

Patterns are so important in order to start of DSA. Whatever topics comes, whether it is **Dynamic Programming, Graphs, Trees, Arrays, Binary Search etc.** one thing is common in all of them, that is **loops**. In order to master loops patterns, help understanding the loops, how to play around it to improved your Data Structure and Algorithm.

To do pattern question, there are 4 steps that will you to do any sort of pattern.

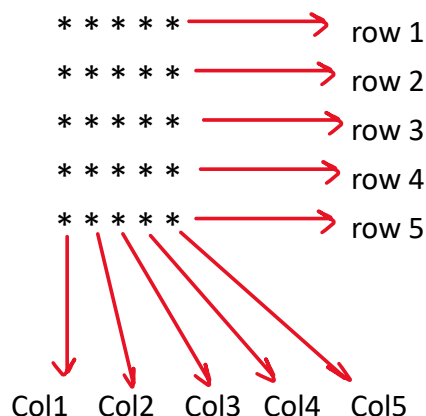
All the pattern will have of **more than 1 loops (Nested Loop)**

- i. **Outer loop:** Outer loops is used specifically for the number of rows.
- ii. **Inner Loop:** Inners loops is used specifically for the number of columns.

4 Rules for solving Patterns

- 1) For the outer, **count the number of rows.**
- 2) For the inner loop, **focus on the columns and connect them somehow to rows.**
- 3) Whatever you printing, **print them inside the inner for loop.**
- 4) Observe symmetry in some pattern **[Optional]**.

For ex:



```
// Outer Loop
for(int i=1;i<=5;i++){
    // Inner Loop
    for(int j=1;j<=5;j++){
        // Printing *
        cout<<"*";
    }
    //After the row1 complete, enter the next line
    cout<<endl;
}
```

