**NAME : RACHANA J N**

**Superset ID :   6416511**

**TASK 1 : Inventory Management System**

**Scenario:**

You are developing an inventory management system for a warehouse. Efficient data storage and retrieval are crucial.

**Steps:**

1. **Understand the Problem:**
   * Explain why data structures and algorithms are essential in handling large inventories.
   * Discuss the types of data structures suitable for this problem.
2. **Setup:**
   * Create a new project for the inventory management system.
3. **Implementation:**
   * Define a class Product with attributes like **productId**, **productName**, **quantity**, and **price**.
   * Choose an appropriate data structure to store the products (e.g., ArrayList, HashMap).
   * Implement methods to add, update, and delete products from the inventory.
4. **Analysis:**
   * Analyze the time complexity of each operation (add, update, delete) in your chosen data structure.
   * Discuss how you can optimize these operations.

**CODE :**

import java.util.HashMap;

import java.util.Map;

public class InventoryManagement {

    Map<Integer, Product> inventory = new HashMap<>();

    public void addProduct(Product product) {

        inventory.put(product.productId, product);

        System.out.println("Added: " + product);}

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

        if (inventory.containsKey(productId)) {

            Product p = inventory.get(productId);

            p.quantity = newQuantity;

            p.price = newPrice;

            System.out.println("Updated: " + p);

        } else

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

    }

    public void deleteProduct(int productId) {

        if (inventory.containsKey(productId)) {

            Product removed = inventory.remove(productId);

            System.out.println("Deleted: " + removed);}

        else

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

    }

    public void displayInventory() {

        System.out.println("\nCurrent Inventory:");

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

            System.out.println(p);}

    }

    public static void main(String[] args) {

        InventoryManagement system = new InventoryManagement();

        Product p1 = new Product(101, "Keyboard", 20, 750.0);

        Product p2 = new Product(102, "Mouse", 35, 500.0);

        Product p3 = new Product(103, "Monitor", 10, 7000.0);

        system.addProduct(p1);

        system.addProduct(p2);

        system.addProduct(p3);

        system.displayInventory();

        system.updateProduct(102, 40, 520.0);

        system.deleteProduct(101);

        system.displayInventory();

    }

}

class Product {

    int productId;

    String productName;

    int quantity;

    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 String toString() {

        return productId + " | " + productName + " | Qty: " + quantity + " | Price: ₹" + price;

}

}

**OUTPUT :**

