## 1. find the sum of first 10 natural numbers. (Using for loop)

```c
#include <stdio.h>
int main()
{
    int  j, sum = 0;

    printf("The first 10 natural number is :\n");

    for (j = 1; j <= 10; j++)
    {
        sum = sum + j;
        printf("%d ",j);
    }
    printf("\nThe Sum is : %d\n", sum);

    return 0;
}
```

**Output:**

```
The first 10 natural number is :
1 2 3 4 5 6 7 8 9 10
The Sum is : 55



...Program finished with exit code 0
Press ENTER to exit console.
```

## 2. display the multiplication table of a given integer (Using while loop)

```c
#include <stdio.h>
void main()
{
  int j=1,n;
  printf("Input the number (Table to be calculated) : ");
  scanf("%d",&n);
  printf("\n");
  while(j<=10)
  {
    printf("%d X %d = %d \n",n,j,n*j);
  j++;
  }
}
```

**Output:**

```
Input the number (Table to be calculated) : 5

5 X 1 = 5
5 X 2 = 10
5 X 3 = 15
5 X 4 = 20
5 X 5 = 25
5 X 6 = 30
5 X 7 = 35
5 X 8 = 40
5 X 9 = 45
5 X 10 = 50


...Program finished with exit code 13
Press ENTER to exit console.
```

### 3. display the n terms of odd natural number and their sum (Using do…while loop)

```c
include <stdio.h>
void main()
{
  int i=1,n,sum=0;

  printf("Input number of terms : ");
  scanf("%d",&n);
  printf("\nThe odd numbers are :");
  while(i<=n)
  {
    printf("%d ",2*i-1);
    sum+=2*i-1;
    i++;
}
  printf("\nThe Sum of odd Natural Number upto %d terms : %d \n",n,sum);
}
```

**Output:**

```
Input number of terms : 20

The odd numbers are :1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39
The Sum of odd Natural Number upto 20 terms : 400


...Program finished with exit code 52
Press ENTER to exit console.
```

## 4. display the pattern like right angle triangles. (Using for loop)
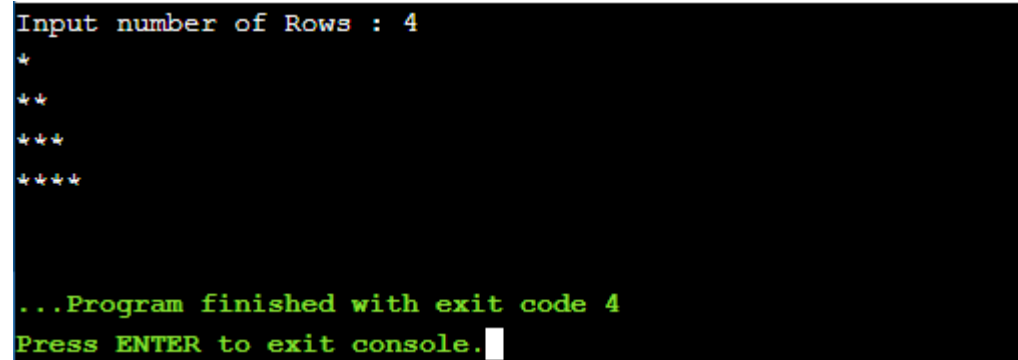
```c
#include <stdio.h>
void main()
{
  int i,j,rows;
  printf("Input number of Rows : ");
  scanf("%d",&rows);
  for(i=1;i<=rows;i++)
  {
for(j=1;j<=i;j++)
printf("*");
printf("\n");
  }
}
```

**Ouput:**

```
Input number of Rows : 4
*
**
***
****



...Program finished with exit code 4
Press ENTER to exit console.
```

**5.** **Display the pattern like right angle triangles. (Using while loop)**

1

2 3

4 5 6

7 8 9 10

```c
#include <stdio.h>
void main()
{
  int i=1,j,rows;
  printf("Input number of rows : ");
  scanf("%d",&rows);

  while(i<=rows)
  {
    j=1;
    while(j<=i){
    printf("%d",j);
    j++;
    }
    printf("\n");
    i++;
  }
}
```

**Output:**

```
Input number of rows : 5
1
12
123
1234
12345


...Program finished with exit code 5
Press ENTER to exit console.
```

6. **Make such a pattern like a pyramid with numbers (Using do...while loop)**

```
 1
 2 3
 4 5 6
7 8 9 10
```

```c
#include <stdio.h>
int main(){
    int i=1,j,k,n,t=1,g;
    printf("Enter the value for n:");
    scanf("%d",&n);
    g=n+4-1;
    do
    {
        for(k=g;k>=1;k--){
            printf(" ");
        }
        for(j=1;j<=i;j++)
            printf("%d",t++);
        printf("\n");
        g--;
        i++;
    }
    while(i<=n);
    return 0;
}
```

**Output:**

```
Enter the value for n:5
         1
        23
       456
      78910
     1112131415


...Program finished with exit code 0
Press ENTER to exit console.
```

## 7. Display Pascal's triangle. (Using for loop)

```
    1
   1 1
  1 2 1
 1 3 3 1
1 4 6 4 1
```

```c
#include <stdio.h>

void main()

{

int no_row,c=1,blk,i,j;
printf("Input number of rows: ");
scanf("%d",&no_row);
for(i=0;i<no_row;i++)
{
for(blk=1;blk<=no_row-i;blk++)
printf("  ");
for(j=0;j<=i;j++)
{
if (j==0||i==0)
c=1;
else
c=c*(i-j+1)/j;
printf("% 4d",c);
}
printf("\n");
}
}
```

**Output:**

```
Input number of rows: 8
                1
              1   1
            1   2   1
          1   3   3   1
        1   4   6   4   1
      1   5  10  10   5   1
    1   6  15  20  15   6   1
  1   7  21  35  35  21   7   1


...Program finished with exit code 8
Press ENTER to exit console.
```

## 8. Display the first n terms of Fibonacci series. (Using for loop)

```c
#include <stdio.h>

void main()
{
  int prv=0,pre=1,trm,i,n;
  printf("Input number of terms to  display : ");
  scanf("%d",&n);
  printf("Here is the Fibonacci series upto  to %d terms : \n",n);
  printf("% 5d % 5d", prv,pre);

 for(i=3;i<=n;i++)
  {
   trm=prv+pre;
   printf("% 5d",trm);
   prv=pre;
   pre=trm;
  }
  printf("\n");
}
```

**Output:**

```
Input number of terms to  display : 5
Here is the Fibonacci series upto  to 5 terms :
    0    1    1    2    3


...Program finished with exit code 10
Press ENTER to exit console.
```

## 9. Check whether a given number is a perfect number or not. (Using while loop)

```c
#include<stdio.h>

int main()
{
    int num, count = 1, sum = 0;

    printf("Enter a number\n");
    scanf("%d", &num);

    while(count < num)
    {
        if(num%count == 0)
        {
            sum = sum + count;
        }
        count++;
    }

    if(sum == num)
    {
        printf("\n%d is a perfect number\n", num);
    }
    else
    {
        printf("\n%d is not a perfect number\n", num);
    }

    return 0;
}
```
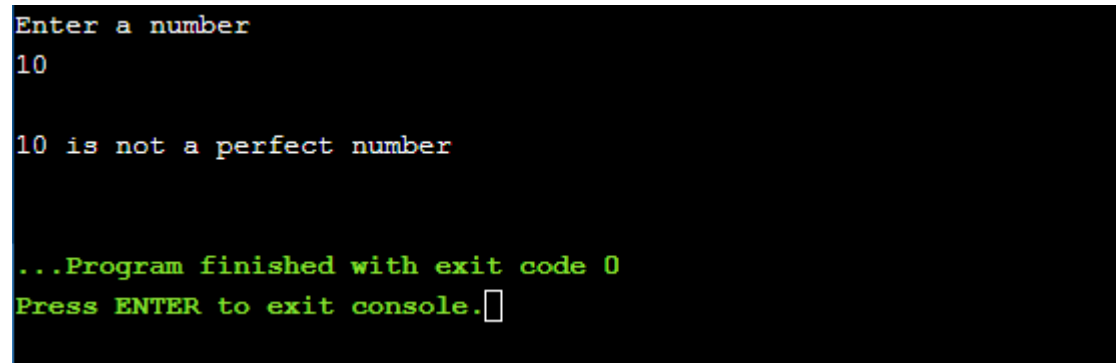
**Output:**

```
Enter a number
10

10 is not a perfect number



...Program finished with exit code 0
Press ENTER to exit console.
```

## 10. Find the Armstrong number for a given range of number. (Using while loop)

```c
#include <stdio.h>
int main() {
    int num, originalNum, remainder, result = 0;
    printf("Enter a three-digit integer: ");
    scanf("%d", &num);
    originalNum = num;

    while (originalNum != 0) {

        remainder = originalNum % 10;

        result += remainder * remainder * remainder;


        originalNum /= 10;
    }

    if (result == num)
        printf("%d is an Armstrong number.", num);
    else
        printf("%d is not an Armstrong number.", num);

    return 0;
}
```

**Output:**

```
Enter a three-digit integer: 321
321 is not an Armstrong number.

...Program finished with exit code 0
Press ENTER to exit console.
```

## 11. Determine whether a given number is prime or not. (Using do…while loop)
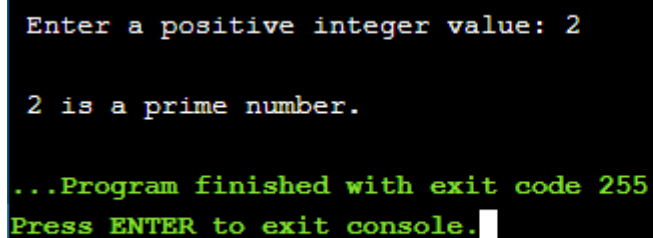
```c
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
//clrscr();
{
   int n, i, flag=0;

    printf("\n Enter a positive integer value: ");
   scanf("%d",&n);

    do {
      if((n!=2) && (n%i==0)){
         flag=1;
         break;
      }
      i++;
   }while(i<=sqrt(n));
    if (flag==0)
      printf("\n %d is a prime number.",n);
   else
      printf("\n %d is not a prime number.",n);
   getch();
}
```

**Output:**

```
Enter a positive integer value: 2

2 is a prime number.

...Program finished with exit code 255
Press ENTER to exit console.
```

**12. Display the number in reverse order. (Using do...while loop)**
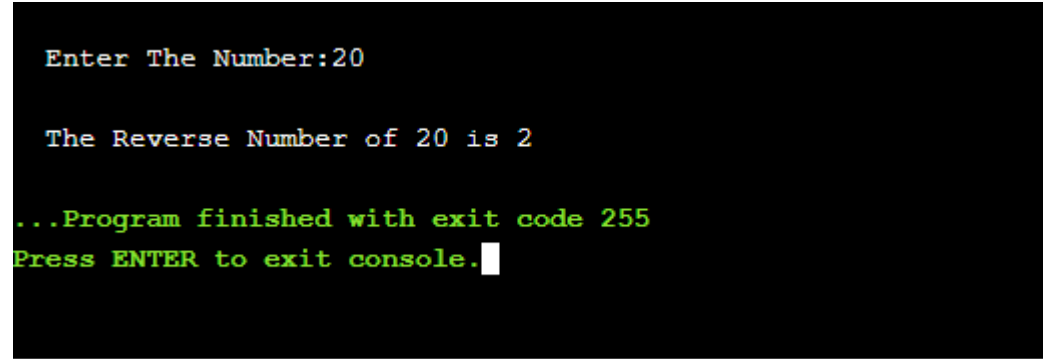
```c
#include<stdio.h>
#include<conio.h>
void main()
{
int n,a,r,s=0;
clrscr();

printf("\n  Enter The Number:");
scanf("%d",&n);
a=n;


do
{
r=n%10;
s=s*10+r;
n=n/10;
}while(n>0);

printf("\n  The Reverse Number of %d is %d",a,s);
getch();
}
```

**Output:**

```
 Enter The Number:20

 The Reverse Number of 20 is 2

...Program finished with exit code 255
Press ENTER to exit console.
```
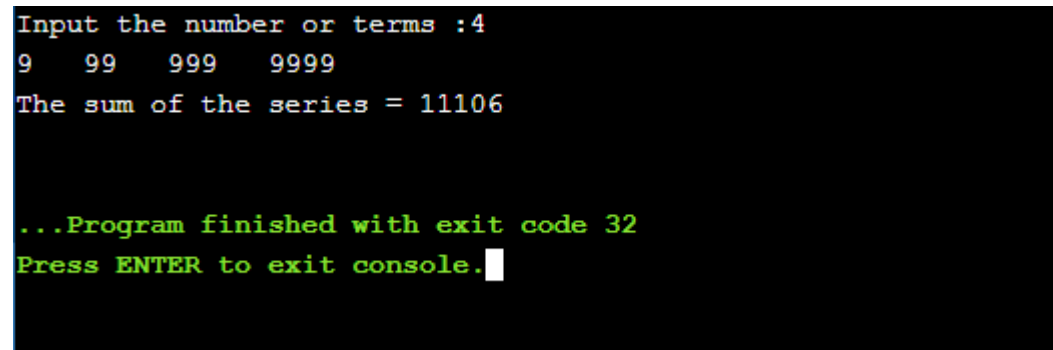
**13. Display the sum of the series [ 9 + 99 + 999 + 9999 ...] (Using for loop)**

```c
#include <stdio.h>

void main()
{   long int n,i,t=9;
int sum =0;
printf("Input the number or terms :");
scanf("%ld",&n);
for (i=1;i<=n;i++)
{ sum +=t;
printf("%ld   ",t);
t=t*10+9;
}
printf("\nThe sum of the series = %d \n",sum);
}
```

**Output:**

```
Input the number or terms :4
9   99   999   9999
The sum of the series = 11106


...Program finished with exit code 32
Press ENTER to exit console.
```

**14. Find the sum of the series [ 1-X^2/2!+X^4/4!- ………]. (Using while loop)**

```c
#include<stdio.h>
#include<math.h>
int main()
{
float x, sum, t, d;
int i, n;
printf("input the value of x :  ");
printf("input the number of terms :  ");
scanf("%d", &n);
sum=1; t=1;
i=1;
while(i<n){
d = (2*i)*(2*i-1);
t= -t*x*x/d;
sum= sum+t;
i++;
}
Printf("\nsum = %f", sum);
return 0;
}
```

**Output:**

```
Input the number or terms :4
9   99   999   9999
The sum of the series = 11106


...Program finished with exit code 32
Press ENTER to exit console.
```

**15. Find the sum of the series [ x - x^3 + x^5 + ......]. (Using do...while loop)**

```c
#include<stdio.h>
#include<math.h>
int main()
{
int x, sum, ctr;
int i=1,n, m, mm, nn;
printf("input the value of x :");
scanf("%d",&x);
printf("input number of terms : ");
scanf("%d",&n);
sum= x; m= -1;
printf("the values of the series: \n");
printf("%d\n",x);
do{
ctr = (2* i+1);
mm= pow(x, ctr);
nn= mm*m;
printf("%d \n",nn);
sum= sum+nn;
m= m* (-1);
i++;
}while(i<n);
printf("\n the sum =- %d\n", sum);
return 0;
}
```

**Output:**

```
input the value of x :14
input number of terms : 6
the values of the series:
14
-2744
537824
-105413504
-2147483648
-2147483648

 the sum =- -104878410


...Program finished with exit code 0
Press ENTER to exit console.
```

16. **Display the n terms of even natural number and their sum.**

```c
#include <stdio.h>

void main()
{
  int i,n,sum=0;

  printf("Input number of terms : ");
  scanf("%d",&n);
  printf("\nThe even numbers are :");
  for(i=1;i<=n;i++)
  {
    printf("%d ",2*i);
    sum+=2*i;
  }
  printf("\nThe Sum of even Natural Number upto %d terms : %d \n",n,sum);
}
```

**Output:**

```
Input number of terms : 8

The even numbers are :2 4 6 8 10 12 14 16
The Sum of even Natural Number upto 8 terms : 72



...Program finished with exit code 51
Press ENTER to exit console.
```

17. Display n terms of natural number and their sum.

```c
#include <stdio.h>
void main()
{
  int i,n,sum=0;
  printf("Input Value of terms : ");
  scanf("%d",&n);
  printf("\nThe first %d natural numbers are:\n",n);
  for(i=1;i<=n;i++)
  {
    printf("%d ",i);
    sum+=i;
  }
  printf("\nThe Sum of natural numbers upto %d terms : %d \n",n,sum);
}
```

**Output:**

```
Input Value of terms : 6

The first 6 natural numbers are:
1 2 3 4 5 6
The Sum of natural numbers upto 6 terms : 21


...Program finished with exit code 47
Press ENTER to exit console.
```

## 18. Display the pattern like a diamond.

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

```c
#include <stdio.h>

void main(){
  int i,j,r;
  printf("Input number of rows (half of the diamond) :");
  scanf("%d",&r);
  for(i=0;i<=r;i++){
   for(j=1;j<=r-i;j++)
    printf(" ");
   for(j=1;j<=2*i-1;j++)
     printf("*");
   printf("\n");
  }
  for(i=r-1;i>=1;i--){
   for(j=1;j<=r-i;j++)
    printf(" ");
   for(j=1;j<=2*i-1;j++)
     printf("*");
   printf("\n");
  }
}
```

**Output:**

```
Input number of rows (half of the diamond) :5

    *
   ***
  *****
 *******
*********
 *******
  *****
   ***
    *



...Program finished with exit code 10
Press ENTER to exit console.
```

**19. Display the pattern like right angle triangle with a number.**

```
1
22
333
4444
```

```c
#include <stdio.h>
void main()
{
  int i,j,rows;

  printf("Input number of rows : ");
  scanf("%d",&rows);
  for(i=1;i<=rows;i++)
  {
      for(j=1;j<=i;j++)
        printf("%d",i);
      printf("\n");
  }
}
```

**Output:**

```
Input number of rows : 5
1
22
333
4444
55555


...Program finished with exit code 5
Press ENTER to exit console.
```

**20. Calculate the factorial of a given number.**

```c
#include <stdio.h>
void main(){
  int i,f=1,num;

  printf("Input the number : ");
  scanf("%d",&num);

  for(i=1;i<=num;i++)
    f=f*i;

  printf("The Factorial of %d is: %d\n",num,f);
}
```
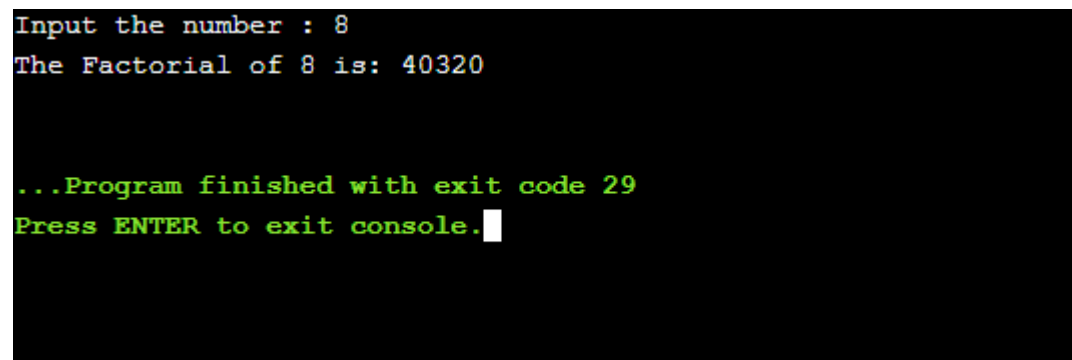
**Output:**

```
Input the number : 8
The Factorial of 8 is: 40320


...Program finished with exit code 29
Press ENTER to exit console.
```

**21. Find the perfect numbers within a given number of range.**

```c
#include <stdio.h>

void  main(){
 int n,i,sum;
 int mn,mx;
 printf("Input the starting range or number : ");
 scanf("%d",&mn);
 printf("Input the ending range of number : ");
 scanf("%d",&mx);
 printf("The Perfect numbers within the given range : ");
 for(n=mn;n<=mx;n++){
  i=1;
  sum = 0;
  while(i<n){
   if(n%i==0)
      sum=sum+i;
     i++;
  }
  if(sum==n)
    printf("%d ",n);
 }
    printf("\n");
}
```
**Output:**

```
Input the starting range or number : 5
Input the ending range of number : 100
The Perfect numbers within the given range : 6 28



...Program finished with exit code 10
Press ENTER to exit console.
```

## 22. Check whether a given number is an armstrong number or not.
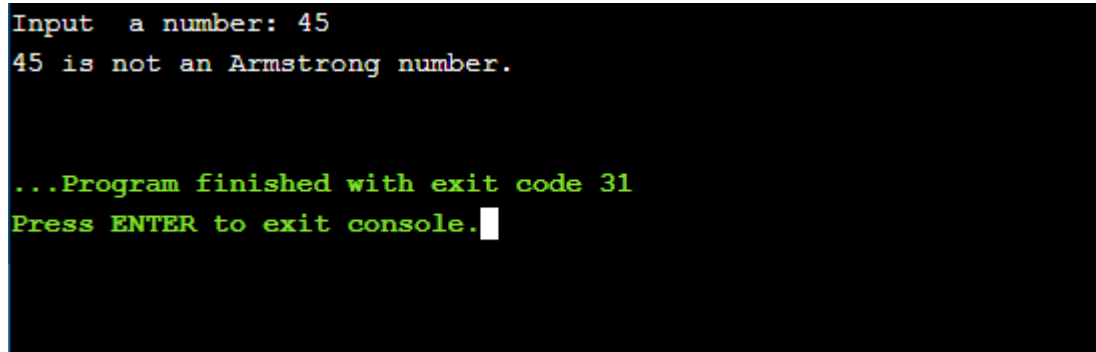
```c
#include <stdio.h>

void main(){
    int num,r,sum=0,temp;

    printf("Input  a number: ");
    scanf("%d",&num);

    for(temp=num;num!=0;num=num/10){
        r=num % 10;
        sum=sum+(r*r*r);
    }
    if(sum==temp)
        printf("%d is an Armstrong number.\n",temp);
    else
        printf("%d is not an Armstrong number.\n",temp);
}
```

**Output:**

```
Input  a number: 45
45 is not an Armstrong number.



...Program finished with exit code 31
Press ENTER to exit console.
```

## 23. Find the prime numbers within a range of numbers.

```c
#include <stdio.h>

void main(){
    int num,i,ctr,stno,enno;

    printf("Input starting number of range: ");
    scanf("%d",&stno);

    printf("Input ending number of range : ");
    scanf("%d",&enno);
    printf("The prime numbers between %d and %d are : \n",stno,enno);

    for(num = stno;num<=enno;num++)
      {
        ctr = 0;

        for(i=2;i<=num/2;i++)
          {
            if(num%i==0){
                ctr++;
                break;
            }
          }

        if(ctr==0 && num!= 1)
            printf("%d ",num);
      }
printf("\n");
}
```

**Output:**

```
Input starting number of range: 5
Input ending number of range : 70
The prime numbers between 5 and 70 are :
5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67


...Program finished with exit code 10
Press ENTER to exit console.
```

24. Check whether a number is a palindrome or not.
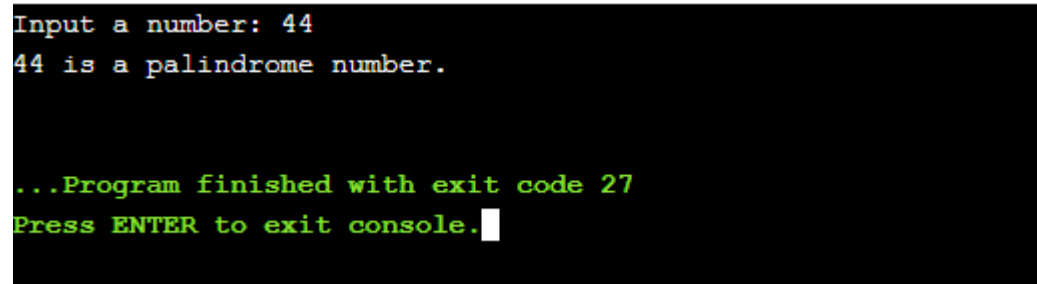
```c
#include <stdio.h>

void main(){
    int num,r,sum=0,t;

    printf("Input a number: ");
    scanf("%d",&num);

    for(t=num;num!=0;num=num/10){
        r=num % 10;
        sum=sum*10+r;
    }
    if(t==sum)
        printf("%d is a palindrome number.\n",t);
    else
        printf("%d is not a palindrome number.\n",t);

}
```

Output:

### 25. Find HCF (Highest Common Factor) of two numbers.

```c
#include <stdio.h>

void main()
{
   int i, n1, n2, j, hcf=1;


    printf("\n\n  HCF of two numbers:\n ");
    printf("----------------------\n");


   printf("Input 1st number for HCF: ");
   scanf("%d", &n1);
   printf("Input 2nd number for HCF: ");
   scanf("%d", &n2);

   j = (n1<n2) ? n1 : n2;

   for(i=1; i<=j; i++)
   {

      if(n1%i==0 && n2%i==0)
      {
         hcf = i;
      }
   }

   printf("\nHCF of %d and %d is : %d\n\n", n1, n2, hcf);
}
```

**Output:**

```
  HCF of two numbers:
  ---------------------
Input 1st number for HCF: 65
Input 2nd number for HCF: 78


HCF of 65 and 78 is : 13




...Program finished with exit code 27
Press ENTER to exit console.
```

**26. Find LCM of any two numbers using HCF.**

```c
#include <stdio.h>

void main()
{
    int i, n1, n2, j, hcf=1,lcm;


     printf("\n\n  LCM of two numbers:\n ");
     printf("----------------------\n");

 printf("Input 1st number for LCM: ");
    scanf("%d", &n1);
    printf("Input 2nd number for LCM: ");
    scanf("%d", &n2);

   j = (n1<n2) ? n1 : n2;

   for(i=1; i<=j; i++)
   {

      if(n1%i==0 && n2%i==0)
      {
         hcf = i;
      }
   }
   lcm=(n1*n2)/hcf;

   printf("\nThe LCM of %d and %d is : %d\n\n", n1, n2, lcm);

}
```

**Output:**

```
  LCM of two numbers:
  ----------------------
Input 1st number for LCM: 87
Input 2nd number for LCM: 99


The LCM of 87 and 99 is : 2871




...Program finished with exit code 33
Press ENTER to exit console.
```

## 27. Check Whether a Number can be Express as Sum of Two Prime Numbers.

```c
#include <stdio.h>
#include <stdlib.h>
#include <math.h>
int main()
{
int num,i,j,temp1,temp2,ctr=0;
printf("input the number:\n");
scanf("%d",&num);
for(i=2;i<=num/2;i++){
temp1=i;
temp2=num-i;
for(j=2;j<=i/2;j++){
if(i%j==0){ctr++;break;}
}
if(ctr==0){
for(j=2;j<=(num-i)/2;j++){
if((num-i)%j==0){ctr++;break;}
}
if(ctr==0) printf("%d can be written as %d + %d.\n ",num,i,num-i);
}
ctr=0;
}
return 0;
}
```

**Output:**

```
input the number:
98
98 can be written as 19 + 79.
 98 can be written as 31 + 67.
 98 can be written as 37 + 61.


...Program finished with exit code 0
Press ENTER to exit console.
```

**28. Find the number & sum of all integer between 100 and 200 which are divisibleby 9.**

```c
#include <stdio.h>

void main()
{
  int i, sum=0;
  printf("Numbers between 100 and 200, divisible by 9 : \n");
  for(i=101;i<200;i++)
  {
   if(i%9==0)
   {
     printf("% 5d",i);
     sum+=i;
   }
  }
  printf("\n\nThe sum : %d \n",sum);
}
```

**Output:**

```
Numbers between 100 and 200, divisible by 9 :
  108   117   126   135   144   153   162   171   180   189   198

The sum : 1683



...Program finished with exit code 18
Press ENTER to exit console.
```
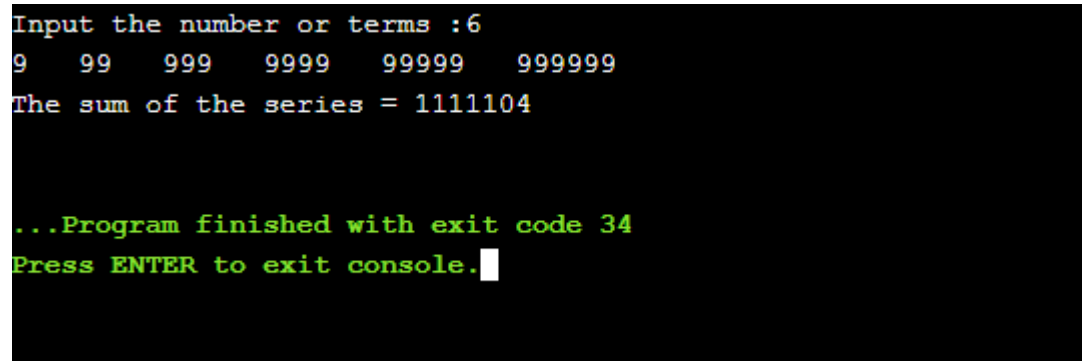
## 29. Display the sum of the series [ 9 + 99 + 999 + 9999 ...]

```c
#include <stdio.h>

void main()
{   long int n,i,t=9;
int sum =0;
printf("Input the number or terms :");
scanf("%ld",&n);
for (i=1;i<=n;i++)
{ sum +=t;
printf("%ld  ",t);
t=t*10+9;
}
printf("\nThe sum of the series = %d \n",sum);
}
```

**Output:**

```
Input the number or terms :6
9    99    999    9999    99999    999999
The sum of the series = 1111104


...Program finished with exit code 34
Press ENTER to exit console.
```

**30. Display the sum of the series [ 1+x+x^2/2!+x^3/3!+....].**

#include <stdio.h>

void main()

{

float x,sum,no_row;

int i,n;

printf("Input the value of x :");

scanf("%f",&x);

printf("Input number of terms : ");

scanf("%d",&n);

sum =1; no_row = 1;

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

{

no_row = no_row*x/(float)i;

sum =sum+ no_row;

}

printf("\nThe sum  is : %f\n",sum);

}

**Output:**

```
Input the value of x :8
Input number of terms : 7

The sum  is : 934.155518


...Program finished with exit code 26
Press ENTER to exit console.
```