

Leap Year:

```
#include<stdio.h>
void main(){
int year;
printf("Enter a year:");
scanf("%d",&year);
if((year%400==0) || ((year%4==0) && (year%100!=0)))
    printf("Leap Year");
else
    printf("Not a leap year");
}
```

Largest of 3 numbers:

```
#include<stdio.h>
void main(){
int a,b,c;
printf("Enter three numbers:");
scanf("%d%d%d",&a,&b,&c);
if(a>b && a>c)
    printf("largest=%d", a);
else if (b>a && b>c)
    printf("largest=%d", b);
else
    printf("largest=%d", c);
}
```

Roots of Quadratic Equation

```
#include<stdio.h>
#include<math.h>
void main(){
float a,b,c,d,r1,r2,rp,ip;
printf("Enter value of a,b,c:");
scanf("%f%f%f",&a,&b,&c);
d = sqrt(b*b - 4*a*c);
if(d>=0)
{
    r1 = (-b+sqrt(d))/2*a;
    r2 = (-b-sqrt(d))/2*a;
    printf("Roots are:%0.2f and %0.2f",r1,r2);
}
else
{
    d = -d;
    rp = -b/2*a;
    ip = d/2*a;
    printf("Roots are:%0.2f+i%0.2f and %0.2f-i%0.2f",rp,ip,rp,ip);
}
}
```

Basic Calculator:

```
#include<stdio.h>
void main(){
int a,b,choice;
float c;
char ans='n';
do
{
    printf("Enter two numbers:");
    scanf("%d%d",&a,&b);
    printf("\n1.ADDITION\n2.SUBTRACTION\n3.MULTIPLICATION\n4.DIVISION");
    printf("\nEnter your choice : ");
    scanf("%d",&choice);
    switch(choice)
```

```

{
    case 1:c=a+b;
        printf("Result: %d",c);
        break;
    case 2:c=a-b;
        printf("Result: %d",c);
        break;
    case 3:c=a*b;
        printf("Result: %d",c);
        break;
    case 4:c=a/b;
        printf("Result: %f",d);
        break;
    default:printf("Wrong Choice");
}
printf("\nDo you want to continue???");
ans = getch();
}while(ans=='y' || ans=='Y');
}

```

Sum of first 'n' numbers:

```

#include<stdio.h>
void main(){
    int n,i,sum=0;
    printf("Enter the value of n:");
    scanf("%d",&n);
    for(i=1;i<=n;i++)
        sum=sum+i;
    printf("Sum of n numbers: %d",sum);
}

```

Factorial of a number:

```

#include<stdio.h>
void main(){
    int i,n,fact=1;
    printf("Enter the no");
    scanf("%d",&n);
    for(i=1;i<=n;i++)
        fact=fact*i;
    printf("Factorial is: %d",fact);
}

```

Fibonacci Series:

```

#include<stdio.h>
void main()
{
    int i,no,a=0,b=1,c;
    printf("Enter the value of n:");
    scanf("%d",&no);
    printf("%d\n%d\n",a,b);
    for(i=1;i<=n-2;i++)
    {
        c=a+b;
        printf("%d",c);
        a=b;
        b=c;
    }
}

```

Factors of a number:

```

#include<stdio.h>
void main(){
    int n,i;

```

```

printf("Enter a number:");
scanf("%d",&n);
printf("Factors are:\n");
i=2;
while(i<=n-1)
{
    if(n%i==0)
        printf("%d\n",i);
    i++;
}
}

```

Prime Number:

```

#include<stdio.h>
void main(){
int n,i=2,prime=1;
printf("Enter the No:");
scanf("%d",&n);
while(i<=n/2)
{
    if(n%i==0)
    {
        prime=0;
        break;
    }
    i++;
}
if(prime==1)
    printf("%d is a Prime no",n);
else
    printf("%d is not a Prime no",n);
}

```

Prime Numbers from 1 to 100:

```

#include<stdio.h>
void main(){
int limit=100,i,n,prime;
for(n=2;n<=limit;n++)
{
    i=2,prime=1;
    while(i<=n/2)
    {
        if(n%i==0)
        {
            prime=0;
            break;
        }
        i++;
    }
    if(prime==1)
    {
        printf("%d\n",n);
    }
}
}

```

Sum and product of digits of a number:

```

#include<stdio.h>
void main(){
int n,dig,sum=0,p=1;
printf("Enter any number:");
scanf("%d",&n);
do

```

```

{
    dig=n%10;
    sum=sum+dig;
    p=p*dig;
    n=n/10;
}while(n!=0);
printf("Sum is:%d",sum);
printf("Product is:%d",p);
}

```

Armstrong Number:

```

#include<stdio.h>
void main(){
int n,cp,dig,sum=0;
printf("Enter any number:");
scanf("%d",&n);
cp=n;
do
{
    dig=n%10;
    sum=sum+dig*dig*dig;
    n=n/10;
}while(n!=0);
if(sum==cp)
    printf("Armstrong Number");
else
    printf("Not an Armstrong Number");
}

```

Armstrong Number from 1 to 1000:

```

#include<stdio.h>
void main(){
int n,temp,dig,sum,limit=1000;
for(n=1; n<=limit; n++)
{
    temp=n;
    sum=0;
    while(n>0)
    {
        dig=n%10;
        sum=sum+(dig*dig*dig);
        n=n/10;
    }
    if(temp==sum)
        printf("%d\n",no);
}
}

```

Reverse of a number:

```

#include<stdio.h>
void main(){
int n,digit,rev=0;
printf("Enter a number");
scanf("%d",&n);
while(n!=0)
{
    digit=n%10;
    rev=rev*10+digit;
    n=n/10;
}
printf("Reverse is: %d",rev);
}

```

Palindrome Number:

```
#include<stdio.h>
void main(){
int n,digit,rev=0,og;
printf("Enter a number:");
scanf("%d",&n);
og = n;
while(n >= 1)
{
    digit = n % 10;
    rev = rev * 10 + digit;
    n = n / 10;
}
if(og==rev)
    printf("Palindrome Number");
else
    printf("Not a Palindrome Number");
}
```

LCM and GCD of numbers:

```
#include<stdio.h>
void main(){
int n1,n2,lcm,gcd;
printf("Enter two numbers:");
scanf("%d%d",&n1,&n2);
if(n1>n2)
{
    lcm=n1;
    gcd=n2;
}
else
{
    lcm=n2;
    gcd=n1;
}
while(lcm%n1!=0 || lcm%n2!=0)
    lcm++;
while(n1%gcd!=0 || n2%gcd!=0)
    gcd--;
printf("LCM=%d\nGCD=%d",lcm,gcd);
}
```

Binary equivalent of Decimal number:

```
#include<stdio.h>
void main(){
long int bn = 0;
int digit, n, temp = 1;
printf("Enter a Number:");
scanf("%d",&n);
while(n!=0){
    digit = n%2;
    bn = bn + digit * temp;
    temp = temp * 10;
    n = n/2;
}
printf("Binary Number is: %ld",bn);
}
```

Even/Odd Number:

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

Largest of 3 Numbers:

```
#include<stdio.h>
void main(){
int a,b,c;
printf("Enter three numbers:");
scanf("%d%d%d",&a,&b,&c);
if(a>b && a>c)
    printf("largest=%d", a);
else if (b>a && b>c)
    printf("largest=%d", b);
else
    printf("largest=%d", c);
}
```

Largest of 3 Numbers using Nested if-else:

```
#include<stdio.h>
void main(){
int a,b,c;
printf("Enter three integers:");
scanf("%d%d%d",&a,&b,&c);
if(a>b){
    if(a>c)
        printf("a is the biggest");
    else
        printf("c is biggest");
}
else {
    if(b>c)
        printf("b is biggest");
    else
        printf("c is biggest");
}
}
```

To find character is an alphabet:

```
#include<stdio.h>
void main(){
char c;
printf("Enter a character:");
scanf("%c",&c);
if((c>='a' && c<='z') || (c>='A' && c<='Z'))
    printf("%c is an alphabet",c);
else
    printf("%c is not an alphabet",c);
}
```

Month Name:

```
#include<stdio.h>
void main(){
int month;
printf("Enter a month number:");
scanf("%d",&month);
switch(month){
```

```
case 1:printf("January"); break;
case 2:printf("February"); break;
case 3:printf("March"); break;
case 4:printf("April"); break;
case 5:printf("May"); break;
case 6:printf("June"); break;
case 7:printf("July"); break;
case 8:printf("August"); break;
case 9:printf("September"); break;
case 10:printf("October"); break;
case 11:printf("November"); break;
case 12:printf("December"); break;
default: printf("Invalid number");
}
}
```

Sum of n numbers:

```
#include<stdio.h>
void main(){
int n,i,sum=0;
printf("Enter the value of n:");
scanf("%d",&n);
for(i=1;i<=n;i++)
    sum=sum+i;
printf("Sum of n numbers: %d",sum);
}
```

To count no. of digits:

```
#include<stdio.h>
void main(){
int n,count=0;
printf("Enter number:");
scanf("%d",&n);
while(n!=0){
    count++;
    n=n/10;
}
}
```

Factors of a number:

```
#include<stdio.h>
void main(){
int n,i;
printf("Enter a number:");
scanf("%d",&n);
printf("Factors are:\n");
i=2;
while(i<=n-1){
    if(n%i==0)
        printf("%d\n",i);
    i++;
}
}
```

Multiplication Table:

```
#include <stdio.h>
void main(){
int n,i,j;
printf("Enter an integer:");
scanf("%d",&n);
for(i=1;i<=n;i++){
    for(j=1;j<=10;j++){
        printf("%d\t", i*j);
    }
    printf("\n");
}
```

Pattern Programs:

1.

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

```
#include<stdio.h>
void main(){
    inti,j,n=4;
    for(i=0;i<n;i++){
        for(j=0;j<n;j++){
            printf("*");
        }
        n--;
        printf("\n");
    }
}
```

2.

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

```
#include<stdio.h>
void main(){
    int i,j;
    for(i=1;i<=3;i++){
        for(j=1;j<=3-i;j++){
            printf(" ");
        }
        for(j=1;j<=i;j++){
            printf("* ");
        }
        printf("\n");
    }
    for(i=3-1;i>=1;i--) { //for downward pyramid
        for(j=1;j<=3-i;j++){
            printf(" ");
        }
        for(j=i;j>=1;j--){
            printf("* ");
        }
        printf("\n");
    }
}
```

3.

```
1
121
12321
1234321
#include<stdio.h>
void main(){
    int i,j;
    for(i=1;i<=4;i++){
        for(j=1;j<=4-i;j++){
            printf(" ");
        }
        for(j=1;j<=i;j++){
            printf("%d",j);
        }
        for(j=i-1;j>=1;j--){
```

```

printf("%d",j);
}
printf("\n");
}
}

```

4.
*
**


```

#include<stdio.h>
void main(){
int no,i,j;
printf("Enter no of rows\n");
scanf("%d",&no);
for(i=1;i<=no;i++){
for(j=1;j<=i;j++){
printf("*");
}
printf("\n");}}

```

5.
1
12
123
1234

```

#include<stdio.h>
void main(){
int no,i,j;
printf("Enter no of rows\n");
scanf("%d",&no);
for(i=1;i<=no;i++){
for(j=1;j<=i;j++){
printf("%d",j);
}
printf("\n");
}
}

```

6.(Pascal triangle)

1
1 1
1 2 1
1 3 3 1

```

#include<stdio.h>
int facto(int no){
int i,fact=1;
for(i=1;i<=no;i++){
fact=fact*i;
}
return fact;
}
void main(){
int no,fa,i,j;
printf("Enter no\n");
scanf("%d",&no);
for(i=0;i<no;i++){
for(j=0;j<no-i;j++){
printf(" ");
}
for(j=0;j<=i;j++){

```



```

fa=facto(i)/(facto(j)*facto(i-j));
printf("%d ",fa);
}
printf("\n");
}
}

```

7.

```

A
ABA
ABCBA
ABCD CBA
#include<stdio.h>
void main(){
int i,j,n;
printf("Enter the number of lines:");
scanf("%d",&n);
for(i=1;i<=n;i++){
for(j=1;j<=n-i;j++){
printf(" ");
}
for(j=1;j<=i;j++){
printf("%c",(char)(j+64));
}
for(j=i-1;j>=1;j--){
printf("%c",(char)(j+64));
}
printf("\n");
}
}

```

8.

```

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

#include<stdio.h>
void main()
{
int i,j,n;
printf("Enter the number of * in the middle line:");
scanf("%d",&n);
for(i=1;i<=n;i++){
for(j=1;j<=n-i;j++){
printf(" ");
}
for(j=1;j<=i;j++){
printf("*");
}
printf("\n");
}
for(i=n-1;i>=1;i--) { //for downward pattern
for(j=1;j<=n-i;j++){
printf(" ");
}
for(j=1;j<=i;j++){
printf("*");
}
printf("\n");
}
}

```

}

9.

A

B C

D E F

G H I J

K L M N

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

```
void main(){
```

```
int i,j,n,k;
```

```
printf("Enter the number of lines:");
```

```
scanf("%d",&n);
```

```
for(i=1,k=1;i<=n;i++){
```

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

```
printf("%c ",64+k);
```

```
k++;
```

```
}
```

```
printf("\n");
```

```
}
```

```
}
```

10.

A

A B

A B C

A B C D

A B C D E

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

```
void main(){
```

```
int i,j,n=5,k;
```

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

```
for(j=1,k=1;j<=i;j++){
```

```
printf("%c ",64+k);
```

```
k++;
```

```
}
```

```
printf("\n");
```

```
}
```

```
}
```

11.

1

1 2

1 2 3

1 2 3 4

Solution:

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

```
void main(){
```

```
int i,j,n;
```

```
printf("Enter line no:");
```

```
scanf("%d",&n);
```

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

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

```
printf("%d",j);
```

```
}
```

```
printf("\n");
```

```
}
```

```
}
```

11.

1

1 2 A

1 2 3 A B

1 2 3 4 A B C

```
#include <stdio.h>
void main(){
int i,j,k,l,n, alpha=65;
printf("Enter line no:");
scanf("%d",&n);
for(i=1;i<=n;i++){
for(j=n;j>i;j--){
printf(" ");
}
for(k=1;k<=i;k++) {
printf("%d",k);
}
for(alpha=65,l=1;l<i;l++,alpha++) {
printf("%c",(char)alpha);
}
printf("\n");
}
}
```

WAP to calculate the value of a series: $1 + 2^2 + 3^3 \dots n^n$.

```
#include<stdio.h>
#include<math.h>
void main(){
int n, i, sum = 0;
printf("Enter any integer:");
scanf("%d",&n);
for(i=1;i<=n;i++)
    sum = sum + pow (i,i);
printf("\nSum = %d",sum);
}
```

WAP to calculate the value of a series: $\frac{1}{2} + \frac{3}{4} + \frac{5}{6} \dots n$ terms.

```
#include<stdio.h>
void main(){
int n,i,j;
float sum = 0;
printf("Enter any integer:");
scanf("%d",&n);
for(i=1,j=1;i<=n;i++,j=j+2)
    sum = sum + (float)j/(j+1);
printf("\nSum=%f",sum);
}
```

WAP to calculate the value of a series: $\frac{1}{2} - \frac{3}{4} + \frac{5}{6} - \frac{7}{8} \dots n$ terms.

```
#include<stdio.h>
void main(){
int n,i,j,s=1;
float sum = 0;
printf("Enter any integer:");
scanf("%d",&n);
for(i=1,j=1;i<=n;i++,j=j+2)
{
    sum = sum + s * (float)j/(j+1);
    s=-s;
}
printf("\nSum=%f",sum);
}
```

WAP to calculate the value of a series: $1/1! + 2/2! + 3/3! \dots n/n!$.

```
#include <stdio.h>
void main(){
float n,sum=0, f=1, i;
printf("Enter the value:");
scanf("%f",&n);
for(i=1;i<=n;i++)
{
    f = f * i;
    sum = sum + (i/f);
}
printf("Sum of the series= %f",sum);
}
```

WAP to calculate value of a series: $x - x/2! + x/3! - x/4! \dots x/n!$

```
#include<stdio.h>
void main(){
float n,sum=0, f=1, i, s=1,x;
printf("Enter value of n and x:");
scanf("%f%f", &n,&x);
for(i = 1; i <= n; i++) {
```

```

    f = f * i;
    sum = sum + s*(x/f);
    s=-s;
}
printf("Sum of the series= %f",sum);
}

```

WAP to calculate value of a series: $\sin x = x - x^3/3! + x^5/5! \dots x^n/n!$

```

#include<stdio.h>
#include<math.h>
void main(){
int i,n,fact=1,sign=-1;
float x,num,sum,term;
printf("Enter the angle in degrees and value of n");
scanf("%f%d",&x,&n);
x=x*3.14/180;
sum=x;
for(i=3;i<=n;i=i+2)
{
    fact=fact*i*(i-1);
    term=pow(x,i)/fact;
    sum=sum+sign*term;
    sign=-sign;
}
printf("Value of series= %f",sum);
}

```

Program to find sum of three numbers:

```
#include<stdio.h>
void main() {
    int a,b,c, sum;
    printf("Enter 3 numbers\n");
    scanf("%d%d%d",&a,&b,&c);
    sum=a+b+c;
    printf("Result is: %d",sum);
}
```

Program to find whether number is even or odd:

```
#include<stdio.h>
void main() {
    int number;
    printf("Enter a number:");
    scanf("%d",&number);
    (number%2==0) ? printf("Number is Even") : printf("Number is Odd");
}
```

Program to find largest of three numbers using conditional operator:

```
#include<stdio.h>
void main() {
    int a,b,c,greatest;
    printf("Enter three numbers:\n");
    scanf("%d%d%d",&a,&b,&c);
    greatest = (a>b) ? (a>c ? a:c) : (b>c ? b:c);
    printf("The greatest Number is: %d", greatest);
}
```

Program to find area of circle and rectangle:

```
#include<stdio.h>
void main(){
    int radius,length,breadth;
    float area;
    const float PI = 3.14;
    printf("Enter radius:");
    scanf("%d",&radius);
    area = PI * radius * radius;
    printf("Area of circle is:%f",area);
    printf("\nEnter length and breadth:");
    scanf("%d%d",&length,&breadth);
    area = length * breadth;
    printf("Area of rectangle is:%f",area);
}
```

Program to swap two numbers:

```
#include<stdio.h>
void main() {
    int a,b,t;
    printf("Enter any two numbers\n");
    scanf("%d%d",&a,&b);
    t=a;
    a=b;
    b=t;
    printf("Answer is=%d%d",a,b);
}
```

Program to swap two numbers without using third variable:

```
#include<stdio.h>
void main() {
    int a,b;
    printf("Enter the value of A and B");
    scanf("%d%d",&a,&b);
}
```

```
printf("\nBefore Swapping: A=%d and B=%d",a,b);  
a=a+b;  
b=a-b;  
a=a-b;  
printf("\nAfter Swapping: A=%d and B=%d",a,b);  
}
```