Patterns:-

```
1 2 3 4 5
2 3 4 5 1
3 4 5 1 2
4 5 1 2 3
5 1 2 3 4
for i in range(1,6):
    for j in range(i,i+5):
        if j<=5:
            print(j,end=" ")
        else:
            print(j-5,end=" ")
    print()
**********************************************
*
* *
* * *
* * * *
* * * * *
* * * * *
* * * *
```

```
* * *
* *
*
for i in range(5):
    x=1
    for j in range(0,i+1):
        print("*",end=" ")
        x+=1
    print()
for i in range(1,6):
    for j in range(i,i+5):
        if j<=5:
            print("*",end=" ")
    print()
```

****

```
      *
    * * *
  * * * * *
* * * * * * *
* * * * * * * * *
for i in range(5):
    print(" "*(5-i-1)*2,end="")
    print("* "*(2*i+1))
```

****

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

```
for i in range(5):
    print(" "*(5-i-1)*2,end=" ")
    print("* "*(2*i+1))
for i in range(4,0,-1):
    print(" "*(4-i+1)*2,end=" ")
    print("* "*(2*i-1))
```

****

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

```
* * * *  * * * *
* * *    * * *
* *      * *
*        *
for i in range(5):
    print("* "*(i+1),end="")
    print(" "*(5-i-1)*2,end="")
    print("* "*(i+1))
for j in range(4,0,-1):
    print("* "*j,end="")
    print(" "*(4-j+1)*2,end="")
    print("* "*j)
**************************************************
* * * * *
 * * * *
  * * *
   * *
    *
for i in range(5,0,-1):
    print(" "*(5-i)*2,end="")
    print("* "*i)
**************************************************
         *
       * *
```

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

```
for i in range(5):
    print(" "*(5-i-1)*2,end="")
    print("* "*(i+1))
for j in range(4,0,-1):
    print(" "*(4-j+1)*2,end="")
    print("* "*j)
```

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

```
*         *
for i in range(5):
    print("* "*(i+1),end="")
    print(" "*(5-i-1)*4,end="")
    print("* "*(i+1))
for j in range(4,0,-1):
    print("* "*(j),end="")
    print(" "*(4-j+1)*4,end="")
    print("* "*(j))
```

****

```
        *         *
      * *       * *
    * * *     * * *
  * * * *   * * * *
* * * * * * * * * *
  * * * *   * * * *
    * * *     * * *
      * *       * *
        *         *
for i in range(5):
    print(" "*(5-i-1)*2,end="")
```

```
    print("* "*(i+1),end="")
    print(" "*(5-i-1)*2,end="")
    print("* "*(i+1))
for j in range(4,0,-1):
    print(" "*(4-j+1)*2,end="")
    print("* "*j,end="")
    print(" "*(4-j+1)*2,end="")
    print("* "*(j))
```

****

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

pattern

```
for i in range(5):
    print(" "*i,end="")
    print("* "*1,end="")
    print(" "*(4-(i+1))*2,end="")
    if i<4:
        print("* "*1,end="")
    else:
        pass
```

```
    print(" "*(2*i+1),end="")
    print("* "*1,end="")  # print() is used to print a new line
    print(" "*(4-(i+1))*2,end="")
    if i<4:
        print("* "*1)
    else:
        pass
```

****

palandrome on string

```
A=str(input("enter any word: "))
i=0
j=len(A)-1
x=True
while i<j:
    if A[i] != A[j]:
        x=False
    i += 1
    j -= 1
if x==False:
    print("the given word",A, "is a not a palandrom")
else:
    print("the given word",A, "is a palandrom")
```

****

* * * * * * * * *

 * * * * * * *

  * * * * *

   * * *

    *

```
for i in range(5,0,-1):
    print(" "*(4-i+1)*2,end="")
    print("* "*(2*i-1))
```

****

Fibonacci sequence

The Fibonacci series is a sequence of numbers where each number is the sum of the two preceding ones.

E.g.,:- **0,1,1,2,3,5,8,13,21,34**

```
need=int(input("enter how many fibno numbers needed: "))
need=need-2
b,a=0,1
print(b,end=",")
print(a,end=",")
for value in range(need):
    fibno=a+b
    print(fibno,end=",")
```

```
    b=a
    a=fibno
**************************************************
        *
       * *
      * * *
     * * * *
    * * * * *
for i in range(5):
    print(" "*(5-i-1)*2,end="")
    x=1
    for j in range(i+1):
        print("*",end=" ")
        x+=1
    print()

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

```
for i in range(5):
    print(" "*(5-i-1)*2,end="")
    x=1
    for j in range(2*i+1):
        print(x,end=" ")
        x+=1
    print()
```

****

Pascal triangle

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

```
for i in range(5):
    print(" "*(5-i-1),end=" ")
    x=1
    for j in range(i+1):
        print(x,end=" ")
```

```
        x=x*(i-j)//(j+1)
    print()
```

****

check whether a given number is palindrome or not?

for Example: 121, 1221, 13331……..

```
num=int(input("enter a number:"))
temp=num
rev=0
while num!=0:
    d=num%10
    rev=rev*10+d
    num//=10
if temp==rev:
    print("given number is plaindrome")
else:
    print("given number is not palindrome")
```

****

reverse a number

```
num=int(input("enter a number:"))
rev=0
while num!=0:
    d=num%10
    rev=rev*10+d
    num//=10
print("reversed number:"+str(rev))
```

****

find out given number is prime or not

```
num=int(input("enter a number:"))
```

```
flag=False
if num>1:
   for i in range(2,num):
      if(num%i)==0:
         flag=True
         break
if flag:
   print(num,"is not a prime number")
else:
   print(num,"is a prime number")
```

****

given number is Armstrong or not

```
num=int(input("enter a number:"))
sum=0
temp=num
while temp>0:
   digit=temp%10
   sum+=digit**3
   temp//=10
if num==sum:
   print(num,"is an armstrong number")
else:
   print(num,"is not an armstrong number")
```

Explanation:

iteration-1:

temp=num=153,sum=0,153>0(t)

digit=153%10=3

sum=0+33=0+27=27**

tem=153//10=15

iteration-2:

temp=num=15,sum=27,15>0(t)

digit=15%10=5

sum=27+53=27+125=152**

tem=15//10=1

iteration-3:

temp=num=1,sum=152,1>0(t)

digit=1%10=1

sum=152+13=152+1=153**

Stripping of trailing separators in patterns:

1
1^2
1^2^3
1^2^3^4
1^2^3^4^5

```
for i in range(5):
   x=1
   m=""
   for j in range(i+1):
      m+=(str(x)+"^")  #1^
      x+=1
   print(m.rstrip("^"))
```