

Application of Nested loops:-

Patterns in Python :-

Presentation By

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(20 MS 091)

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5 columns

Solid Square!

5 rows

2 loops;
first; outer loop → Rows
Second; Inner loop → Columns

outer loop is for rows in

for i in range (0,5): → (0,1,2,3,4)
 Print ("*")

output

* → 0
* → 1
* → 2
* → 3
* → 4

So we need to add columns
means

inner loop :-

```
for i in (0,5):
```

```
    for j in (0,5):
```

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

After one '*'
we won't
jump to
new line!

out put

***** *****

25 Stars

```
for i in (0,5):  
    for j in (0,5):  
        Print("*", end = " ")
```

Print()  outside inner loop
Creates a new
line!

out put

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

* * * * *

* * * * *

* * * * *

* * * * *

* * * * *

5 columns

5 rows

Final Code!

```
for i in (0,5):
```

```
    for j in (0,5):
```

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

```
    print()
```

Increasing Triangle !

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

2 loops

the outer loop - Rows

the inner loop - Columns

↳ In inner loop there will
be **print** function

0	-	*				
1	-	*	*			
2	-	*	*	*		
3	-	*	*	*	*	
4	-	*	*	*	*	*

first we will code the outer loop:-

for each row we have to print the value so here comes inner loop :-

for j in range(i+1):

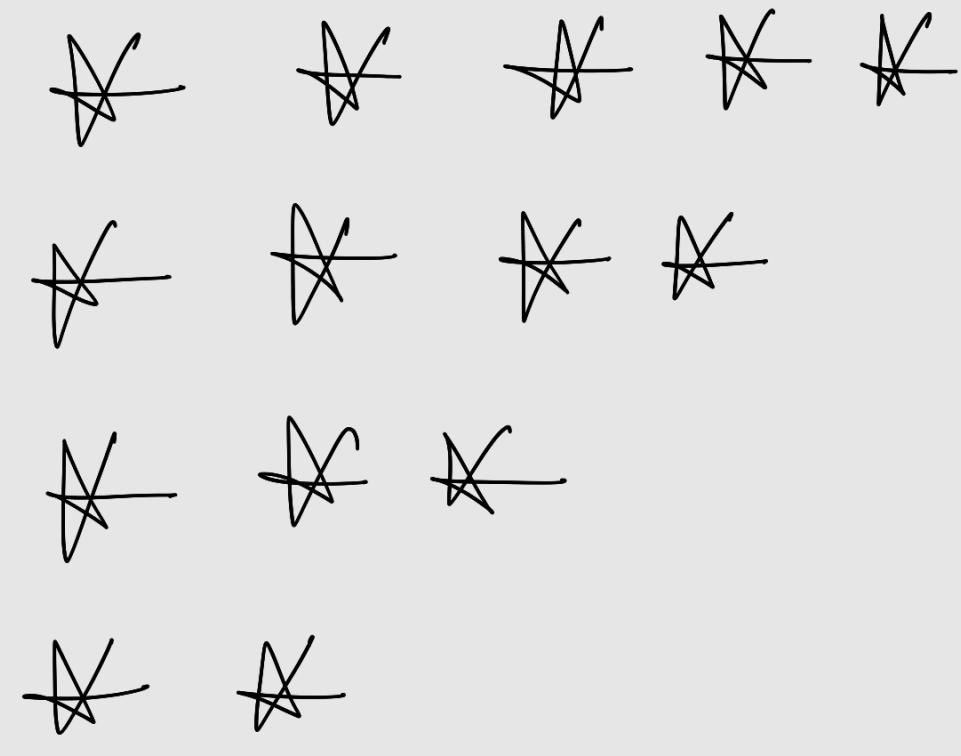
```
Print ("*", end = " ")
```

When $i=0$ (1st row), $j=0+1=1 \rightarrow$ times iteration

$i=2$ (3rd row), $j=2+1=3 \rightarrow$ times iteration

← Point ()

For each row it prints, it should come to next line.



5 columns

5 rows

Decreasing
Triangle!

* * * * * → 5

* * * * → 4

* * * → 3

* * → 2

* → 1

(5, 4, 3, 2, 1) ← for i in (5, 0, -1)

for j in (i)

when i = 5
j = 5 (0, 1, 2, 3, 4)

when i = 1
j = 1 (0)

Print ("*", end = " ")

Print ()

```

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

for i in range (5)
 Print (" " * i + "*" * (n-i))

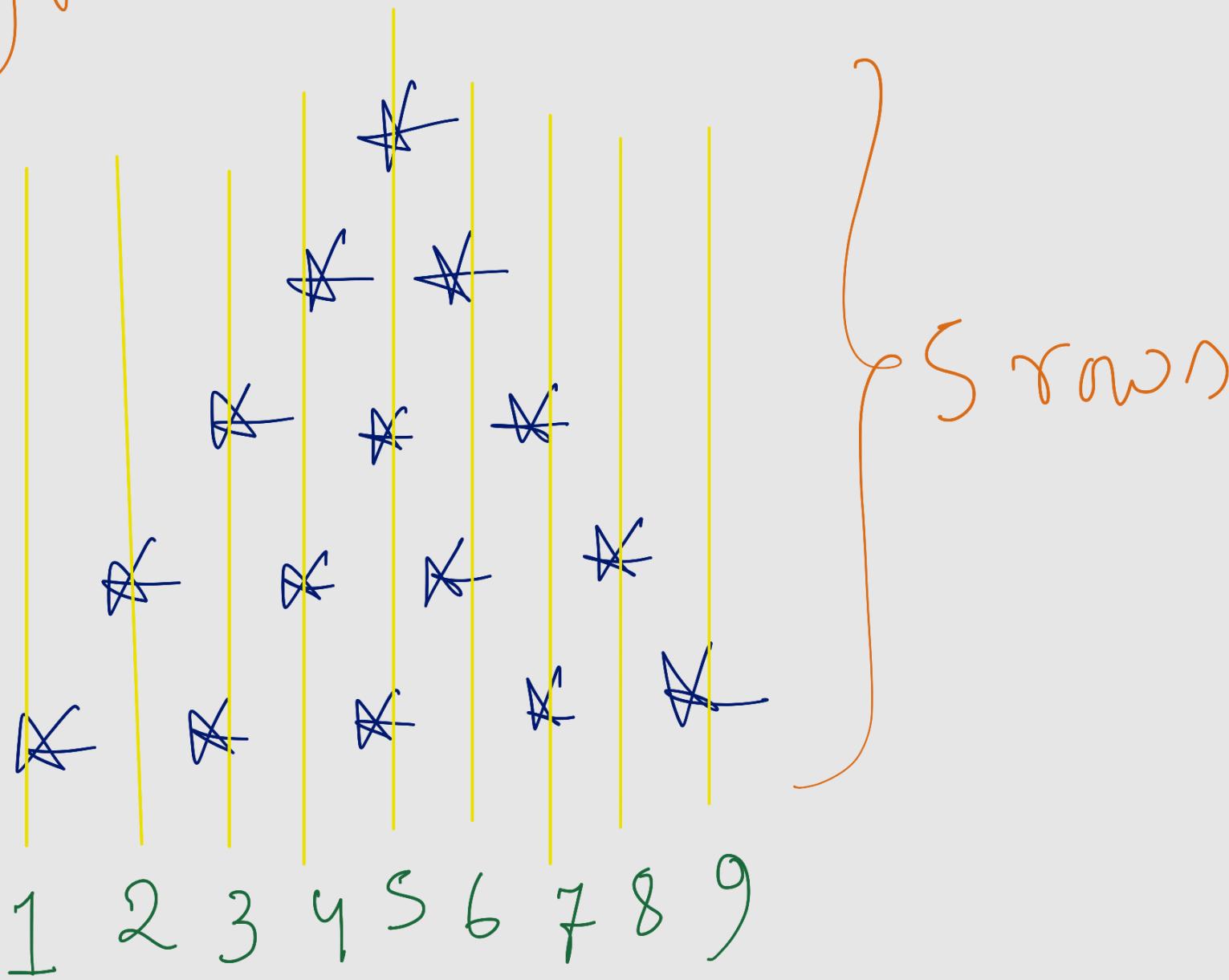
range 5 means:-
 (0, 1, 2, 3, 4, 5)

Downward triangle mirror

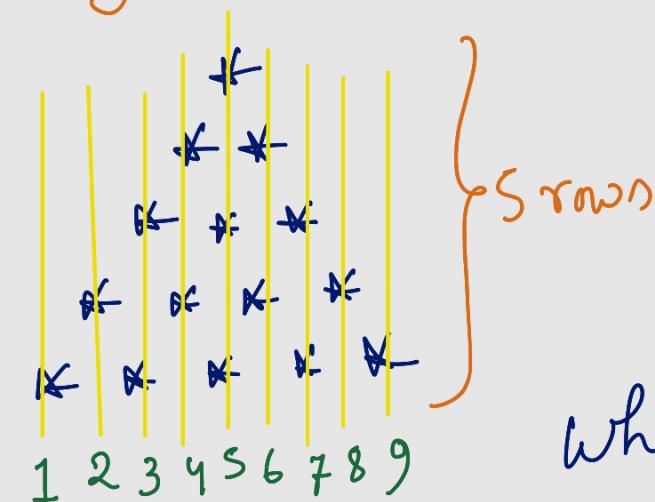
Do for first row:- $i = 0$
 So space will be printed
 0 times & "*" will be printed

$(5 - 0) = 5$ time!

Pyramid!



Pyramid!



$$n = 5$$

for i in range (n)

Print(" "*(n-i-1)+ "*"*(i+1))

When

(0, 1, 2, 3, 4)

$(5-0-1) = 4$ spaces $\leftarrow i = 0, \rightarrow 0+1 = 1$ * gets printed

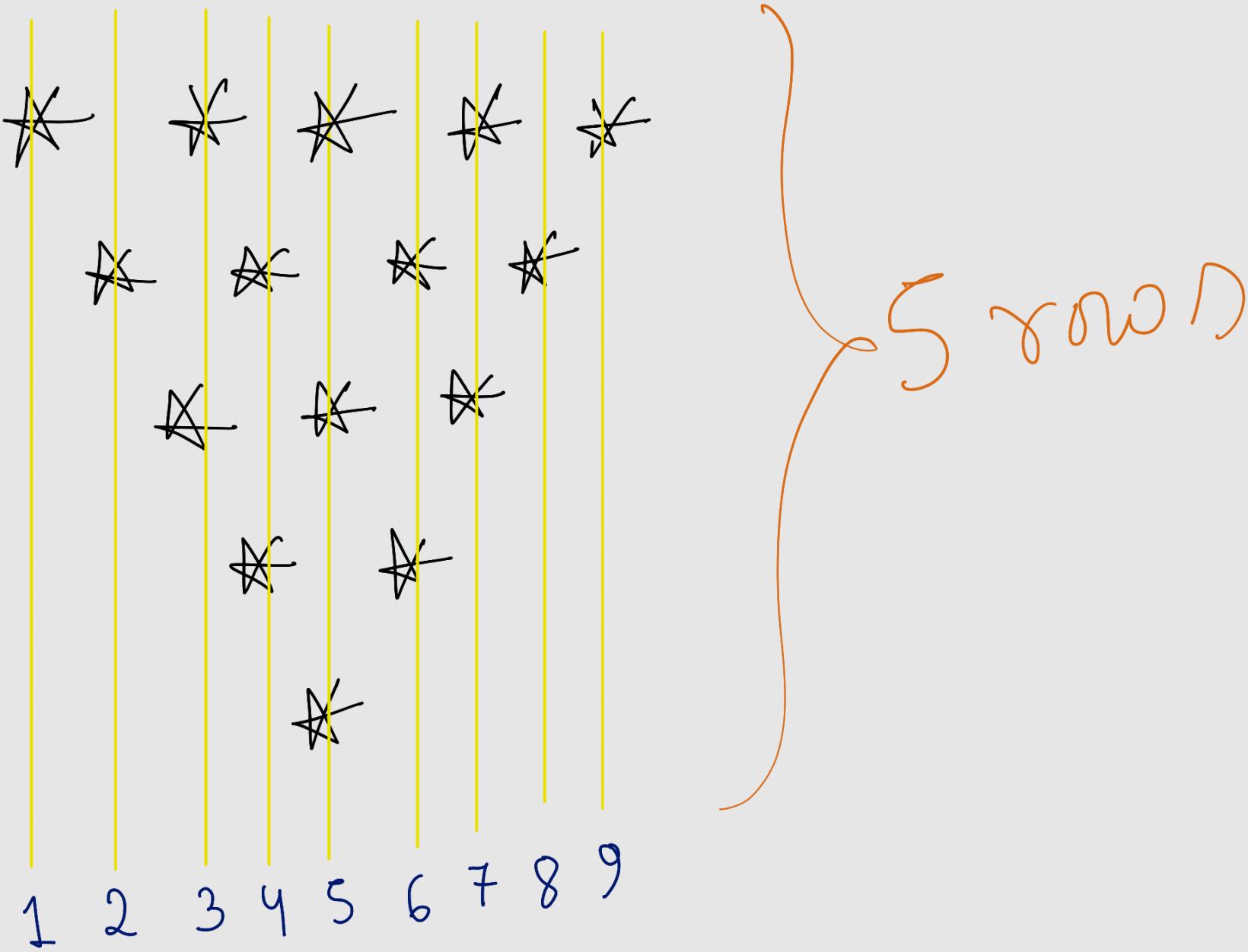
$(5-1-1) = 3$ $\leftarrow i = 1, \rightarrow 1+1 = 2$ * get printed

$(5-2-1) = 2$ $\leftarrow i = 2, \rightarrow 2+1 = 3$ * \leftarrow

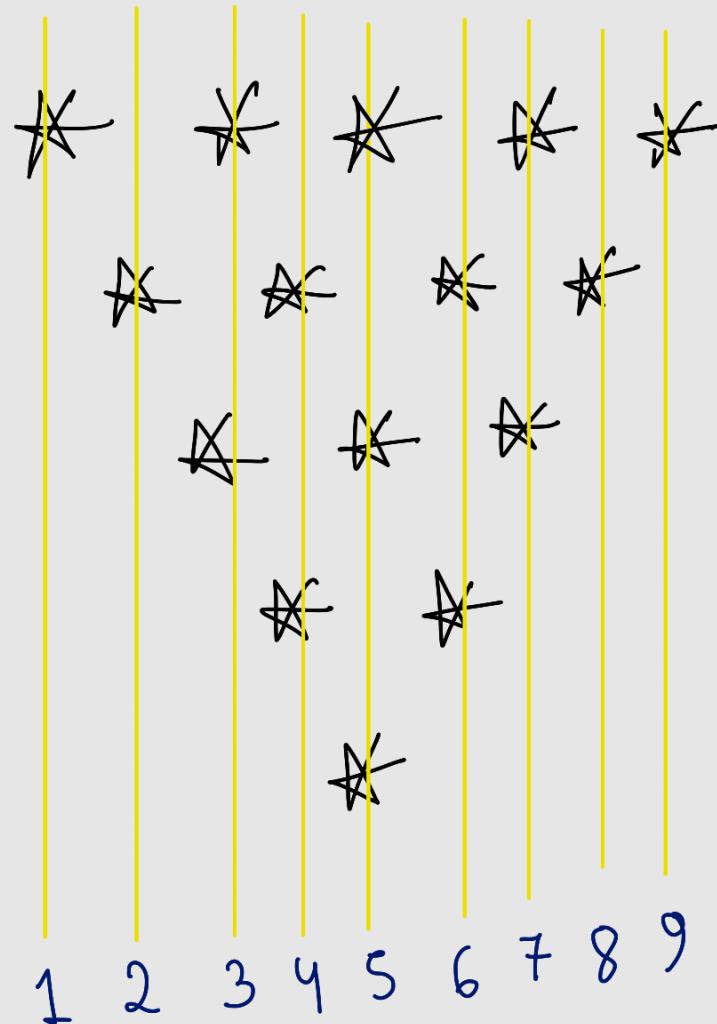
$(5-3-1) = 1$ $\leftarrow i = 3, \rightarrow 3+1 = 4$ * \leftarrow

$(5-4-1) = 0$ $\leftarrow i = 4, \rightarrow 4+1 = 5$ * \leftarrow

Inverted Pyramid Pattern



Inverted Pyramid Pattern:



$n = 5$

for i in range (n):

 print (" " * i + "*" * (n-i))

$i = (0, 1, 2, 3, 4)$

When $i = 0$, $\rightarrow 0$ space, $(5-0) = 5$ *

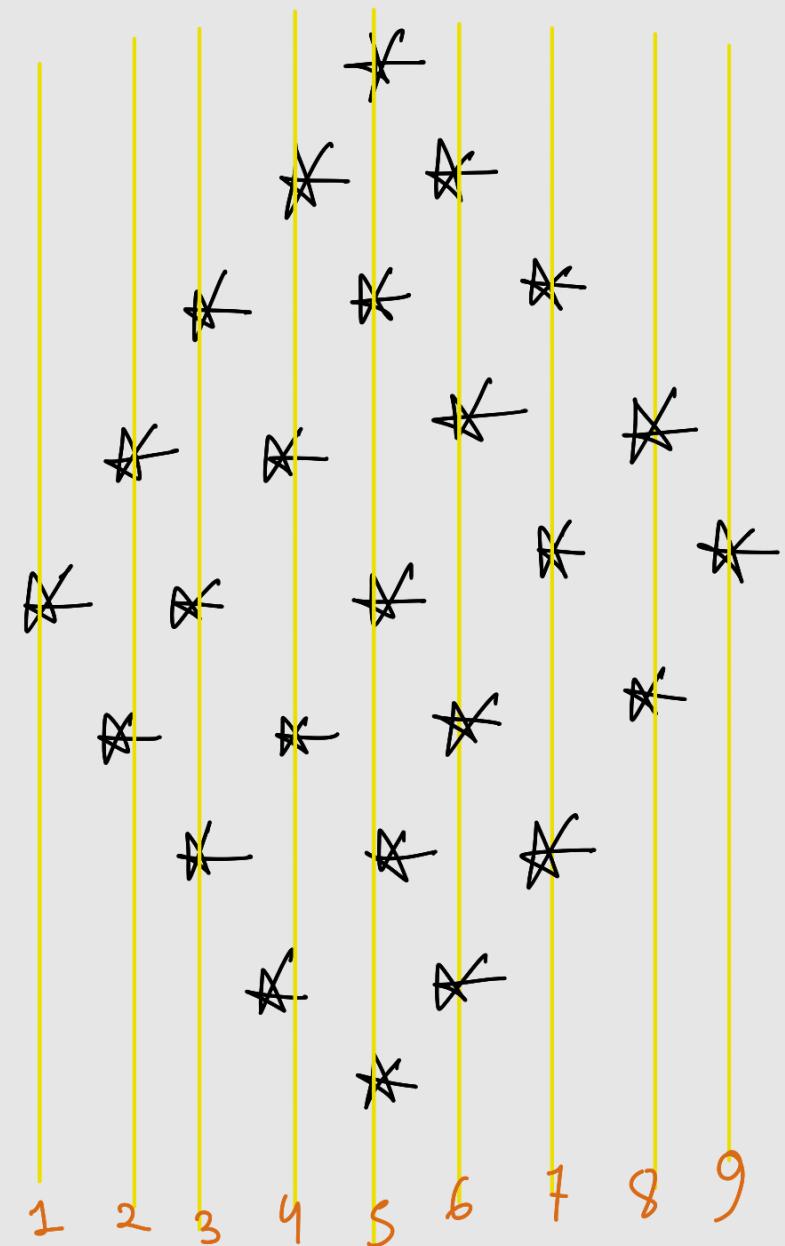
$i = 1$, $\rightarrow 1$ space, $(5-1) = 4$ *

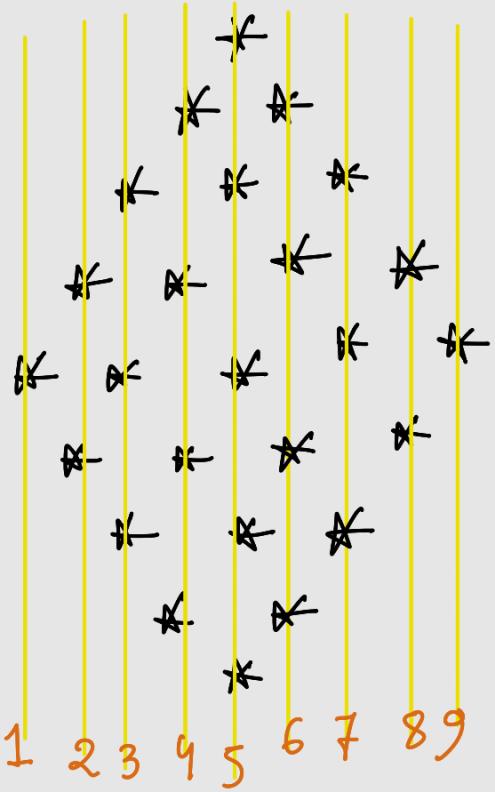
$i = 2$, $\rightarrow 2$ space, $(5-2) = 3$ *

$i = 3$, $\rightarrow 3$ space, $(5-3) = 2$ *

$i = 4$, $\rightarrow 4$ space, $(5-4) = 1$ *

Dimond Pattern:





$n = 5$
 for i in range(n): $\rightarrow (0, 1, 2, 3, 4)$
 Print (' ' * (n-i-1) + '*' * (i+1))
 for i in range($n-1$): $\rightarrow (0, 1, 2, 3, 4)$
 Print (' ' * (i+1) + '*' * (n-i-1))
 When $i = 0$, $\rightarrow 5-0-1 = 4$ spaces, & $(0+1) = 1$ '*'
 $\rightarrow (0+1) = 1$ space & $(5-0-1) = 4$ *

$1+1 = 2$ spaces & $(5-1-1) = 3$ * $\leftarrow i = 1 \rightarrow 5-1-1 = 3$ spaces & $(1+1) = 2$ *
 $2+1 = 3$ spaces & $(5-2-1) = 2$ * $\leftarrow i = 2 \rightarrow 5-2-1 = 2$ spaces & $(2+1) = 3$ *
 $3+1 = 4$ spaces & $(5-3-1) = 1$ * $\leftarrow i = 3 \rightarrow 5-3-1 = 1$ spaces & $(3+1) = 4$ *
 $4+1 = 5$ spaces & $(5-4-1) = 0$ * $\leftarrow i = 4 \rightarrow 5-4-1 = 0$ spaces & $(4+1) = 5$ *

Set 2 :- Q :- S

1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

}

5 rows

Next item is getting increased by 1!

5 Columns

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

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

Set ÷ 2

877

1 2 3 4 5

1 2 3 4

1 2 3

1 2

1

1 2 3 4 5

1 2 3 4

1 2 3

for i in range(5, 0, -1)

1 2

for j in range(i)

1

Print(j+1, print="")

Print()