

## Pattern Printing 2:

Q1) Given N,

n = 3

```

  ☆ ☆ ☆
  ☆ ☆
  ☆
  
```

i, j  $\Rightarrow$  rows, col

n = 5

	Col 1	Col 2	Col 3	Col 4	Col 5	
Row 1 $\rightarrow$	☆	☆	☆	☆	☆	5
2 $\rightarrow$	☆	☆	☆	☆		4
3 $\rightarrow$	☆	☆	☆			3
4 $\rightarrow$	☆	☆				2
5 $\rightarrow$	☆					1

for row in range(1, n+1):

for col in range(1, n-row+2):

print("☆", end=" ")

print()

row

1

n-row+2

2

3

4

5

col.

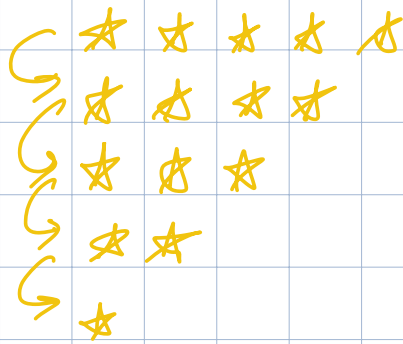
5-1+2 = (1, 6)  $\Rightarrow$  1, 2, 3, 4, 5

5-2+2 = (1, 5)  $\Rightarrow$  1, 2, 3, 4

5-3+2  $\Rightarrow$  (1, 4)  $\Rightarrow$  1, 2, 3

5-4+2  $\Rightarrow$  (1, 3)  $\Rightarrow$  1, 2

5-5+2  $\Rightarrow$  (1, 2)  $\Rightarrow$  1



### ★ Tips:

- i) Find no. of times you want to run outer loop
- ii) No. of times inner loop is going to run
- iii) Find what you need to print

★ If you ask to do this/thet in a code. First try yourself after session.

Q2: Given  $n$ , print:

$n = 5$

★  
★ 2  
★ 2 ★  
★ 2 ★ 4  
★ 2 ★ 4 ★

$n = 3$

★  
★ 2  
★ 2 ★

$n = 5$

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

$n = 3$

1  
1 2  
1 2 3

outer loop :  $n$  times  $\Rightarrow$  range(1,  $n+1$ )  
inner loop : row times  $\Rightarrow$  range(1, row+1)  
print col no. : col

```
for row in range(1, n+1):  
    for col in range(1, row+1):  
        print(col, end=" ")  
    print()
```

```
for row in range(1, n+1):  
    for col in range(1, row+1):  
        if col % 2 == 0:  
            print(col, end=" ")  
        else:  
            print("*", end=" ")  
    print()
```

★ Spaces:

★ ★ ★ ★

```
print(" ", end = " ")
for i in range(4):
    print("★", end = " ")
print(" ")
```

Q.3: Given  $N$ , print :

$N = 3$

★  
★  
★

$n = 5$

★  
★  
★  
★  
★

spaces  $\Rightarrow n - 1$

⇒ outer loop : n times  
 ⇒ inner loop : print ("★", end = " ")  
 loop ⇒ range (n-1) spaces  
 print ("★")  
 print ( )

for row in range (n):  
 print ("★", end = " ")  
 for col in range (n-1):  
 print (" ", end = " ")  
 print ("★")  
 print ( )

Q4: Given n. Print:

n = 3

n = 5

Star: row

	col:	1	2	3	4	5	Space
1	i	←	4	→	★		n-row
2	ii	←	3	→	★	★	n-row
3	iii	2	★	★	★		n-row
4	iv	1	★	★	★	★	n-row
5	v	★	★	★	★	★	n-row

⇒ outer loop : n times : range(1, n+1)  
inner loop : (n-row) times space  
row times star.

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

⇒  $n=5$  ,  $n=5$   
range(1, n+1) , range(n)

⇓  
1, 2, 3, 4, 5  
└──────────┘

loop will run  
5 times

0, 1, 2, 3, 4  
└──────────┘

loop will run 5  
times