In [1]:

```
rows = 5
num = rows
# reverse for loop
for i in range(rows, 0, -1):
    for j in range(0, i):
        print(num, end=' ')
    print("\r")
```

```
5 5 5 5 5
5 5 5 5
5 5 5
5 5
5
```

In [3]:

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

```
0 1 2 3 4 5
0 1 2 3 4
0 1 2 3
0 1 2
0 1
```

In [5]:

```
rows = 5
i = 1
while i <= rows:
    j = 1
    while j <= i:
        print((i * 2 - 1), end=" ")
        j = j + 1
    i = i + 1
    print('')
```

```
1
3 3
5 5 5
7 7 7 7
9 9 9 9 9
```

In [6]:

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

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

In [7]:

```
start = 1
stop = 2
current_num = stop
for row in range(2, 6):
    for col in range(start, stop):
```

```
            current_num -= 1
            print(current_num, end=' ')
    print("")
    start = stop
    stop += row
    current_num = stop
```

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

In [8]:

```python
def print_pascal_triangle(size):
    for i in range(0, size):
        for j in range(0, i + 1):
            print(decide_number(i, j), end=" ")
        print()


def decide_number(n, k):
    num = 1
    if k > n - k:
        k = n - k
    for i in range(0, k):
        num = num * (n - i)
        num = num // (i + 1)
    return num

rows = 7
print_pascal_triangle(rows)
```

```
1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1
1 6 15 20 15 6 1
```

In [9]:

```python
rows = 5
for i in range(1, rows + 1):
    for j in range(1, rows + 1):
        if j <= i:
            print(i, end=' ')
        else:
            print(j, end=' ')
    print()
```

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

In [10]:

```python
rows = 8
# rows = int(input("Enter the number of rows "))
for i in range(1, rows + 1):
    for j in range(1, i + 1):
        # multiplication current column and row
        square = i * j
        print(i * j, end='  ')
    print()
```

```
1
2  4
3  6  9
```

```
4   8   12   16
5   10   15   20   25
6   12   18   24   30   36
7   14   21   28   35   42   49
8   16   24   32   40   48   56   64
```

In [11]:

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

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

In [13]:

```python
size = 7
m = (2 * size) - 2
for i in range(0, size):
    for j in range(0, m):
        print(end=" ")
    m = m - 1
    for j in range(0, i + 1):
        print("* ", end=' ')
    print(" ")
```

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

In [14]:

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

print(" ")

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

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

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

```
*
```

In [15]:

```python
rows = 5
for i in range(0, rows):
    for j in range(0, i + 1):
        print("*", end=' ')
    print("\r")

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

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

In [16]:

```python
rows = 5
i = 1
while i <= rows:
    j = i
    while j < rows:
        # display space
        print(' ', end=' ')
        j += 1
    k = 1
    while k <= i:
        print('*', end=' ')
        k += 1
    print()
    i += 1

i = rows
while i >= 1:
    j = i
    while j <= rows:
        print(' ', end=' ')
        j += 1
    k = 1
    while k < i:
        print('*', end=' ')
        k += 1
    print('')
    i -= 1
```

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

In [17]:

```python
rows = 5
i = 0
```

```python
while i <= rows - 1:
    j = 0
    while j < i:
        # display space
        print('', end=' ')
        j += 1
    k = i
    while k <= rows - 1:
        print('*', end=' ')
        k += 1
    print()
    i += 1

i = rows - 1
while i >= 0:
    j = 0
    while j < i:
        print('', end=' ')
        j += 1
    k = i
    while k <= rows - 1:
        print('*', end=' ')
        k += 1
    print('')
    i -= 1
```

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

```python
rows = 14
print("*" * rows, end="\n")
i = (rows // 2) - 1
j = 2
while i != 0:
    while j <= (rows - 2):
        print("*" * i, end="")
        print("_" * j, end="")
        print("*" * i, end="\n")
        i = i - 1
        j = j + 2
```

```
**************
******  ******
***** __ *****
**** _____ ****
*** _____ ***
** _____ **
* _____ *
```