



C Program To Print Star Pattern - 3

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In this tutorial, we will write a program to print a star pattern in C language. The star pattern for which we will write a C program is shown in the figure below

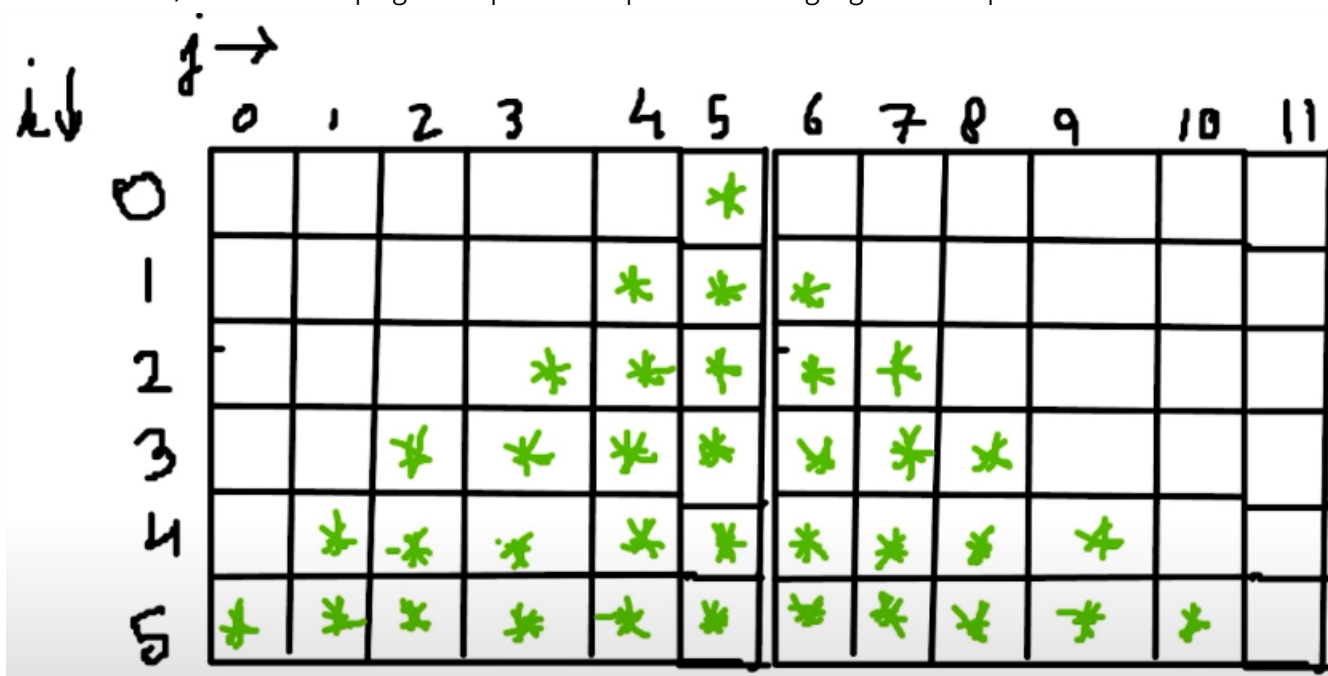


Figure 1: Star Pattern

As shown in figure 1, consider the row as “i” and the columns as “j”. To deduce the formula about when to print the stars see that when the value of (i = 0) the star printed for the value of (j = 5); when the value of (i = 1) the stars printed for the values of (j = 4, 5, 6); similarly when the value of (i = 2) the stars printed for the values of (j = 3, 4, 5, 6, 7) and so on.

To print this star pattern we will use the formula (j>=n-1-i && j<=n-1+i), if the condition (j>=n-1-i && j<=n-1+i) will be true then we will print the star otherwise we will print the space; where “i” is the current index of row and “j” is the current index of column whereas “n” is the length of rows which will specify the range of the stars to print.

Note: The main thing to note here is that the star pattern shown in figure 1 is for n = 6

C program to print the following pattern is shown below

```
int main(){

    int n = 6;

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

    {

        for (int j = 0; j < 2*n; j++)

        {
```

Code Snippet 1: Main Program 1

As shown in the code snippet 1, we have to use the nested “for” loop to print such a pattern because the first loop will run for each row and the second loop will run for each column.

1. We have initialized an integer variable “n” and assigned value “6” to it
2. The first “for” loop will start from the value “0” and runs till (n); the value of “n” is “6” so the loop will run until the value of “i” becomes “5”
3. The second “for” loop will start from the value “0” and runs till (2*n); the value of “n” is “6” so the loop will run until the value of “j” becomes “11”

```
if(j>=n-1-i && j<=n-1+i){
```

```
        printf("*");

    }

    else{

        printf(" ");

    }

}

printf("\n");

}

return 0;


}
```

Code Snippet 2: Main program 2

As shown in the code snippet 2, we have used the formula $(j \geq n-1-i \ \&\& \ j \leq n-1+i)$ in the “if” condition to determine whether to print star or print space, for example, if the value of “i” is “0” and the value of “j” is “5” and the value of “n” is “6” by solving the values “6-1-0” and “6-1+0” we get the value “5” which is equal to the value of “j” which is “5” so the star will be printed.

Similarly if the value of “i” is “1” and the value of “j” is “3” by solving the values “6-1-1” and “6-1+1” we get the value “4” and “5” which don’t make the condition true so space will be printed.

The output of the following program is shown in figure 2



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

Figure 2: Program Output

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