DSA - 8

Hard level

Pattern & question

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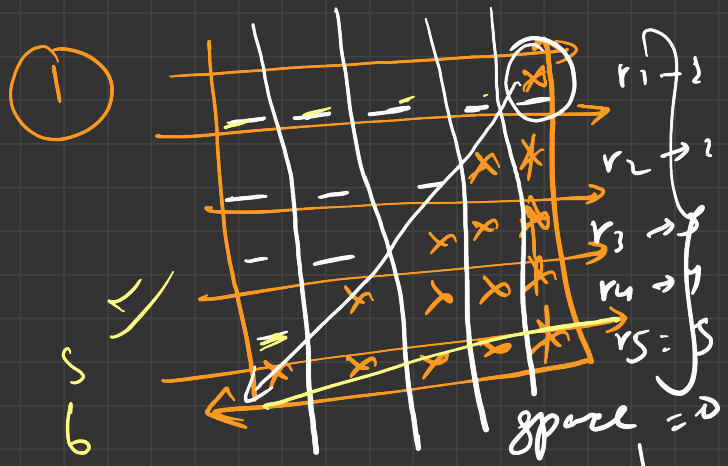


space ?

cout << " "

n = 5

row	space (n-row)	step
1	5-1	1
2	5-2	2
3	5-3	3
4	5-4	4

① row = 1
② row ≤ n
③ print space, n-row times
④ print *, row time
⑤ row+1

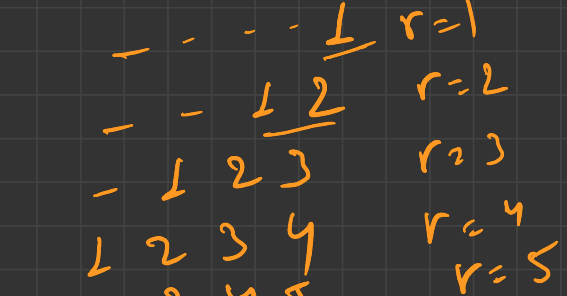
n=5

row=1

col=1 2 3 4 5

col=1 2

```
for (row=1; row<=n; row++) {
    for (col=1; col<=n-row; col++) {
        cout << " ";
    }
    for (col=1; col<=row; col++) {
        cout << "*";
    }
    cout << endl;
}
```



Space → n - row

num → 1 to row

row = 1

row ≤ n

print space n - row time

print 1 to row

row ++

for(row = 1; row ≤ n; row++){

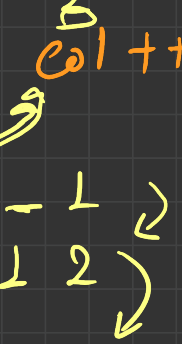
n=3

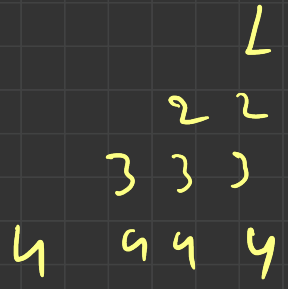
row = 0 2 3-1

col = 1 2 ≤ 3-2(1)

col = 1 2

```
for(col=1; col<=n-row; col++){
    cout<<" ";
}
for(col=1; col<=row; col++){
    cout<<col;
}
cout<<endl;
```





Space = n - row

print - row 叫

① row = 1

② row ≤ n

③ print Space, n-row times

④ print row, row time

⑤ row ++

n = 4
row = 1
col = 1

```
for(row=1; row<=n; row++){
for(col=1; col<=n-row; col++){
cout<<" ";
for(col=1; col<=row; col++)
cout<<row;
}
cout<<endl;
```

Local

Global

Parent

child

child

int n

```
   1        r1 → 1
  2 1       r2 → 2 to 1
 3 2 1      r3 → 3 to 1
4 3 2 1     r4 → 4 to 1
            rn → n to 1
```

Space → n - row

print → row to 1

1. row = 1
2. row ≤ n
3. print space, n - row times
4. print row to 1
5. row ++

$n = 4$

row : $\neq 2$ ✓

col : $\neq 2, \leq 2$ ✗

$4 - 2$
$= 2$

col : ≥ 1 ✓
✗ 0 ✗

$---1$
$--21$

A → r_1

A B → r_2

A B C

A B C D

space = n - row

print A to A + (row - 1)

A to A + (1 - 1)

A to A

① row = 1

② row ≤ n

③ print space, n-row time

④ print A to A + (row - 1)

⑤ row + +

'A'

A + (2 - 1)

A + 1

65 + 1 = 66 → B

n = 4
r = 2
c = 1
ch = 'A'

2 <= 4

2 <= 4 - 2

2 <= 2

<= 'A' from -1

'A' + 2 - 1

65 + 1

66

(66 + 1)

B C D ... A' X <= 'D'

B C D <= D

— — A)

— — A B)