Lab Assignment 02

Inspiring Excellence

Course Code:	**CSE111**
Course Title:	**Programming Language II**
Topic:	**Loops**
Number of Tasks:	**11**

(There are 11 total tasks, therefore you would have 11 total `.java` files.
If any task has parts a, b, c etc, complete all the parts in the same file)

Task 1

Using while loops, write a java code to display/print the following serieses:

(a) `2, 6, 10, 14, 18, 22, 26, 30, 34, 38, 42, 46, 50`

(Hint: Identify the start, end, and common increment)

(b) `1, 3, 6, 10, 15, 21, 28, 36, 45, 55, 66, 78, 91, 105, 120`

(Hint: at each iteration, the increment amount also increases)

Task 2

Using for loop or while loop, write a java program that displays the following palindromic sequence of numbers:
(A palindromic sequence of numbers means the sequence stays the same when the numbers are reversed)

`2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 18, 16, 14, 12, 10, 8, 6, 4, 2`

Task 3

Write a java program that takes 10 inputs from the user in a loop, and displays the sum, average, minimum and maximum of those numbers.

Sample Input	Sample Output
1 4 2 9 2 -4 3 -1 0 1	Sum = 17 Minimum = -4 Maximum = 9 Average = 1.7
23 2 -4 0 8	Sum = 138 Minimum = -11 Maximum = 53 Average = 13.8

12 34 -11 53 21	

Task 4

Write a java program that takes 10 inputs from the user in a loop, and displays the sum, average, minimum and maximum of **ONLY THE POSITIVE ODD NUMBERS** from those numbers. If no such numbers are found, then display the message “No odd positive numbers found”.

Sample Input	Sample Output
1 4 2 9 2 -4 3 -1 0 1	Sum = 14 Minimum = 1 Maximum = 9 Average = 3.5
34 -11 50 24 -24 2 -4 0 8 12	No odd positive numbers found
23 2 -4 0 8 12 34	Sum = 97 Minimum = 21 Maximum = 53 Average = 32.333333333333336

-11 53 21	

Task 5

Write a java program that takes inputs from the user in a loop **until three consecutive zeros are entered**, then displays the sum, average, minimum and maximum of those numbers. You can consider the zeros in the input to be excluded in the sum / max / min / average.

Sample Input	Sample Output
4 1 12 54 0 0 37 4 0 0 0	Sum = 112 Minimum = 1 Maximum = 54 Average = 18.666666666666668
0 0 0	No numbers found

Task 6

Write a java program to calculate **weighted average** of 5 decimal numbers, where the numbers will be given in the following format:

num1
weight1
num2
weight2
num3
weight3
num4
weight4

num5
weight5

The formula for calculating weighted average is as follows:

$$W = \frac{\sum_{i=1}^{n} w_i X_i}{\sum_{i=1}^{n} w_i} = \frac{w_1 X_1 + w_2 X_2 + \ldots}{w_1 + w_2 + \ldots} = \frac{sum(weight*number)}{sum(weight)}$$

Sample Input	Sample Output
95.5 2 72.1 4 -3.8 1 0 2 59 1	Weighted Average = 53.459999999999994
3 2 4 2 5 2 6 2 7 3	Weighted Average = 5.181818181818182

Task 7

Fibonacci sequence is a sequence in which each number is the sum of the two preceding numbers, where starting values are most commonly two 1s (1, 1, . . .).

(a) Write a java program to display the fibonacci sequence until an input number.

Sample Input	Sample Output
15	1 1 2 3 5 8 13

70	1 1 2 3 5 8 13 21 34 55

(b) Write a java program to display the fibonacci sequence until an input number, along with the sum of the sequence.

Sample Input	Sample Output
15	1 1 2 3 5 8 13 Sum = 33
77	1 1 2 3 5 8 13 21 34 55 Sum = 143

Task 8

Write a java program that takes 2 integer numbers as input and calculates how many prime numbers exist between them.

Sample Input	Sample Output
10 15	There are 2 prime numbers between 10 and 15.
150 100	There are 10 prime numbers between 100 and 150.

Task 9

(a) Write a java program to take an **integer** as input and display how many digits there are in the number.

Sample Input	Sample Output
5500	4 digits

`647823`	`6 digits`

(b) Write a java program that encrypts an input integer by multiplying each digit by 7. (Hint: You will need to use the code from part *a*).

Sample Input	Sample Output
`3705`	`21 49 0 35`
`99944`	`63 63 63 28 28`

Task 10

Write a java program that when given an amount of money, it calculates how many paper notes it will take to represent it. For simplicity let's assume we have only 500, 100, 50,10, 5 and 1 paper notes available.

Note: You cannot use multiplication or division for this task

Sample Input	Sample Output
1500	3 500's note
3724	7 500's note 2 100's note 2 10's note 4 1's note

Task 11

Write a java programs to print the following patterns

(a) Square pattern

Sample Input	Sample Output
5	***** ***** ***** ***** *****

(b) Triangle pattern

Sample Input	Sample Output
5	* ** *** **** *****