

Discussion 7: Intro to Recursion

Factorials are Factorials Times Factorials

Factorials are defined as the product of a positive integer and all consecutive smaller positive integers. For example, $\text{factorial}(5) = 5 \times 4 \times 3 \times 2 \times 1$. Fill in the code below to recursively compute a factorial. Don't worry about the case of $n < 1$.

```
factorial(n):  
    if n = 1  
        report 1  
    else  
        report n x factorial(n - 1)
```

PalindromeemordnilaP

A palindrome is a word that is spelled the same way forwards and backwards. In other words, the first letter must equal the last letter, the second letter must equal the second to last letter, etc.

Using the above information, fill in the recursive palindrome function. You may find the following functions below helpful:

all but first letter of word

ord

all but last letter of word

wor

is (word) a palindrome?

```
if length of (word) < 2
```

```
    report true
```

```
else:
```

```
    if letter 1 of (word) = letter last of (word)
```

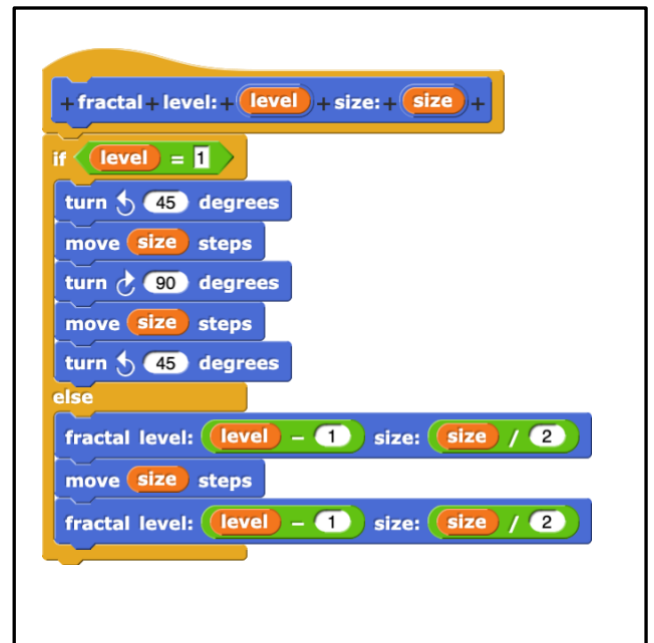
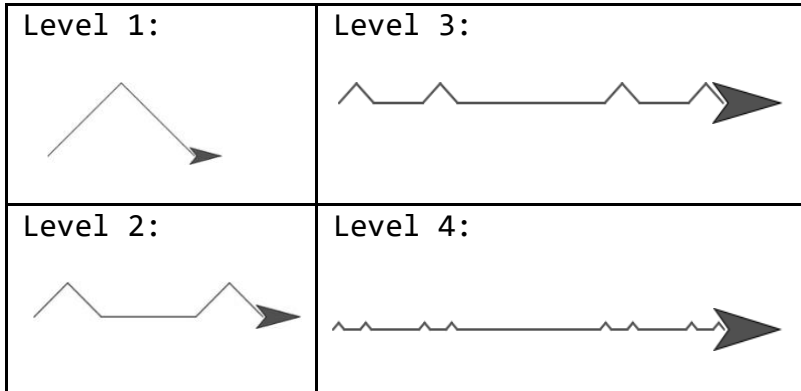
```
        report is (all but first letter of (all but last letter  
of (word))) a palindrome?
```

```
    else:
```

```
        report false
```

Fractals

Write out the code to draw the fractal below. At each level, the triangles are half of the size they were in the previous level.



Extra Practice

1. The block to the right checks if a list contains a certain item, but it doesn't work as intended. Identify and fix the bug so that it works properly.



This block is missing a base case. There should be an additional base case as follows:

```

if item 1 of (list) = (item)
  report true
  
```

2. Write a block called multiply that multiplies two numbers together using recursion. You may not use the "times" block in your answer.

