Government Arts and Science College(Women)

Sathankulam

Department of Computer Science

C Programming Lab Manual

List of Programs

1. To find all possible roots of a quadratic equation using if statement

2. Program to check vowel or consonant using switch case statement

3. Evaluate Sine series using while loop Sin (x) = x – x 3 / 3! + x5 / 5!-….. x n / n

4. Sort a list of numbers in ascending order

5. Search an element in an array

6. Reverse a number

7. Check the given string is palindrome or not 8. Find the binomial coefficient (nCr) value using recursion

9. Multiply two matrices (check for compatibility)

10. Transpose of a matrix

11. Find the sum of 'n' numbers by making function call

12. Alphabetical sorting (passing array as argument to function)

13. Exchange values using pointers and function

14. Prepare the student details using structure

15. Prepare mark sheet using file

Program 1

```c
#include<stdio.h>
#include<math.h>
#include<conio.h>
void main()
{
    int flag;
    float x,x1,x2;
    float a,b,c,d;
    float rpart,ipart;
    clrscr();
    printf("\n Enter Coefficient a,b and c:");
    scanf("%f%f%f",&a,&b,&c);
    d=b*b-4*a*c;
    if(d>0)
    flag=1;
    else if(d==0)
    flag=2;
```

```c
    else
    flag=3;
    switch(flag)
    {
    case 1:
    printf("\n Real & Distinct roots are:");
    x1=(-b+sqrt(d))/(2*a);
    x2=(-b-sqrt(d))/(2*a);
    printf("\n Root1=%7.3f\nRoot2=%7.3f",x1,x2);
    break;
    case 2:
    printf("\n Real & Same Root  is:");
    x1=-b/(2*a);
    x2=x1;
    printf("\nx1&x2=%7.3f",x1);
    break;
    case 3:
    d=sqrt(abs(d));
    rpart=-b/(2*a);
    ipart=d/(2*a);
    printf("\n Complex roots are:");
    printf("\n x1=%7.3f+i%7.3f",rpart,ipart);
    printf("\n x2=%7.3f-i%7.3f",rpart,ipart);
```

```
    break;

    }

    getch();

}
```

Output

Enter Coefficient a,b and c:

1

2

1

Real & Same Root is:

x1&x2= -1.000

Enter Coefficient a,b and c:

3

3

3

Complex roots are:

x1= -0.500+i 0.866

x2= -0.500-i 0.866

Enter Coefficient a,b and c:

2

7

11

Real & Distinct roots are:

Root1=4611686018427387900.000

Root2= 0.000

```
/*------------------------------------------------------------------------------
```

2. Vowel or consonant

```
------------------------------------------------------------------------------*/

#include<stdio.h>

#include<conio.h>

void main()

{

 char alphabet;

 clrscr();

 printf("\n Enter the alphabet  :\n");

 scanf("%c",&alphabet);

 switch(alphabet)

 {

  case 'a':

    printf("\n a is a vowel");

    break;

  case 'e':

    printf("\n e is a vowel");

    break;

  case 'i':

    printf("\n i is a vowel");

    break;
```

```c
    case 'o':

      printf("\n o is a vowel");

      break;

    case 'u':

      printf("\n u is a vowel");

      break;

    default:

      printf("\n Entered Alphabet is a consonant");

      break;

    }

 getch();

}
```

Output

 Enter the alphabet :

a

 a is a vowel

 Enter the alphabet :

d

Entered Alphabet is a consonant

```
/*-------------------------------------------------------------------------------------

                                  3. Sine Series

-----------------------------------------------------------------------------------------*/


 #include<stdio.h>

#include<conio.h>

#include<math.h>

void main()

{

 int i,n;

 float x,val,sum,t;

 clrscr();

 printf("\n Enter the value for sine:");

 scanf("%f",&x);

 printf("\n Enter the number of terms:");

 scanf("%d",&n);

 val=x;
```

```
x=x*3.14159/180;

t=x;

sum=x;

i=1;

while(i<=n)

{

 t=(t*(-1)*x*x)/(2*i*(2*i+1));

 sum=sum+t;

 i=i+1;

}
printf("\n Sine value of %3.3f is %3.4f",val,sum);

getch();

}
```

Output

Enter the value for sine:90

Enter the number of terms:25

Sine value of 90.000 is 1.0000

Program 4

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int a[20],i,j,t,n;
clrscr();
printf("\n Enter the number of terms:  ");
scanf("%d",&n);
printf("\n Enter the numbers  : \n");
for(i=1;i<=n;i++)
 scanf("%d",&a[i]);
for(i=1;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;

    }

   }

}

printf("\n The sorted array is:");

for(i=1;i<=n;i++)

 printf("\n \t %d",a[i]);

getch();

}
```

Output

 Enter the number of terms: 5

 Enter the numbers :

23

10

46

28

43

 The sorted array is:

        10

23

28

43

46

Program : 5

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int a[20],i,n,srh,c;
clrscr();
printf("\n Enter the n:");
scanf("%d",&n);
printf("\n Enter the array element:\n");
for(i=0;i<n;i++)
scanf("%d",&a[i]);
printf("\n Enter the number to be searched:");
scanf("%d",&srh);
for(i=0;i<=n;i++)
  if(srh==a[i])
    c=1;
```

```c
if(c==1)

printf("\n The given number is present");

else

printf("\n The given number is not present");

getch();

}
```

Output

Enter the n:5

Enter the array element:

2

5

3

6

4

Enter the number to be searched:4

The given number is present

Enter the n:4

Enter the array element:

1

2

3

5

 Enter the number to be searched:7

 The given number is not present

Program 6

#include<stdio.h>

#include<conio.h>

void main()

{

 int n,rev=0;

 clrscr();

 printf("Enter the number:\n");

 scanf("%d",&n);

 while(n!=0)

 {

 rev=rev*10;

 rev=rev+n%10;

 n=n/10;

 }

 printf("Reverse of the number=%d",rev);

 getch();

 }

Output

Enter the number:

2345

Reverse of the number=5432

Program 7

```c
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
  char str1[30];
  int i,length;
  int flag=0;
  clrscr();
  printf("\n Enter the string  : ");
  scanf("%s",str1);
  length=strlen(str1);
  for(i=0;i<length;i++)
  {
   if(str1[i]!=str1[length-i-1])
    {
     flag=1;
```

```c
        break;

         }

       }

   if(flag)

     printf("%s is not a palindrome",str1);

   else

     printf("%s is a palindrome",str1);

    getch();

   }
```

Output

Enter the string : MADAM

MADAM is a palindrome

Enter the string : ANI

ANI is not a palindrome

Program 8

```c
#include<stdio.h>

#include<conio.h>

#include<string.h>

long int fact(long int);  //function declaration

void main()
{
  long int n,r,ncr;
  clrscr();
  printf("\n \t Enter n and r value \n");
  scanf("%ld %ld",&n,&r);
  ncr=fact(n)/(fact(n-r)*fact(r));
  printf("\n \n NCR=%d",ncr);
  getch();
}
```

//Function Definition

```
long int fact (long int n)
{
 long int f;
 if(n==1)
   return(1);
 else
   f=n* fact(n-1);
  return(f);
}
```

Output

Enter n and r value

5

2

NCR=10

Program 9

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int i,j,k,r1,r2,c1,c2,a[10][10],b[10][10],c[10][10];
clrscr();
printf("\n Enter r1,r2,c1,c2 \n");
scanf("%d %d %d %d",&r1,&r2,&c1,&c2);
if(r1==c2)
{
printf("\n Enter the matrix A");
for(i=0;i<r1;i++)
{
for(j=0;j<c1;j++)
{
scanf("%d",&a[i][j]);
}
```

```c
}
printf("\n Enter the matrix B");
for(i=0;i<r2;i++)
{
 for(j=0;j<c2;j++)
 {
  scanf("%d",&b[i][j]);
 }
}
printf("\n Matrix A \n");
for(i=0;i<r1;i++)
{
 for(j=0;j<c1;j++)
 {
  printf("\t %d",a[i][j]);
 }
 printf("\n");
}
printf("\n Matrix B \n");
for(i=0;i<r2;i++)
{
 for(j=0;j<c2;j++)
 {
```

```c
    printf("\t %d",b[i][j]);

   }

  printf("\n");

 }

 for(i=0;i<r1;i++)

 {

  for(j=0;j<c2;j++)

  {

   c[i][j]=0;

   for(k=0;k<r2;k++)

   {

    c[i][j]=c[i][j]+a[i][k]*b[k][j];

   }

  }

 }

 printf("\n Matrix C \n");

 for(i=0;i<r1;i++)

 {

  for(j=0;j<c2;j++)

  {

   printf("\t %d",c[i][j]);

  }

  printf("\n");
```

```
  }
 }
else
printf("\n Matrix multiplication is impossible");
getch();
}
```

Output

Enter the matrix A

2

2

2

2

Enter the matrix B

2

2

2

2

Matrix A

    2   2

    2   2

Matrix B

    2   2

    2   2

Matrix C

     8   8

     8   8

Program 10

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int i,j,a[10][10],r,c;
clrscr();
printf("\n Enter row and column \n");
scanf("%d %d",&r,&c);
printf("\n Enter the matrix \n");
for(i=0;i<r;i++)
{
 for(j=0;j<c;j++)
 {
  scanf("%d",&a[i][j]);
 }
}
printf("\n Matrix is \n");
```

```c
for(i=0;i<r;i++)

{

for(j=0;j<c;j++)

{

printf("\t %d",a[i][j]);

}

printf("\n");

}

printf("\n Transpose of matrix \n");

for(i=0;i<c;i++)

{

for(j=0;j<r;j++)

{

printf("\t %d",a[j][i]);

}

printf("\n");

}

getch();

}
```

Output

Enter row and column

2

2

Enter the matrix

2

3

4

5

Matrix is

    2   3

    4   5

Transpose of matrix

    2   4

    3   5

Program 11

```c
#include<stdio.h>
#include<conio.h>
void main()
{
int n,l;
printf("\n Enter the number of terms:");
scanf("%d",&n);
sum(n);
getch();
}
int sum(int x)
{
int s=0,i;
for(i=1;i<=x;i++)
s=s+i;
printf("Sum of n numbers=%d",s);
return(0);
```

```
}
```

Output

Enter the number of terms:3

Sum of n numbers=6

Program 12

```c
#include<stdio.h>
#include<conio.h>
#include<string.h>
void sort(int n,char*name[]);
void main()
{
char*name[25];
int i,n=0;
clrscr();
printf("\n Enter the number of names to be sorted:");
scanf("%d",&n);
printf("\n Enter the names:");
for(i=0;i<n;i++)
{
name[i]=(char*)malloc(20*sizeof(char));
scanf("%s",name[i]);
}
```

```c
sort(n,name);
printf("\n After sorting:");
for(i=0;i<n;i++)
printf("\n \t %s",name[i]);
getch();
}
void sort(int n,char*name[])
{
int i,j;
char t[20];
for(i=0;i<n-1;i++)
{
for(j=i+1;j<n;j++)
{
if(strcmp(name[i],name[j])>0)
{
strcpy(t,name[i]);
strcpy(name[i],name[j]);
strcpy(name[j],t);
}
}
}
return;
```

}

Output

Enter the number of names to be sorted:5

Enter the names:Jini

Mini

Binu

Ani

Shini

After sorting:

Ani

Binu

Jini

Mini

Shini

Program 13

```c
#include<stdio.h>
#include<conio.h>
void swap(int*p,int*q);
void main()
{
int a,b;
clrscr();
printf("\n Enter values for A and B:");
scanf("%d %d",&a,&b);
printf("\n Before swapping ");
printf("\n==============\n");
printf("\n value of A:%d",a);
printf("\n value ofB:%d",b);
swap(&a,&b);
getch();
}
```

```c
// Function

void swap(int*p,int*q)
{
int*t;


*t=*p;
*p=*q;
*q=*t;


printf("\n After swapping");
printf("\n==============\n");
printf("\n Value for A:%d",*p);
printf("\n Value of B:%d",*q);;
}
```

Output

Enter values for A and B:34 89

Before swapping

===============

value of A:34
value ofB:89

After swapping

===============

Value for A:89

Value of B:34

Program 14

```c
#include<stdio.h>
#include<conio.h>
struct student
{
char name[50];
int regno;
float marks;
}s;
void main()
{
clrscr();
printf("\n Enter the student information:\n");
printf("\n Enter the name:");
scanf("%s",s.name);
printf("\n Enter the register number:");
scanf("%d",&s.regno);
printf("\n Enter the Total Mark:");
```

```
scanf("%f",&s.marks);

printf("\n \n \t Displaying student information \n");

printf("\n \t ***************************** \n");

printf("\n \t Name:%s",s.name);

printf("\n \t Register number:%d",s.regno);

printf("\n \t Total Mark:%f",s.marks);

getch();

}
```

Output

Enter the student information:

Enter the name:Ani

Enter the register number:3445

Enter the Total Mark:472

    Displaying student information

    ****

    Name:Ani

    Register number:3445

    Total Mark:472.000000

Program 15

```c
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

int main()
{
FILE *fptr;
char name[50];
int sub1,sub2,sub3,total,i,n;
clrscr();
printf("\n Enter the number of students :");
scanf("%d",&n);
fptr=(fopen("student1.txt","w"));
printf("File created\n");
if(fptr==NULL)
 {
  printf("error");
```

```c
    exit(1);

  }

for(i=0;i<n;i++)

 {

   printf("\n Enter the name of student:\t");

   scanf("%s",name);

   printf("\n Enter the 3 marks:");

   scanf("%d %d %d",&sub1,&sub2,&sub3);

   total=sub1+sub2+sub3;

   fprintf(fptr,"\n Name:%s\n Subject1=%d\n Subject2:%d\n Subject3:%d\n
Total:%d",name,sub1,sub2,sub3,total);

}
fclose(fptr);

return(0);

}
```

Output

 Enter the number of students :5

File created

 Enter the name of student: shini

Enter the 3 marks:89   90   86

Enter the name of student: Ani

Enter the 3 marks:85   56   94

Enter the name of student: Nancy

Enter the 3 marks:67   57   96

Enter the name of student: Daray

Enter the 3 marks:87   57   95

Enter the name of student: Baby

Enter the 3 marks:98   76   86

STUDENT1.TXT

Name:shini
Subject1=89

Subject2:90

Subjcet3:86

Total:265

Name:Ani

Sub1=85

Sub2:56

Sub3:94

Total:235

Name:Nancy

Sub1=67

Sub2:57

Sub3:96

Total:220

Name:Daray

Sub1=87

Sub2:57

Sub3:95

Total:239

Name:Baby

Sub1=98

Sub2:76

Sub3:86

Total:260