0 1 1 2 3 5 8 13

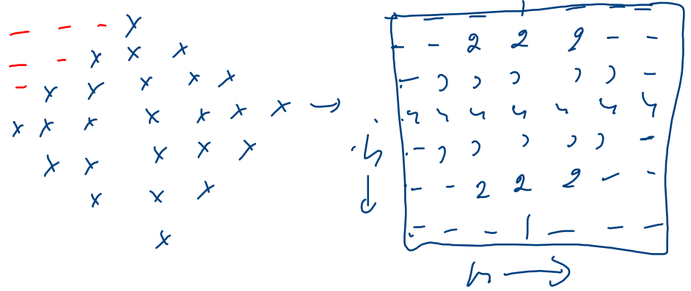
a sum

b

0 1 1 2)

15

```
        1
      2 3 2
    3 4 5 4 3
  4 5 6 7 6 5 4
    3 4 5 4 3
      2 3 2
        1
```

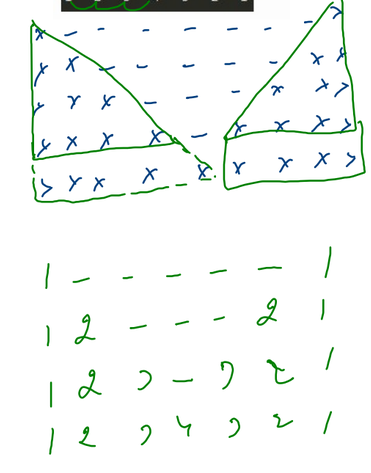


Extra

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

Q1

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



n	ans	sum
4	1	5
5	1	7
6	1	9
7	1	11
m	1	(2*m-3)

2*6-3 = 12-3 = 9

count: 1 2 3 4 5 4 3 2 1

```
1 - - - - - 1
1 2 - - - 2 1
1 2 3 - 3 2 1
1 2 3 4 3 2 1
```

```
    0 1 2 3 4 5
0   1
1   1 1
2   1 2 1
3   1 3 3 1
4   1 4 6 4 1
5   1 5 10 10 5 1
    ..
```

$$nC_r = \frac{n!}{r!(n-r)!}$$

$$nC_{r-1} = \frac{n!}{(r-1)!(n-r+1)!}$$

$$\frac{nC_r}{nC_{r-1}} = \frac{\frac{n!}{r!(n-r)!}}{\frac{n!}{(r-1)!(n-r+1)!}} = \frac{(r-1)!(n-r+1)!}{r!(n-r)!} = \frac{n-r+1}{r}$$

$$nC_r = \frac{(n-r+1)}{r} \times nC_{r-1}$$

proof

$$\frac{nC_r}{nC_{r-1}} = \frac{\frac{n!}{r!(n-r)!}}{\frac{n!}{(r-1)!(n-r+1)!}} = \frac{(r-1)!(n-r+1)!}{r!(n-r)!} = \frac{n-r+1}{r}$$

$$nC_r = \frac{(n-r+1)}{r} \times nC_{r-1}$$

$$nC_{r+1} = \frac{n-r}{r+1} \times nC_r$$

$$nC_{r+1} = \frac{n-r}{r+1} \times \frac{n!}{r!(n-r)!}$$

$$nC_{r+1} = \frac{n!}{(r+1)!(n-r-1)!}$$

$$\frac{nC_{r+1}}{nC_r} = \frac{\frac{n!}{(r+1)!(n-r-1)!}}{\frac{n!}{r!(n-r)!}} = \frac{r!(n-r)!}{(r+1)!(n-r-1)!} = \frac{n-r}{r+1}$$

$$nC_{r+1} = \frac{n-r}{r+1} \times nC_r$$

```
0 0
1 1 1
2 2 2 2
3 3 3 3 3
4 4 4 4 4 4
5 5 5 5 5 5 5
6 6 6 6 6 6 6 6
7 7 7 7 7 7 7 7 7
8 8 8 8 8 8 8 8 8 8
```

$$5C_1 = \frac{(n-1)}{1} * 1 = 5$$

$$5C_2 = \left(\frac{5-2+1}{2}\right) * 5 = 10$$

$$5C_3 = \left(\frac{5-3+1}{3}\right) * 10 = 10$$

$$5C_4 = \left(\frac{5-4+1}{4}\right) * 10 = 5$$

$$5C_5 = \left(\frac{5-5+1}{5}\right) * 5 = 1$$