# Assignment Practice Problem

Assignment 1: Personal Finance Manager

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| public class PersonalAccount { private String accountHolderName, accountNumber; private double currentBalance, totalIncome, totalExpenses; private static int totalAccounts = 0; private static String bankName;    public PersonalAccount(String name) { accountHolderName = name; accountNumber = generateAccountNumber(); totalAccounts++;  }    public static void setBankName(String name) { bankName = name;  }    public static int getTotalAccounts() { return totalAccounts;  }    public static String generateAccountNumber() { return "PA" + (totalAccounts + 1);  }    public void addIncome(double amt, String desc) { if (amt > 0) { totalIncome += amt; currentBalance += amt;  }  }    public void addExpense(double amt, String desc) { if (amt > 0 && amt <= currentBalance) { |
| totalExpenses += amt; currentBalance -= amt;  }  }    public double calculateSavings() { return totalIncome - totalExpenses;  }    public void displayAccountSummary() {  System.out.println(accountHolderName + " " + accountNumber + " " + currentBalance + " Savings: " + calculateSavings()); }    public static void main(String[] args) { setBankName("SafeBank");    PersonalAccount a1 = new PersonalAccount("Alice");  PersonalAccount a2 = new PersonalAccount("Bob");  PersonalAccount a3 = new PersonalAccount("Charlie");    a1.addIncome(1000, "Salary"); a1.addExpense(200, "Groceries");    a2.addIncome(2000, "Freelance"); a2.addExpense(500, "Rent");    a3.addIncome(1500, "Salary");    a1.displayAccountSummary(); a2.displayAccountSummary(); a3.displayAccountSummary();    System.out.println("Bank: " + bankName + " Total Accounts: " + getTotalAccounts());  }  } |

Assignment 2: Online Shopping Cart System

class Product {

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| String productId, productName, category; double price; int stockQuantity;  static int totalProducts = 0;    public Product(String id, String name, double p, String cat, int qty) { productId = id; productName = name; price = p; category = cat; stockQuantity = qty; totalProducts++;  }    public static Product findProductById(Product[] products, String id) { for (Product p : products) if (p.productId.equals(id)) return p; return null;  }  }    class ShoppingCart {  String cartId, customerName;  Product[] products = new Product[10]; int[] quantities = new int[10]; int count = 0; double cartTotal = 0;    public ShoppingCart(String id, String name) { cartId = id;  customerName = name;  }    public void addProduct(Product p, int qty) { if (p.stockQuantity >= qty) { products[count] = p; quantities[count] = qty; cartTotal += p.price \* qty; p.stockQuantity -= qty; count++;  }  } |
| public void removeProduct(String id) { for (int i = 0; i < count; i++) { if (products[i].productId.equals(id)) { cartTotal -= products[i].price \* quantities[i]; products[i].stockQuantity += quantities[i]; products[i] = null;  }  }  }    public void displayCart() {  System.out.println(customerName + "'s Cart Total: " + cartTotal); for (int i = 0; i < count; i++) if (products[i] != null)  System.out.println(products[i].productName + " x " + quantities[i]);  }    public void checkout() {  System.out.println("Checkout done. Total: " + cartTotal); }    public static void main(String[] args) { Product[] store = { new Product("P1", "Laptop", 50000, "Electronics", 10), new Product("P2", "Shirt", 1200, "Clothing", 20), new Product("P3", "Phone", 25000, "Electronics", 15) };    ShoppingCart c1 = new ShoppingCart("C1", "Alice"); c1.addProduct(store[0], 1); c1.addProduct(store[1], 2); c1.displayCart(); c1.checkout();  }  } |

Assignment 3: Hotel Reservation System

class Room { String roomNumber, roomType;

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| double pricePerNight; boolean isAvailable = true; int maxOccupancy;    public Room(String num, String type, double price, int occ) { roomNumber = num; roomType = type; pricePerNight = price; maxOccupancy = occ;  }  }    class Guest {  String guestId, guestName, phoneNumber, email; String[] bookingHistory = new String[5]; int count = 0;    public Guest(String id, String name, String phone, String mail) { guestId = id; guestName = name; phoneNumber = phone; email = mail;  }    public void addBooking(String bookingId) { bookingHistory[count++] = bookingId;  }  }    class Booking {  String bookingId, checkInDate, checkOutDate;  Guest guest; Room room; double totalAmount;    static int totalBookings = 0; static double hotelRevenue = 0; static String hotelName;    public Booking(Guest g, Room r, String in, String out, int days) { guest = g; room = r; checkInDate = in; |
| checkOutDate = out; bookingId = "B" + (++totalBookings); totalAmount = r.pricePerNight \* days; r.isAvailable = false; hotelRevenue += totalAmount; g.addBooking(bookingId);  }    public static void getTotalRevenue() {  System.out.println("Total Revenue: " + hotelRevenue); }    public void printDetails() {  System.out.println(bookingId + " " + guest.guestName + " " + room.roomNumber + " Amount: " + totalAmount);  }    public static void main(String[] args) { hotelName = "DreamStay";    Room r1 = new Room("101", "Deluxe", 3000, 2); Room r2 = new Room("102", "Suite", 5000, 4);    Guest g1 = new Guest("G1", "Alice", "1234567890", "a@mail.com");    Booking b1 = new Booking(g1, r1, "2025-08-01", "2025-08-05", 4); b1.printDetails();    getTotalRevenue();  }  } |

Assignment 4: Student Grade Management System

class Student {

String studentId, studentName, className; String[] subjects; double[][] marks; double gpa;

static int totalStudents = 0;

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| static String schoolName; static String[] gradingScale = {"A", "B", "C", "D", "F"}; static double passPercentage = 40;    public Student(String id, String name, String cls, String[] subs) { studentId = id; studentName = name; className = cls; subjects = subs; marks = new double[subs.length][1]; totalStudents++;  }    public void addMarks(String subject, double score) { for (int i = 0; i < subjects.length; i++)  if (subjects[i].equals(subject)) marks[i][0] = score; }    public void calculateGPA() { double sum = 0;  for (int i = 0; i < marks.length; i++) sum += marks[i][0]; gpa = sum / subjects.length;  }    public void generateReportCard() { calculateGPA();  System.out.println(studentName + " GPA: " + gpa); }    public static void main(String[] args) { schoolName = "Greenfield High";  String[] subs = {"Math", "Science", "English"};    Student s1 = new Student("S1", "Alice", "10A", subs); s1.addMarks("Math", 80); s1.addMarks("Science", 70); s1.addMarks("English", 90);    s1.generateReportCard();  System.out.println("School: " + schoolName);  }  } |