

Practice Session on

Patterns (loops)

Pattern - 05

Sample Input 0

5

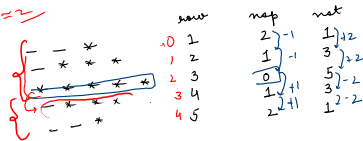
Sample Output 0

```

x
xxxx
xxxxx
xxxx
x

```

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



for (int i=1; i<=n; i++)  
→ 5 times.

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

$$n = 5$$

$$map = \frac{n}{2} = \frac{5}{2} = 2 \quad i = 2$$

$$\text{int } map = \frac{n}{2}, \text{ not} = 1$$

for (int i=0; i<n; i++) {

for (int j=1; j<=map; j++)

{  
  space(" ");

for (int j=1; j<=not; j++)  
  space("x");

if (i<=map) {

  map = 1;  
  not = 2;

} else {  
  map = 1;  
  not = 2;

  space();

$$map = 2, \text{ not} = 3$$

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=4<3 (F)

i=2

j=2

j=3

j=4

j=5

j=6

j=7

j=8

j=9

j=10

j=11

j=12

j=13

j=14

j=15

j=16

j=17

j=18

j=19

j=20

j=21

j=22

j=23

j=24

j=25

j=26

j=27

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j=248

j=249

j=250

j=251

Pattern-06  
5 min

→ 5-6 min

```
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

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

$n = 5$

		row	net1	nap	net2
<u>* * *</u>	—	0	3 } -1	1 } +2	3 } -1
<u>* *</u>	—	1	2 } -1	3 } +2	2 } -1
* — —	—	2	1 } +1	5 } -2	1 } +1
* * —	—	3	2 } +1	3 } -2	2 } +1
* * *	—	4	3	1	3 } +1

$$nap = 1, \quad net1 = \frac{n}{2} + 1, \quad net2 = \frac{n}{2} + 1$$

for (int i = 0; i < n; i++)

ust+1

usp

ust+2

→ if (i < n/2) {  
 net1 = 1  
 net2 = 1  
 nap = 2  
 }  
 else {  
 net1 = 1  
 net2 = 1  
 nap = 2  
 }

Pattern - 07  
5 min

```
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

```

*
 *
  *
   *
    *

```

$n = 5 \rightarrow$

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

```
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();

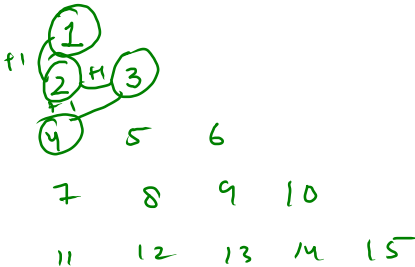
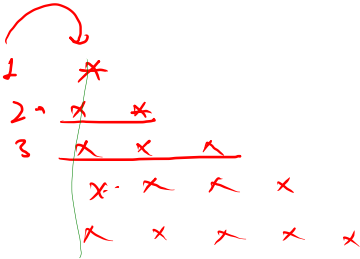
        for(int i=1;i<=n;i++){
            for(int j=1;j<=n;j++){
                if(i==j){
                    System.out.print("*");
                }else{
                    System.out.print(" ");
                }
            }
            System.out.println();
        }
    }
}
```

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++)  
{  
    sysout(count+"");  
    sysout.print("x\t");  
    count++;  
}

sysout();

)



Pattern - 09

5 min

```
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 STDOUT */
        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();
        }
    }
}
```



Sumin

+

Sample Input 0

5

Sample Output 0

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

for line

\*  
\* \*  
\* \* \*  
\* \* \* \*  
\* \* \* \* \*

fibonacci series  
→ 0 1 1 2 3 5 8 13 21 34 55 - - -

a = 0  
b = 1

```
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();
        }
    }
}
```