Today's agenda

↳ Patterns

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

Ex: 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

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

How many rows

Printing in one row

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

i	i<=N
1	t
2	t
3	t
4	f → exit

j	j<=N
1	t
2	t
3	t
4	f

Q) Pattern 1:

↳ Print the triangle Pattern.

N=2:

```
*
* *
```

N=4:

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

nst = 1 2 3 4 5

N=4

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

Print star

Prep for next line

i	i<=N	j	j<=nst
1	t	1	t
		2	f → exit
2	t	1	t
		2	t
		3	f → exit
3	t	1	t
		2	t
		3	t
		4	f → exit
4	t	1	t
		2	t
		3	t
		4	t
5	→ exit	5	

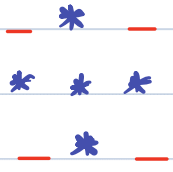
```
*
* *
* * *
* * * *
```

→

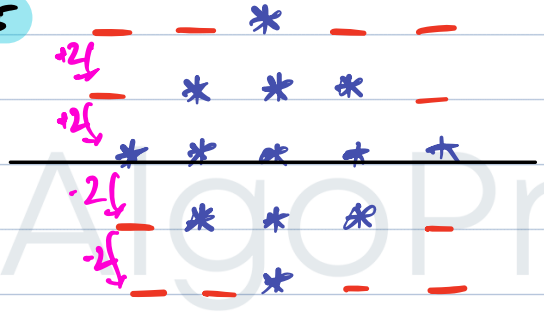
Q) Pattern 2

↳ Print the following Pattern.

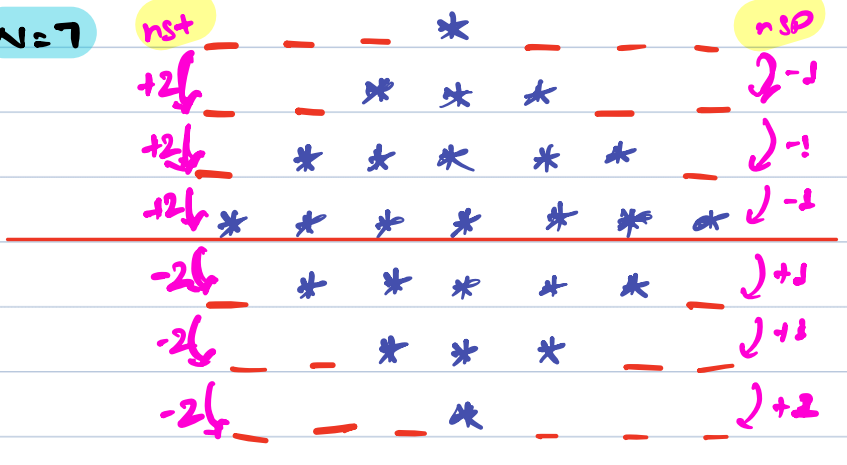
N = 3



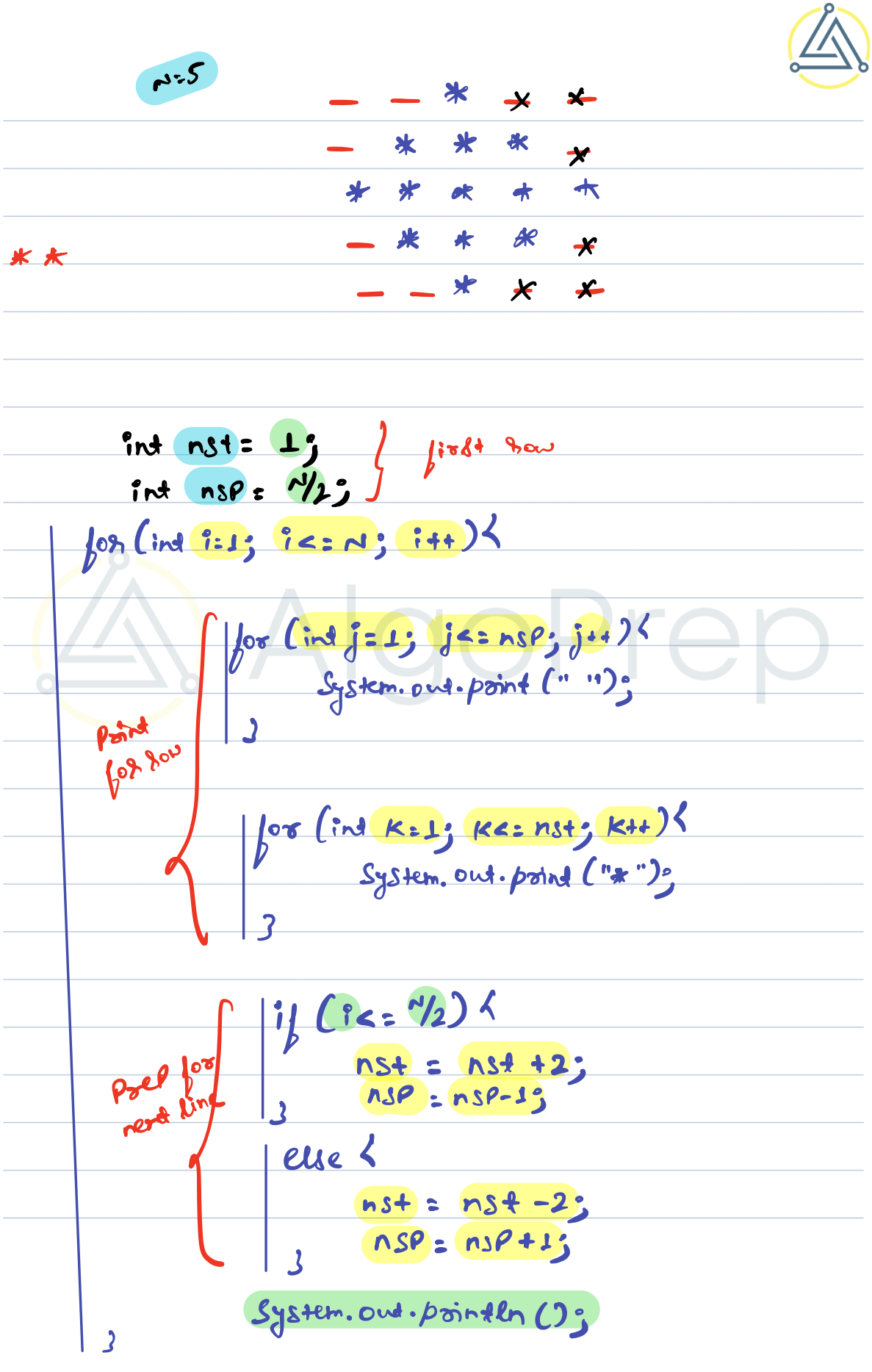
N = 5



N = 7



N = 6 -> incorrect input


n=5
int nst = 1;
int nsp = n/2;
first row
for (int i=1; i<=n; i++){
for (int j=1; j<=nsp; j++)
System.out.print(" ");
print for row
for (int k=1; k<=nst; k++)
System.out.print("*");
if (i<=n/2){
nst = nst+2;
nsp = nsp-1;
else {
nst = nst-2;
nsp = nsp+1;
prep for next line
System.out.println();

n=5

i=1 _ _ * * *
2 _ * * * *
3 * * * * *
4 _ * * * *
5 _ _ * * *

```
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 = nsp-1;
    }else{
        nst = nst-2;
        nsp = nsp+1;
    }
    System.out.println();
}
```

first row

print for row

print for next line

nsp = 2 → 0 ; nst = 1 → 5

n=5

i	i<=n	i<=n/2
1	+	+
2	+	2<=5/2 +
3	+	3<=5/2 f → nsp=1, nst=3
4	+	4<=5/2 f → nsp=2, nst=1
5	+	5<=5/2 f → nsp=3, nst=-1
6	f	↳ exit

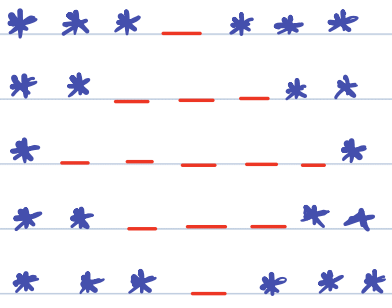
_ _ *
_ * * *
* * * * *
_ * * *
↳ _ _ *

Break till 9:36 pm

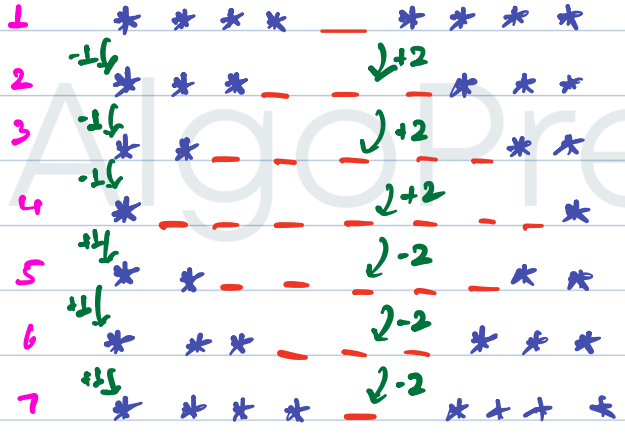
Q) Pattern 3

Print the following Pattern.

N = 5 :



N = 7



// Pseudo code

```
int nsp = 1;
int nst = N/2 + 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();
}
```


int nsp = 1;
int nst = n/2 + 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();
}
N=5:
1 * * * _ * * *
2 * * _ _ _ * *
3 * _ _ _ _ _ *
4 * * _ _ _ * *
5 * * * _ * * *
nsp=1 nst=3
i i<=N i<=n/2
1 + +
nsp=3
nst=2
2 + 2<=5 +
nsp=5
nst=1
3 + 3<=5 6
nsp=3
nst=2
4

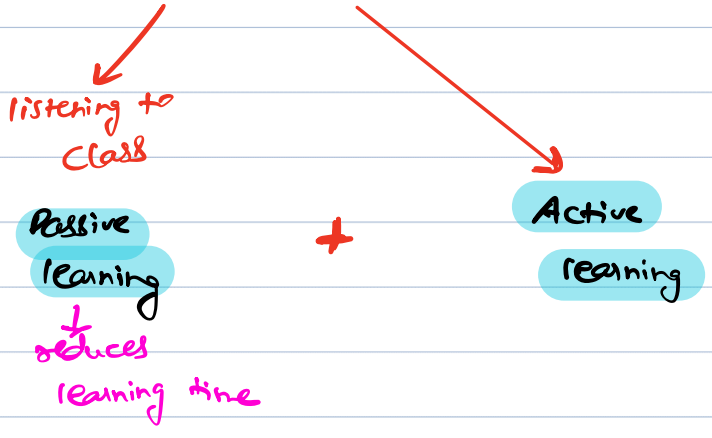
Q) Pattern 4:

↳ Print the triangle Pattern with number

N=2:
```
1
2 3
```

N=4:
```
1
2 3
4 5 6
7 8 9 10
```

```
int val=1;
int nst = 1;
for(int i=1; i<=N; i++){
    for(int j=1; j<=nst; j++){
        System.out.println(val);
        val++;
    }
    nst++;
    System.out.println();
}
```


listening to
Class
Passive
learning
reduces
learning time
+
Active
learning