In [ ]:

Patterns

In [3]:
```python
for i in range(1,6):
    print("*" *i)
```

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

In [6]:
```python
for i in range(6,0,-1):
    print('*' *i)
```

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

In [10]:
```python
for i in range(1,5):
    print(" "*(5-i)+'*'*(2*i-1))
```

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

In [17]:
```python
for i in range(6,0,-1):
    print(" "*(6-i)+ "*"*(2*i-1))
```

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

In [18]:
```python
n= 5
for i in range(n,0,-1):
    print(" "*(n-i)+"*"*(2*i-1))
```

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

In [19]:
```python
for i in range(1,5):
    print(" "*(5-i)+"*"*(2*i-1))
for i in range(5,0,-1):
```

```
        print(" "*(5-i)+"*"*(2*i-1))
```

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

In [ ]:
```python
for i in range(10):
    for j in range(10):
        if i==0 or i==9 or j==0 or j==9:     # why we have choosen o
            print("*",end=' ')
        else:
            print(" ",end=' ')
    print()
```

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

In [ ]:
```python
for i in range(-1,10):
    for j in range(-1,10):
        if i == 0 or i == 8 or j == 0 or j == 8: #here we have 2 di
            print("*",end = ' ')
        else:
            print(' ',end = ' ')
    print()
```

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

In [29]:
```python
for i in range(5):
    print(" * "*5)
```

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

In [32]:
```python
for i in range(0,6):
    print(' '.join(str(x) for x in range(1,i+1)))
```

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

In [34]:
```python
for i in range(5,0,-1):
    print(' '.join(str(x) for x in range(1,i+1)))
```

```
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1
```

In [35]:
```python
num=1
for i in range(1,6):
    for j in range(1,i+1):
        print(num,end=' ')
        num+=1
    print()
```

```
1
2 3
4 5 6
7 8 9 10
11 12 13 14 15
```

In [37]:
```python
for i in range(1,10):
    for j in range(1,i+1):
        if j == 1 or j ==i or i == 9:
            print("*", end = ' ')
        else:
            print(' ',end= ' ')
    print()
```

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

In [38]:
```python
for i in range(1,10):
    for j in range(1,i+1):
```

```
        if i == 9 or j ==i or j == 1:
            print("*", end = ' ')
        else:
            print(' ',end= ' ')
    print()
```

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

In [39]:
```
for i in range(1,10):
    for j in range (9-i):
        print(' ',end= ' ')
    for j in range(2*i-1):
        if i ==9 or j==0 or j == 2*i-2:
            print("*", end = ' ')
        else:
            print(' ',end = ' ')
    print()
```

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

In [47]:
```
n = 5
for i in range(1,n+1):
    for j in range (n-i):
        print(' ',end= ' ')
    for j in range(2*i-1):
        if  j==0 or j == 2*i-2:
            print("*", end = ' ')
        else:
            print(' ',end = ' ')
    print()

n = 5
for i in range(n-1,0,-1):
    for j in range (n-i):
        print(' ',end= ' ')
    for j in range(2*i-1):
        if  j==0 or j == 2*i-2:
            print("*", end = ' ')
        else:
            print(' ',end = ' ')
    print()
```

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

In [48]:
```python
n = 5
for i in range(1,n+1):
    for j in range (n-i):
        print(' ',end= ' ')
    for j in range(2*i-1):
        if  j==0 or j == 2*i-2:
            print(i, end = ' ')
        else:
            print(' ',end = ' ')
    print()

n = 5
for i in range(n-1,0,-1):
    for j in range (n-i):
        print(' ',end= ' ')
    for j in range(2*i-1):
        if  j==0 or j == 2*i-2:
            print(i, end = ' ')
        else:
            print(' ',end = ' ')
    print()
```

```
        1
      2   2
    3       3
  4           4
5               5
  4           4
    3       3
      2   2
        1
```

In [59]:
```python
n = 5
for i in range(1,n+1):
    for j in range(1,i+1):
        print(j,end= ' ')
    for j in range(2*(n-i)):
        print(" ", end= ' ')
    for j in range(1,i+1):
        print(j, end = ' ')
    print()
for i in range(n,0,-1):
    for j in range(1,i+1):
        print(j, end = ' ')
    for j in range(2*(n-i)):
        print(" ", end = ' ')
```

```
        for j in range(1,i+1):
            print(j, end = ' ')
        print()
```

```
1                   1
1 2               1 2
1 2 3           1 2 3
1 2 3 4       1 2 3 4
1 2 3 4 5 1 2 3 4 5
1 2 3 4 5 1 2 3 4 5
1 2 3 4       1 2 3 4
1 2 3           1 2 3
1 2               1 2
1                   1
```

In [61]:
```python
n = 5
for i in range(1,n+1):
    for j in range(1,i+1):
        print('*',end= ' ')
    for j in range(2*(n-i)):
        print(" ", end= ' ')
    for j in range(1,i+1):
        print('*', end = ' ')
    print()
for i in range(n,0,-1):
    for j in range(1,i+1):
        print(j, end = ' ')
    for j in range(2*(n-i)):
        print(" ", end = ' ')
    for j in range(1,i+1):
        print(j, end = ' ')
    print()
```

```
*                   *
* *               * *
* * *           * * *
* * * *       * * * *
* * * * * * * * * *
1 2 3 4 5 1 2 3 4 5
1 2 3 4       1 2 3 4
1 2 3           1 2 3
1 2               1 2
1                   1
```

In [62]:
```python
n = 5
for i in range(1,n+1):
    for j in range(1,i+1):
        print('*',end= ' ')
    for j in range(2*(n-i)):
        print(" ", end= ' ')
    for j in range(1,i+1):
        print('*', end = ' ')
    print()
for i in range(n,0,-1):
    for j in range(1,i+1):
        print('*', end = ' ')
```

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

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

In [64]:
```
n = 5
for i in range(1,n+1):
    for j in range(1,i+1):
        print('*',end= ' ')
    for j in range(2*(n-i)):
        print(" ", end= ' ')
    for j in range(1,i+1):
        print(j, end = ' ')
    print()
for i in range(n,0,-1):
    for j in range(1,i+1):
        print(j, end = ' ')
    for j in range(2*(n-i)):
        print(" ", end = ' ')
    for j in range(1,i+1):
        print('*', end = ' ')
    print()
```

```
*                       1
* *                 1 2
* * *             1 2 3
* * * *         1 2 3 4
* * * * * 1 2 3 4 5
1 2 3 4 5 * * * * *
1 2 3 4         * * * *
1 2 3             * * *
1 2                 * *
1                       *
```

In [66]:
```
n = 5
for i in range(1,n+1):
    for j in range(1,i+1):
        print(j,end= ' ')
    for j in range(2*(n-i)):
        print(" ", end= ' ')
    for j in range(1,i+1):
        print('*', end = ' ')
    print()
for i in range(n,0,-1):
    for j in range(1,i+1):
```

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

```
1                   *
1 2               * *
1 2 3           * * *
1 2 3 4       * * * *
1 2 3 4 5 * * * * *
* * * * * 1 2 3 4 5
* * * *       1 2 3 4
* * *           1 2 3
* *               1 2
*                   1
```

In [74]:
```
n = 5
for i in range(1,n+1):
    for j in range(n-i):
        print(" ", end = ' ')
    for j in range(1,2*i):
        if j == 1 or j == 2*i-1 or i ==n :
            print(i, end = ' ')
        else:
            print(' ', end = ' ')
    print()
```

```
        1
      2   2
    3       3
  4           4
5 5 5 5 5 5 5 5 5
```

In [77]:
```
for i in range(1,5):
    for j in range (n-i):
        print(' ', end = ' ')
    for j in range(2*i-1):
        print('*', end = ' ')
    print()
```

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

In [80]:
```
n = 5
for i in range(n,0,-1):
    for j in range(n-i):
        print(' ', end = ' ')
    for j in range(2*i-1):
        print('*', end = ' ')
    print()
```

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

In [81]:
```python
n = 5
for i in range(1, n+1):
    for j in range(i):
        print('*', end = ' ')
    print()
```

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

In [85]:
```python
n = 5
for i in range(1, n+1):
    for j in range(1,i+1):
        print(j, end = ' ')
    print()
```

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

In [86]:
```python
n = 5
for i in range(1,n+1):
    for j in range(n-i):
        print(' ', end = ' ')
    for j in range(1,i+1):
        print(j,end = ' ')
    print()
```

```
        1
      1 2
    1 2 3
  1 2 3 4
1 2 3 4 5
```

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]: