LAB – 06

Assignment-1

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

public class ArmstrongNumbers {

    // Method to check if a number is an Armstrong number
    public static boolean isArmstrong(int num) {
        int originalNum = num;
        int sum = 0;
        int digits = 0;

        // Calculate number of digits
        while (num != 0) {
            num /= 10;
            digits++;
        }

        num = originalNum;

        // Calculate the sum of each digit raised to the power of number of digits
        while (num != 0) {
            int digit = num % 10;
            int temp = 1;

            // Manually calculate the power of the digit
            for (int i = 0; i < digits; i++) {
                temp *= digit; // Multiply the digit by itself 'digits' times
            }

            sum += temp;
            num /= 10;
        }

        // Return true if the sum is equal to the original number
        return sum == originalNum;
    }

    // Method to print Armstrong numbers in a given range
    public static void printArmstrongNumber(int start, int end) {
        System.out.println("Armstrong numbers between " + start + " and " + end + " are:");

        // Loop through the range and check for Armstrong numbers
        for (int i = start; i <= end; i++) {
            if (isArmstrong(i)) {
                System.out.println(i);
            }
        }
    }

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Take input from the user for the start and end range
        System.out.print("Enter the start of the range: ");
        int start = scanner.nextInt();

        System.out.print("Enter the end of the range: ");
        int end = scanner.nextInt();

        // Call the method to print Armstrong numbers within the range
        printArmstrongNumber(start, end);

        // Close the scanner
        scanner.close();
    }
}
```

Output

```
Enter the start of the range: 10
Enter the end of the range: 1000
Armstrong numbers between 10 and 1000 are:
153
370
371
407
```

Assignment-2

```java
package lab;

import java.util.Scanner;

public class EmployeeSalaryCalculator {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        boolean continueInput = true;

        while (continueInput) {
            // Take basic salary input from the user
            System.out.print("Enter basic salary of the employee: ");
            double basicSalary = scanner.nextDouble();

            // Declare variables for HRA, DA, and gross salary
            double HRA, DA, grossSalary;

            // Calculate HRA and DA based on basic salary
            if (basicSalary > 15000) {
                HRA = basicSalary * 0.20;  // 20% HRA
                DA = basicSalary * 0.60;   // 60% DA
            } else {
                HRA = 3000;                // Fixed HRA of 3000
                DA = basicSalary * 0.70;   // 70% DA
            }

            // Calculate gross salary
            grossSalary = basicSalary + HRA + DA;

            // Display the calculated salary details
            System.out.println("Basic Salary: " + basicSalary);
            System.out.println("HRA: " + HRA);
            System.out.println("DA: " + DA);
            System.out.println("Gross Salary: " + grossSalary);

            // Ask user if they want to continue or exit
            System.out.print("Enter -1 to continue or any other number to exit: ");
            int choice = scanner.nextInt();

            if (choice != -1) {
                continueInput = false;  // Exit the loop if the user doesn't enter -1
            }
        }

        // Closing scanner object to prevent resource leak
        scanner.close();
        System.out.println("Program ended.");
    }
}
```

Output

```
Enter basic salary of the employee: 50000
Basic Salary: 50000.0
HRA: 10000.0
DA: 30000.0
Gross Salary: 90000.0
Enter -1 to continue or any other number to exit: -1
Enter basic salary of the employee: 13000
Basic Salary: 13000.0
HRA: 3000.0
DA: 9100.0
Gross Salary: 25100.0
Enter -1 to continue or any other number to exit: 0
Program ended.
```

Assignment-3

```java
package lab;
import java.util.Scanner;
public class OddEvenCounter {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Initialize counters for odd and even numbers
        int evenCount = 0;
        int oddCount = 0;

        // Loop for user input
        while (true) {
            System.out.print("Enter a number (or -1 to stop): ");
            int number = scanner.nextInt();

            // Check if user wants to exit
            if (number == -1) {
                break;  // Exit the loop
            }

            // Check if the number is even or odd
            if (number % 2 == 0) {
                evenCount++;  // Increment even count
            } else {
                oddCount++;   // Increment odd count
            }
        }

        // Print the result
        System.out.println("Total even numbers: " + evenCount);
        System.out.println("Total odd numbers: " + oddCount);

        // Close the scanner to prevent resource leak
        scanner.close();
    }
}
```

Output

```
Enter a number (or -1 to stop): 1995
Enter a number (or -1 to stop): 12
Enter a number (or -1 to stop): 30
Enter a number (or -1 to stop): 2002
Enter a number (or -1 to stop): 4
Enter a number (or -1 to stop): 3
Enter a number (or -1 to stop): -1
Total even numbers: 4
Total odd numbers: 2
```