

COL 100

Assignment 4: Loops

Questions 1, 3 are graded.

Question 2 is a non graded question

Question 1. Write a C++ program to print out the value of e^x using taylor series expansion. The expansion should continue until the absolute value of the N^{th} term is less than Err.

The program takes 2 user inputs - X , Err.

X : Real number

Err: Positive Allowable error, N^{th} term of the e^x is lesser than err

Output of the program is

e^x : natural exponential of a number

N : Number of terms necessary for computing

In case invalid data input is recieved the program should output "INVALID INPUT" .

Example 1:

X = 2

Error = 1

Taylor series

$$e^x = 1/1 + x/1 + x^2/2 + x^3/6 + \dots + x^n/n! + \dots$$

$$e^2 = 1/1 + 2/1 + 2^2/2 + 2^3/6 + \dots + 2^n/2! + \dots$$

$$e^2 = 1 + 2 + 2 + 1.33 + 0.67 + \dots$$

If now error is 1.

We can terminate the series at 0.67

$$e^2 = 1 + 2 + 2 + 1.33 + 0.67 = 7$$

So, Output is

$$e^2 = 7$$

$$N = 5$$

Non Graded

Question 2. In C++ print A-Z, a-z and 0-9 on the terminal using a loop.

Hint : Use ascii equivalents. Eg: 'A' = 0x41, 'B' = 0x42 and so on, 'Z' = 0x5A

Question 3. Print the following pattern on the terminal for positive value of N(≤ 26).

In case invalid data input is recieved the program should output "INVALID INPUT"

Example below shows

Input N=1

Output :

A

Input N=2

Output :

ABA

A A

ABA

Input N=5

Output :

ABCDEDCBA

ABCD DCBA

ABC CBA

AB BA

A A

AB BA

ABC CBA

ABCD DCBA

ABCDEDCBA

Input N=-1

Output :

INVALID INPUT