
**GIFT School of Engineering and Applied Sciences**

**Fall 2020**

**CS-124: Introduction to Programming - Lab**

# Lab-9 Manual

**Iterations and Input Validation**

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# Task #1: Writing both *for* and a *while* loop

In this task, you are being asked to write loops in Java using the *for* iteration.

Write a for and while loop that displays the following set of numbers:

**0, 10, 20, 30, 40, 50 ... 1000**

1. Create a program called **Loops1Lab9.java**
2. Correctly display appropriate messages.

# Task #2: Writing both *for* and a *while* loop

In this task, you are being asked to write loops in Java using the *while* and *for* iterations.

Write a loop that asks the user to enter a number. The loop keeps a running total of the numbers entered. The loop should ask the user whether he or she wishes to perform the operation again. If so, the loop should repeat; otherwise it should terminate.

**NOTE:** Write the loop using both *while* and *for* iterations. Use a character input of **y** or **Y** to repeat, and **n** and **N** to terminate the loop. No **break** statement is allowed.

**HINT:** Use **nextLine()** method of **Scanner** to get the **String** input, and then use the **chatAt(0)** method of **String** to get the single character input.

1. Create a program called **Loops2Lab9.java**
2. Create appropriate variables and assign values using a **Scanner** object.
3. Correctly display appropriate messages.

# Task #3: Writing both *for* and a *while* loop

In this task, you are being asked to write loops in Java using the *while* and *for* iterations.

Write a loop that asks the user to enter two numbers. The numbers should be added, and the sum displayed. The loop should ask the user whether he or she wishes to perform the operation again. If so, the loop should repeat; otherwise it should terminate.

**NOTE:** Write the loop using both *while* and *for* iterations. Use a character input of **y** or **Y** to repeat, and **n** and **N** to terminate the loop. No **break** statement is allowed.

**HINT:** Use **nextLine()** method of **Scanner** to get the **String** input, and then use the **chatAt(0)** method of **String** to get the single character input.

1. Create a program called **Loops3Lab9.java.**
2. Create appropriate variables and assign values using a **Scanner** object.
3. Correctly display appropriate messages.

## Task #4: Writing a *for* loop

In this task, you are being asked to write loops in Java using the *for* iteration.

Write a *for* loop that calculates the total of the following series of numbers:

$$\frac{1}{30}+\frac{2}{29}+\frac{3}{28}+\cdots\frac{30}{1}$$

1. Create a program called **SeriesLoopLab9.java.**
2. Correctly display appropriate messages.

# Task #5: Performing input validation

In this task, you are being asked to perform input validation using a loop in Java.

Write a program that asks the user to input two positive integers. The first integer must be an **even** integer, and the second must be an **odd** integer. Use input validation to make sure that the numbers are positive and the first is an **even** and the second is an **odd** integer. The program prints a running total, a count, and the square of both numbers.

The loop should ask the user whether he or she wishes to perform the operation again. If so, the loop should repeat; otherwise it should terminate.

**NOTE:** Write the loop using the *while* iteration. Use a character input of **y** or **Y** to repeat, and **n** and **N** to terminate the loop. No **break** statement is allowed.

**HINT:** Use **nextLine()** method of **Scanner** to get the **String** input, and then use the **chatAt(0)** method of **String** to get the single character input.

1. Create a program called **Loops5Lab9.java.**
2. Correctly display appropriate messages.

# Task #6: Performing input validation

In this task, you are being asked to perform input validation using a loop in Java.

The distance a vehicle travels can be calculated as follows:

***Distance = Speed * Time***

For example, if a train travels 40 miles-per-hour for three hours, the distance traveled is 120 miles. Write a program that asks for the speed of a vehicle (in miles-per-hour) and the number of hours it has traveled. It should use a loop to display the distance a vehicle has traveled for each hour of a time period specified by the user. For example, if a vehicle is traveling at 40 mph for a three-hour time period, it should display a report similar to the one that follows:

| **Hour** | **Distance Traveled** |
|---|---|
| **1** | **40** |
| **2** | **80** |
| **3** | **120** |

***Input Validation:*** Do not accept a negative number for speed and do not accept any value less than 1 for time traveled.

1. Create a program called **DistanceTraveledLab9.java.**
2. Create appropriate variables and assign values using a **Scanner** object.
3. Correctly display appropriate messages.

# Task #7: Using a Sentinel value to control a loop

In this task, you are being asked to write a loop in Java controlled using a sentinel value.

Write a program with a loop that lets the user enter a series of integers. The user should enter **-99** to signal the end of the series. After all the numbers have been entered, the program should display the sum and average of the numbers.

**NOTE:** Use the value **-99** as the sentinel value.

1. Create a program called **SentinelValueLab9.java.**
2. Create appropriate variables and assign values using a **Scanner** object.
3. Correctly display appropriate messages.