

Assignment - 2

```

1 import java.util.*;
class demo {
    public static void main (String[] args) {
        Scanner sc = new Scanner (System.in);
        int n = sc.nextInt();

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

```

Dry run :-

```

i = 1
└─ j = 1 == 1 — True → *
    j = 2 == 1 — space
    j = 3 == 1 — False
    j = 4 == 1 — False
    j = 5 == 1 — *
    j = 5 == 5 — True → *

```

*

*

$i = 2$
└ $j = 1 \Rightarrow j == 1 \rightarrow \text{True} (*)$
 $j = 2 \rightarrow \text{false}$
 $j == 5 \rightarrow \text{True} (*)$

$j = 3$
└ $j = 1 (j == 1) \text{ True} (*)$
 $j = 2 (j == 1) \text{ false}$
 $j = 3 (j == 1) \text{ false}$
 $j = 5 (j == 5) \text{ True} (*)$

i = 5

└─ j = 1 (j == 1) → True (*)
 j = 2 (j == 1) → False
 j = 3 (j == 1) → False
 j = 5 (j == 5) → True (*)

output

```

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

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

```

import java.util.*;
class demo {
    public static void main (String[] args) {
        for (int i=1 ; i<=5 ; i++) {
            for (int j=1 ; j<=5 ; j++) {
                if (i==j || i+j==6) {
                    system.out.println("X");
                }
            }
        }
        system.out.println();
    }
}

```


$i=1$
└─ $j=1 == 1$ ── *
 $j=2 == 1$ ── False

$i=2$
└─ $j=1 == 2$ ── X
 $j=2 == 2$ ── *
 $j=3 == 2$ ── X

$i=3$
└─ $j=1 == 3$ ── X
 $j=2 == 3$ ── X
 $j=3 == 3$ ── ✓ (*)
 $j=4 == 3$ ── False

$i=4$
└─ $j=1 == 4$ ── False
 $j=2 == 4$ ── False
 $j=3 == 4$ ── False
 $j=4 == 4$ ── True (*)

or
 $i=1$ ($i+j == 6$)
└─ $j=1+1 == 6$ (False)
 $j=2+1 == 6$ (False)
 $j=3+1 == 6$ (False)
 $j=4+1 == 6$ (False)
 $j=5+1 == 6$ (True) → *

~~$i=2$~~
└─ ~~$j=2+1 ==$~~

$i = 2$

$\hookrightarrow j = 1 + 2 == 6$ (False)

$j = 2 + 2 == 6$ (False)

$j = 3 + 2 == 6$ (False)

$j = 4 + 2 == 6$ (True) $\rightarrow *$

$i = 3$

$\hookrightarrow j = 1 + 3 == 6$ (False)

$j = 2 + 3 == 6$ (False)

$j = 3 + 3 == 6$ (~~False~~) $\rightarrow *$
True

$i = 4$

$\hookrightarrow j = 1 + 4 == 6$ (False)

$j = 2 + 4 == 6$ (True) $\rightarrow *$

1,1	1,2	1,3	1,4
*	*	*	*
2,1	2,2	2,3	2,4
*	*	*	*
3,1	3,2	3,3	3,4
*	*	*	*
4,1	4,2	4,3	4,4
*	*	*	*

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

```
class demo {
```

```
    public static void main(String[] args) {
```

```
        for (int i = 1; i <= 4; i++) {
```

```
            for (int j = 1; j <= i; j++) {
```

```
                system.out.print(" ");
```

```
            }
```

```
        }
```

```
        system.out.println();
```

```
    }
```

i = 1

j <= i

1 → *

i = 2

j <= i

1 <= 2

2 <= 2 *

1 2 *

i = 3

j <= i

1 <= 3

2 <= 3 *

1 2 3 *

1 2 3 *

$3 \leq 3 \rightarrow *$

$i = 4$

$j \leq i \rightarrow *$

$1 \leq 4 \rightarrow *$

$2 \leq 4 \rightarrow *$

$3 \leq 4 \rightarrow *$

$4 \leq 4 \rightarrow *$

3,1	3,2	3,3	3,4
*	*	*	*
2,1	2,2	2,3	2,4
*	*	*	*
3,1	3,2	*	*
4,1	*	*	*

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

```
class demo {
```

```
    public static void main (String [] args) {
```

```
        for (int i = 4; i >= 1; i++) {
```

```
            for (int j = 1; j <= i; j++) {
```

```
                system.out.print("*");
```

```
            }
```

```
            system.out.println();
```

```
        }
```

```
    }
```

```
}
```

$i = 4$

$j \leq i$

$j = 1 \leq 4 \rightarrow *$

$2 \leq 4 \rightarrow *$

$3 \leq 4 \rightarrow *$

$4 \leq 4 \rightarrow *$

$$i = 1$$
$$\quad \underline{\hspace{1cm}} \quad j <= i$$
$$\qquad\qquad\qquad \underline{\hspace{1cm}} \quad j = 1 <= i$$
$$\qquad\qquad\qquad\qquad\qquad \underline{\hspace{1cm}} \quad *$$

1,1	1,2	1,3	1,4
*	#	*	#
2,1	2,2	2,3	2,4
#	*	#	*
3,1	3,2	3,3	3,4
*	#	*	#
4,1	4,2	4,3	4,4
#	*	#	*

```
class demo {
    public static void main(String[] args) {
        for(int i=1; i<=4; i++) {
            for(int j=1; j<=4; j++) {
                int num = i+j;

                if (num%2 == 0) {
                    System.out.println("*");
                }
            }
        }
    }
}
```

3

```
else {  
    system.out.print("#");  
}
```

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

$i=1 \rightarrow$

$j=1$	$(1+1)$	$= 2$	$\rightarrow *$
$j=2$	$(1+2)$	$= 3$	$\rightarrow \#$
$j=3$	$(1+3)$	$= 4$	$\rightarrow *$
$j=4$	$(1+4)$	$= 5$	$\rightarrow \#$

$i=2 \rightarrow$

$j=1$	$(1+2)$	$= 3$	$\rightarrow \#$
$j=2$	$(2+2)$	$= 4$	$\rightarrow *$
$j=3$	$(2+3)$	$= 5$	$\rightarrow \#$
$j=4$	$(2+4)$	$= 6$	$\rightarrow *$

$i=3 \rightarrow$

$j=1$	$(3+1)$	$= 4$	$\rightarrow *$
$j=2$	$(3+2)$	$= 5$	$\rightarrow \#$
$j=3$	$(3+3)$	$= 6$	$\rightarrow *$
$j=4$	$(3+4)$	$= 7$	$\rightarrow \#$

$\left[\begin{array}{l} \text{if } (i+j) \text{ is even} \rightarrow \text{print } (*) \\ \text{if } (i+j) \text{ is odd} \rightarrow \text{print } (\#) \end{array} \right]$