Practice Session on

Patterns (loops)

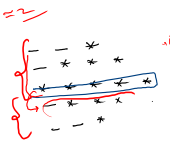
Pattern-05

Sample Input 0

```
5
```

Sample Output 0

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



row	
0	1
1	2
2	3
3	4
4	5

nsp		nst	
2	-1	1	+2
1	-1	3	+2
0		5	
1	+1	3	-2
2	+1	1	-2

$\frac{5}{2} = 2.5 = 2$

for (int i=1; i<=n; i++) → (1,2,3,4,5)
↳ 5 times.

for (int i=0; i<n; i++)
↳ 5 times (0,1,2,3,4)

n = 5

$nsp = \frac{n}{2} = \frac{5}{2} = 2$

i <= 2

```
int nsp = n/2, nst = 1
for (int i=0; i<n; i++) {
    for (int j=1; j<=nsp; j++)
    {
        sysso(" ");
    }
    for (int j=1; j<=nst; j++)
        sysso("*");
    if ( i <= n/2) {
        nsp--;
        nst += 2;
    } else {
        nsp++;
        nst -= 2;
    }
    sysso();
}
```

nsp = 2,1,0 nst = 1 3 5

i=0<5 (T)
- j=1<=2 (T)
- j=2<=2 (T)
- j=3<=2 (F)
- j=1<=1 (T)
- j=2<=1 (F)

0<=2 (T)

i=1<5 (T)
- j=1<=1 (T)
- j=2<=1 (F)
- j=1<=3 (T)
- j=2<=3 (T)
- j=3<=3 (T)
- j=4<=3 (F)

1<=2 (T)

i=2
i=3
i=4

Pattern-06

5 min

→ 5-6 min

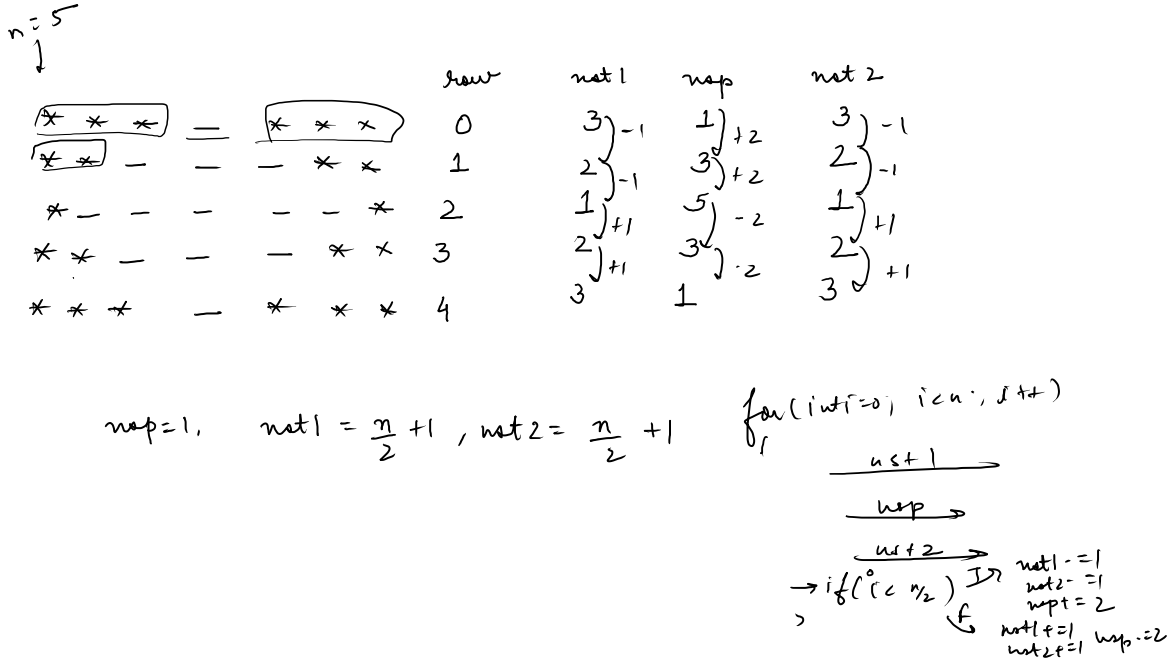
```java
import java.io.*;
import java.util.*;

public class Solution {

    public static void main(String[] args) {
        /* Enter your code here. Read input from STDIN. P
        Scanner scn = new Scanner(System.in);
        int n = scn.nextInt();

        int nsp = n/2,nst = 1;
        for(int i=0;i<n;i++){
            for(int j=1;j<=nsp;j++){
                System.out.print(" ");
            }
            for(int j=1;j<=nst;j++){
                System.out.print("*");
            }

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

            System.out.println();
        }

    }
}
```

Sample Input 0

```
5
```

Sample Output 0

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



Pattern - 07

5 min

```java
public class Solution {

    public static void main(String[] args) {
        /* Enter your code here. Read input from STDIN. Print output to STDOUT.
        Scanner scn = new Scanner(System.in);
        int n = scn.nextInt();

        int nst1 = n/2+1, nst2 = n/2+1, nsp =1;

        for(int i=0;i<n;i++){
            for(int j=1;j<=nst1;j++){
                System.out.print("*");
            }

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

            for(int j=1;j<=nst2;j++){
                System.out.print("*");
            }

            if(i<n/2){
                nst1-=1;
                nst2-=1;
                nsp+=2;
            }
            else{
                nst1+=1;
                nst2+=1;
                nsp-=2;
            }

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

→ 5 min

Pattern-07

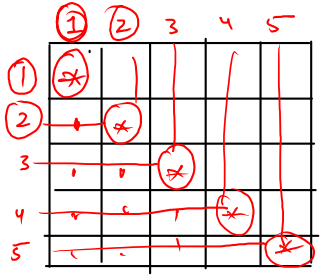
Sample Input 0

```
5
```

Sample Output 0

```
*
 *
  *
   *
    *
```

n = 5 →




```
for (int i = 1; i <= n; i++) → rows
{
    for (int j = 1; j <= n; j++) → cols
    {
        if (i == j)
            System.out.print("*");
        else
            System.out.print(" ");
    }
    System.out.println();
}
```

Pattern-08

5 min

→ 5 min

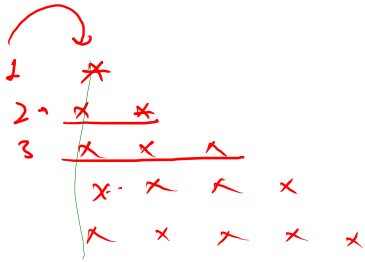
```java
import java.io.*;
import java.util.*;

public class Solution {

    public static void main(String[] args) {
        /* Enter your code here. Read input from STDIN. Print output to
        Scanner scn = new Scanner(System.in);
        int n = scn.nextInt();

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

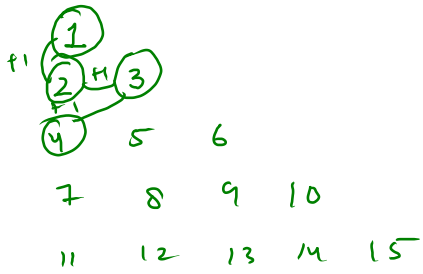
Sample Input 0

```
5
```

Sample Output 0

```
1
2 3
4 5 6
7 8 9 10
11 12 13 14 15
```





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

Pattern - 09

5 mins

```java
import java.io.*;
import java.util.*;

public class Solution {

    public static void main(String[] args) {
        /* Enter your code here. Read input from STDIN. Print output to STDOU
        Scanner scn = new Scanner(System.in);
        int n = scn.nextInt();
        int count =1;

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

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

→ 5 mins

Sample Input 0

```
5
```

Sample Output 0

```
0
1 1
2 3 5
8 13 21 34
55 89 144 233 377
```

a = 0
b = 1

```java
import java.io.*;
import java.util.*;

public class Solution {

    public static void main(String[] args) {
        /* Enter your code here. Read input from STDIN. Print output
        Scanner scn = new Scanner(System.in);
        int n = scn.nextInt();

        int a = 0;
        int b = 1;

        for(int i=1;i<=n;i++){
            for(int j=1;j<=i;j++){
                System.out.print(a+" ");
                int c = a+b;
                a=b;
                b=c;
            }
            System.out.println();
        }
    }
}
```