C PROGRAMS
1.Solution of a quadratic equation

```c
#include <stdio.h>
#include <math.h>
#include<conio.h>
int main() {
    float a, b, c, d, root1, root2;
    clrscr();
    printf("Enter coefficients a, b and c: ");
    scanf("%f %f %f", &a, &b, &c);
    d = b * b - 4 * a * c;
    if (d > 0) {
        root1 = (-b + sqrt(d)) / (2 * a);
        root2 = (-b - sqrt(d)) / (2 * a);
        printf("root1 = %.2f and root2 = %.2f", root1, root2);
    }
    else if (d == 0) {
        root1 = root2 = -b / (2 * a);
        printf("root1 = root2 = %.2f;", root1);
    }
    else {
        printf("roots are imaginary ");
    }
    getch();
    return 0;
}
```

2.Sum of the digits and reverse of a number

```c
#include<stdio.h>
#include<conio.h>
void main( )
{
clrscr( )
int num,sum=0,rev=0,d;
printf("Enter the number: ");
scanf("%d",&num);
while(num){
d=num%10;
num=num/10;
sum=sum+d;
rev=rev*10+d;
}
printf("Sumof digits = %d",sum);
printf("\nReverse of the number = %d",rev);
getch( );
}
```

3.Nth Fibonacci number

```c
#include <stdio.h>
#include<conio.h>
void main()
{
int a, b, c, i, n;
printf("\nEnter a number to generate fibonacci series
upto nth term\n");
scanf("%d", &n);
a = 0;
b = 1;
```

```c
c = 0;
printf("Fibonacci terms: \n");
for(i=1; i<=n; i++)
{
printf("%d, ", c);
a = b;
b = c;
c = a + b;
}
getch();}
```

4.Count of positives , negatives and zeros in a set of n numbers

```c
#include < stdio.h >
#include<conio.h>
int main()
{
    int limit, num, positive = 0, negative = 0, zero = 0;
clrscr();
    printf("Enter the limit\n");
    scanf("%d", &limit);
      printf("Enter %d numbers\n", limit);
      while(limit)
    {
      scanf("%d", &num);
        if(num > 0)
      {
          positive++;
      }
        else if(num < 0)
```

```c
        {
            negative++;
        }
        else
        {
            zero++;
        }
            limit--;
    }
    printf("\nPositive Numbers: %d\n", positive);
    printf("Negative Numbers: %d\n", negative);
    printf("Number of zero: %d\n", zero);
    getch();
    return 0;
}
```

5.Evaluate 1+x+x2 /2! +x3 /3! +…………+xn /n!

```c
#include <stdio.h>
#include<conio.h>
void main()
{
    float x,sum,row;
    int i,n;
    clrscr();
    printf("Enter the value of x :");
    scanf("%f",&x);
    printf("Enter the value of n : ");
    scanf("%d",&n);
    sum =1; row = 1;
    for (i=1;i<=n;i++)
```

```c
    {
      row = row*x/(float)i;
      sum =sum+ row;
    }
    printf("\nThe sum  is : %f\n",sum);
    getch();
}
```

6.Display pyramid using *

```c
#include <stdio.h>
void main()
{
int i, space, rows, k=0;
printf("Enter number of rows: ");
scanf("%d",&rows);
for(i=1; i<=rows; ++i, k=0)
{
for(space=1; space<=rows-i; ++space)
{
printf(" ");
}
while(k != 2*i-1)
{
printf("* ");
++k;
}
printf("\n");
}
getch();
}
```

7.Armstrong numbers in a range

```
#include <stdio.h>
void main(){
int num,r,sum,temp;
int stno,enno;
printf("Input starting number of range: ");
scanf("%d",&stno);
printf("Input ending number of range : ");
scanf("%d",&enno);
printf("Armstrong numbers in given range are: ");
for(num=stno;num<=enno;num++){
temp=num;
sum = 0;
while(temp!=0){ r=temp % 10;
temp=temp/10;
sum=sum+(r*r*r); }
if(sum==num)
printf("%d ",num);
}
printf("\n");
getch():
}
```

8.Display the pattern with a number eg:- N=39174

Pattern:
3 9 1 7 4
9 1 7 4
1 7 4
7 4
4

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,i;
printf("\n enter the number\t");
scanf("%d",&n);
for(i=10;i<n;i=i*10);
while(n>0)
{i=i/10;
printf("%d\n",n);
n=n%i;
}
getch();
}
```

9.Leap years in a range

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

void main()
{
    int year;
    int minyear,maxyear;
    clrscr();

    printf("Enter the lowest year: ");
    scanf("%d",&minyear);

    printf("Enter the heighest year: ");
    scanf("%d",&maxyear);
```

```c
    printf("Leap years in given range are: ");
    for(year = minyear;year <= maxyear; year++){

if(((year%4==0)&&(year%100!=0))||(year%400==0))
        printf("%d ",year);
    }

    getch();
}
```

10.Convert a decimal to new base
```c
#include<stdio.h>
#include<conio.h>
void main()
{
int b,n,i,r,digit,p,count=0;
har a[100];clrscr();
printf("\nEnter the decimal number:\n");
scanf("%d",&n);
printf("\nEnter the base to be converted:\n");
scanf("%d",&b);
p=n;
do
{
r=p%b;
digit='0'+r;
if(digit>'9')
digit=digit+7;
a[count]=digit;
count++;
p=p/b;
```

```c
} while(p!=0);
printf("\nbase %d equivalent of num %d is ",b,n);
for(i=count-1;i>=0;--i)
printf("%c",a[i]);
printf(".\n");
getch();
}
```

11.Location of a given number in an array

```c
#include <stdio.h>
#include<conio.h>
int main()
{
    int a[10],n,i,loc,flag=0,val;
    clrscr();
    printf("Enter the limit: ");
    scanf("%d", &n);
    printf("Enter elements in array: ");
    for(i=1; i<=n; i++)
    {
        scanf("%d", &a[i]);
    }
    printf("\nEnter element to search: ");
    scanf("%d", &val);
    for(i=1; i<=n; i++)
    {
```

```c
        if(arr[i] == val)
        {
            flag = 1;
            break;
        }
    }
    if(flag== 1)
    {
        printf("\n%d is found at position %d", val, i );
    }
    else
    {
        printf("\n%d is not found in the array", val);
    }
}
```

12.Append two arrays A and B

```c
#include<stdio.h>
#include<string.h>
int main() {
    int a[20],b[20],c[40],a_len,b_len,i,j,k,m,n;

    printf("Enter number of elements in first array : ");
    scanf("%d",&m);
    printf("Enter the elements : ");
    for(i = 0; i < m; i++) {
        scanf("%d",&a[i]);
    }

    printf("Enter number of elements in second array : ");
    scanf("%d",&n);
```

```c
    printf("Enter the elements : ");
    for(i = 0; i < n; i++) {
        scanf("%d",&b[i]);
    }
    for(i = 0; i < m; i++) {
        c[i]=a[i];
    }

    for(j = 0; j < n; j++) {
        c[j+m]=b[j];
    }
    printf("Array one ");
    for(i=0;i<m;i++){
        printf("%d ",a[i]);
    }
    printf("\n");
    printf("Array two ");
    for(i=0;i<n;i++){
        printf("%d ",b[i]);
    }
    printf("\n");
    printf("Arrays after appending : ");
    for(i=0;i<m+n;i++){
        printf("%d ",c[i]);
    }
    return 0;
}
```

13. Currency denomination

```c
#include <stdio.h>
#define SIZE 8
int main()
{
int amount, notes;
int denominations[SIZE] = {2000,500,200, 100, 50, 20, 10, 1};
printf("Enter amount: ");
scanf("%d", &amount);
printf("\n");
for (int i = 0; i < SIZE; i++)
{
notes = amount / denominations[i];
if (notes)
{
amount = amount % denominations[i]; // remaining money
printf("%d * %d = %d \n", notes, denominations[i], notes * denominations[i]);
}
}
return 0;
}
```

14. Matrix transpose

```c
#include <stdio.h>
void main()
{
int row, col, i, j, matrix[10][10], transpose[10][10];
```

```c
printf("Enter the number of rows and columns of a
matrix\n");
scanf("%d%d", &row, &col);
printf("Enter elements of the matrix\n");
for (i = 0; i < row; i++)
for (j = 0; j < col; j++)
scanf("%d", &matrix[i][j]);
for (i = 0; i < row; i++)
for (j = 0; j < col; j++)
transpose[j][i] = matrix[i][j];
printf("Transpose of the matrix:\n");
for (i = 0; i < col; i++) {
for (j = 0; j < row; j++)
printf("%d\t", transpose[i][j]);
printf("\n");
}
getch();
}
```

15.Matrix multiplication

```c
#include<stdio.h>
#include<conio.h>
int main()
{
  int r1,c1,r2,c2,i,j, k, tot = 0,fst[10][10], sec[10][10],
mul[10][10];
  clrscr();
  printf(" Enter the row and column of first matrix \n ");
  scanf("%d %d", &r1, &c1);
  printf(" Enter the first matrix elements : \n ");
```

```c
    for (i = 0; i < r1; i++)
      for (j= 0; j < c1; j++)
        scanf("%d", &fst[i][j]);
    printf(" Enter the  rows and column of second
matrix\n");
    scanf(" %d %d", &r2, &c2);
    if (c1 != r2)
      printf(" Your given matrices cannot be multiplied with
each other. \n ");
    else
    {
      printf(" Enter the second matrix elements \n ");
      for (i = 0; i < r2; i++)
        for (j = 0; j < c2; j++)
          scanf("%d", &sec[i][j] );

      for (i = 0;i < r1; i++) {
        for (j = 0; j < c2; j++) {
          for (k = 0; k < r2; k++) {
            tot = tot + fst[i][k] * sec[k][j];
          }
          mul[i][j] = tot;
          tot = 0;
        }
      }
      printf(" The result of matrix multiplication or product
of the matrices is: \n ");
      for (i = 0;i < r1; i++) {
        for (j = 0; j < c2; j++)
          printf("%d \t", mul[i][j] );
        printf(" \n ");
```

```
    }
  }
  return 0;
}
```

16.Factorial of a number using recursion

```
#include<stdio.h>
int fact(int);
void main(){
int num,f;
printf("\nEnter a number: ");
scanf("%d",&num);
f=fact(num);
printf("\nFactorial of %d is: %d",num,f);
getch();
}
int fact(int n){
if(n==1)
{
return 1;
}
else
{
return(n*fact(n-1));
}
}
```

17.Short form of a string eg:- Computer Science : CS

```
#include<stdio.h>
```

```c
#include<string.h>
void main()
{
char str[200];
int i=0;
int len;
printf("Enter a string:");
gets(str);
printf("%c",*str);
len = strlen(str);
for(i=0;i<=len;i++)
{
if(str[i]==' ')
{
putchar(str[i+1]);
}
}
getch();
}
```

18.Number of vowels in a string

```c
#include <stdio.h>
#include <conio.h>
void main()
{
    char a[100];
    int len,i,vow=0;
    clrscr();
    printf("\nENTER A STRING: ");
    gets(a);
    len=strlen(a);
```

```c
        for(i=0;i<len;i++)
        {
                if(a[i]=='a' || a[i]=='A' || a[i]=='e' ||
a[i]=='E' || a[i]=='i' || a[i]=='I' || a[i]=='o' || a[i]=='O' ||
a[i]=='u' || a[i]=='U')
                    vow++;
        }
        printf("\nTHERE ARE  %d VOWELS IN THE
STRING",vow);
        getch();
}
```

19.Generate mark list of N students in a class using array of structures.

```c
 #include<stdio.h>
#include<conio.h>
struct student {
        char name[20];
        int rollno, marks;
        };
int main( )
{
    int i,n;
     struct student stuarr[100];
     clrscr();
    printf("Enter how many records u want to store :: ");
    scanf("%d",&n);

    printf("Enter name, roll no. and marks Below :: \n");

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

```c
            printf("\nEnter %d record :: \n",i+1);

            printf("Enter Name :: ");
            scanf("%s",stuarr[i].name);
            printf("Enter RollNo. :: ");
            scanf("%d",&stuarr[i].rollno);
            printf("Enter Marks :: ");
            scanf("%d",&stuarr[i].marks);

    }
    printf("\n\tName\tRollNo\tMarks\t\n");
    for(i=0; i<n; i++)
            printf("\t%s\t%d\t%d\t\n", stuarr[i].name,
stuarr[i].rollno, stuarr[i].marks);
            getch();
            return 0;
}
```

20.Length of a string using pointer

```c
#include <stdio.h>
#include<conio.h>
int main() {
    char str[100], * ptr;
    int count=0;
    clrscr();
    printf("Enter any string: ");
    gets(str);

    ptr = str;
```

```c
    while ( *ptr != '\0') {
      count++;
      ptr++;
    }
    printf("The length of the string is: %d", count);
    getch():
    return 0;
}
```

21.Write odd and even numbers into two files

```c
#include<stdio.h>
#include<conio.h>
void main()
{
FILE *f1,*f2,*f3;
int number,i;
clrscr();
printf("Contents of DATA file\n\n");
f1 = fopen("DATA","w");
for(i=1;i<=10;i++)
{
scanf("%d",&number);
if(number==-1)break;
putw(number,f1);
}
fclose(f1); f1 = fopen("DATA","r");
f2 = fopen("ODD","w");
f3 = fopen("EVEN","w");
while((number = getw(f1)) != EOF)
{
if(number%2==0)
```

```c
putw(number,f3);
else
putw(number,f2);
}
fclose(f1);
fclose(f2);
fclose(f3);
f2 = fopen("ODD","r");
f3 = fopen("EVEN","r");
printf("\n\nContents of ODD file \n\n");
while((number = getw(f2)) != EOF)
printf("%4d",number);
printf("\n\nContents of EVEN file \n\n");
while((number = getw(f3)) != EOF)
printf("%4d",number);
fclose(f2);
fclose(f3);
getch();
}
```