Assignment-II

Write your name, roll number, PC number and assignment number in the header of the program file as comments. You may give your program file name as <asgn><no_><RollNo>.c. For example, a student with roll number 17CS1001 should name the program file for assignment number 2(a), as asgn2a_17CS1001.c.

Submit all the programs separately against each assignment (i.e. asgn2a, asgn2b, and asgn2c) in the Moodle System 15 minutes before the end of the laboratory session.

All the results for each assignment should be submitted together in a separate file (named result.txt). Provide the result in a separate output file (named, result_<assgn><no>.txt). Use standard output redirection feature to generate the output file.

Hints. Suppose you would like to redirect your output to a file 'result.txt'. 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

Input redirection (optional):

You may also store your input (the ordering as per requirement of the program should be preserved) in an input file in.txt, and execute the program as follows:

./a.out <in.txt >result.txt

2(a) Write a C-program which given an input value x (a real number to be read) computes functional value as well as the sign of the the derivative of the following function at x as given below

$$f(x)= 2x^3-6x^2+4.5\ x-2$$

If the derivative is positive, it prints '1'. If it is negative, prints '-1'. Otherwise, it prints '0'. Run your program to provide results for the following input numbers.

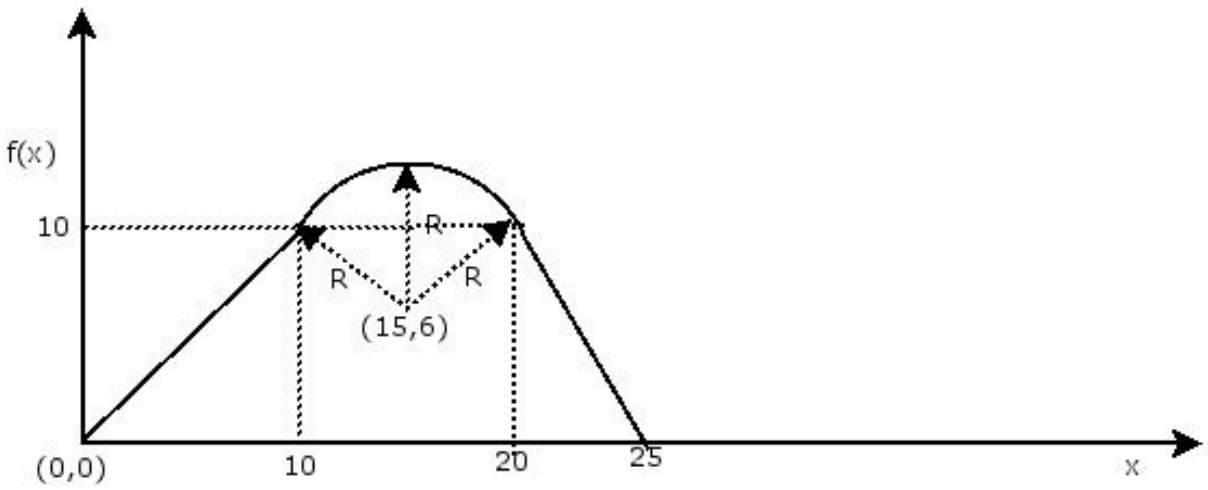
-3.4, 2.8, -10, 10, 0

2(b) Write a C-program which reads the center (x and y coordinates) and radius of a circle as input, and given a point p (to be read) prints whether the point lies within, outside or on the circle. You may print a suitable message as a result of the above test.

Provide results for the following input data set:

1. Center: (4.5, 3) ; Radius: 20; Point p= (15, 18).
2. Center: (5, 5) ; Radius: 5; Point p= (10, 5).
3. Center: (5, 10) ; Radius: 5; Point p= (10, 20).
4. Center: (-5, 15) ; Radius: 15; Point p= (0, 0).
5. Center: (15, 5) ; Radius: 25; Point p= (40,20).

2(c). Write a C-program and implement the function given in the following diagram.



Provide functional values at the following values of x

x= 5, 15, 17, 23, 25, and 60.

N.B. All your programs may be tested by other input values.