

Diamond of Stars

Problem Description: You are given with an input number N, then you have to print the given diamond pattern corresponding to that number N.

For example if N=5

Pattern output :

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

How to approach?

1. Take N as input from the user.
2. Figure out the number of rows, (which is N here) and run a loop for that. Here you need to run 2 loops, one for upper half and another for the lower half.
3. Now, figure out the number of columns in ith row (i.e. $2*(i)-1$) and run a loop for that within this. Here, first you need to run a loop to print the spaces too.
4. Now, figure out “What to print?” in a particular row, column number. Here we have to print “*”.

Pseudo code for the given problem:

input=N

n1=N/2+1

i=1

While i is less than equal to n1:

spaces=1

While spaces is less than (n1-i):

print(' ')

Increment spaces by 1

j=1

*While j is less than equal to 2*i-1:*

print(“”)*

Increment j by 1

Increment i by 1

Add a new line here

$n2 = n - n1$

$i = n2$

While i is greater than equal to 1:

$spaces = 1$

While $spaces$ is less than $(n1 - i)$:

$print(' ')$

Increment $spaces$ by 1

$j = 1$

While j is less than equal to $2 * i - 1$:

$print("*")$

Increment j by 1

Increment i by 1

Add a new line here

❑ Let us dry run the Code for $N=5$, $n1=3$

- $i=1(<=3)$
 - $3-1=2$ spaces are getting printed first.
 - $j=1(<=2*1-1)$, so print `"*"`
 - $j=2(>2*1-1)$, move out of the inner loop with a new line
- $i=2(<=3)$
 - $3-2=1$ space is getting printed first.
 - $j=1(<=2*2-1)$, so print `"*"`
 - $j=2(<=2*2-1)$, so print `"*"`
 - $j=3(<=2*2-1)$, so print `"*"`
 - $j=4(>2*2-1)$, move out of the inner loop with a new line
- $i=3(<=3)$
 - $3-3=0$ space is getting printed first.
 - $j=1(<=2*3-1)$, so print `"*"`
 - $j=2(<=2*3-1)$, so print `"*"`
 - $j=3(<=2*3-1)$, so print `"*"`
 - $j=4(<=2*3-1)$, so print `"*"`
 - $j=5(<=2*3-1)$, so print `"*"`
 - $j=6(>2*3-1)$, move out of the inner loop with a new line
- $n2=5-3=2$
- $i=2(>=1)$

- $3-2=1$ space is getting printed first.
- $j=1$ ($\leq 2*2-1$), so print “*”
- $j=2$ ($\leq 2*2-1$), so print “*”
- $j=3$ ($\leq 2*2-1$), so print “*”
- $j=4$ ($> 2*2-1$), move out of the inner loop with a new line

- $i=1$ (≥ 4)
 - $3-1=2$ spaces are getting printed first.
 - $j=1$ ($\leq 2*1-1$), so print “*”
 - $j=2$ ($> 2*1-1$), move out of the inner loop with a new line

So , final output:

```

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