PDS-Lab (Section-17, Autumn 2020-21)
Class Test – 1 (4^{th} Jan 2021, 2.30 – 4.30 PM) Marks = 100

Instructions:

a) *Create a directory named as <rollno>_ct1, where <rollno> is your roll number.*
b) *Give the name of the program as <p>.c where <p> implies the problems number, like 1.c 2.c 3.c etc. Store all the program under this class test in the directory <rollno>_ct1. Zip the entire directory <rollno>_ct1.*
c) *You should upload your zipped file <rollno>_ct1.zip to the Moodle course web page latest by **4.30 PM** (without penalty). The **cutoff time** will be till **5.00 PM** with a penalty of **25%** on your secured marks (i.e., if you secured 80 marks, after penalty you will get 60 marks). Beyond 5.00 PM, the moodle system will not allow you to submit, as a result you will get zero.*
d) Do not use library functions
e) *Penalty for plagiarism/copying: You will be awarded **0 (zero)** in the Test if you are involved in plagiarism/copying and an **additional 10 marks** will be deducted from overall PDS Lab marks.*
f) *Keep your Camera **ON** (with **No virtual background**) throughout the Test. You should be always in front of the camera.*

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1. Write a C program to compute the approximate sum of the given infinite series, where the final term to be added/subtracted to be greater than 10^{-5} or (0.00001) **(25 Marks)**

   Sum = $x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \ldots\ldots\ldots\ldots$

   The program has to accept the value of ***x*** from the user and display each term to be added to the Sum, and finally it should print the number of terms considered for summation and Sum value.

2. Write a C program to do the following: **(35 Marks)**
   (a) Accept the value of N (maximum up to 100) from the user through keyboard. If user enters N <= 0, the program should display an error message to the user and suggest to enter positive integer. This process has to repeat till the user enters valid integer (1<=n<=100).
   (b) Enter N integer values from the keyboard into an array.
   (c) Find the maximum and minimum values present in an array. Display the maximum and minimum values and their positions in the array.
   (d) Place the minimum and maximum values of an array at the beginning and ending of the array, respectively.

Example:

N = -7
Entered N value is not valid. The range of N is 1<=N<=100.
N=7
Array elements = 78, 22, -5, 10, -2, 101, 61
Max = 101
Position of Max in the array = 5
Min = -5
Position of Min in the array = 2
Re-arranged array = -5, 78, 22, 10, -2, 61, 101

3. Write a C program to print all possible sub-strings of a given string from the end in reverse order. First, accept the input string (alpha-numeric characters) terminated with a new line character. Print the input string collected through key board, and print the sub-strings as shown below: **(40 Marks)**

Input: abcdefg
Output:

g	f	e	d	c	b	a
gf	fe	ed	dc	cb	ba	
gfe	fed	edc	dcb	cba		
gfed	fedc	edcb	dcba			
gfedc	fedcb	edcba				
gfedcb	fedcba					
gfedcba						

Input: 12345

Output:

5	4	3	2	1
54	43	32	21	
543	432	321		
5432	4321			
54321				