

King Saud University
College of Computer & Information Science
CSC111 - Lab04
Loops
All Sections

Instructions

Web-CAT submission URL:

<http://10.131.240.28:8080/Web-CAT/WebObjects/Web-CAT.woa/wa/assignments/eclipse>

Objectives:

Student should learn how to:

- 1- Follow the loop design strategy to develop loops.
- 2- Control a loop with a sentinel value.
- 3- Write loops using for statements

Lab Exercise 1

Write a program that reads an unspecified number of integers, determines how many positive and negative values have been read, and computes the total and average of the input values (not counting zeros). Your program ends with the input 0. Display the average as a floating-point number.

Here are some sample runs:

```
Enter integers ending with 0: 1 2 -1 3 0 ↵
The number of positives is 3
The number of negatives is 1
The total is 5
The average is 1.25
```

Enter integers ending with 0: 0 ↵
no numbers are entered except 0

Solution

- 1- Create a new project in eclipse and name it **lab04**
- 2- Create a new class and name it **CountPosNeg**. Make sure you choose the public static void main option.
- 3- Write the program as following (you can ignore comments):

```
import java.util.Scanner;

public class CountPosNeg {
    public static void main(String[] args) {
        int countPositive = 0, countNegative = 0;
        int count = 0, total = 0, num;

        Scanner input = new Scanner(System.in);
        System.out.print("Enter integers ending with 0: ");
        num = input.nextInt();

        while (num != 0) {
            if (num > 0)
                countPositive++;
            else if (num < 0)
                countNegative++;

            total += num;
            count++;

            // Read the next number
            num = input.nextInt();
        }

        if (count == 0)
            System.out.println("no numbers are entered except 0");
        else {
            System.out.println("The number of positives is " + countPositive);
            System.out.println("The number of negatives is " + countNegative);
            System.out.println("The total is " + total);
            System.out.println("The average is " + total * 1.0 / count);
        }
    }
}
```

- 4- When you are done, save your program and run it. Make sure it prints the output as shown above.
- 5- Submit your program to WebCAT through. Ask your TA for help.

Lab Exercise 2

Write a program that prompts the user to enter the number of students and each student's name and score (at least two students), and finally displays the student with the highest score and the student with the second-highest score.

Here is a sample runs:

```
Enter the number of students: 4 ↵
Enter a student name: Mohammed ↵
Enter a student score: 75 ↵
Enter a student name: Ali ↵
Enter a student score: 85 ↵
Enter a student name: Fahad ↵
Enter a student score: 98 ↵
Enter a student name: Khalid ↵
Enter a student score: 65 ↵
Top two students:
Fahad's score is 98.0
Ali's score is 85.0
```

Solution

- 1- Use the same project **lab04** that you created before
- 2- Create a new class and name it **HighScore**. Make sure you choose the `public static void main` option.
- 3- Write the program as following (you can ignore comments):

```
import java.util.*;

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

        // Prompt the user to enter the number of students
        System.out.print("Enter the number of students: ");
        int numberOfStudents = input.nextInt();

        System.out.print("Enter a student name: ");
        String student1 = input.next();

        System.out.print("Enter a student score: ");
        double score1 = input.nextDouble();

        System.out.print("Enter a student name: ");
        String student2 = input.next();

        System.out.print("Enter a student score: ");
        double score2 = input.nextDouble();

        // Make sure that student1 is for the highest
        // and student2 is for the second highest
        if (score1 < score2) {
            // Swap
            String tempString = student1;
            double tempScore = score1;

            student1 = student2;
            score1 = score2;

            student2 = tempString;
            score2 = tempScore;
        }
    }
}
```

```
for (int i = 0; i < numberOfStudents - 2; i++) {
    System.out.print("Enter a student name: ");
    String student = input.next();

    System.out.print("Enter a student score: ");
    double score = input.nextDouble();

    if (score > score1) {
        student2 = student1; // student1 now is the second highest
        score2 = score1;

        student1 = student; // new student becomes the highest
        score1 = score;
    }
    else if (score > score2) {
        student2 = student; // new student becomes the second highest
        score2 = score;
    }
}

System.out.println("Top two students:");
System.out.println(student1 + "'s score is " + score1);
System.out.println(student2 + "'s score is " + score2);
}
```

- 6- When you are done, save your program and run it. Make sure it prints the output as shown above.
- 7- Submit your program to WebCAT through. Ask your TA for help.

Done...