

Q1: Given  $N$ , print the following pattern

$N = 3$

```

  * * * * *
 * *   * *
*   *   *

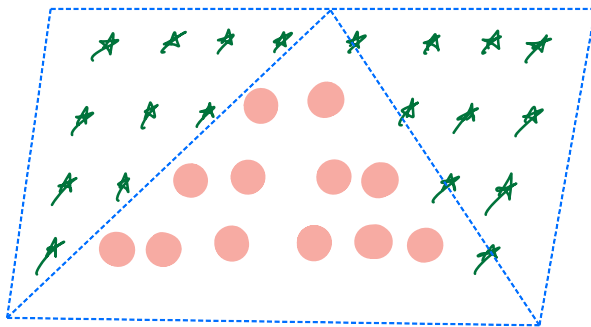
```

$N = 4$

```

 * * * * * * *
 * *   *   *
 * *   *   *   *
 * *   *   *   *   *
 *   *   *   *   *

```



Row	$\star_1$	spaces	$\star_2$
1	4	0	4
2	3	2	3
3	2	4	2
4	1	6	1
	$\Downarrow$ $n+1-\text{row}$	$\Downarrow$ $2 \times \text{row} - 2$	$\Downarrow$ $n+1-\text{row}$

$$\text{row} + \star_1 = n + 1$$

$$\star_1 = n + 1 - \text{row}$$

$$2 \times \text{row} \propto \text{spaces}$$

```
for(int row=1; row ≤ n; row++) {
```

```
    // Print  $\star_1$ 
```

```
    for(int star=1; star ≤ n+1-row; star++) {
```

```
        SOP(" * ");
```

```
    }
```

```
    // Print spaces
```

```

for (int 'spaces=1; spaces ≤ n-row-2; spaces++) {
    SOP(" ");
}

```

// Print  $\star_2$

```

for (int star=1; star ≤ n+1-row; star++) {
    SOP("★");
}

```

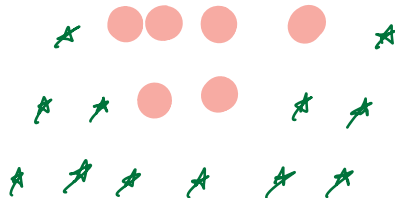
```

SOP("\n");
}

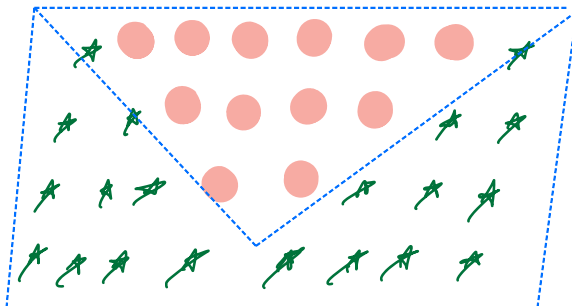
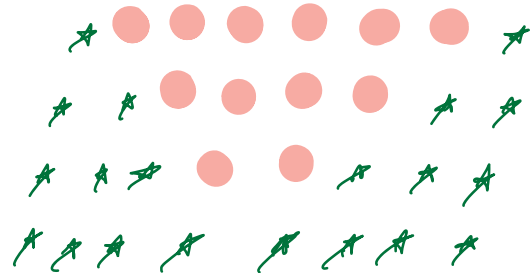
```

Q2: Given  $N$ , print the following pattern

$N=3$



$N=4$



Row	$\star_1$	spaces	$\star_2$
1	1	6	1
2	2	4	2
3	3	2	3
4	4	0	4
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <math>\Downarrow</math> row </div> <div style="text-align: center;"> <math>\Downarrow</math>  <math>2 \times n - 2 \times \text{row}</math> </div> <div style="text-align: center;"> <math>\Downarrow</math> row </div> </div>			

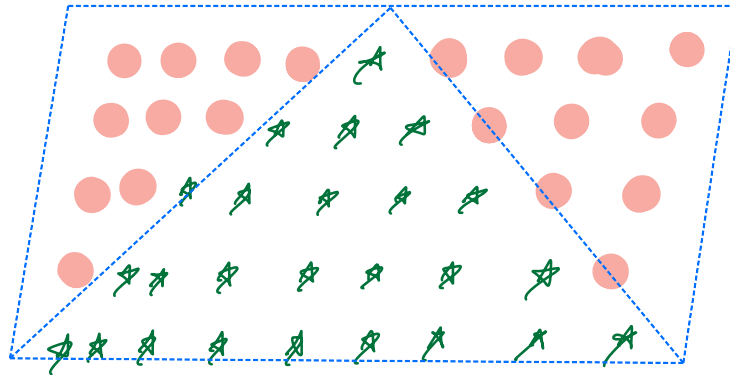
$$2 \times \text{row} \propto \text{spaces}$$

$$2 \times \text{row} + \text{spaces} = 2 \times N$$

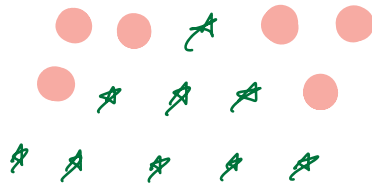
$$\text{spaces} = 2N - 2 \times \text{row}$$

Q3: Given  $N$ , print the following

$N = 5$



$N = 3$



	Row	spaces	stars		$2 \times \text{row}$
$+1 \downarrow$	1	4	1	$\downarrow +2$	2
	2	3	3		4
	3	2	5		6
	4	1	7		8
	5	0	9		10

$\downarrow$   
 $n - \text{row}$

$$2 \times \text{row} \propto \text{stars}$$

$$2 \times \text{row} - 1 = \text{stars}$$

Q4: Given  $N$ , print the following

$N = 5$

```

      * * * * *
     * * * * *
    * * * * *
   * * * * *
  * * * * *
 * * * * *

```

	Row	spaces	stars		$2 \times \text{row}$
+1 ↓	1	0	9	↓ -2	2
	2	1	7		4
	3	2	5		6
	4	3	3		8
	5	4	1		10

↓  
row-1

$$\begin{aligned}
 2 \times \text{row} &\propto \text{stars} \\
 2 \times \text{row} + \text{stars} &= 2 \times n + 1 \\
 \rightarrow \text{stars} &= 2 \times n - 2 \times \text{row} + 1
 \end{aligned}$$

Break : 10:10 pm

Q5: Given  $N$ , print the following

$N = 5$

● ● ● ● ● 1

●   ●   ●   2   3   4  
 ●   ●   3   4   5   6   7  
 ●   4   5   6   7   8   9   10  
 5   6   7   8   9   10   11   12   13

Row	spaces	s	cnt	e	3*row
1	4	1	1	1	3
2	3	2	3	4	-6
3	2	3	5	7	9
4	1	4	7	10	12
5	0	5	9	13	15

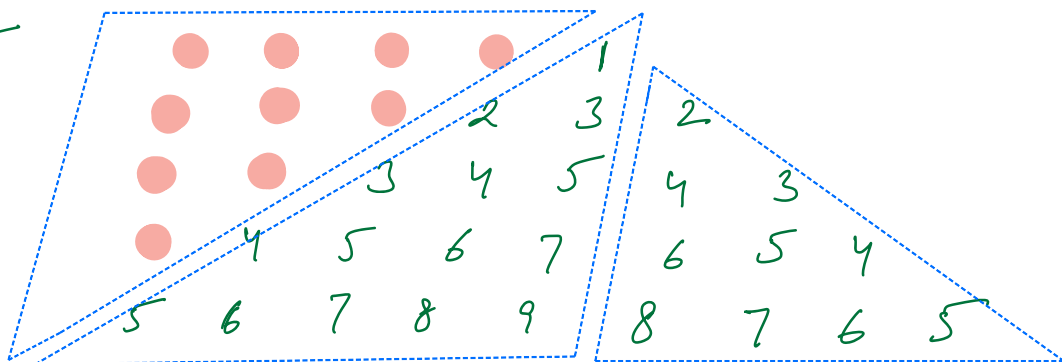
$\Downarrow$     $\Downarrow$     $\Downarrow$   
 $n - row$     $row$     $2 \times row - 1$

$3 \times row \times e$   
 $\rightarrow 3 \times row - 2$

$2 \times row \times cnt$   
 $2 \times row - 1 = cnt$

Q6:

$N = 5$



Seq, 1

Seq, 2

Row	spaces	s	'e	s	'e
1	4	1	1	—	—
2	3	2	3	2	2
3	2	3	5	4	3
4	1	4	7	6	4
5	0	5	9	8	5

$\Downarrow$   $\Downarrow$   $\Downarrow$   $\Downarrow$   $\Downarrow$   
 $n\text{-row}$   $\text{row}$   $2 \times \text{row} - 1$   $2 \times \text{row} - 2$   $\text{row}$

$N = 7$

```

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

Code : <https://www.interviewbit.com/snippet/8035d9ccb147f282302e/>