

# Programming for Problem Solving Lab. (CS102)

## Assignment-1

1. Draw a flowchart to find the sum of N natural numbers.
2. Draw a flowchart to find the factorial of a number.
3. Draw a flowchart to find the smallest among 3 numbers.
4. Find all the real roots of a quadratic equation  $ax^2+bx+c=0$
5. Draw a flowchart to find the odd and even numbers in a range.
6. Draw a flowchart to solve the following series  
 $S=x-x^3+x^5-x^7+\dots+x^n$

## Assignment-2

1. Write a C program to calculate the simple and compound interest using formula  $I=PNR/100$   
Where, P=Principal amount; N=Number of years; R=Rate of interest
2. Write a C program to find the sum and average of 4 floating point numbers through user input.
3. Write a C program to take your name as user input and print hello with that name.
4. Write a C program to find the area of a triangle using 3 sides.
5. Write a program to swap 2 numbers using a third variable.
6. Write a program to take input of name, rollno and marks obtained by a student in three subjects of 100 marks each and display the name, rollno with percentage score secured.

## Assignment-3

1. Write a C program to check whether a year is leap year or not. [check the result with the year,1996,1900,2000,2004]
2. Write a program to find the real roots of quadratic equation.
3. Write a C program to find the factorial of a number.
4. Write a C program to calculate the commission for sales as per the sales amount given below.  
if sales  $\leq$  Rs. 500, commission is 5%  
if sales  $> 500$  but  $\leq 2000$ , commission is Rs.35 plus 10 % above Rs.500  
if sales  $> 2000$  but  $\leq 5000$ , commission is Rs. 185 plus 12% above Rs. 2000  
if sales  $> 5000$ , commission is 12.5%
5. Write a Program to Check Whether a Number is Prime or not.
6. Write a program to check number is Armstrong or not. [A number is Armstrong if the sum of cubes of individual digits of a number is equal to the number itself]
7. Write a C program to find the GCD of two numbers.

## Assignment-4

1. Write a C program to find the value of Y by using

$Y(x,n)=1+x$  when  $n=1$   
 $1+x/n$  when  $n=2$   
 $1+x^n$  when  $n=3$   
 $1+nx$  when  $n>3$  or  $n<1$

2. The formula  $y=1.36\sqrt{1+x+x^3}+x^{1/4}+e^x$  is to be evaluated for  $x$  which varies from 1.0 to 3.0 in steps of 0.2. Write a C program to perform this and print a table for various values of  $x$  with proper headings.
3. Write a C program to sum the following series  
 $S=1+(1+2)+(1+2+3)+\dots+(1+2+3+\dots+N)$
4. Write a C program to find the sum of digits of any given positive number.
5. Write a C program to reverse a given integer.
6. Write a C program to generate the Fibonacci series  
0 1 1 2 3 5 8... up to  $n$

## Assignment-5

1. Write a C program to evaluate the series  
 $S=1+1/2+1/3+\dots+1/N$
2. Write a program to find whether a character is consonant or vowel using switch statement.
3. Write a C program to check whether a number is perfect number or not.
4. Write a program to check whether a number is positive, negative or zero using switch case.
5. Write a C program to find the biggest of given  $n$  numbers.
6. Write a C program to find the sum and average of  $n$  numbers.

## Assignment-6

1. Write a C program to read a list of test marks (integers in the range 0-100) of 50 students. Calculate the mean of marks and print a list of marks greater than the mean.
2. Write a C program to sort  $n$  numbers using ascending order.
3. Write a C program to add two matrices of order  $m \times n$
4. Write a C program to determine whether a given matrix is symmetric or not.
5. Write a C program to find and print the transpose of a given matrix.

## Assignment-7

1. Write a C program to count the occurrence of a particular character in a given string.
2. Write a C program to count the number of vowels present in a sentence.
3. Write a C program to read an array of names and sort them in alphabetical order.

4. Write a program to display the following pattern.

```
*  
* *  
* * *  
* * * *
```

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

6. Write a C program to accept a string from keyboard and display the characters of the string on monitor in each line.

## Assignment-8

1. Write a program to add, subtract, multiply and divide two integers using user defined type function with return type.
2. Write a program to calculate sum of first 20 natural numbers using recursive function.
3. Write a program to generate Fibonacci series using recursive function.
4. Write a program to swap two integers using call by value and call by reference methods of passing arguments to a function.
5. Write a C program to apply binary search to a set of N numbers using a function.

## Assignment-9

1. Write a program to find the sum of all the elements of an array using pointers.
2. Write a program to find the arithmetic mean of a given list of n real values using pointer.
3. Write a program using a pointer to read an array of integers and print its elements in the reverse order.
4. Write a C program using pointers to check whether the s\given string is a palindrome.
5. Declare a structure of a student with details like roll number, student name and total marks. Using this declare an array with 50 students. Write a C program to read details of 'n' students and print the list of students who have scored 75 marks and above.