



GIFT School of Engineering and Applied Sciences

Fall 2020

CS-124: Introduction to Programming - Lab

Lab-8 Manual

Iterations

Task #1: Writing a while loop

In this task, you are being asked to write a loop in Java.

Write a program that reads a set of **10** integers and then finds and prints the sum of the even and odd integers.

1. Create a program called **WhileLoops1Lab8.java**.
2. Use a Scanner object for the input.
3. Correctly display appropriate messages.

Task #2: Writing a while loop

In this task, you are being asked to write a loop in Java.

Write a program that reads a set of **20** integers and then finds and prints the count of the even and odd integers.

1. Create a program called **WhileLoops2Lab8.java**.
2. Create appropriate variables and assign values using a **Scanner** object.
3. Correctly display appropriate messages.

Task #3: Drawing a flowchart and writing a while loop

In this task, you are being asked to draw a flowchart and then write a loop in Java.

Draw a flowchart and write a program that prompts the user to input a positive integer. It should then output a message indicating whether the number is a prime number.

Note: An even number is prime if it is 2. An odd integer is prime if it is not divisible by any odd integer less than or equal to the square root of the number.

1. Create a program called **PrimeNumber1Lab8.java**
2. Create appropriate variables and assign values using a **Scanner** object.
3. Correctly display appropriate messages.

Task #4: Drawing a flowchart and writing a while loop

In this task, you are being asked to draw a flowchart and then write a loop in Java.

Draw a flowchart and write a program that prompts the user to input a positive integer. It should then output a message indicating whether the number is a prime number.

Note: Any integer is prime if it is not divisible by any other number, starting from **2**, and less than or equal to half of that number.

HINTS: The minimum divisor (factor) you should consider is **2**. The largest factor of any number would be half of that number.

1. Create a program called **PrimeNumber2Lab8.java**
2. Create appropriate variables and assign values using a **Scanner** object.
3. Correctly display appropriate messages.

Task #5: Writing a while loop

In this task, you are being asked to write a loop in Java.

Write a program that uses while loops to perform the following steps:

- a) Prompt the user to input two integers: firstNum and secondNum (firstNum must be less than secondNum).
 - b) Output all odd numbers between firstNum and secondNum.
 - c) Output the sum of all even numbers between firstNum and secondNum.
 - d) Output the numbers and their squares between firstNum and secondNum.
 - e) Output the sum of the square of the odd numbers between firstNum and secondNum.
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1. Create a program called **WhileLoops3Lab8.java**. All loops will be written in this file.
 2. Create appropriate variables and assign values using a **Scanner** object.
 3. Correctly display appropriate messages.

Task #6: Writing a while loop

In this task, you are being asked to write a loop in Java.

Write a program that uses **while** loops to perform the following steps:

- a) Output all uppercase letters.
- b) Output all lowercase letters.
- c) Output all uppercase letters between **J** and **S**
- d) Output all lowercase letters starting from **a** and skipping two letters
For example, **a, d, g, ...**
- e) All uppercase letters from **Z** to **K**, by decrementing loop

HINTS: To print characters, see the below code:

```
char c = 'A';  
System.out.println(c);           //prints A  
  
++c;  
System.out.println(c);           //prints B
```

1. Create a program called **CharactersLab8.java**. All loops will be written in this file.
2. Correctly display appropriate messages.

Task #7: Writing a while loop

In this task, you are being asked to write a loop in Java.

Write a program that prints a Celsius/Fahrenheit conversion table, starting from **0** to **100**, such as the following.

```
Celsius | Fahrenheit
-----+-----
      0 |    32
     10 |    50
     20 |    68
     . . . . .
    100 |   212
```

HINTS: Use the following formula to convert the Celsius to Fahrenheit:

$$T(^{\circ}\text{F}) = T(^{\circ}\text{C}) \times 9/5 + 32$$

1. Create a program called **CelsiusToFahrenheitLab8.java**.
2. Correctly display appropriate messages.

Task #8: Writing a while loop

In this task, you are being asked to write a loop in Java.

Write a program that takes inputs a **base** and an **exponent** from the user and prints the power for that number. Both base and exponent must be greater than or equal to zero. You must also handle the case when the exponent is zero (see sample below).

Note: You cannot use any built-in library function from **Math** class.

Sample Output:

```
Enter Base: 2
Enter Exponent: 5
2 ^ 5 = 32

Enter Base: 3
Enter Exponent: 0
3 ^ 0 = 1
```

1. Create a program called **ExponentLab8.java**.
2. Correctly display appropriate messages.