

Assignment III

Submit all the programs separately against each assignment (i.e. asgn3a, asgn3b, and asgn3c) in the Moodle System 15 minutes before the end of the laboratory session. Provide the result in a separate output file (named, result_<assgn><no>.txt). Use standard output redirection feature to generate the output file.

Hints. If you run the program with the following command

`./a.out >result.txt`

Output of your program (generated by printf(.) function) will be written in file result.txt. You need to provide input from your input, by remembering the sequence of inputs to be given.

If you execute the program multiple times, you may concatenate the outputs in a single file by using the following redirection command:

`./a.out >>result.txt`

3(a) Write a program which computes the following series till the accuracy of 5th place of decimal.

$$S=1+x^2/2!+x^4/4!+....$$

Provide output for following values of x:
x= -2.5, -1.0, 0.5, 1.0, 2.5

3(b) Read a real value x and an integer number N , and compute the following sum S .

$$S = 1/(1+x) + (1+x)/(1+x+x^2) + (1+x+x^2)/(1+x+x^2+x^3) + \dots \text{ to } N \text{ terms}$$

Note that the sum S must be a floating-point number (float or double).

Provide outputs for the following:

$$N=5, x=1.0$$

$$N=10, x=0.5$$

$$N=15, x=-1$$

$$N=20, x=0.5$$

$$N=25, x=2$$

3(c) Given an integer M , let the product of its distinct prime factors be denoted as P . We define the distinct primal fraction of the number as a ratio of P and M , i.e. P/M . Write a program, which reads an integer N and a fractional value $t(<1)$, and prints the sequence of number from 2 to N , whose distinct primal functions are less or equal to t .

For example, given $N=10$, $t=0.5$, it prints the following:

4, 8, 9

Provide the output for the following input:

$$N=32, t=0.75$$

$$N=16, t=0.5$$

$$N=100, t=0.75$$

$$N=128, t=0.9$$

$$N=256, t=0.5$$

N.B. All your programs may be tested for other input data.