Assignment CSE 104 (Evening) Instructions Marks: 20

Submission Deadline

· **Softcopy – August 18, 2023; 11:59 PM; [Google Classroom]**

Guidelines

I have listed down a few problems in this file. You will have to solve **at least any 10** for the **lab assignment** using C.

After solving the problems, prepare a report on it. Prepare the report according to the following criteria:

- Use the attached cover page template.
- Paste your code for each problem and give an explanation for each code.
- Then submit the softcopy of the report in a **single file PDF** format on Google Classroom before the deadline.
- Preserve your copy of the report for future reference.

Here are the problems:

1. Write logical expressions that tests whether a given character variable ***c*** is
    - lower case letter
    - upper case letter
    - digit
    - white space (includes space, tab, new line)

2. Write a program to print the numbers between 1 and 10, along with an indication of whether each is even or odd, like this:

    1 is odd
    2 is even
    3 is odd

3. Write a ***square()*** function and use it to print the squares of the numbers 1-10:

   1 1
   2 4
   3 9
   4 16
   ...
   9 81
   10 100

4. Write a function to compute the factorial of a number, and use it to print the factorials of the numbers 1-7.

5. Write the following function:

   int countchars(char string[], int ch)

   It returns the number of times the character ***ch*** appears in the ***string.*** For example, the call

   countchars("Hello, world!", 'o');

   would return ***2.***

6. Write a program in C that takes as input a set of numbers and calculates the mean, variance and standard deviation. (Variance is defined as Σ [(xi - $\bar{x}$) ^2]/n - 1, where xi = i th number in the set, $\bar{x}$ is the mean and n = cardinality of the set; standard deviation is the square root of variance).

7. Write a C program that calculates the HCF and LCM of two numbers.

8. Write a C program to display and find the sum of the series 1+11+111+....111 up to ***n.*** For e.g., if n=4, the series is: 1+11+111+1111. Take the value of 'n' as input from the user.

9. Write a C program that reads a positive integer ***n*** and then prints the following pattern

```
 *********
_********
__*******
___******
____*****
_____****
______***
_______**
________*
```

where ***n*** is the number of lines.

10. Write a C function for the following problem: Given a positive integer ***n,*** print the binary representation of ***n.***

11. Write a C program to find the reverse of an integer number.

12. Write a C program to input ***n*** numbers in an array, calculate the sum of all even numbers and all odd numbers in the array and print the larger sum.

    Example:

    If the array contains the following elements:
    2, 3, 3, 5, 4, 8, 7, 11, 2
    The sum of all even elements is 2+4+8+2=16
    Sum of all odd elements is 3+3+5+7+11=29
    Therefore, the output should be 29.

13. Write a C program to print the following pattern:

a) 1
1 2
1 2 3
1 2 3 4
1 2 3 4 5

b) 1
2 2
3 3 3
4 4 4 4
5 5 5 5 5

14. Write a C program to accept the basic salary of an employee from the user. Calculate the gross salary on the following basis:

Basic	HRA	DA
1 - 4000	10%	50%
4001 - 8000	20%	60%
8001 - 12000	25%	70%
12000 and above	30%	80%

15. Write a C program to take a list of ***n*** elements from the user. Store it in an array. Reverse the list.

16. Write a C program to check whether a given string is palindrome or not.

17. Use the ***pow()*** function which is included in ***math.h*** header file to calculate a^b**.** Take ***a*** and ***b*** as input.

18. Write two different C functions to compute area and perimeter of a triangle whose sides ***a, b,*** and ***c*** are given by user as inputs.

    Formula to compute perimeter = a + b + c
    Formula to compute area = [s(s-a)(s-b)(s-c)]^0.5
    Where s = 0.5 * (a+b+c)

    Function prototypes are:
    double perim(double a, double b, double c)
    double area(double a, double b, double c)

19. Write the following function:

    replace(char stringA[], char b[], char c[])

    It finds the string ***b*** in the string ***stringA*** and replaces it with the string ***c.*** You may assume that ***b*** and ***c*** are the same length. For example, the code

char string[] = "recieve";

replace(string, "ie", "ei");

should change string to "receive".

DO NOT COPY! Do not miss the deadline!