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!- .....]. (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 + ...]. (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
```