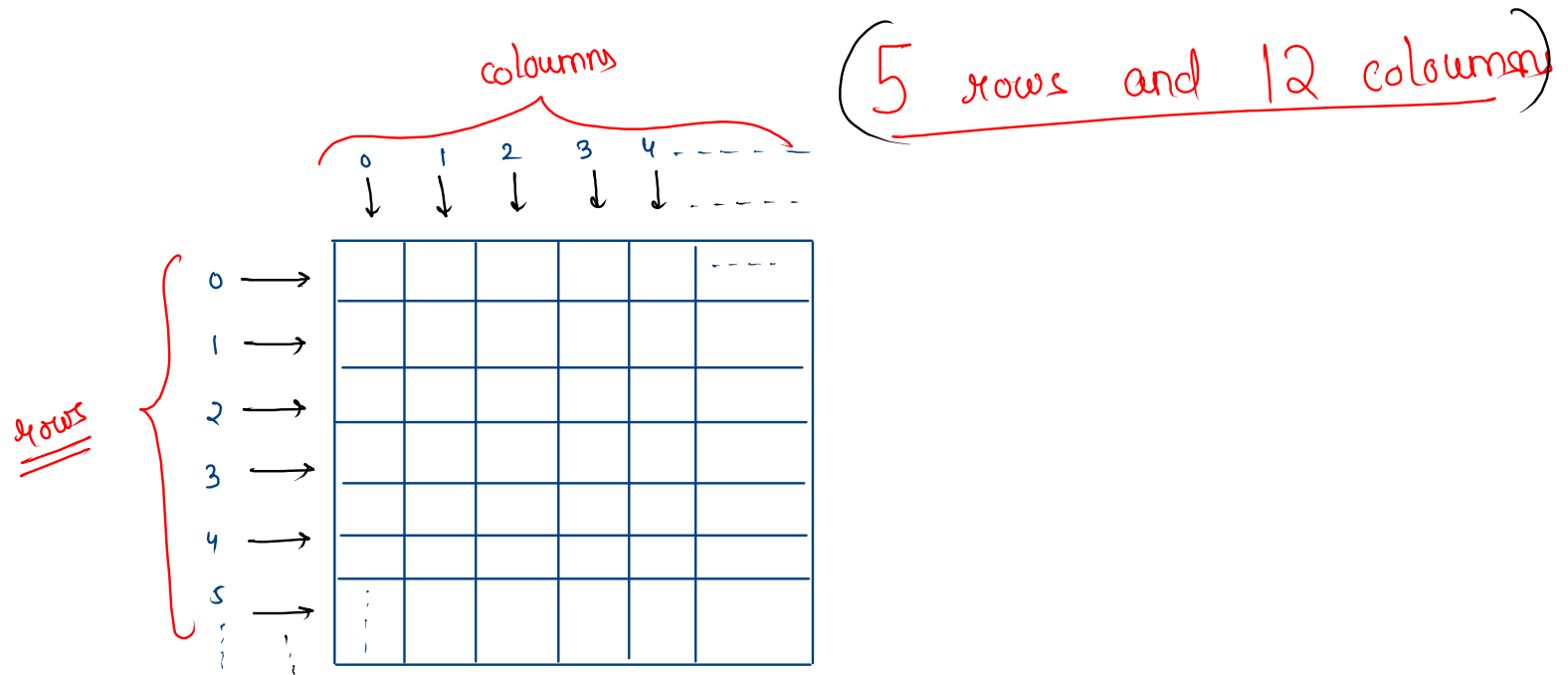


Nested loops

Pattern 2 - Print n x 12 star rectangle

i/p n = 5 dimension :- 5 x 12



2D structure



	0	1	2	3	4
0	(0,0)	(0,1)	(0,2)	(0,3)	(0,4)
1	(1,0)	(1,1)	(1,2)	(1,3)	(1,4)
i → 2	(2,0)	- - -	-	-	-
3	-	-	-	-	-
4	-	-	-	-	-

int → 2 byte

String → 4 byte

Pattern 2 - Print n x 12 star rectangle

```
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    → int n = scn.nextInt();
    for (int i = 0; i < 12; i++) {
        for (int j = 0; j < n; j++) {
            System.out.print("*");
        }
        System.out.println();
    }
}
```

for each value of 'i',
j loop is running 'n'

$$12 \times n$$
$$n = 3$$
$$i = 0, j = 0$$
$$j = 1$$
$$j = 2$$
$$j = 3$$
$$i=1, j=0, 1, 2$$
$$i=2, j=0, 1, 2$$
$$i=3, j=0,1,2$$

1.

$$i = 12$$

زونا

 $(0,0)$ $(0, 1)$ $(0, 2)$ $(1, 0)$ (I, \mathcal{P}) $(1, 2)$ $(2, 0)$

$(2, 1)$

$(2, 2)$

 $(3, 0)$

!

☆☆☆
→☆☆☆
☆☆☆
→☆☆☆
| —
| —
| —
| —
| —
| —
| —
| —
| —
| —

Pattern 3 - nxn star rectangle

```
public static void main(String[] args) {  
    Scanner scn = new Scanner(System.in);  
    int n = scn.nextInt();  
  
    for (int i = 0; i < n; i++) { // rows  
        for (int j = 0; j < n; j++) { // cols  
            System.out.print("*");  
        }  
        System.out.println();  
    }  
}
```

GKSTR19 Pattern_4

n=5

0	★				
1	★	★			
2	★	★	★		
3	★	★	★	★	
4	★	★	★	★	★

no. of
rows to
print

template

```
int st = 1;
```

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

```
    for (int j = 0; j < st; j++) {
```

```
        Syso("★");
```

```
    }
```

```
    st++;
```

```
    SysoLn();
```

```
}
```

```

public static void main(String[] args) {
    → Scanner scn = new Scanner(System.in);
    → int n = scn.nextInt();

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

```

O/p

```

*
**
***
****
*****

```

n = 5 , st = ~~1~~ ~~2~~ ~~3~~ ~~4~~ ~~5~~ 6

i = 0, j = 0
j = 1

i = 1, j = 0 (0 < 2)
j = 1 (1 < 2)
j = 2 (2 < 2) x

i = 2, j = 0 (0 < 3)
j = 1 (1 < 3)
j = 2 (2 < 3)
j = 3 (3 < 3) x

i = 3, j = 0 (0 < 4)
j = 1 (1 < 4)
j = 2 (2 < 4)
j = 3 (3 < 4)
j = 4 (4 < 4) x

i = 4, j = 0 (0 < 5)
j = 1 (1 < 5)
j = 2 (2 < 5)
j = 3 (3 < 5)
j = 4 (4 < 5)
j = 5 (5 < 5) x
i = 5 (5 < 5) x

Ques n=5

```

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

```

```
public static void main(String[] args) {
    int n = 5;

    int st = n;
    for (int i = 0; i < n; i++) {
        for (int j = 0; j < st; j++) {
            System.out.print("* ");
        }
        st--;
        System.out.println();
    }
}
```

n = 5 ,

st = ~~1~~ ~~2~~ ~~3~~ ~~4~~ ~~5~~ 6

i = 0, j = 0
j = 1

i = 1, j = 0 (0 < 2)
j = 1 (1 < 2)
j = 2 (2 < 2) x

i = 2, j = 0 (0 < 3)
j = 1 (1 < 3)
j = 2 (2 < 3)
j = 3 (3 < 3) x

i = 3, j = 0 (0 < 4)
j = 1 (1 < 4)
j = 2 (2 < 4)
j = 3 (3 < 4)
j = 4 (4 < 4) x

i = 4, j = 0 (0 < 5)
j = 1 (1 < 5)
j = 2 (2 < 5)
j = 3 (3 < 5)
j = 4 (4 < 5)
j = 5 (5 < 5) x
i = 5 (5 < 5) x

i, j
, 0) → 1
, 0) → 1
, 1) → 2
, 0) → 1
, 1) → 2
, 2) → 3
, 0) → 1
, 1) → 2
2) → 3
, 3) → 4
, 0) → 1
, 1) → 2
, 2) → 3
, 3) → 4

	0	1	2	3	4
0	1				
1	1	2			
2	1	2	3		
3	1	2	3	4	
4	1	2	3	4	5

code

```
public static void main(String[] args) {  
    Scanner scn = new Scanner(System.in);  
    int n = scn.nextInt();  
  
    int st = 1;  
    for (int i = 0; i < n; i++) {  
        for (int j = 0; j < st; j++) {  
            System.out.print((j + 1) + " ");  
        }  
        st++;  
        System.out.println();  
    }  
}
```

Pattern 6 - Right triangle of 5 multiples

	0	1	2	3	4
0	1				
1	1	2			
2	1	2	3		
3	1	2	3	4	
4	1	2	3	4	5

tab → 4 spaces

```
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    int n = scn.nextInt();

    int st = 1;
    for (int i = 0; i < n; i++) {
        for (int j = 0; j < st; j++) {
            System.out.print((j + 1) * 5 + "\\t");
        }
        st++;
        System.out.println();
    }
}
```

GKSTR20 Pattern_5

n=5

	0	1	2	3	4
0	-	-	-	-	★
1	-	-	-	★	★
2	-	-	★	★	★
3	-	★	★	★	★
4	★	★	★	★	★

```
int st = 1;  
int sp = n-1;
```

```
for (int i=0; i<n; i++) {  
    for (int j=0; j<sp; j++) {  
        syso("-");  
    }  
    for (int j=0; j<st; j++) {  
        syso("★");  
    }
```

```
        st++;  
        sp--;  
    }  
    sysoln();  
}
```