

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

```
#include <stdio.h>

int main() {
    int i,sum = 0;
    printf("The first 10 natural number is:\n");

    for(i=1;i<=10;i++)
    {
        sum = sum + i;
        printf(" %d ",i);
    }
    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
```

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

```
#include <stdio.h>

int main() {
    int num,i = 1;
    printf("Enter a number :");
    scanf("%d",&num);
    printf("Multiplication table for %d is :\n",num);
    while (i<=10)
    {
        printf("%d * %d = %d\n",num,i,(num * i));
        i++;
    }
    return 0;
}
```

Output:

```
Enter a number :2
Multiplication table for 2 is :
2 * 1 = 2
2 * 2 = 4
2 * 3 = 6
2 * 4 = 8
2 * 5 = 10
2 * 6 = 12
2 * 7 = 14
2 * 8 = 16
2 * 9 = 18
2 * 10 = 20
```

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

```
#include <stdio.h>

int main() {
    int num,i=1,sum;
    printf("Enter the number :");
    scanf("%d",&num);

    do
    {
        if(i % 2!= 0){
            sum = sum + i;
        }
        i++;
    }
    while(i<=num);
    printf("sum of all odd integer is %d",sum);

    return 0;
}
```

Output:

```
Enter the number : 10
Sum of all odd integer is 25
```

4. display the pattern like right angle triangles. (Using for loop)

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

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

    printf("Enter value of n: ");
    scanf("%d", &n);

    for(i=1; i<=n; i++)
    {
        for(j=1; j<=i; j++)
        {
            printf("*");
        }

        printf("\n");
    }
    return 0;
}
```

Output:

Enter value of n: 4

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

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

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

```
#include <stdio.h>
int main()
{
    int n,i= 1,j,k= 1;
    printf("Enter the number of rows:");
    scanf("%d",&n);
    while ( i <= n){
        j = 1;
        while ( j <= i){
            printf (" %d ",k++);
            j++;
        }
        i++;
        printf("\n");
    }
    return 0;
}
```

Output:

```
Enter the number of rows :4
1
2  3
4  5  6
7  8  9  10
```

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

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

```
#include <stdio.h>
int main(){
    int i=1,j,k,rows,t=1,g;
    printf("Enter the number of rows:");
    scanf("%d",&rows);
    g=rows+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<=rows);

        return 0;
    }
```

Output:

Enter the number of rows:4

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

7. display Pascal's triangle. (Using for loop)

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

```
#include <stdio.h>
int main()
{
    int row,c=1,s,i,j;
    printf("Input number of rows:");
    scanf("%d",&row);
    for(i=0;i<row;i++)
    {
        for( s=1;s<=row-i;s++ )
            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");
    }
    return 0;
}
```

Output:

Input number of rows:5

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

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

```
#include <stdio.h>
int main()
{
    int i, n, t1 = 0, t2 = 1, s;
    printf("Enter the number of terms: ");
    scanf("%d", &n);
    printf("Fibonacci Series: ");
    for (i = 1; i <= n; ++i) {
        printf(" %d ", t1);
        s = t1 + t2;
        t1 = t2;
        t2 = s;
    }

    return 0;
}
```

Output:

```
Enter the number of terms: 10
Fibonacci Series:  0  1  1  2  3  5  8  13  21  34
```


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

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

```
int main()
{
    int i = 1, Num, Sum = 0 ;
    printf("Enter any number:") ;
    scanf("%d", &Num) ;

    while( i < Num )
    {
        if(Num % i == 0)
            Sum = Sum + i ;
        i++;
    }

    if (Sum == Num)
        printf(" %d is a Perfect Number", Num) ;
    else
        printf(" %d is not the Perfect Number", Num) ;

    return 0 ;
}
```

Output:

```
Enter any number:24
24 is not the Perfect Number
```

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

```
#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");
}
```

Output:

```
Input starting number of range: 1
Input ending number of range : 1000
Armstrong numbers in given range are: 1 153 370 371 407
```

11. determine whether a given number is prime or not. (Using do...while loop)

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

```
int main(){
    int n,i,count=0;
    printf("Enter a number:");
    scanf("%d",&n);
    do{
        if((n!=2) && (n%i==0))
        {
            count=1;
            break;
        }
        i++;
    }
    while(i<=sqrt(n));
    if (count==0)
        printf(" %d is a prime number",n);
    else
        printf(" %d is not a prime number",n);
    return 0 ;
}
```

Output:

```
Enter a number:153
153 is a prime number
```

12. display the number in reverse order. (Using do...while loop)

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

```
int main()
{
    int n,a,r,s=0;
    printf("Enter a 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);

    return 0 ;
}
```

Output:

```
Enter a number:458
The reverse number of 458 is 854
```

13. display the sum of the series [9 + 99 + 999 + 9999 ...] (Using for loop)

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

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

    return 0 ;
}
```

Output:

```
Input the number:5
9  99  999  9999  99999
The sum of series 111105
```

14. find the sum of the series [$1 - X^2/2! + X^4/4! - \dots$]. (Using while loop)

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

```
void main(){
    float x,sum,t,d;
    int i=1,n;
    printf("Enter the value for x:");
    scanf("%f",&x);
    printf("Enter the value for n:");
    scanf("%d",&n);
    sum=1;
    t=1;
    while(i<n){
        d=(2*i)*(2*i-1);
        t=-t*x*x/d;
        sum=sum+t;
        i++;
    }
    printf("the sum=%f\n value of n=%d\n value of x=%.2f\n",sum,n,x);
}
```

Output:

```
Enter the value for x:2
Enter the value for n:5
the sum=-0.415873
value of n=5
value of x=2.00
```

15. find the sum of the series [$x - x^3 + x^5 + \dots$]. (Using do...while loop)

```
#include <stdio.h>
#include <math.h>
void main(){
    int x,sum,ctr,i=1,n,m,mm,nn;
    printf("Enter the value for x:");
    scanf("%d",&x);
    printf("Enter the value for n:");
    scanf("%d",&n);
    sum=x;
    m=-1;
    printf("The value 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);
}
```

Output:

```
Enter the value for x:2
Enter the value for n:5
The value of the series:
2
-8
32
-128
512

The sum=410
```