

In [1]:

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

```
1
22
333
4444
55555
```

In [5]:

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

```
1
12
123
1234
12345
```

In [6]:

```
rows = 6
for i in range(rows):
    for j in range(i):
        print('*', end="")
    print()
```

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

In [7]:

```
rows = 6
b = 0
for i in range(rows, 0, -1):
    b += 1
    for j in range(1, i+1):
        print(b, end="")
    print('\r')
```

```
111111
22222
3333
444
55
6
```

In [11]:

```
rows = 6
b = 0
for i in range(rows, 0, -1):
    b = i
    for j in range(0, i):
        print(b, end="")
    print('\r')
```

666666
55555
4444
333
22
1

In [12]:

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

55555
5555
555
55
5

In [21]:

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

012345
01234
0123
012
01

In [25]:

```
rows = 5
current_num = 1
stop_num = 2
for i in range(rows):
    for j in range(1, stop_num):
        print(current_num, end="")
        current_num+=1
    print()
    stop_num+=1
```

1
23
456
78910
1112131415

In [35]:

```
rows = 5
start_num = 1
stop_num = 2
current_num=2
for i in range(2,6):
    for j in range(start_num, stop_num):
        current_num-=1
        print(current_num, end="")
    print()

    start_num = stop_num
    stop_num+=i
    current_num =stop_num
```

1
32
654

10987

In [42]:

```
rows = 6
for i in range(1, rows+1):
    for j in range(1, i-1):
        print(j, end="")
    for j in range(i-1, 0, -1):
        print(j, end="")
    print()
```

```
1
121
12321
1234321
123454321
```

In [49]:

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

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

In [51]:

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

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

In [84]:

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

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

In [85]:

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

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

In [81]:

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

```

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

In [57]:

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

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

In [70]:

```
n=6
k = 2*n-2
for i in range(0, n):
    for j in range(0, i + 1):
        print("* ", end="")
    print("\r")
for i in range(n, -1 , -1):
    for j in range(0, i + 1):
        print("* ", end="")
    print("\r")
```

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

```

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

```

In [73]:

```

n=6
k = 2*n-2
for i in range(0, n-1):
    for j in range(0, k):
        print(end=" ")
        k = k - 2
        for j in range(0, i + 1):
            print("* ", end="")
        print("\r")
k = -1
for i in range(n-1,-1,-1):
    for j in range(k,-1,-1):
        print(end=" ")
        k = k + 2
        for j in range(0, i + 1):
            print("* ", end="")
        print("\r")

```

```

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

```

In [78]:

```

n=6
k = n-2
for i in range(n, -1,-1):
    for j in range(k,0,-1):
        print(end=" ")
        k=k+1
        for j in range(0,i+1):
            print("*",end=" ")
        print("\r")
k=2*n-2
for i in range(0,n+1):
    for j in range(0,k):
        print(end=" ")
        k=k-1
        for j in range(0,i+1):
            print("*",end=" ")
        print("\r")

```

```

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

```

```

* * * * *
* * * * *

```

In [91]:

```

n=6
k =2*n-2
for i in range(0,n):
    for j in range(0,k):
        print(end=" ")
    k=k-1
    for j in range(0,i+1):
        print("* ",end="")
    print("\r")
k=n-2
for i in range(n,-1,-1):
    for j in range(k,0,-1):
        print(end=" ")
    k=k+1
    for j in range(0,i+1):
        print("* ",end="")
    print("\r")

```

```

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

```

In [93]:

```

n=5
for i in range(n):
    for j in range(n):
        if i + j == 2 or i - j == 2 or i + j == 6 or j - i == 2:
            print("*", end="")
        else:
            print(end=" ")
    print()

```

```

*
* *
*  *
* *
*

```

In [94]:

```

n = int(10)
alphabets = "abcdefghijklmnopqrstuvwxyz"

data = []
for i in range(n):
    data.append(alphabets[i])

items = list(range(n))
items = items[:-1]+items[::-1]

for i in items:
    start_index = i+1
    original =data[-start_index:]
    reverse = original[::-1]
    row = "-".join(reverse+original[1:])
    column = n*4-3

```

```
row = row.center(column, "-")
print(row)
```

```
-----j-----
-----j-i-j-----
-----j-i-h-i-j-----
-----j-i-h-g-h-i-j-----
-----j-i-h-g-f-g-h-i-j-----
-----j-i-h-g-f-e-f-g-h-i-j-----
-----j-i-h-g-f-e-d-e-f-g-h-i-j-----
----j-i-h-g-f-e-d-c-d-e-f-g-h-i-j----
--j-i-h-g-f-e-d-c-b-c-d-e-f-g-h-i-j--
j-i-h-g-f-e-d-c-b-a-b-c-d-e-f-g-h-i-j
--j-i-h-g-f-e-d-c-b-c-d-e-f-g-h-i-j--
----j-i-h-g-f-e-d-c-d-e-f-g-h-i-j----
-----j-i-h-g-f-e-d-e-f-g-h-i-j-----
-----j-i-h-g-f-e-f-g-h-i-j-----
-----j-i-h-g-f-g-h-i-j-----
-----j-i-h-g-h-i-j-----
-----j-i-h-i-j-----
-----j-i-j-----
-----j-----
```

In [99]:

```
n=6
k =2*n-2
x=0
for i in range(0,n):
    x=x+1
    for j in range(0,k):
        print(end=" ")
    k=k-1
    for j in range(0,i+1):
        print(x,end=" ")
    print("\r")
k=n-2
x=n+2
for i in range(n,-1,-1):
    x-=1
    for j in range(k,0,-1):
        print(end=" ")
    k=k+1
    for j in range(0,i+1):
        print(x,end=" ")
    print("\r")
```

```
1
22
333
4444
55555
666666
7777777
666666
55555
4444
333
22
1
```

In [100]:

```
n=6
k =2*n-2
x=0
for i in range(0,n):
    x=x+1
    for j in range(0,k):
        print(end=" ")
    k=k-1
    for j in range(0,i+1):
```

```

        print(x, end="")
    print("\r")
k=n-2
x=n+2
for i in range(n,-1,-1):
    x-=1
    for j in range(k,0,-1):
        print(end=" ")
    k=k+1
    for j in range(0,i+1):
        print(x, end="")
    print("\r")

```

```

    1
    22
    333
    4444
    55555
    666666
    7777777
    666666
    55555
    4444
    333
    22
    1

```

In [101]:

```

n=6
k =2*n-2
x=0
for i in range(0,n):
    x=x+1
    for j in range(0,k):
        print(end=" ")
    k=k-1
    for j in range(0,i+1):
        print(x, end=" ")
    print("\r")
k=n-2
x=n+2
for i in range(n,-1,-1):
    x-=1
    for j in range(k,0,-1):
        print(end=" ")
    k=k+1
    for j in range(0,i+1):
        print(x, end=" ")
    print("\r")

```

```

    1
    2 2
    3 3 3
    4 4 4 4
    5 5 5 5 5
    6 6 6 6 6 6
    7 7 7 7 7 7 7
    6 6 6 6 6 6
    5 5 5 5 5
    4 4 4 4
    3 3 3
    2 2
    1

```

In [103]:

```

k = 2 * n - 2
for i in range(0, n):
    for j in range(0, k):
        print(end=" ")
    k = k - 1

```



```

for j in range(0, i + 1):
    print('10', end=" ")
print("\r")

```

```

10
1010
101010
10101010
1010101010
101010101010

```

In [104]:

```

x = 65
for i in range(0, n):
    ch = chr(x)
    x += 1
    for j in range(0, i + 1):
        print(ch, end=" ")
    print("\r")

```

```

A
B B
C C C
D D D D
E E E E E
F F F F F F

```

In [107]:

```

x = 65
k = 2*n-2
for i in range(0, n):
    for j in range(0, k):
        print(end=" ")
    k=k-1
    for j in range(0, i + 1):
        ch = chr(x)
        print(ch, end=" ")
        x += 1
    print("\r")

```

```

A
B C
D E F
G H I J
K L M N O
P Q R S T U

```

In [108]:

```

x = 65
k = 2*n-2
for i in range(0, n):
    for j in range(0, k):
        print(end=" ")
    k=k-1
    for j in range(0, i + 1):
        ch = chr(x)
        print(ch, end=" ")
        x += 1
    print("\r")

```

```

A
B C
D E F
G H I J
K L M N O
P Q R S T U

```

In [115]:

```

n=5
k =2*n-2

for i in range(0,n):

    for j in range(0,k):
        print(end=" ")
    k=k-1
    x=65
    for j in range(0,i+1):
        ch = chr(x)
        print(ch,end=" ")
        x+=1
    print("\r")
k=n-2
x=65
for i in range(n,-1,-1):
    for j in range(k,0,-1):
        print(end=" ")
    k=k+1
    for j in range(0,i+1):
        ch = chr(x)
        print(ch,end=" ")
        x+=1
    print("\r")

```

```

      A
     A B
    A B C
   A B C D
  A B C D E
 A B C D E F
G H I J K
 L M N O
  P Q R
   S T
    U

```

In [138]:

```

n=6

for i in range(0, n):
    print(end="")
    for j in range(0, i + 1):
        res = 1
        if (j > i - j):
            j = i - j
        for l in range(0, j):
            res = res * (i - l)
            res = res // (l + 1)
        print(res, " ", end="")
    print()

```

```

1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1

```

In [139]:

```

a=6
b=4
for x in range(0, a):
    for y in range(0, b):
        print(' * ', end='')
    print(' ')

```

```

* * * *
* * * *

```

```

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

```

In [141]:

```

rows =6
coef = 1

for i in range(1, rows+1):
    for space in range(1, rows-i+1):
        print(" ",end="")
    for j in range(0, i):
        if j==0 or i==0:
            coef = 1
        else:
            coef = coef * (i - j)//j
        print(coef, end = " ")

    print()

```

```

1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1

```

In [146]:

```

n=7
for i in range(1,2*n):
    for j in range(1,2*n):
        if j==n or i==j or i+j==2*n:
            print('*', end=' ')
        else:
            print(' ', end=' ')
    print()

```

```

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

```

In [148]:

```

n=8
for i in range(n):
    for k in range(i+1):
        print('*',end=' ')
    print()
for i in range(n):
    for k in range(i+1):
        print('*',end=' ')
    print()
for i in range(n):
    print('*')

```

```

*
* *
* * *
* * * *

```

```

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

```

In [150]:

```

n=7
def first_tree(n):
    for i in range(n):
        for j in range(n-i):
            print(' ', end=' ')
        for k in range(2*i+1):
            print('*', end=' ')
        print()

first_tree(n)
first_tree(n)
for i in range(n):
    for j in range(n-1):
        print(' ', end=' ')
    print('* * *')
```

```

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

```

In [155]:

```

n=5
for i in range(1,2*n):
    for j in range(1,2*n):
        if i==n or j==n:
            print('*', end='')
        else:
            print(' ', end='')
    print()
```

```

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

```

In [156]:

```

n=6
for i in range(1,2*n):
    for j in range(1,2*n):
        if i==j or i+j==2*n:
            print('*', end='')
        else:
            print(' ', end='')
    print()

```

```

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

```

In [158]:

```

row=8
n =row//2
for i in range(1,n+1):
    for j in range(1, 2*n+1):
        if j>i and j< 2*n+1-i:
            print(" ", end="")
        else:
            print("* ", end="")
    print()

for i in range(n,0,-1):
    for j in range(2*n,0,-1):
        if j>i and j< 2*n+1-i:
            print(" ", end="")
        else:
            print("* ", end="")
    print()

```

```

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

```

In [167]:

```

row=6
for i in range(row, 0, -1):
    for j in range(row-i):
        print(" ", end="")
    for j in range(1, 2*i):
        if i==1 or i==row or j==1 or j==2*i-1:
            print("*", end="")
        else:

```

```
print(" ", end="")  
print()
```

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

In []: