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February 25, 2023 ▪ Pattern

Pattern – 7: Star Pyramid

Problem Statement: Given an integer **N,** print the following pattern :

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

Here, N = 5.

Examples:

```
Input Format: N = 3
Result:
  *
 ***
*****
Input Format: N = 6
Result:
     *
    ***
   *****
```

Search

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

Solution

Disclaimer: *Don't jump directly to the solution, try it out yourself first.*

Problem Link

Approach:

There are 4 general rules for solving a pattern-based question :

- We always use nested loops for printing the patterns. For the outer loop, we count the number of lines/rows and loop for them.
- Next, for the inner loop, we focus on the number of columns and somehow connect them to the rows by forming a logic such that for each row we get the required number of columns to be printed.
- We print the '*' inside the inner loop.
- Observe symmetry in the pattern or check if a pattern is a combination of two or more similar patterns or not.

In this particular pattern, we run the outer loop for N times as we have to print N rows as usual. Now, the question arises what will be the logic behind the inner loop?

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As we can clearly observe that for each row there are some spaces that get printed then some stars and then again some spaces giving it a final pyramidal look. For eg: In the first row (i=0) there are 4 spaces, 1 star, then again 4 spaces. In the second row (i=1) there are 3 spaces, 3 stars, then again 3 spaces so we can say that there are N–i–1 spaces, 2*i+1 stars, and then again N–i–1 spaces for each row where i is the row index. We thus simply run 3 inner loops first for printing the spaces, then the stars, and then the spaces again.

Code:

C++ Code ▼

```cpp
#include <bits/stdc++.h>
using namespace std;

void pattern7(int N)
{
    // This is the outer loop which will l
    for (int i = 0; i < N; i++)
    {
        // For printing the spaces before
        for (int j =0; j<N-i-1; j++)
        {
            cout <<" ";
        }

        // For printing the stars in each
        for(int j=0;j< 2*i+1;j++){

            cout<<"*";
        }

        // For printing the spaces after t
```

```cpp
        for (int j =0; j<N-i-1; j++)
        {
            cout <<" ";
        }

        // As soon as the stars for each i
        // next row and give a line break
        // would get printed in 1 line.
        cout << endl;
    }
}

int main()
{
    // Here, we have taken the value of N
    // We can also take input from the use
    int N = 5;

    pattern7(N);

    return 0;
```

Output

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

Java Code

```java
class Main {
    static void pattern7(int N)
    {
        // This is the outer loop which will 1
        for (int i = 0; i < N; i++)
        {
            // For printing the spaces before
```

```java
        for (int j =0; j<N-i-1; j++)
        {
            System.out.print(" ");
        }

        // For printing the stars in each
        for(int j=0;j< 2*i+1;j++){

            System.out.print("*");
        }

        // For printing the spaces after t
         for (int j =0; j<N-i-1; j++)
        {
            System.out.print(" ");
        }



        // As soon as the stars for each i
        // next row and give a line break
        // would get printed in 1 line.
        System.out.println();
    }
}

public static void main(String[] args)

    // Here, we have taken the value o
    // We can also take input from the
    int N = 5;
    pattern7(N);
}
```

Output

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

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> If you also wish to share your knowledge
> with the takeUforward fam, please check
> out this article. If you want to suggest any
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