SRI VASAVI ENGINEERING COLLEGE (Autonomous)

PEDATADEPALLI, TADEPALLIGUDEM.

Certificate

This is to certify that this is a bonafide record of Practical Work done in ***Programming Lab in C for Problem Solving*** *by Mr./Miss*_____ *bearing Roll No*_____*of*_____*Branch of* ***I Semester*** *during the academic year* ***2022 -23****.*

No. of Experiments Done:

Faculty In charge of the Laboratory **Head of the Department**

EXTERNAL EXAMINER

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MODULE 1 (Problem Solving Concepts)

Program 1:

Aim: Develop a C program to print following output by using given information.

Program:

```
#include<stdio.h>
int main()
{
    char name[20],creator[20],purpose[20];
    int spa;
    float speed;
    printf("Enter the Name:");
    scanf("%s",name);
    printf("\nEnter the Creator Name:");
    scanf("%s",creator);
    printf("\nEnter the Purpose:");
    scanf("%s",purpose);
    printf("\nMemory Space:");
    scanf("%d",&spa);
    printf("\nSpeed:");
    scanf("%f",&speed);
    printf("\nMy Details :");
    printf("\nI am the Robot named %s.",name);
    printf("\nI was created by %s.",creator);
    printf("\nI am created for the purpose of %s.",purpose);
    printf("\nMy memory space is around %dGb and my speed is %.1fTb.",spa,speed);
    return 0;
}
```

Input :

```
Enter the Name :
Chitti
Enter the Creator Name :
Dr.Vasegran
Enter the Purpose :
militaryservice
Memory Space :
22
Speed :
1.1
```

Output :

```
My Details :
I am the Robot named Chitti.
I was created by Dr.Vasegran.
I am created for the purpose of militaryservice.
My memory space is around 22Gb and my speed is 1.1Tb.
```

MODULE 2(Operators)

Program 1(1):
Aim: Develop a c program to convert and print the Celsius to Fahrenheit(vice-Versa).
Program:

```
#include<stdio.h>
int main()
{
    int c;
    printf("Temperature in Celsius:");
    scanf("%d",&c);
    printf("\nTemperature in Fahrenheit is %.1fF",((9*c)/5.0)+32);
}
```

Input :

```
Temperature in Celsius:
12
```

Output:

```
Temperature in Fahrenheit is 53.6F
```

Program 1(2):

```
#include<stdio.h>
 int main()
{
    float f;
    printf("Temperature in Fahrenheit:");
    scanf("%f",&f);
    printf("\nTemperature in Fahrenheit is %.1fC",((5.0/9)*(f-32)));
}
```

Input :

```
Temperature in Fahrenheit:53.6
```

Output:

```
Temperature in Fahrenheit is 12.0C
```

Program 2:
Aim: Develop a C program to swap two numbers using bitwise XOR operator.
Program:

```
#include<stdio.h>
int main()
{
    int x,y;
    printf("Enter the two numbers");
    scanf("%d%d",&x,&y);
    x=x^y;
    y=x^y;
    x=x^y;
   printf("\nThe two values after swapping are\n%d\n%d",x,y);
}
```

Input :

```
Enter the two numbers
3
4
```

Output:

```
The two values after swapping are
4
3
```

Program 3 :
Aim: Develop a C program to find if the given number is odd or even Using bitwise AND(&) operator.
Program:

```
#include<stdio.h>
int main()
{
    int n;
    printf("Enter any number:");
    scanf("%d",&n);
     if((n&1)==1)
    printf("\n%d is odd.",n);
    else
    printf("\n%d is even.",n);
}
```

Input 1 :

```
Enter any number: 4
```

Output 1 :

```
4 is even.
```

Input 2 :

```
Enter any number: 5
```

Output 2 :

```
5 is odd.
```

Program 4 :

Aim: Develop a C program to find whether the given number is positive or negative using Ternary Operator.

Program:

```
#include<stdio.h>
int main()
{
    int n;
    printf("Enter the number:");
    scanf("%d",&n);
    (n>0)?printf("Positive"):printf("Negative");
}
```

Input 1:

Enter the number :
14

Output 1:

Positive

Input 2:

Enter the number :
-1

Output 2:

Negative

Program 5 :

Aim:Develop a C program to find remainder of two numbers without using % symbol.

Program:

```
#include<stdio.h>
int main()
{
   int a,b,x;
   printf("\nEnter the value of a :");
   scanf("%d",&a);
   printf("\nEnter the value of b :");
   scanf("%d",&b);
   x=a-b*(a/b);
   printf("\nRemainder is %d",x);
   return 0;
}
```

Input:

Enter the value of a :
11
Enter the value of b :
2

Output :

Remainder is 1

Program 6:

Aim: Develop a C program to accept 2 points and to calculate the distance between them using functions and pointers.

Program:

```
#include<stdio.h>
#include<math.h>
int main()
{
    int  x1,x2,y1,y2;
    float d;
    printf("\nEnter x1");
    scanf("%d",&x1);
    printf("\nEnter y1");
    scanf("%d",&y1);
    printf("\nEnter x2");
    scanf("%d",&x2);
    printf("\nEnter y2");
    scanf("%d",&y2);
    d=sqrt((*x2-*x1)*(*x2-*x1)+(*y2-*y1)*(*y2-*y1));
    printf("\nDistance between 2 points is %.2f",d);
    return 0;
}
```

Input :

```
Enter x1
2
Enter y1
3
Enter x2
4
Enter y2
1
```

Output :

```
Distance between 2 points is 2.83
```

MODULE 3(Conditional and Looping Statements)

Program 1:
Aim: Develop a C program to find whether a given integer is odd or even number.
Program:

```
#include<stdio.h>
int main()
{
    int n;
    scanf("%d",&n);
    if(n%2==0)
    printf("%d is an even number",n);
    else
    printf("%d is an odd number",n);
}
```

Input 1:
3
Output 1 :
3 is an odd number
Input 2:
44
Output 2 :
44 is an even number

Program 2 :

Aim: Develop a program to determine whether it is a right triangle, isosceles triangle, right isosceles triangle or equilateral triangle.

```
#include <stdio.h>
int main()
{
   int   a,b,c;
   scanf("%d%d%d",&a,&b,&c);
   if((a+b+c)==180)
   {
      if(a==b && a==c)
      {
         printf("\nTriangle is equilateral");
      }
      else if(a==b && c==90)
      {
         printf("Triangle is right isosceles");
      }
      else if((a==90) && (b!=c))
      {
         printf("Triangle is right");
      }

      else if(a==b && b!=c)
      {
         printf("Triangle is isosceles");
      }
      else if(a!=b && a!=c)
      {
         printf("Triangle is not special");
      }
   }
   else
   {
      printf("Not a Triangle");
   }
   return 0;
}
```

Input :

60 60 60

Output :

Triangle is equilateral

Program 3 :

Aim: Develop a C program to accept roll no, name and total mark obtained by a student and assign grades according to the following conditions, display the roll number, name, total mark and grade:

Program:

```
#include<stdio.h>
int main()
{
    char n[30];
    int rno;
    float total;
    printf("\nEnter the roll number of student");
    scanf("%d",&rno);
    printf("\nEnter the name of student");
    scanf("%s",n);
    printf("\nEnter the total mark of student");
    scanf("%f",&total);
    printf("\nGrade details\n%d %s %.0f",rno,n,total);
    if(total>=90)
    printf("A");
    else if(total>=80 && total<90)
    printf("B");
    else if(total>=70 && total<80)
    printf("C");
    else if(total>=60 && total<70)
    printf("D");
    else if(total>=50 && total<60)
    printf("E");
    else
    printf("Fail");
}
```

Input 1:

```
Enter the roll number of student
1
Enter the name of student
Abhi
Enter the total mark of student
94
```

Output 1:

```
Grade details
1 Abhi 94 A
```

Input 2:

```
Enter the roll number of student
3
Enter the name of student
Arun
Enter the total mark of student
30
```

Output 2:

```
Grade details
3 Arun 30 Fail
```

Program 4 :
Aim: Develop a program to print the multiplication table of an integer n upto m rows.
Program:

```
#include<stdio.h>
int main()
{
   int n,i=1,m;
   printf("\nEnter n");
   scanf("%d",&n);
   printf("\nEnter m");
   scanf("%d",&m);
   printf("\nThe multiplication table of %d is",n);
   while(i<=m)
   {
     printf("\n%d*%d=%d",i,n,i*n);
     i++;
   }
}
```

Input :

```
Enter n
5
Enter m
4
```

Output:

```
The multiplication table of 5 is
1*5=5
2*5=10
3*5=15
4*5=20
```

Program 5 :
Aim: Develop a C program to find the sum of first n numbers.
Program:

```
#include<stdio.h>
int main()
{
    int n,sum=0,i;
    scanf("%d",&n);
    for(i=1;i<=n;i++)
        sum=sum+i;
    printf("%d",sum);
}
```

Input:

```
5
```

Output:

```
15
```

Program 6 :

Aim: Develop a C program to find the sum of digits of a given number.

Program:

```
#include<stdio.h>
int main()
{
   int n,sum=0,r,t;
   printf("\nEnter the value :");
   scanf("%d",&n);
   t=n;
   while(n>0)
   {
            r=n%10;
            sum=sum+r;
            n=n/10;
   }
   printf("\nSum of digits in %d is %d",t,sum);
}
```

Input :

Enter the value :
1234

Output :

Sum of digits in 1234 is 10

Program 7 :

Aim: Develop a C program to find the reverse of a given number.

Program:

```
#include<stdio.h>
int main()
{
    int n,sum=0,r,t;
    printf("\nEnter the value :");
    scanf("%d",&n);
    t=n;
    while(n>0)
    {
        r=n%10;
        sum=sum*10+r;
        n=n/10;
    }
    printf("\nReverse number of %d is %d",t,sum);
}
```

Input :

Enter the value :
1234

Output :

Reverse number of 1234 is 4321

Program 8 :

Aim: Develop a C program to find whether a given number is prime or not.

Program:

```
#include<stdio.h>
int main()
{
   int  n,count=0,i;
   scanf("%d",&n);
   for(i=1;i<=n;i++)
   {
          if(n%i==0)
             count++;
   }
   if(count==2)
     printf("Prime");
   else
     printf("Not prime");
}
```

Input 1:

13

Output1:

Prime

Input 2:

33

Output2:

Not prime

Program 9:

Aim: Develop a C program to convert a decimal number to its equivalent binary number using while loop.

Program:

```
#include <stdio.h>
int main()
{
    int  number1,number,cnt,i,bin[30];
    printf("Enter the decimal number\n");
    scanf("%d",&number);
    cnt=0;
    number1=number;
    while(number>0)
    {
            bin[cnt]=number%2;
            number=number/2;
            cnt++;
    }
    printf("The binary equivalent of decimal number %d is ",number1);
    for(i=(cnt-1); i>=0;i--)
            printf("%d",bin[i]);
    return 0;
}
```

Input :

Enter the decimal number
10

Output :

The binary equivalent of decimal number 10 is 1010

Program 10 :

Aim: Develop a C program to print the Triangle.

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

Program:

```
#include<stdio.h>
int main()
{
    int  i=1,j,n;
    scanf("%d",&n);
    while(i<=n)
    {
        j=1;
        while(j<=i)
        {
            printf(" *");
            j++;
         }
         i++;
        printf("\n");
      }
}
```

Input :

```
5
```

Output :

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

Program 11 :

Aim: Develop a C program to find the given number is palindrome or not.

Program:

```
#include<stdio.h>
int main()
{
    int n,sum=0,r,t;
    printf("\nEnter the value :");
    scanf("%d",&n);
    t=n;
    while(n>0)
    {
            r=n%10;
            sum=sum*10+r;
            n=n/10;
    }
    if(sum==t)
    printf("\nGiven number is Palindrome");
    else
    printf("\nGiven number is Not Palindrome");
}
```

Input 1:

Enter the value :

12321

Output :

Given number is Palindrome

Input 2:

Enter the value :

12345

Output :

Given number is Not Palindrome

Program 12 :

Aim: Develop a C program to find the given number is Armstrong or not.

Program:

```
#include<stdio.h>
int main()
{
    int n,sum=0,r,t;
    printf("\nEnter the value :");
    scanf("%d",&n);
    t=n;
    while(n>0)
    {
        r=n%10;
        sum=sum+r*r*r;
        n=n/10;
    }
    if(sum==t)
    printf("\nGiven number is Armstrong ");
    else
    printf("\nGiven number is Not Armstrong ");
}
```

Input 1:

Enter the value :

153

Output :

Given number is Armstrong

Input 2:

Enter the value :

123

Output :

Given number is Not **Armstrong**

Module 4 (Arrays)

Program 1 :

Aim: Develop a C program to find the sum of the elements in an array.

Program:

```
#include<stdio.h>
int main()
{
    int i,n,sum=0,a[25];
    scanf("%d",&n);
    for(i=0;i<n;i++)
        scanf("%d",&a[i]);
    for(i=0;i<n;i++)
        sum=sum+a[i];
    printf("\nThe sum of the elements in the array is %d",sum);
}
```

Input :

```
5
2
3
6
8
1
```

Output :

```
The sum of the elements in the array is 20
```

Program 2 :

Aim: Develop a C program to find the sum of even numbers in an array.

Program:

```
#include<stdio.h>
int main()
{
    int a[25],n,i,sum=0;
    scanf("%d",&n);
    for(i=0;i<n;i++)
    scanf("%d",&a[i]);
    for(i=0;i<n;i++)
    {
        if(a[i]%2==0)
           sum=sum+a[i];
    }
    printf("\nThe sum of the even numbers in the array is %d",sum);
}
```

Input :

```
5
2
3
6
8
-1
```

Output :

The sum of the even numbers in the array is 16

Program 3:
Aim: Develop a program to find the maximum element in an array.
Program:

```
#include<stdio.h>
int main()
{
    int a[20],n,i,max,min;
    scanf("%d",&n);
    for(i=0;i<n;i++)
    scanf("%d",&a[i]);
    min=max=a[0];
    for(i=0;i<n;i++)
    {
        if(a[i]>max)
        max=a[i];
        if(a[i]<min)
        min=a[i];
    }
    printf("\n%d is the maximum element in the array",max);
    printf("\n%d is the minimum element in the array",min);
}
```

Input :

```
5
2
3
6
8
1
```

Output :

```
8 is the maximum element in the array
1 is the minimum element in the array
```

Program 4 :
Aim: Develop a program to search for an element 'a' in the array.
Program:

```
#include<stdio.h>
int main()
{
    int a[25],i,key,n,f=0;
    scanf("%d",&n);
    for(i=0;i<n;i++)
    scanf("%d",&a[i]);
    scanf("%d",&key);
    for(i=0;i<n;i++)
    {
        if(a[i]==key)
         {
           f=1;
          break;
         }
    }
    if(f==1)
    printf("%d is present in the array",key);
    else
    printf("%d is not present in the array",key);
}
```

Input 1:

```
5
2 3 6 8 1 6
```

Output :

```
6 is present in the array
```

Input 2:

```
5
2 3 6 8 1
60
```

Output :

```
60 is not present in the array
```

Program 5:
Aim: Develop a program to sort an array in ascending order.
Program:

```
#include<stdio.h>
int main()
 {
    int a[15],n,i,t,j;
    scanf("%d",&n);
    for(i=0;i<n;i++)
    scanf("%d",&a[i]);
    for(i=0;i<n;i++)
            for(j=i+1;j<n;j++)
              {
                  if(a[i]>a[j])
                  {
                              t=a[i];
                              a[i]=a[j];
                              a[j]=t;
                   }
              }
    for(i=0;i<n;i++)
    printf("%d  ",a[i]);
 }
```

Input :

```
5
2  3 6  8  1
```

Output :

```
1 2 3 6 8
```

Program 6:

Aim: Develop a C program to find the median of the elements in the array. (Median is the middle value in a sorted array. If there are even number of elements in the array, median is the mean of the 2 middle values)

Program:

```
#include<stdio.h>
int main()
{
int a[20],i,n,j,t,x;
printf("\nEnter the number of elements in the array");
scanf("%d",&n);
printf("\nEnter the elements in the array");
for(i=0;i<n;i++)
scanf("%d",&a[i]);
for(i=0;i<n;i++)
for(j=i+1;j<n;j++)
{
if(a[i]>a[j])
        {
       t=a[i];
       a[i]=a[j];
       a[j]=t;
        }
 }
x=n/2;
if(n%2!=0)
printf("\nThe median of the array is %.2lf",(double)a[x]);
else
printf("\nThe median of the array is %.2lf",(double)(a[x-1]+a[x])/2);
}
```

Input :

```
Enter the number of elements in the array
5
Enter the elements in the array
2  4 1 3  5
```

Output :

```
The median of the array is 3.00
```

Program 7:

Aim:Develop a C program to perform matrix addition. Assume only square matrices of the same dimension.

Program:

```
#include<stdio.h>
int main()
{
    int a[10][10],b[10][10],c[10][10],i,j,m;
    scanf("%d",&m);
    for(i=0;i<m;i++)
    {
        for(j=0;j<m;j++)
        scanf("%d",&a[i][j]);
    }
    for(i=0;i<m;i++)
    {
        for(j=0;j<m;j++)
        scanf("%d",&b[i][j]);
    }
    for(i=0;i<m;i++)
    {
        for(j=0;j<m;j++)
        {
        c[i][j]=a[i][j]+b[i][j];
        printf("%d  ",c[i][j]);
        }
        printf("\n");
    }
}
```

Input :

```
2
4 5
6 9
1 2
3 4
```

Output :

```
5 7
9 13
```

Program 8:

Aim: Develop a C program to perform matrix multiplication. Assume only square matrices of the same dimension.

Program:

```
#include<stdio.h>
int main()
{
    int  a[10][10],b[10][10],c[10][10],m,i,j,k;
    scanf("%d",&m);
    for(i=0;i<m;i++)
    {
            for(j=0;j<m;j++)
            scanf("%d",&a[i][j]);
    }
    for(i=0;i<m;i++)
    {
            for(j=0;j<m;j++)
            scanf("%d",&b[i][j]);
    }
    for(i=0;i<m;i++)
    {
          for(j=0;j<m;j++)
          {
          c[i][j]=0;
          for(k=0;k<m;k++)
                  c[i][j]=c[i][j]+a[i][k]*b[k][j];
          printf("%d ",c[i][j]);
          }
          printf("\n");
    }
}
```

Input : 2

4 5

6 9

1 2

3 4

Output :

19 28

33 48

Modul5 (Strings)

Program 1:

Aim:Develop a C program to check whether two strings are correct, almost correct and wrong by considering the degree of correctness as :

- CORRECT if it is an exact match
- ALMOST CORRECT if no more than 2 letters are wrong
- WRONG if 3 or more letters are wrong

Program:

```
#include<stdio.h>
int main()
{
    char s1[10],s2[10];int
    i,c=0;
    scanf("%s",s1);
    scanf("%s",s2);
    for(i=0;s1[i]!='\0';i++)
       {
                if(s1[i]!=s2[i])
                c++;
       }
    if(c==0)
    printf("%s IS CORRECT",s2);
    else if(c<=2)
    printf("%s IS ALMOST CORRECT",s2);
    else
    printf("%s IS WRONG",s2);
}
```

Input:

SAMPLE
SIMPLE

Output:

SIMPLE IS ALMOST CORRECT

Program 2:

Aim: Develop a C program to delete all vowels present in a string.

Program:

```
#include<stdio.h>
int main()
{
    char  s1[200],s2[200];
    int  i,j=0;
    printf("\nEnter the input string");
    scanf("%s",s1);
    for(i=0;s1[i]!='\0';i++)
      {
        if(s1[i]=='a'||s1[i]=='e'||s1[i]=='i'||s1[i]=='o'||s1[i]=='u')
         continue;
         else
        {
                s2[j]=s1[i];
                j++;
        }
      }
    s2[j]='\0';
    printf("\nThe output string is %s",s2);
}
```

Input :

```
Enter the input string
Amphisoft
```

Output:

```
The output string is mphsft
```

Program 3:

Aim: Develop a C program to compute the frequency of each lowercase letter in thestring.

Program:

```
#include<stdio.h>
int main()
{
        char s1[200],a[30]="abcdefghijklmnopqrstuvwxyz";
        int   i,j,count;
        printf("\nEnter the input string: ");
        scanf("%s",s1);
        printf("\nThe letter frequency is");
        for(i=0;a[i]!='\0';i++)
        {
                count=0; for(j=0;s1[j]!='\0';j++)
                if(a[i]==s1[j])
                count++;
                if(count!=0)
                printf("\n%c %d",a[i],count);
        }
  }
```

Input :

Enter the input string: Anitha

Output:

The letter frequency isA 2
H 1
I 1
N 1
T 1

Program 4:

Aim: Develop a C program to sort a string in alphabetical order.

Program:

```
#include<stdio.h>
#include<string.h>
int main()
{
char  s1[20];
char  t;
int  i,j,n;
printf("\nEnter the input string");
scanf("%s",s1);
n=strlen(s1);
for(i=0;i<n-1;i++)
   {
      for(j=i+1;j<n;j++)
      {
         if(s1[i]>s1[j])
         {
            t=s1[i];
            s1[i]=s1[j];
            s1[j]=t;
         }
      }
   }
  printf("\nThe output string is %s",s1);
}
```

Input :

```
Enter the input string
Anitha
```

Output:

```
The output string is Aahint
```

Program 5:

Aim: Develop a C program to remove special characters and numbers in the string.

Program:

```
#include<stdio.h>
int main()
{
    char s1[100];
    int i;
    scanf("%s",s1);
    for(i=0;s1[i]!='\0';i++)
    {
        if((s1[i]>='A'&& s1[i]<='Z')||(s1[i]>='a' && s1[i]<='z'))
        {
            printf("%c",s1[i]);
        }
    }
}
```

Input :

P^&y2!#!@#t3250.h**on

Output :

Python

Program 6:

Aim:Develop a C program to concatenate two string without using strcat().

Program:

```
#include<stdio.h>
int main()
{
    char s1[50],s2[50];
    int i,j;
    printf("\nEnter the first name");
    scanf("%s",s1);
    printf("\nEnter the last name");
    scanf("%s",s2);
    for(i=0;s1[i]!='\0';i++);
    s1[i]=' ';
    for(i++,j=0;s2[j]!='\0';j++,i++)
    s1[i]= s2[j];
    s1[i]='\0';
    printf("\nThe concatenated string is\n%s",s1);
}
```

Input :

```
Enter the first name
Sri
Enter the last name
Vasavi
```

Output :

```
The concatenated string is
Sri Vasavi
```

Program 7:

Aim:Develop a C program on different string handling functions.

Program:

```
#include <stdio.h>
#include<string.h>
int main()
{
   char   s1[10]="Hello",s2[10],s3[20]="WORLD",s4[20];
   printf("\nLength of s1 is %d",strlen(s1));
   printf("\nCopied String s2 is %s",strcpy(s2,s1));
   printf("\nConcatenated String s3 is %s",strcat(s1,s3));
   printf("\nReverse of s1 is %s",strrev(s1));
   printf("\nUppercase of s1 is %s",strupr(s1));
   printf("\nLowercase of s3 is %s",strlwr(s3));
   return 0;
}
```

Output :

```
Length of s1 is 5
Copied String s2 is Hello
Concatenated String s3 is HelloWORLD
Reverse of s1 is DLROWolleH
Uppercase of s1 is DLROWOLLEH
Lowercase of s3 is world_
```

Program 8:

Aim: Develop a C program to find given string is palindrome or not using string handling functions.

Program:

```
#include <stdio.h>
#include<string.h>
int main()
{
    char s1[10],s2[10];
    printf("Enter a string");
    gets(s1);
    strcpy(s2,s1);
    strrev(s2);
    if(strcmp(s1,s2)==0)
        puts("Given string is Palindrome");
    else
        puts("Given string is Not Palindrome");
    return 0;
}
```

Input :

```
Enter a string
vasavi
```

Output :

```
Given string is Not Palindrome
```

Program 9:

Aim: Develop a C program to find given string is palindrome or not without using string handling functions.

Program:

```
#include <stdio.h>
int main()
{
    char s1[10];
    int i,j,len=0,flag=1;
    printf("Enter a string");
    gets(s1);
    for(i=0;s1[i]!='\0';i++)
    len++;
    for(i=0,j=len-1;i<=j;i++,j--)
    if(s1[i]!=s1[j])
    {
    flag=0;
    break;
    }
    if(flag==1)
            puts("Given string is Palindrome");
    else
            puts("Given string is Not Palindrome");
    return 0;
}
```

Input 1:

```
Enter a string
vasavi
```

Output 1:

```
Given string is Not Palindrome
```

Input 2:

```
Enter a string
madam
```

Output 2:

```
Given string is Palindrome
```

Module 6(Functions)

Program 1:

Aim: Develop a C program to find the area of a circle using functions.

Program:

```
#include<stdio.h>
float  calcarea(float  x)
{
       return (3.14*x*x);
}
int main()
{
    float x;
    scanf("%f",&x);
    printf("\nThe area of the circle is %.2f",calcarea(x));
    return 0;
}
```

Input:

3

Output:

The area of the circle is 28.26

Program 2:

Aim: Develop a C program to find the maximum of 3 numbers using functions.

Program:

```
#include<stdio.h>
int findmaximum(int,int,int);
int main()
{
    int  a,b,c,max;
    scanf("%d%d%d",&a,&b,&c);
    max=findmaximum(a,b,c);
    printf("%d is the maximum number",max);
    return 0;
}
Int  findmaximum(int a,int b,int c)
{
       int Max;
       Max=(a>b&&a>c)?a:(b>c)?b:c;
       return Max;
}
```

Input:

13 45 23

Output:

45 is the maximum number

Program 3:

Aim:Develop a C program to implement a menu driven calculator.

Program:

```
#include<stdio.h>
#include<math.h>
int addition(int a,int b)
{
    return a+b;
}
int subtraction(int a,int b)
{
    return a-b;
}
int multiplication(int a,int b)
{
    return a*b;
}
float division(int a,int b)
{
    return (float)a/b;
}
int modulo(int a,int b)
{
    return a%b;
}
int power(int a,int b)
{
    return pow(a,b);
}
float average(int a,int b)
{
    return (float)(a+b)/2;
}
```

```
int main()
{
    int a,b,ch; scanf("%d%d%d",&a,&b,&ch);
    switch(ch)
    {
    case 1: printf("\n%d",addition(a,b));
    break;
    case 2: printf("\n%d",subtraction(a,b));
    break;
    case 3:  printf("\n%d",multiplication(a,b));
    break;
    case 4: printf("\n%.2f",division(a,b));
    break;
    case 5: printf("\n%d",modulo(a,b));
    break;
    case 6: printf("\n%.2f",average(a,b));
    break;
    case 7: printf("\n%d",power(a,b));
    break;
    }
    return 0;
}
```

Input 1:

23 22 1

Output1:

45

Input 2:

23 2 3

Output2:

46

Program 4:

Aim: Develop a C program to compute the factorial of a number using recursion.

Program:

```
#include<stdio.h>
int computeFactorial(int n)
{
    if(n==0||n==1)
    return 1;
    else
    return (n*computeFactorial(n-1));
}
int main()
{
    int n;
    printf("\nEnter the value of n");
    scanf("%d",&n);
    printf("\nThe factorial of %d is %d",n,computeFactorial(n));
    return 0;
}
```

Input :

Enter the value of n5

Output:

The factorial of 5 is 120

Program 5:

Aim: Develop a C program to find the nth term in the Fibonacci series using recursion.

Program:

```
#include<stdio.h>
int fibo(int);
int main()
{
    int n,x;
    printf("\nEnter the value of n");
    scanf("%d",&n);
    x=fibo(n);
    printf("\nThe term %d in the fibonacci series is %d",n,x);
    return 0;
}
int fibo(int n)
{
    if(n==1)
    return 0;
    else
    if(n==2)
    return 1;
    else
    return (fibo(n-1)+fibo(n-2));
}
```

Input :

Enter the value of n4

Output :

The term 4 in the fibonacci series is 2

Program 6:

Aim: Develop a C program to find the sum of digits in a number using recursion.

Program:

```
#include<stdio.h>
int computeSum(int n)
{
    if(n==0)
    return 0;
    else
    return (n%10)+computeSum(n/10);
}
int main()
{
    int n;
    printf("Enter the value of n");
    scanf("%d",&n);
    printf("\nThe sum of digits in %d is %d",n,computeSum(n));
    return 0;
}
```

Input :

```
Enter the value of n432
```

Output :

```
The sum of digits in 432 is 9
```

Program 7:

Aim: Develop a C program to compute GCD of 2 numbers using recursion.

Program:

```
#include<stdio.h>
int gcd(int n1,int n2)
{
    if(n2!=0)
    return gcd(n2,n1%n2);
    else
    return n1;
}
int main()
{
    int n1,n2;
    printf("\nEnter n1");
    scanf("%d",&n1);
    printf("\nEnter n2");
    scanf("%d",&n2);
    printf("\nGCD of %d and %d = %d",n1,n2,gcd(n1,n2));
    return 0;
}
```

Input :

```
Enter n136
Enter n227
```

Output :

```
GCD of 36 and 27 = 9
```

Program 8:

Aim: Develop a C program to compute a^n (a power n) using recursion.

Program:

```
#include<stdio.h>
int computePower(int a,int  n)
{
    if(n==0)
    return 1;
    else
    return (a*computePower(a,n-1));
}
int main()
{
    int  a,n;
    printf("Enter the value of a\n");
    scanf("%d",&a);
    printf("Enter the value of n\n");
    scanf("%d",&n);
    printf("The value of %d power %d is %d",a,n,computePower(a,n));
    return 0;
}
```

Input :

```
Enter the value of a2
Enter the value of n8
```

Output :

```
The value of 2 power 8 is 256
```

Program 9:

Aim:Develop a C program to compute the sum of elements in an array using recursion.

Program:

```
#include<stdio.h>
int findsum(int *a,int  n)
{
    if(n<=0)
    return 0;
    else
    return (findsum(a,n-1)+a[n-1]);
}
int main()
{
    int a[20],i,n;
    printf("\nEnter the number of elements");
    scanf("%d",&n);
    printf("\nEnter the elements in the array");
    for(i=0;i<n;i++)
    scanf("%d",&a[i]);
    printf("\nThe sum of the elements in the array is %d",findsum(a,n));
    return 0;
}
```

Input : Enter the number of elements6
Enter the elements in the array2
5
1
7
4
2

Output:

The sum of the elements in the array is 21

Module 7(Pointers)

Program 1:

Aim: Develop a C program to accept 2 integers and to swap them using functions and pointers.

Program:

```
#include<stdio.h>
void swap(int *a,int *b)
{
    int  t;
    t=*a;
   *a=*b;
   *b=t;
}
int main()
{
     int a,b;
     printf("\nEnter the value of a");
     scanf("%d",&a);
     printf("\nEnter the value of b");
     scanf("%d",&b);
     printf("\nBefore swapping a=%d b=%d",a,b);
     swap(&a,&b);
     printf("\nAfter swapping a=%d b=%d",a,b);
     return 0;
}
```

Input :

```
Enter the value of a
5
Enter the value of b
3
```

Output:

```
Before swapping
a = 5 b = 3
After swapping
a = 3 b = 5
```

Program 2:

Aim: Develop a C program to accept 2 points and to calculate the distance between them using functions and pointers.

Program:

```
#include<stdio.h>
#include<math.h>
float distance(int *x1,int *y1,int *x2,int *y2)
{
    float d=sqrt((*x2-*x1)*(*x2-*x1)+(*y2-*y1)*(*y2-*y1));
    return  d;
}
int  main()
{
    int x1,x2,y1,y2;
    printf("\nEnter x1");
    scanf("%d",&x1);
    printf("\nEnter y1");
    scanf("%d",&y1);
    printf("\nEnter x2");
    scanf("%d",&x2);
    printf("\nEnter y2");
    scanf("%d",&y2);
    printf("\nDistance between 2 points is %.2f",distance(&x1,&y1,&x2,&y2));
    return 0;
}
```

Input :

```
Enter x1
2
Enter y1
3
Enter x2
4
Enter y2
1
```

Output :

```
Distance between 2 points is 2.83
```

Program 3:

Aim: Develop a C program to find the maximum element in the array using functions.

Program:

```
#include<stdio.h>
int findMax(int n, int *a)
{
   int i,m;
   m=*(a+0);
   for(i=1;i<n;i++)
   {
      if(m<*(a+i))
      m=*(a+i);
   }
   return m;
}
int main()
{
   int a[20],i,n,max;
   printf("Enter the number of elements in the array\n");
   scanf("%d",&n);
   printf("Enter the elements in the array\n");
   for(i=0;i<n;i++)
   scanf("%d",&a[i]);
   max=findMax(n,&a[0]);
   printf("The maximum element in the array is %d",max);
   return 0;
}
```

Input :

Enter the number of elements in the array

5

Enter the elements in the array

2 4 1 3 5

Output :

The maximum element in the array is 5

Module 8(Structures)

Program 1 :

Aim: Develop a C program to create a structure called student with rno, name and percentage as data members and display it.

Program:

```
#include <stdio.h>
struct student
{
     int rno;
     char name[20];
     float percentage;
}st;
int main()
{
   st.rno=10;
   strcpy(st.name,"vasavi");
   st.percentage=70.89;
  printf("Roll no is %d\nName is %s\nPercentage is %f",st.rno,st.name,st.percentage);
 return 0;
}
```

Output:

```
Roll no is 10
Name is vasavi
Percentage is 70.889999
```

Program 2 :

Aim :Develop a C program to swap two numbers using structures.

Program:

```
#include <stdio.h>
struct swap
{
   int a,b,c;
};
struct swap x;
void main()
{
printf("Enter s,b values");
scanf("%d%d",&x.a,&x.b);
printf("\nBefore swapping a=%d,b=%d",x.a,x.b);
x.c=x.a;
x.a=x.b;
x.b=x.c;
printf("\nAfter  swapping  a=%d,b=%d",x.a,x.b);
}
```

Input :

```
Enter s,b values5 10
```

Output:

```
Before  swapping  a=5,b=10
After swapping a=10,b=5
```

Program 3:

Aim :Develop a C program to access a structure through pointer.

Program:

```
#include <stdio.h>
struct sports
{
int nplayers;
char name[20];
float score;
}st;
int main()
{
struct sports sp,*p;
p=&sp;
printf("\nEnter no of players:");
scanf("%d",&p->nplayers);
printf("\nEnter name of sport:");
scanf("%s",p->name);
printf("\nEnter score:");
scanf("%f",&p->score);
printf("\nNo of Players is %d\nName is %s\nScore is %f",p->nplayers,p->name,p->score);
return 0;
}
```

Input:

```
Enter no_of_players:10
Enter name of sport:Cricket
Enter score:200
```

Output:

```
No of Players is 10
Name is Cricket
Score is 200.000000
```

Module 9(File Handling)

Program 1:

Aim: Develop a C program to copy the content from one file to another file.

Program:

```
#include<stdio.h>
int main()
{
   FILE *fp1,*fp2;
   char c;
   fp1=fopen("input.txt","r");
   fp2=fopen("output.txt","w");
  while((c=fgetc(fp1))!=EOF)
   {
       fputc(c,fp2);
   }
fclose(fp1);
fclose(fp2);
return 0;
}
```

Input :(input.txt)

```
Hello World!
Welcome to C
```

Output :(output.txt)

```
Hello World!
Welcome to C
```

Program 2:

Aim: Develop a C program to count the number of characters in the given file.

Program:

```
#include<stdio.h>int main()
{
        FILE *fp;char ch;
        int count=0; fp=fopen("sample.txt","r");
        while((ch=fgetc(fp))!=EOF)
        {
                count++;
        }
        printf("\nThe number of characters present in file is: %d",count);
        fclose(fp);
        return 0;
}
```

Input :(sample.txt)

c is Structured language

Output : The number of characters present in file is: 24

Program 3:

Aim: Develop the program to open an input file and read the number of lines in the input file.

Program:

```
#include<stdio.h>
int main()
{
    FILE *fp;char ch;
    int count=0;
    fp=fopen("input.txt","r");
    while((ch=fgetc(fp))!=EOF)
    {
        if(ch=='\n')
        count++;
    }
    printf("\nThe file has %d lines",count);
    fclose(fp);
    return 0;
}
```

Input : (input.txt)

C was invented to Develop an operating system called UNIX.
C is a successor of B language which was introduced around 1970.
Today C is the most widely used System Programming Language.

Output :

The file has 3 lines

Module 10(Command Line Arguments)

Program 1:

Aim: Write a program to accept a string as command line argument and print the same.

Program:

```
#include<stdio.h>
int main(int argc,char *argv[])
{
printf("%s ",argv[1]);
printf("- Command Line Arguments");
return 0;
}
```

Input : Programming

Output : Programming - Command Line Arguments

Program 2:

Aim: Develop a C program to accept strings as command line argument and print the number of arguments entered.

Program:

```
#include<stdio.h>
int main(int argc,char *argv[])
{
int i;
printf("\nArguments:");
for(i=1;i<argc;i++)
printf("\n%s ",argv[i]);
printf("\nNumber of arguments is %d",argc-1);
return 0;
}
```

Input : Command Arguments

Output :

Arguments :
Command
Arguments
Number of arguments is 2