

**Lab 05: Loops**

**CSE 4108**

**Structured Programming I Lab**

September 2023

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**Lab Tasks**

**1. Reverse Digits 2 - Use of Loops:**

In **Lab 4 - Expressions (Reverse Digits)**, you were asked to write a program that displays a *two-digit* number with its digits reversed. Generalize the program so that the number can have one, two, three, or more digits.

**2. Even Squares:**

Write a program that prompts the user to enter a number *n*, then prints all even squares

between *1* and *n*. For example, if the user enters *100*, the program should print the following:

Sample run:

**Enter the value of n: 100**

**4**

**16**

**36**

**64**

**100**

**3. A lot to print:**

Write a program that finds a bunch of things (***number of inputs, sum, average, maximum, number of odd values***)in a series of numbers entered by the user. The program must prompt the user to enter numbers one by one. When the user enters **0** or **a negative number**, the program will end and display the results.

Sample Run:

**Enter a number: 5**

**Enter a number: 10**

**Enter a number: 11**

**Enter a number: 1**

**Enter a number: 3**

**Enter a number: 8**

**Enter a number: 10**

**Enter a number: 4**

**Enter a number: 1**

**Enter a number: 6**

**Enter a number: 7**

**Enter a number: 10**

**Enter a number: 7**

**Enter a number: 0**

**The number of inputs is 13**

**The sum of the input values is 83**

**The average of the input values is 6.38**

**The number of odd values input is 7**

**The maximum value entered was 11**

**4. Forever A loan:**

ABC Bank Ltd. provides loans to its customers. The customers return the amount by a fixed monthly payment. On each month however, the remaining balance is incremented by the interest rate assigned for each customer. The total balance at the end of each month can be calculated using the following formula:

*currBalance = prevBalance - pay + (prevBalance × rate)*

*Here,*

*currBalance = Updated Balance*

*prevBalance = Previous Balance*

*pay = Monthly Payment*

*rate = Monthly Interest Rate*

Your task is to write a program that calculates the remaining payable amount on a loan after

each monthly payment.

Your program will take the loan amount, yearly interest rate, and ask the user for monthly payments as inputs and show the remaining balance as outputs. When the user enters **0** or **a negative number**, the program will end.

You need to display each balance with two digits after the decimal point.

Sample Run:

**Enter amount of loan: 20000.00**

**Enter interest rate: 6.0**

**Enter monthly payment: 386.66**

**Balance remaining after payment 1: $19713.34**

**Enter monthly payment: 386.66**

**Balance remaining after payment 2: $19425.25**

**Enter monthly payment: 0**

**End of Program!!**

**5. E:**

The value of the mathematical constant e can be expressed as an infinite series:

Write a program that approximates e by computing the value of:

where n is an integer entered by the user.

**6. Is it really Christmas?:**

Given an integer input **n**, build a christmas tree.

Sample run:

| Input | Output |
| --- | --- |
| 1 | 1  \* |
| 2 | \*  \*\*\*  \*  \* |
| 3 | \*  \*\*\*  \*\*\*\*\*  \*\*\*  \*\*\*  \*\*\* |
| 4 | \*  \*\*\*  \*\*\*\*\*  \*\*\*\*\*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\* |

**7. Sasha and Sticks:**

Login to Codeforces using your handle and submit the solution to the following problem: <https://codeforces.com/problemset/problem/832/A>

**8. Bear and Big brother:**

Login to Codeforces using your handle and submit the solution to the following problem:

<https://codeforces.com/problemset/problem/791/A>