

```
In [1]: n = int(input("enter the number : "))

for i in range(n):
    for j in range(n):
        print("*", end = " ")
    print()
```

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

```
In [2]: n = int(input("enter the number : "))

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

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

```
In [3]: n = int(input("enter the number : "))

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

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

```
In [4]: n = int(input("enter the number : "))

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

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

```
In [5]: n = 5

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

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

```
In [6]: n = 5

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

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

```
In [7]: n = 5

for i in range(n):
    #for printing spaces..
    for j in range(n-i-1):
        print(" ", end = " ")

    #printing starts..in row
    for j in range(2*i + 1):
        print("*", end = " ")

    print("")
```

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

```
In [8]: n = 6

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

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

    for j in range(n-i-1):
```

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

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

In [9]: n = 5

```
for i in range(n):
    #for printing spaces..
    for j in range(n-i-1):
        print(" ", end = " ")

    #printing starts..in row
    for j in range(2*i + 1):
        print("*", end = " ")

    print("")

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

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

    # for j in range(n-i-1):
    #     print(" ", end = " ")
    print("")
```

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

In [10]: n = 5

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

for i in range(n-1, -1, -1):
    for j in range(i):
```

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

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

```
In [11]: n = 5

start = 1
for i in range(n):
    start = 1 if i%2 == 0 else 0
    for j in range(i+1):
        print(start, end = " ")
        start = 1 - start

    print()
```

```
1
0 1
1 0 1
0 1 0 1
1 0 1 0 1
```

```
In [12]: n = 5
spaces = 2*(n-1)
for i in range(n):
    for j in range(i+1):
        print(j+1, end = " ")

    for j in range(spaces):
        print(" ", end = " ")

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

    print()
    spaces -= 2
```

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

```
In [13]: n = 5

val = 1
```

```

for i in range(n):
    for j in range(i+1):
        print(val, end = " ")
        val += 1
    print()

```

```

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

```

```

In [14]: n = 5

char = "A"
for i in range(n):
    for j in range(i+1):
        print(chr(ord(char) + (j)), end = " ")
    print()

```

```

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

```

```

In [15]: n = 5
char = "A"
for i in range(n, -1, -1):
    for j in range(i):
        print(chr(ord(char) + j), end = " ")
    print()

```

```

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

```

```

In [16]: n = 5
char = "A"
for i in range(1,n+1):
    for j in range(i):
        print(chr(ord(char) + i-1), end = " ")
    print()

```

```

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

```

```

In [17]: n = 5
char = "A"
for i in range(n):
    for j in range(n-i-1):
        print(" ", end = " ")

```

```

for j in range(2*i+1):
    print(chr(ord(char) + i), end = " ")
print()

```

```

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

```

```

In [18]: n = 5
char = "A"
for i in range(n):
    for j in range(n - i - 1):
        print(" ", end=" ")

    ch = ord(char)

    for j in range(2 * i + 1):
        if j <= i:
            print(chr(ch + j), end=" ")
        else:
            print(chr(ch + (2 * i - j)), end=" ")

    print()

```

```

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

```

```

In [19]: ## another approach...
n = 5
char = "A"

for i in range(n):
    # Print leading spaces
    for j in range(n - i - 1):
        print(" ", end=" ")

    # Initialize character
    ch = ord(char)

    # Increasing part
    for j in range(i + 1):
        print(chr(ch + j), end=" ")

    # Decreasing part
    for j in range(i - 1, -1, -1):
        print(chr(ch + j), end=" ")

    print() # Move to next line

```

```

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

```

```

In [20]: n = 5

ch = "A"
for i in range(n):
    for j in range(i+1):
        print(chr(ord(ch) + n - j-1), end = " ")
    print()

```

```

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

```

```

In [21]: n = 5
for i in range(n):
    start = ord('E') - i # starting letter for the row
    for j in range(i + 1):
        print(chr(start + j), end=" ")
    print()

```

```

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

```

```

In [22]: n = 5

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

    for j in range(2*i):
        print(" ", end = "")

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

    print()

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

    for j in range(i+1):

```

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

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

```
In [23]: n = 5

cnt = 0
for i in range(n):
    for j in range(i+1):
        print("*", end = " ")

    cnt += 2
    for j in range(2*n - cnt):
        print(" ", end = " ")

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

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

        for j in range(2*i):
            print(" ",end = " ")

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

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

```
In [24]: n = 6
for i in range(n):
    print("*", end = "")

    if i == 0 or i == n-1:
        for i in range(n-2):
```



```

        print("*", end = "")
    else:
        for i in range(n-2):
            print(" ", end = "")

    print("*", end = "")
    print()

```

```

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

```

```

In [25]: n = 6
        for i in range(n):
            for j in range(n):
                if i == 0 or j == 0 or i == n-1 or j == n-1:
                    print("*", end = "")
                else:
                    print(" ", end = "")
            print()

```

```

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

```

```

In [26]: def pattern22(n):
        for i in range(2 * n - 1):
            for j in range(2 * n - 1):
                print(n - min(i, j, 2 * n - 2 - i, 2 * n - 2 - j), end=" ")
            print()

        # Example usage:
        pattern22(5)

```

```

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

```

print all prime factors of a number

```

In [35]: from math import sqrt
        n = 780

```

```

for i in range(2, int(sqrt(n))+1):
    if n % i == 0:
        print(i)

    while n % i == 0:
        n //= i

```

2
3
5
13

```

In [36]: import math
num = math.exp(2)
print(num)

res = 2 ** 3
print(res)

val = pow(2, 3)
print(val)

```

7.38905609893065
8
8

exponential

```

In [33]: def exponential(x, n):
ans = 1
while n > 0 :
    if n % 2 == 1:
        ans = ans * x
        n = n-1
    else:
        n //= 2
        x *= x

    return ans

val = exponential(2, 5)
print(val)

```

32

given a number n , print all primes till n

In []: