Today's agenda

↳ Patterns

Q) Print N "*" in a single row.

Eg: N=4 → ****

N iteration ←

```
for (int i=1; i<=N; i++){
        System.out.print("*");
}
```

Q) Given Integer N, Print Square of N*N using "*".

Ex: N = 4

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

N = 5

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

N = 3

How many rows you want to print

```
for (int i = 1; i <= N; i++) {
    for (int j = 1; j <= N; j++) {
        System.out.print("*");
    }
    System.out.println();
}
```

What to print in 1 row

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

i	i <= N	j	j <= N
1	T	1	T
		2	T
		3	T
		4	F
		↳ exit	
2	T	1	T
		2	T
		3	T
		4	F → exit
3	T	1	T
		2	T
		3	T
		4	F → exit
4	F		
↳ exit			

Q) Pattern 1:

↳ Print the triangle Pattern.

N = 2:

*
* *

N = 4:

*
* *
* * *
* * * *

N = 3

int nst = 1; // print row no. of stars

for (int i = 1; i <= N; i++) { // num of rows

  for (int j = 1; j <= nst; j++) {
    System.out.print("*"); // print for 1st row
  }

  nst++;
  System.out.println(); } print for next line

*
* *
* * *

nst = 1 2 3 4

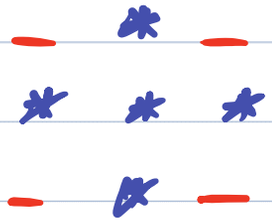
i	i<=N	j	j<=nst
1	T	1	T
		2	F
			↳ exit
		j	j<=nst
2	T	1	T
		2	T
		3	F
			↳ exit
		j	j<=nst
3	T	1	T
		2	T
		3	T
		4	F
			↳ exit
4	F		
	↳ exit		

Q) Pattern 2

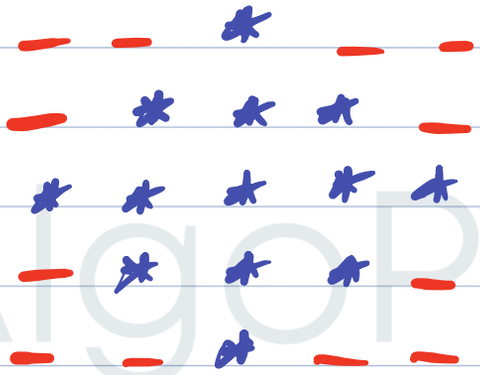
-diamond Pointing

↳ Point the following Pattern.

N = 3



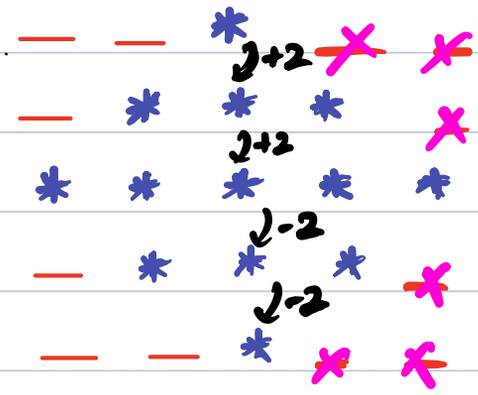
N = 5



N = 7

N = 6 → incorrect input

N=5



2356 .....
457

```
int nst=1;
int nsp= n/2;

for(int i=1; i<=n; i++) {

    for(int j=1; j<=nsp; j++)
        System.out.print(" ");

    for(int k=1; k<=nst; k++)
        System.out.print("*");

    if (i<= n/2) {
        nst = nst +2;
        nsp--;
    }
    else {
        nst= nst-2;
        nsp++;
    }
    System.out.println();

}
```

```
int nst = 1;
int nsp = n/2;

for(int i=1; i<=n; i++) {
    for(int j=1; j<=nsp; j++)
        System.out.print(" ");
    for(int k=1; k<=nst; k++)
        System.out.print("*");
    if(i <= n/2) {
        nst = nst + 2;
        nsp--;
    }
    else {
        nst = nst - 2;
        nsp++;
    }
    System.out.println();
}
```

n = 5

nst = 1 2 3 4 5 3 1

nsp = 2 1 0 1 2

i	i<=n	i<=n/2
1	T	T
2	T	T
3	T	T
4	T	T
5	T	T
6	F	

↳ exit

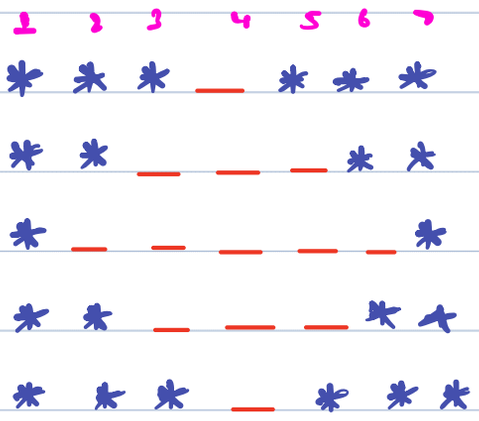
```
  *
 ***
*****
 ***
  *
```

Break till 10:40 Pm

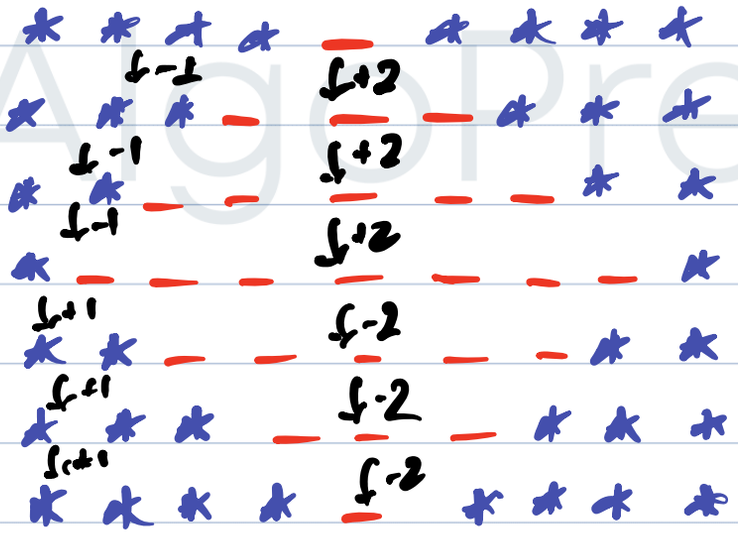
Q) Pattern 3

↳ Print the following Pattern.

N = 5 :



N = 7



Pseudo code

```
int nst = n/2 + 1;
int nsp = 1;

for(int i = 1; i <= n; i++ ){

    for(int j = 1; j <= nst ; j++){
        System.out.print("*");
    }

    for(int k = 1; k <= nsp; k++){
        System.out.print(" ");
    }

    for(int j = 1; j <= nst ; j++){
        System.out.print("*");
    }


    if (i <= n/2) {
        nst = nst - 1;
        nsp = nsp + 2;
    }
    else{
        nst = nst + 1;
        nsp = nsp - 2;
    }
    System.out.println();

}
```

(Q) Pattern 4:

↳ Print the triangle Pattern with number

N = 2:

```
*
* *
```

→

```
1
2 3
```

N = 4:

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

→

```
1
2 3
4 5 6
7 8 9 10
```



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

    for (int j=1; j<=nst; j++){
        System.out.print(count);
        count++;
    }

    nst++;
    System.out.println();
}
```