

Section 16

PDS Lab

Assignment - 5

28.08.2018

Instructions:

Create a sub directory named as **Lab5**.

Give the name of the programs as <p>_1.c, <p>_2.c, .. etc. for the problem 1, 2....., respectively. Here <p> implies the part number. For example, Part-A

Store all the programs under this assignment in the directory **Lab5**.

Zip the entire directory **Lab5** and rename it as <R>_Lab5_tar.gz. where <R> denotes your Roll No.

You should upload your zipped file to the Moodle course web page latest by 11:55 hrs.

Part-A

1. Define a function void **PrintName** () which should read a string from the user and then print “Hello” followed by the string entered. Call the function **PrintName** () from the **main** () function.

Test input:

- i. Kharagpur
- ii. IIT Kharagpur

2. Write a function **int max3 (int x, int y, int z)** which will take 3 integer values as the argument and return the largest value among them.

Run the function from **main** ().

Test input:

- i. 5 5 5
- ii. 6 9 4
- iii. 4 5 6
- iv. 6 5 4
- v. 6 5 5

3. (a) Declare an array say X of floating point values in global section of size MAX.
(b) Define a function **void readValues (int n)** to read n float values from the keyboard and store them in the array X.
(c) Define another function **void arrangeReverse (int n)** to arrange the n numbers in reverse order.

(d) Call the function **readValues (..)** from the **main ()**, then call the function **arrangeReverse (..)** from the function **readValues (..)**.

(e) Print the array from the **main ()**.

Test input:

- I. 4.5 5.6 6.7 7.8 8.9 9.0
- II. 67 56 45 34 23 12 89
- III. 9.9 7.7 5.5 4.4 6.6 8.8 1.1

Part-B

4. Write a function **void qeqnSolver (..)** which will take an equation $ax^2 + bx + c = 0$ from the user and then do the following.

(a) If $a = 0$ print the solution $x = -\frac{c}{b}$

(b) If $a \neq 0$ and $b^2 \geq 4ac$, then print the two solutions

$$x_1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a} \text{ and}$$

$$x_2 = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

(c) If $a \neq 0$ and $b^2 < 4ac$, then print “No real solution possible”. You should call the function **qeqnSolver (..)** from **main ()**.

Test input:

- i. $3x^2 - 12x + 12 = 0$
- ii. $5x - 6 = 0$
- iii. $3x^2 + 5x - 9 = 0$
- iv. $-5.1x^2 - 3.2x - 2.3 = 0$

5. (a) Write a function **int sumString (..)** which will calculate the sum of ASCII values of all the characters in a string.

(b) Write another function **void stringComp (..)** which will read two strings from the keyboard and store them as S_1 and S_2 . This function calls **sumString (..)** function for S_1 and S_2 and then return the values say y_1 and y_2 .

(c) Finally, **stringComp** (..) function will print the string S_1 if $y_1 \geq y_2$ else S_2 .

Test input:

- i. iit kgp
- ii. iitkgp NULL
- iii. kharagpur 721302
- iv. NULL NULL

Part-C

6. (a) Read any two strings S_1 and S_2 and say their lengths are l_1 and l_2 .
- (b) Read any integer number say k such that $0 < k < l$ where l is the smallest of l_1 and l_2 .
- (c) Write a function **void crossover** () which produces two strings S'_1 and S'_2 such that in S'_1 , the first k characters from S_1 and then the trailing $(l_2 - k)$ characters from S_2 and vice-versa.



(d) Solve the problem writing a C program using as much function as you can think.

Test input:

- i. "Ram is a very good boy"
- i. "Sita is a nice girl" with $k = 4$.
- ii. "Kolkata" "Kharagpur" with $k = 10$ and then $k = 1$.