Pre Assignment: -

Work with known c programs in linux environment using **gcc** compiler.

Some Hints to work on:-

Follow modern(ISO) standards like C99 while coding , no more old standards like **ANSI/C89**

- no **conio.h** please, so no more **clrscr, getch** (instead you can use unix/linux command **clear** or **ctrl+L** to clear the screen, and no problem of holding output screen with getch)
- return type of **main** must be **int**
- add **return 0** at the end of main

Rest of the changes across the standards can be discussed in further sessions & assignments.

A simple program

```
#include<stdio.h>
int main()
{
        printf("Hello World\n");
        return 0;
}
```

How to build and run:-

1) Open a terminal and switch to desired directory
2) vi hello.c
3) Hit **i** to enter INSERT mode
4) Enter above code/edit existing code
5) Hit **Esc** key , followed by **:wq**
6) gcc hello.c -o hello
   If any errors go to step2
7) ./hello
   If any runtime errors or o/p mismatch go to step2.

(or) 6th and 7th steps can be, i.e. in absence of -o option default executable name is a.out

6) gcc hello.c
7) ./a.out

You may try the following problems with different possible alternatives wherever possible, spot out the optimal logic among the alternatives if any.

Note:- You may skip any part of this assignment if you are confident enough.

1)Basics:-

(1a) Area of the circle

(1b) Swapping of two numbers

(1c) Reversing 3 digit no.

Control Structures:-

2)Simple if-else

(2a) Biggest of two numbers

(2b) Even or odd numbers

(2c) Absolute value of a number

(2d) Given character is vowel or not

(2e) Given year is leap or not

3)Nested if-else

(3a) Biggest of 3,4 numbers

(3b) Quadrant of a point (Q1,Q2,Q3,Q4 etc)

(3c) Leap year or not

4)Else if ladder

(4a) Biggest of 3,4 numbers

(4b) Quadrant of a point (Q1,Q2,Q3,Q4,on axis, origin etc)

(4c) Leap year or not

(4d) Day of the week

(4e) Grade of the student based on marks in n subjects

(4f) Choice based arithmetic (1-add,2-sub,3-mul,4-div etc)

(4g) Electricity bill or Income tax problem

(4h) Roots of a quadratic equation

5) switch

(5a) Day of the week

(5b) Choice based arithmetic (1-add,2-sub,3-mul,4-div etc)

(5c) Given character is vowel or not

6) Loops

(6a) Printing no. series

(6b) Sum & Avg of n numbers

(6c) Multiplication by repetitive addition

(6d) Division by repetitive subtraction – find quotient and remainder

(6e) Reversing no., palindrome or not, sum of digits in a given number

(6f) Evaluation of **a power m**

(6g) Factorial of given no.

(6h) Evaluation of **n c r** (use only 2 loops)

(6i) G.C.D of two no.s(try with while/for and do-while)

(6j) G.C.D with repetetive subtraction

(6k) L.C.M of two no.s(without finding G.C.D)

(6L) Fibonacci series

(6m) Given no. is armstrong or not

(6n) Given no.is perfect no. or not

(6O) Given no.is prime no. or not

(6P) Evaluation of series (Note:- you shoudn't calculate x^k in every iteration)

$1+x+x^2//2!+x^3/3!+.....+x^n/n!$

7) Nested loops

(7a) Recursive sum of digits in a number

(eg:- 9785 ==> 9+7+8+5 ==> 29 ==> 2+9 ==> 11 ==> 1+1 ==> 2

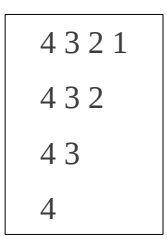
(7b) Printing pascal trianle

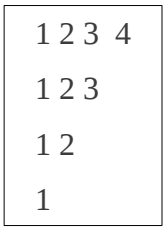
(7c) List of prime numbers

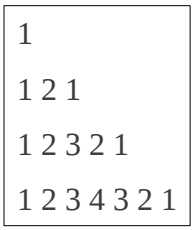
(7d) Generation of number tables, triangles

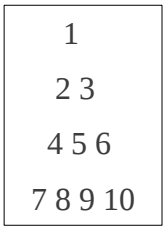
(7e, 7f, 7g, 7h, 7i, 7j, 7k, 7l, 7m, 7n, 7o) Few examples are:-

1 2 3 4	1	1	a	4
2 4 6 8	1 2	2 1	a b	4 3
3 6 9 12	1 2 3	3 2 1	a b c	4 3 2
4 8 12 16	1 2 3 4	4 3 2 1	a b c d	4 3 2 1


4 3 2 1
4 3 2
4 3
4


1 2 3 4
1 2 3
1 2
1


1
1 2 1
1 2 3 2 1
1 2 3 4 3 2 1


1
2 3
4 5 6
7 8 9 10