



AGENDA

- Lot of questions



Q1. Given N, print the following pattern :-

$N=3$	$N=5$	$N=6$
*	*	*
* 2	* 2	* 2
* 2 *	* 2 * 4	* 2 * 4
	* 2 * 4 *	* 2 * 4 *
		* 2 * 4 *
		6

odd nos even

cols

	1	2	3	4	5	6
1	*					
2	*	2				
3	*	2	*			
4	*	2	*	4		
5	*	2	*	4	*	
6	*	2	*	4	*	6

rows

if col no. is odd → *

if col no. is even → col no.

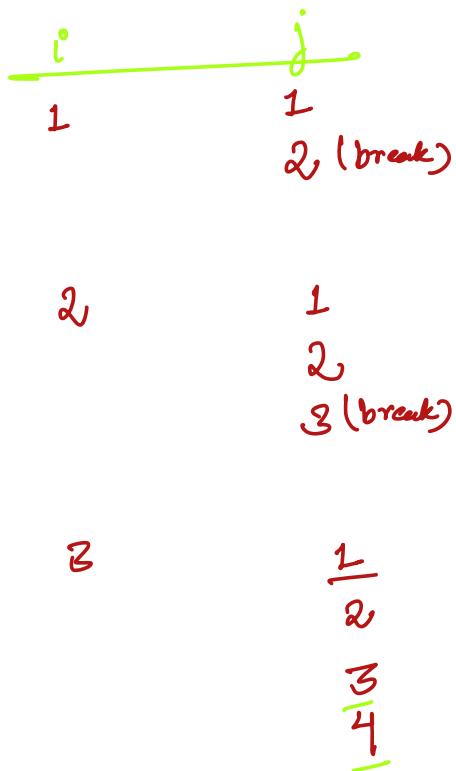
* ↓
2 ↓
* 2 * ↓

```

for( int i=1; i<=N; i++ ) {
    for( int j=1; j<=i; j++ ) {
        if( j%2 != 0 ) {
            System.out.print("*");
        } else {
            System.out(j);
        }
    }
    System.out.println();
}

```

N=4



Q2. Given N, print the following pattern :-

$N=3$	$N=5$	$N=6$
* * 1 * 1 *	* 1 * 1 * * 1 * 2 * 1 * 2 *	* 1 * 1 * * 1 * 2 * 1 * 2 * 3

	1	2	3	4	5	6
1	*					
2	*	1				
3	*	1	*			
4	*	1	*	2		
5	*	1	*	2	*	
6	*	1	*	2	*	3

when j is odd
→ print *

when j is even
→ $j/2$

```
for (int i=1; i<=N; i++) {
    for (int j=i; j<=i; j++) {
        if (j%2 != 0) {
            System.out.print("*");
        } else {
            System.out.print(j/2);
        }
    }
    System.out.println();
}
```

→ Each row has its own series starting j with a fixed no.

Approach 2:

```

for( int i=1; i<=N; i++ ) {
    int k=1;
    for( int j=1; j<=i; j++ ) {
        if( j * 2 != 0 ) {
            S.O.P(*);
        } else {
            S.O.P(K);
            k++;
        }
    }
}

```

J

N=4

i	k	j
1	1	1

2 (break)

2	1	1
2	2	2

3 (break)

As soon as you
print K, increment
it.

3	1	1
3	2	2

4 (break)

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

1
2
3
4
(break)

Q3. Given N, print the following pattern :-

$N=3$	$N=4$	$N=5$
1	1	1
2 3	2 3	2 3
4 5 6	4 5 6	4 5 6
	7 8 9 10	7 8 9 10
		11 12 13 14 15

is the starting no. in each row same?

`int k=1;`

```
for(int i=1; i<=N; i++) {
    for(int j=1; j<=i; j++) {
        s.o.p(k);
        k++;
    }
}
```

1
2 3
4 5 6
7 8 9 10
}

k	i	j
①	1	1
		2 (break)

2	2	1
3		2
		3 (break)

4	3	1
5		2
6		3
		4 (break)
7	4	1
		2
		3
		4

Q4. Given N , print the following pattern:-
(spaces & stars)

$N=3$	$N=4$	$N=5$
— — *	— — — *	— — — — *
— * *	— — * *	— — — * *
* * *	— * * *	— — * * *
	* * * *	— * * *
		* * *

Count Based Approach

$N=5$

— — — — *
— — — * *
— — * * *
— * * * *
* * * * *

i	<u>spaces</u> $\left(\frac{N-i}{N}\right)$	<u>stars</u>
1	$4 \rightarrow 5-1$ $(N)(i)$	<u>1</u> (i)
2	$3 \rightarrow 5-2$ $(N)(i)$	<u>2</u> (i)
3	$2 \rightarrow 5-3$ $(N)(i)$	<u>3</u> (i)
4	$1 \rightarrow 5-4$ $(N)(i)$	<u>4</u> (i)
5	$0 \rightarrow 5-5$ $(N)(i)$	<u>5</u> (i)

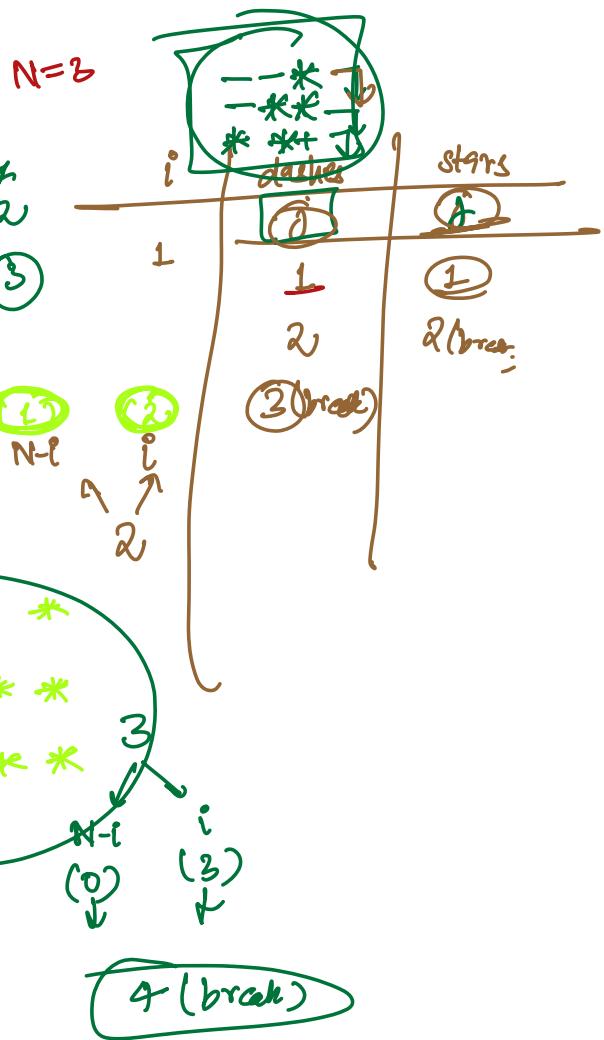
Each row \rightarrow Some dashes + Some stars
 ↓ ↓
 $(n-i)$ i

Code :

```

for (int i=1; i<=N; i++) {
    // print dashes
    for (int j=1; j<=n-i; j++) {
        S.O.P(" -");
    }
    S.O.P("\n");
}
    
```

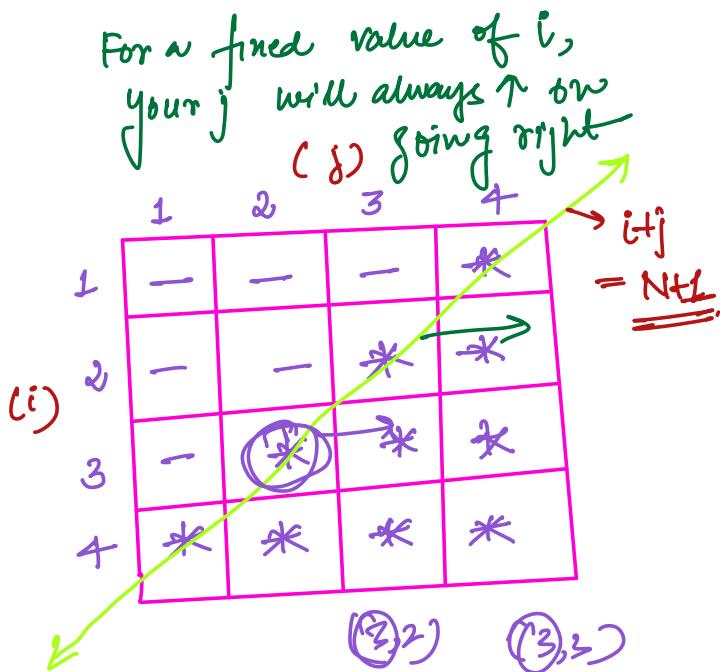
scope ceases to exist as soon as you exit out of the for loop



Ex. Print the same pattern using if - else.

$N=4$

N=4



$i+j = N+1$
• Keep i same
• Increase j

$$\begin{aligned}10+2 &= 13 \\10+4 &\\10+5 &\\10+6 &\end{aligned}$$

```
for(int i=1; i<=N; i++) {  
    for(int j=1; j<=N; j++) {  
        if( i+j >= N+1 ) {  
            S.O.P(" * ");  
        } else {  
            S.O.P(" - ");  
        }  
        S.O.Put();  
    }  
}
```

10..36

Q5. Given N , print the following pattern:-
(Spaces as stars)

$N=3$

* * *
- * *
-- *

$N=4$

* * * *
- * * *
-- * *
--- *

$N=5$

* * * * *
- * * * *
-- * * *
--- * *
---- *

Count Based Approach.

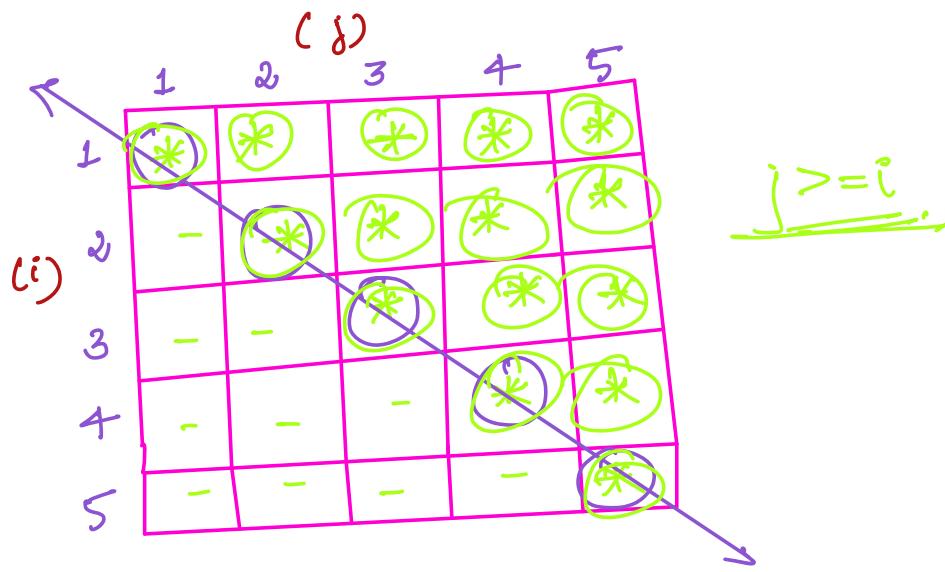
$N=5$.

* * * * *
- * * * *
-- * * *
--- * *
---- *

i	spaces	stars
1	0	5 - 0
2	1	5 - 1
3	2	5 - 2
4	3	5 - 3
5	4	5 - 4
	$i-1$	$N - (i-1)$
		$N - i + 1$

Each row = $(i-1)$ dark
 $+ (N-i+1)$ stars.

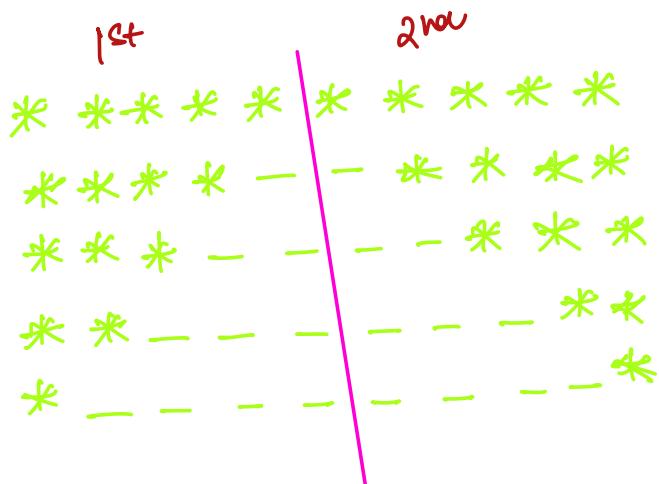
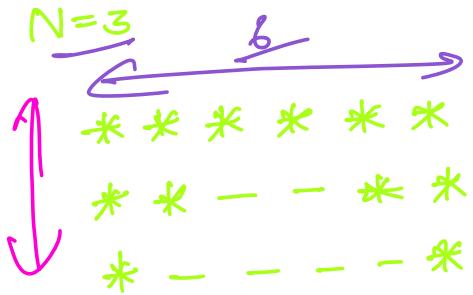
How to solve using if - Else?



```

for (int i=1; i<=N; i++) {
    for (int j=1; j<=N; j++) {
        if (j >= i) {
            S.O.P(" * ");
        } else {
            S.O.P(" - ");
        }
    }
}
  
```

Q6. Given N , print the following pattern:-



i	1st Part		2nd Part	
	stars dashes	dashes stars	stars dashes	dashes stars
1	5 5-0	0 1-1	0	5
2	4 5-1	1 21	1	4
3	3 5-2	2 31	2	3
4	2 5-3	3 41	3	2
5	1 5-4	4 51	4	1
	\downarrow	\downarrow	\downarrow	\downarrow
	$(n-i+1)$	$(i-1)$	$(i-1)$	$(n-i+1)$

Each row = stars + dashes + dashes + stars

$$\begin{array}{c}
 \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \\
 (n-i+1) \quad (i-1) \quad (i-1) \quad (n-i+1) \\
 \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \\
 \boxed{(n-i+1) \text{ stars}} + \underline{2*(i-1) \text{ dashes} + (n-i+1) \text{ stars}}
 \end{array}$$

```
for (int i=1; i<=N; i++) {
```

// print $(n-i+1)$ stars

```
for (int j=1; j<= n-i+1; j++) {  
    S.O.P("*");
```

}

// print (2^{i-1}) dashes

```
for (int j=1; j<= 2^(i-1); j++) {  
    S.O.P("-");
```

}

// print $(n-i+1)$ stars

```
for (int j=1; j<= n-i+1; j++) {  
    S.O.P("*");
```

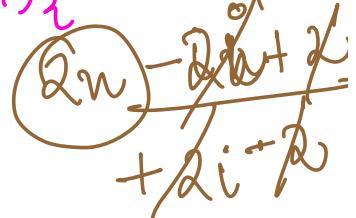
}

```
S.O.P("v");
```

}

$$\begin{aligned} & n-i+1 \\ & + 2^{i-1} \end{aligned}$$

$$+ n-i+1$$



$$+ 2^i - 2$$

Q7. Given N , print the following pattern:-

$N=3$

```
* - - - - *
* * - - * *
* * * * * *
```

$N=5$

```
* - - - - -
* * - - - -
* * * - - - -
* * * * - - -
* * * * * - - -
```

$i=4$ 2nd

```
* - - - - -
* * - - - -
* * * - - - -
* * * * - - -
* * * * * - - -
```

Each row
→ stars +
dashes
+ stars.

i	1st Part		2nd part	
	stars	dashes	dashes	stars
1	1	4	4	1
2	2	3	3	2
3	3	2	2	3
4	4	1	1	4
5	5	0	0	5

$\oplus \psi$

$N - P$

ψ
 i

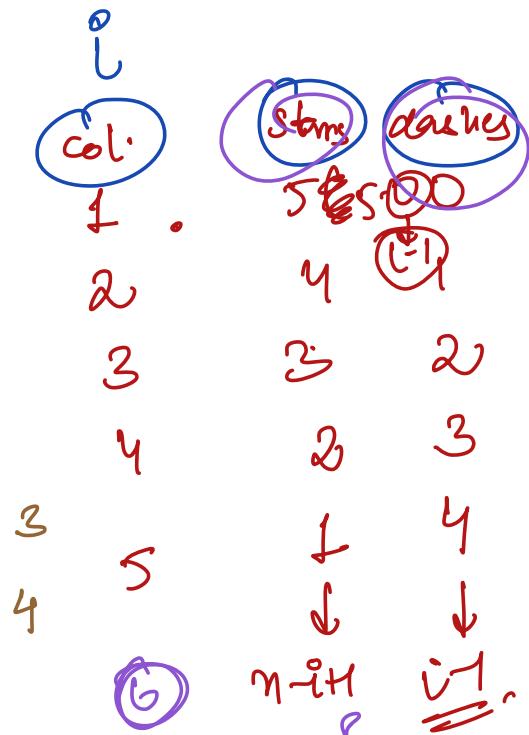
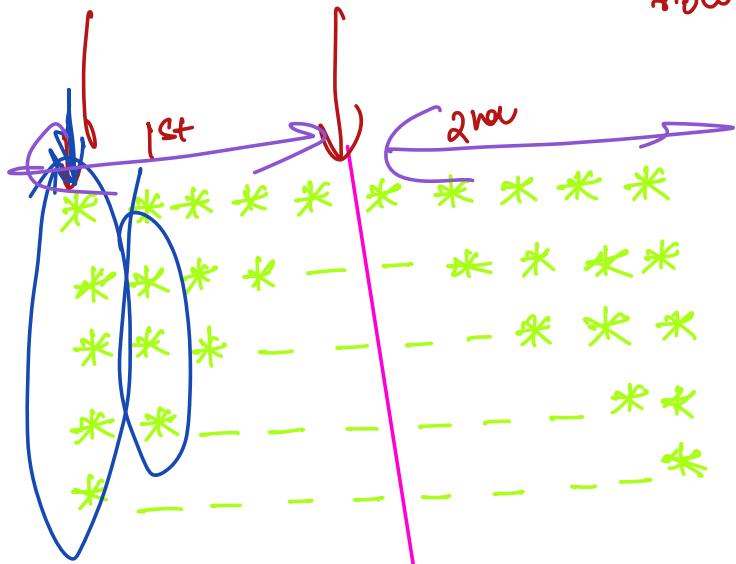
i° stars + $(N-i)$ dashes
+ $(N-i)$ dashes
+ i° stars

\star i° stars + 2^* $(N-i)$ dashes
+ i° stars

\oplus
 \parallel

* * * * * * * * *
* * * * - - * * *
* * * - - - - * * *
* * - - - - - - *
* - - - - - - - - *
* - - - - - - - - *
* * - - - - - - * *
* * * - - - - * * *
* * * * * * * * * *

DOUBTS



```
for (int i=1; i <= 2*N; i++) {
    for (j=1; j <= N; j++) {
```

}