

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**

- 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
- 7) ./hello

If any errors 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 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.

Basics:-

Area of the circle

Swapping of two numbers

Reversing 3 digit no.

Control Structures:-

a)Simple if-else

Biggest of two numbers

Even or odd numbers

Absolute value of a number

Given character is vowel or not

Given year is leap or not

b)Nested if-else

Biggest of 3,4 numbers

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

Leap year or not

c)Else if ladder

Biggest of 3,4 numbers

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

Leap year or not

Day of the week

Grade of the student based on marks in n subjects

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

Electricity bill or Income tax problem

Roots of a quadratic equation

d) switch

Day of the week

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

Given character is vowel or not

e) Loops

Printing no. series

Sum & Avg of n numbers

Multiplication by repetitive addition

Division by repetitive subtraction – find quotient and remainder

Reversing no., palindrome or not, sum of digits in a given number

Evaluation of **a power m**

Factorial of given no.

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

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

G.C.D with repetitive subtraction

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

Fibonacci series

Given no. is armstrong or not

Given no.is perfect no. or not

Given no.is prime no. or not

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

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

f) Nested loops

Recursive sum of digits in a number

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

Printing pascal trianle

List of prime numbers

Generation of number tables, triangles

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	1 2 3 4	1	1
4 3 2	1 2 3	1 2 1	2 3
4 3	1 2	1 2 3 2 1	4 5 6
4	1	1 2 3 4 3 2 1	7 8 9 10