Assignment-1: -

Write c programs for the following and build them with gcc and debug with gdb wherever necessary

Use various options of gcc like -E, -c, -S, -g to understand various development phases

Basics:-

- Swapping of two no.s (with, without temporary, with xor operator)
- Write a program to find area, perimter of the circle

  a) consider PI as symbolic constant

  b) consider pi as constant double variable

  Check the preprocessed output for above program using -**E** option of gcc in both the cases
- Differentiate between post, pre decrement operators

  a) k=i++, k=++i

  b) y=x++*10, y=++x*10

  c) q=p--/3, q=--p/3
- Reversing 4 digit no.
- Conversion of ip address in a.b.c.d format into 32 bit unsigned integer and vice versa
- Using bitwise operators for the expressions for

  a) set k^{th} bit

  b) reset k^{th} bit

  c) flip k^{th} bit

  d) query the k^{th} bit
- Biggest of 3 no.s using conditional operator
- Using sizeof operator find no.of bytes required for different data types
- Find the max,min values supported by different data types with the constants defined in limits.h
- Write a program to convert time between hh:mm:ss format and total no.of seconds(note:- you may take the input hh,mm,ss separately, need not be in string form)

  for eg:- 1:2:30 ==> 3750

  8000 ==> 2:13:20
- Go through the functions provided in math.h, ctype.h files
- Formatted I/O using printf, scanf (%5d, %05d,%-5d,%8.2f, %.2f etc.)

- Evaluate following expressions,find x,y,z values in each case assuming x=1,y=5 initially, what do you observe

  a) z=++x && ++y;

  b) z=--x && --y;

  c) z=++x || ++y;

  d) z=--x || --y;

Control Structures:-

- Biggest of 3 no.s using a) nested if-else b) if-else ladder
- Leap Year or not using a) simple if-else b) nested if-else c) if-else ladder
- Quadrant of a point (Q1, Q2,Q3 or Q4) using a) nested if-else b) if-else ladder
- Electricity bill calculation as per following tariff

  upto 100 Units : Rs.1

  100-199 Units : Rs.2

  200 – 399 units : Rs.3

  400 units and above – Rs.4
- Student grade using switch case as per following criteria

  >= 70% - A grade, 60-69% - B grade 50 – 59%: C Grade, 30-49% - D grade <30% - Fail
- Vowel or consonant using a) if-else b) switch
- Choice based arithmetic using a) if-else ladder b) switch
- Recursive sum of digits in a no.

  Eg:- sumdigits(5689) = 28, sumdigits(28) = 10, sumdigits(10) = 1
- Series generation 1 + x + x^2/2! + x^3/3!+...x^n/n!
- To find armstrong no.s in the range 1-1000
- GCD of two no.s , try both solutions with do-while & while
- LCM of two no.s
- N c R calculation
- List of prime no.s
- Printing triangles, pyramids with no.s/characters
- Printing Pascal triangle