CS100 Computational Problem Solving
Fall 2019-20

Section 1

Tuesday, 22 October 2019

Lab 08: Exercise

Lab Guidelines

1. Make sure you get your work graded before the lab time ends.
2. You put all your work into the folder **Lab8_YourRollNo_TAname** and submit it on LMS (Assignment>Lab8) before the time the lab ends.
3. Talking to each other is NOT permitted. If you have a question, ask the lab assistants.
4. The object is not simply to get the job done, but to get it done in the way that is asked for in the lab.
5. Phone is NOT allowed. Put it in bag or at instructor desk.
6. Any cheating case will be reported to Disciplinary Committee without any delay.

Coding Conventions:

1. Constants are ALL_CAPS.
2. Variables are all_small.
3. All curly brackets defining a block must be vertically aligned.

Learning Objective:

1. PO-02 Develop proficiency in the practice of computing.
2. CO-02 To help students analyze and solve programming problems
3. LO-02 Critical Thinking and Analysis
4. LO-03 Problem Solving
5. LO-05 Responsibility

Marks: Name: _____ Roll #: _____

Task1									Total
									20

Task2	Q1	Q2							Total
	15	20							35

Task 3									Total
									20

Task 4									Total
									25

Total Marks Obtained

/100

TA: _____

Let's Begin

Task 1: [20 marks]

Write a program which asks the user to enter a phrase/sentence and then provides the following information to the user:

- Total number of words in the phrase
- Total number of vowels in the phrase

Task 2: [35 marks]

Part A: [15 marks]

Write a program which prints first **n** odd numbers and their sum. Take the value of **n** from the user and then use for loop to perform the task.

Part A: [20 marks]

Perfect Number: A positive integer that is equal to the sum of its proper divisors. The smallest perfect number is 6, which is the sum of 1, 2, and 3. 28 is also a perfect number.

Using for loop, write a C++ program to find if the given number is perfect or not.

Task 3: [20 marks]

Write a program in C++ to find the sum of the series 1 + 1/2^2 + 1/3^3 + ……. + 1/n^n.

Sample Output:

Input the value for nth term: 5
1/1^1 = 1
1/2^2 = 0.25
1/3^3 = 0.037037
1/4^4 = 0.00390625
1/5^5 = 0.00032
The sum of the above series is: 1.29126

Task 4: **[25 marks]**

Write a program in C++ to convert a binary number (taken as an integer variable) to a decimal number. Negative Binary Inputs should be considered as an error in your code. You must do error handling for inputs given as string, char or non-binary numbers such as 1002.

Sample output:

Enter any binary number: 1101
Binary Number 1101 as a Decimal Number is: 13