, 499.99);

        Product p2 = new Product(102, "Keyboard", 30, 899.99);

        Product p3 = new Product(103, "Monitor", 20, 9999.99);

        manager.addProduct(p1);

        manager.addProduct(p2);

        manager.addProduct(p3);

        manager.displayAll();

        manager.updateProduct(102, 40, 799.99);

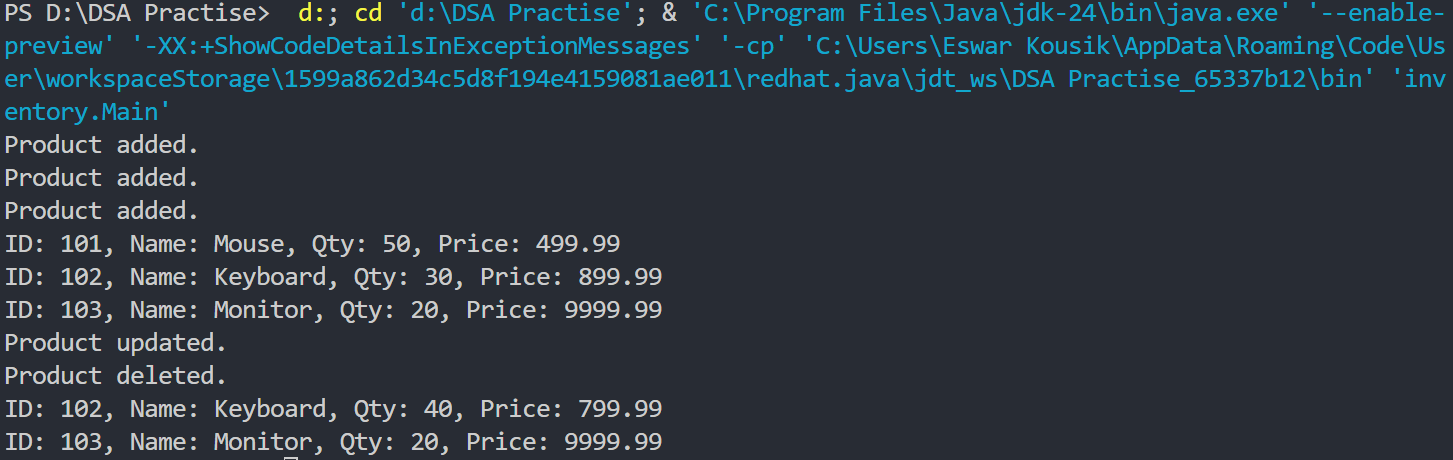
        manager.deleteProduct(101);

        manager.displayAll();

    }

}

**Output:**



**Exercise 7: Financial Forecasting**

**Forecaster.java**

**Code:**

package Forecast;

public class Forecaster {

    public double futureValueRecursive(double presentValue, double rate, int years) {

        if (years == 0) {

            return presentValue;

        }

        return (1 + rate) \* futureValueRecursive(presentValue, rate, years - 1);

    }

}

**Main.java**

**Code:**

package Forecast;

public class Main {

    public static void main(String[] args) {

        Forecaster forecaster = new Forecaster();

        double presentValue = 1000.0;

        double rate = 0.05;

        int years = 10;

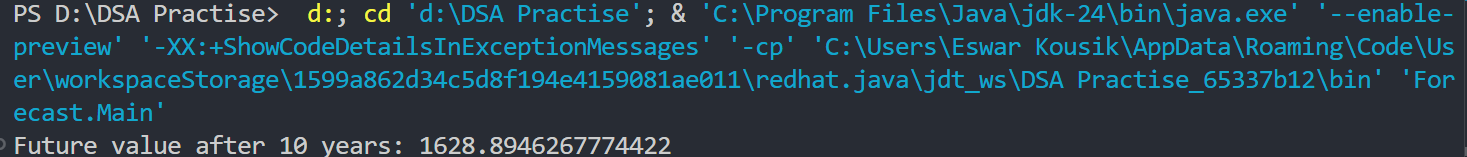
        double result = forecaster.futureValueRecursive(presentValue, rate, years);

        System.out.println("Future value after " + years + " years: " + result);

    }

}

**Output**

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