

Shiv Nadar Institution of Eminence, Delhi, NCR

Lab sheet for CSD101 (Introduction to computing and Programming)

Semester of Implementation: Monsoon, 2024

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Instructions:

1. Once you complete the assignment, please show it to the TA.
2. Students must come to the lab and must show the assignments in the designated lab hours. Day-to-day lab performances will be recorded and will carry 15% weightage in internal assessment.
3. Lab will start in exact time. Students should enter the lab and take a seat 5 minutes before.
4. It is recommended to use LINUX platform for execution of the program.
5. Batch change to show the assignments WILL NOT be allowed.
6. Malpractice (in ANY form) will attract heavy penalties.
7. A useful link: <https://www.w3schools.com/c/index.php>

Lab Assignment 9

Deadline: 03-11-2024 (11:55 PM) for Monday batch

05-11-2024 (11:55 PM) for Wednesday batch

06-11-2024 (11:55 PM) for Thursday batch

07-11-2024 (11:55 PM) for Friday batch

Total Marks: 100

Objective: Programs based on Pointers

Steps to run C program

Step 1: gedit filename.c

Step 2: Compiling using GCC compiler

We use the following command in the terminal for compiling our filename.c source file

```
$ gcc filename.c -o filename
```

Step 3: Executing the program

After compilation executable is generated and we run the generated executable using the below command.

```
$ ./filename
```

Q1. Calculator using Function Pointers

Write a C program that implements a simple calculator performing various mathematical operations using function pointers. The operations to implement are *addition*, *subtraction*, *multiplication*, and *division*. The user would need to specify which operation they would like to perform by entering the corresponding operator '+', '-', '*', and '/'.

Input and Output:

```
Enter first number: 9
Enter second number: 2
Enter an operator (+, -, *, /): /
```

Result: 4.50

```
Enter first number: 8
Enter second number: 2
Enter an operator (+, -, *, /): +
```

Result: 10

Q2. Array Operations without Indices

Pointers provide a convenient way to access array elements without using array indices (i.e. array[i]). Implement two array operations *using pointers* instead of indices. Write a C program where a user inputs an array and it can,

[a] Reverse the array elements.

[b] Find the maximum element within the array.

Both the operation [a] and [b] should be implemented as two different functions respectively. In both the cases you should not use array indices. For [a] you should return the maximum element and print that value within the main function.

Input and Output:

Enter the array size: 7

Enter the array elements: {3, 6, 7, 9, 11, 34, 23, 17}

The reversed array is: {17, 23, 34, 11, 9, 7, 6, 3}

The maximum element within the array is: 34

Complementary Assignment for self-practice

Q3. Extend the above question for other array operations like,

[c] Finding sum of array elements.

[d] Finding the count of similar elements within the array.

Input and Output:

Enter the array size: 6

Enter the array elements: {3, 6, 7, 9, 9, 30, 13}

Enter the element to count occurrence: 9

Sum of elements is: 67

Frequency of element 9 is: 2

Q4. Consider a string as a character array and find its length using only pointers (do not use indices). Write a C program to find the length of an input string

Input: Enter the string: "Hello World"

Output: String length is: 11

Submission Format:- You have to upload: (1) The source code in the following format in a zipped folder: Assgn9_RollNo.zip. Inside the zipped folder save each program with Assgn6_task#_RollNo.c

Note: Please follow this naming convention mentioned above.

Grading Policy:- The policy for grading this assignment will be - (1) show to TA 66 marks
(2) Code submission with indentation: 34 marks.

- All submissions are subject to plagiarism checks. Any case of plagiarism will be dealt with severely.