# Patterns

**Problem :** Take n as an integer If. Print n * (star) in one straight line

**Constraints**

$0 \le n \le 2^{31} - 1$

$2^{10}$ : 1024 → $10^3$

$2^{20}$ : $2^{10+10}$

↓

$2^{10} \times 2^{10}$

↓

1024 * 1024


$2^{30}$ : $10^9$

```
Scanner sc = new Scanner(System.in);
int n = sc.nextInt();
for(int i=0 ; i<n ;i++){
    SOUT("*");
      ↳ print
}
}
```

```
for(int i=9; i<=n+9; i++){
  - - -
}
```

**Example**

n = 5

for(int i=10; i<=n+9; i++)

**Problem** Extension of last problem. Print n * in n different lines s.t every line has n *.

**If :** n = 3

**of :**

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

| $c_1$ | $c_2$ | $c_3$ | |
|---|---|---|---|
| * | * | * | $R_1$ |
| * | * | * | $R_2$ |
| * | * | * | $R_3$ |

3 Rows X 3 Cols

Go to each row first, then print * of each row i.e., all the columns

```
for (int i=0; i<3; i++) {
    for (int j=0; j<3; j++) {
        SOUT(" * ");
                ↳ print
    }
    SOUT;
      ↳ println
}
```

* * *

| | | |
|---|---|---|
| 0,0 | 0,1 | 0,2 |
| 1,0 | 1,1 | 1,2 |
| 2,0 | 2,1 | 2,2 |

Every cell in above matrix/2D array represents (x,y) where x is the row number & y is column number

Problem: We are given n rows & m columns.

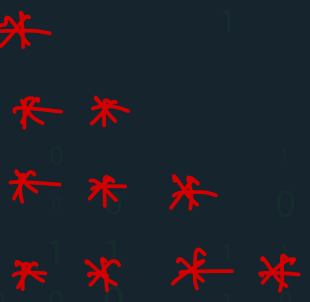
```
for (int i=0; i<n; i++) {
    for (int j=0; j<m; j++) {
        sout print(" * ");
```

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

n = 3 , m = 4

3x4 matrix / 2D array

Problem : Print below pattern



If n=4
i.e., 4 rows

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

    }
}
```

for i=1 ; j=0 ; j<1

when i is 1 i.e., IInd iteration, the j loop will run only 1 time.