

C2: Diamonds

Centered Triangles

The picture we want to print out is a centered triangle based on the number of lines.

Lines? 4

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

Lines? 5

```
*
```



```
***
```



```
*****
```



```
*****
```



```
*****
```

Lines? 2

```
*
```



```
***
```

Further analysis shows:

The initial number of spaces is the number of lines -1.

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | * | | | |
| | | | * | * | * | |
| | * | * | * | * | * | |
| * | * | * | * | * | * | * |

The number of stars is the (line number * 2) -1

| | | | | | |
|---|---|---|---|---|---|
| | | * | | | |
| | | * | * | * | |
| * | * | * | * | * | * |
| * | * | * | * | * | * |

line 1 = $(1*2 - 1) = 1$ star

line 2 = $(2*2 - 1) = 3$ stars

line 3 = $(3*2 - 1) = 5$ stars

line 4 = $(4*2 - 1) = 7$ stars

This is the code required:

The Scratch script starts with an event "onEvent (draw, click)" and a variable declaration "var howmany = promptNum("How big? ");". It initializes "spaces" to "howmany-1". A loop begins with "repeat for the lines required". Inside the loop, it prints spaces ("print spaces") and decreases "spaces" ("decrease for next line"). Then, it prints stars ("print stars") and moves down a line ("move down a line"). Finally, it puts out a new line ("put out new line"). The script ends with a closing brace for the repeat loop.

```
onEvent (▼ "draw", ▼ "click", function(event) {  
    var howmany = promptNum("How big? ");  
    var spaces = howmany-1;  
    repeat for the lines required  
        for (var i = 1; i <= howmany; i++) {  
            var line = "";  
            for (var k = 1; k <= spaces; k++) {  
                line = line + " ";  
            }  
            spaces--; decrease for next line  
            for (var j = 1; j <= (2*i-1); j++) {  
                line = line + "*";  
            }  
            line = line + "\n"; move down a line  
            setText (▼ "output", (getText (▼ "output") + " ") + line); put out new line  
        }  
    }  
})
```

Your assignment:

Make an app that prints out a diamond. The lines will still refer to the lines of the triangle on the top.

Lines? 4

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

Lines? 5

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

Lines? 2

```
***  
*  
*
```