

(1)  $nst = 1, nsp = 4$


A 3x5 grid of handwritten red marks. The marks are as follows:

—	—	X	*	X
—	X	X	X	X
X	X	X	X	X

Row	nst	nsp
5	1	4
6	1	5
10	1	9
n	1	(n-1)

Spec      Story

xxx  
- x x x



A 5x5 grid of handwritten digits. The digits are: Row 1: 0, 1, 2, 3, 4; Row 2: 1, 2, 3, 4, 5; Row 3: 2, 3, 4, 5, 6; Row 4: 3, 4, 5, 6, 7; Row 5: 4, 5, 6, 7, 8. The digit '0' in the top-left corner is circled in red.

$N = 5$ ,  $ns = 12245$   
 $np = 48210$

$x = x \neq x \neq x \neq x \neq x$

A hand-drawn diagram of a 2D coordinate system. It features a horizontal dashed line and a vertical dashed line intersecting at the origin. A red ellipse is drawn around the upper-left quadrant, with an arrow pointing to it from the left. Another red ellipse is drawn around the lower-right quadrant, with an arrow pointing to it from the bottom-left.


7- 4 4 4  
1 4 4 4 4  
4 4 4 4 4


```
def pattern_01(N):
    nst = 1
    nsp = N - 1


    for r in range(1, N + 1):
        # spaces
        for csp in range(1, nsp + 1):
            print(" ")


        # stars
        for cst in range(nst + 1):
            print("* ")

        nst += 1
        nsp -= 1
```

①  ✓

①  ✓

②  ✓

④  ✓

1588

row	wt	hgt
5	5	0
7	7	0
10	10	0
N	N	0

①

1					
2	3				
4	5	6			
7	8	9	10		

→

x					
x	x				
x	x	x			
x	x	x	x		

→

1					
1	1				
1	1	1			
1	1	1	1		

②

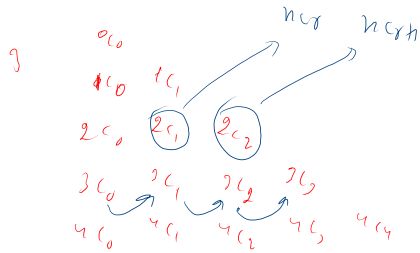
0					
1	1				
2	3	5			
8	13	21	34		

→

$a_1 = 6$

0, 1, 1, 2, 3, 5, 8

13, 21, 34



1				
1	1			
1	2	1		
1	3	3	1	

$$h_{cr} = \frac{h!}{(h-r)! r!} \quad \checkmark$$

$$h_{crh} = \frac{h!}{(h-r)! (r-h)!} \quad \checkmark$$

$$\frac{h_{crh}}{h_{cr}} = \frac{\frac{h!}{(h-r)! (r-h)!}}{\frac{h!}{(h-r)! r!}} = \frac{r!}{(r-h)!} = \binom{r}{h-r}$$

$$h_{crh} = \frac{(h-r) \cdot h_{cr}}{\binom{r}{h}}$$

$h=4$   
 $r=$

h	nsp	hst
4	3	1
5	4	1
10	9	1
N	(m)	1

h	nst	hsp
4	7	0
5	9	0
6	11	0
N	(2m)	0

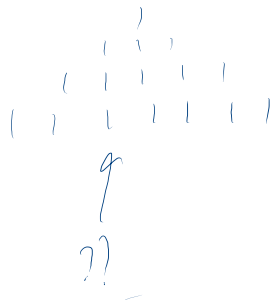
①

-	-	-	x		
-	-	x	x	x	
-	x	x	x	x	*
x	x	x	x	x	x

②

x	x	x	x	x	x	x
-	x	x	x	x	x	
-	-	x	x	x		
-	-	-	x			

$$\begin{array}{ccccccc}
 (1) & - & - & - & 1 & & \\
 & - & - & 1 & 2 & 1 & \\
 & & - & 1 & 2 & 3 & 2 & 1 \\
 & & & 1 & 2 & 3 & 4 & 3 & 2 & 1
 \end{array}
 \rightarrow$$



$$\begin{array}{ccccccc}
 (2) & - & - & - & 1 & & \\
 & - & - & 1 & 2 & 1 & \\
 & - & + & 2 & 4 & 2 & 1 \\
 & 1 & 2 & 4 & 8 & 4 & 2 & 1
 \end{array}$$


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$$\begin{array}{ccccccc}
 1 & 2 & 3 & 2 & 1 & 5 & 6 & +
 \end{array}$$

$$val = x^2 y^2 z^2$$

$$\begin{array}{c|ccccccc}
 1 & - & - & - & * & & & \\
 2 & - & - & * & * & * & & \\
 3 & - & * & * & * & * & * & \\
 4 & * & * & * & * & * & * & * \\
 5 & & * & * & * & * & * & \\
 6 & & & * & * & * & & \\
 7 & & & & * & & & 
 \end{array}$$

$$\begin{array}{l}
 \gamma=1, \quad w_A = 2 \\
 \gamma=2, \quad w_A = 1 \\
 \gamma=3, \quad w_A = 2
 \end{array}$$

$$\begin{array}{l}
 \gamma=4, \quad w_A = 2 \\
 \gamma=5, \quad " \\
 \gamma=6, \quad " \\
 \gamma=7, \quad "
 \end{array}$$

$$N=7 \text{ (odd)}$$

$n$	$w_A$	$w_B$
7	1	5
6	1	4
5	1	3
4	1	2
3	1	1
2	1	0
1	1	0
$N$	1	$(N/2)$

$$\gamma \leq (N/2)$$