Patterns in Java

In Java, **patterns** refer to structured arrangements of characters (often stars `*`, numbers, or other symbols) printed using loops. These patterns are primarily created using **nested loops**, where:

- The **outer loop** controls the **rows**.
- The **inner loop** controls the **columns**.

Understanding how **`i` and `j`** move:

- `i` (outer loop) controls **which row** is being printed.
- `j` (inner loop) controls **what to print in each row**.

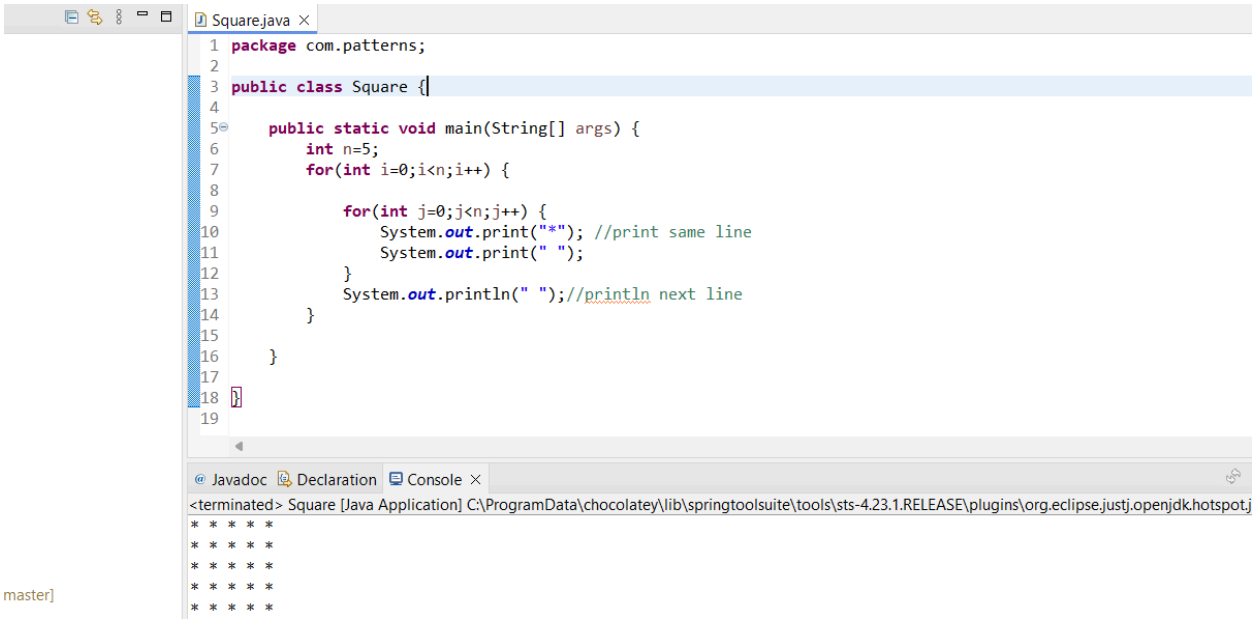
1. Square / Rectangle Pattern

A **simple square or rectangle** pattern consists of a fixed number of rows and columns.

How `i` and `j` move:

1. `i = 0` → `j = 0,1,2,3,4` → Print row 1
2. `i = 1` → `j = 0,1,2,3,4` → Print row 2
3. `i = 2` → `j = 0,1,2,3,4` → Print row 3
4. `i = 3` → `j = 0,1,2,3,4` → Print row 4
5. `i = 4` → `j = 0,1,2,3,4` → Print row 5

Each `j` loop completes before `i` moves to the next row.



Ex2: **Right Half Pyramid Pattern / Right-Angled Triangle Pattern**

How `i` and `j` move:

1. `i = 0` → `j = 0` → `*`
2. `i = 1` → `j = 0,1` → `* *`
3. `i = 2` → `j = 0,1,2` → `* * *`
4. `i = 3` → `j = 0,1,2,3` → `* * * *`
5. `i = 4` → `j = 0,1,2,3,4` → `* * * * *`

```java
package com.patterns;

public class Square {

    public static void main(String[] args) {
        int n=5;
        for(int i=0;i<n;i++) {

            for(int j=0;j<=i;j++) {
                System.out.print("*"); //print same line
                System.out.print(" ");
            }
            System.out.println(" ");//println next line
        }

    }

}
```

```
Javadoc  Declaration  Console ×
<terminated> Square [Java Application] C:\ProgramData\chocolatey\lib\springtoolsuite\tools\sts-4.23.1.RELEASE\plugins\org.eclipse.justj.openjdk.hotspot
*
* *
* * *
* * * *
* * * * *
```

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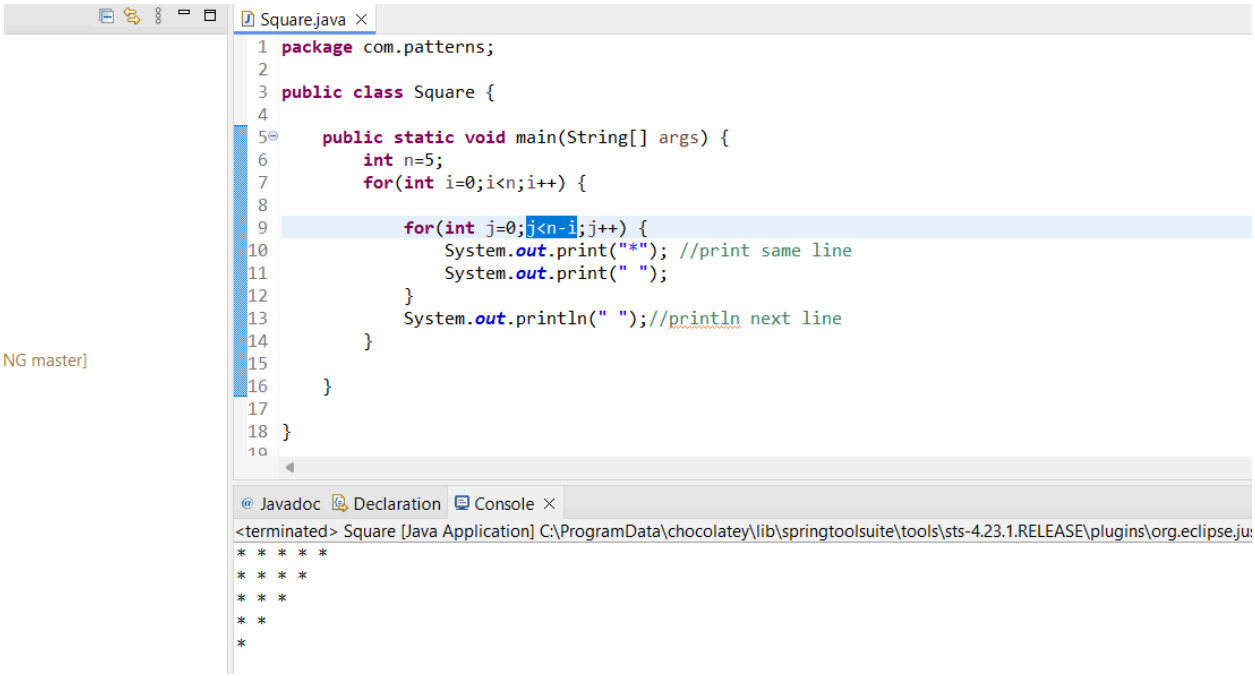
3) Reverse Right Half Pyramid Pattern or Inverted Right-Angled Triangle

How `i` and `j` move:

1. `i = 0` → `j = 0,1,2,3,4` → `* * * * *`
2. `i = 1` → `j = 0,1,2,3` → `* * * *`
3. `i = 2` → `j = 0,1,2` → `* * *`
4. `i = 3` → `j = 0,1` → `* *`
5. `i = 4` → `j = 0` → `*`



4) Pyramid Pattern