

## F4 Problem 220: Highway Dragon

May 3, 2019

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My code is as follows:

Variable: N = number of iterations (number of times the letters will be replaced)

Variable: Do = string of initial letters containing the letters a,b,f,l, or r (such as 'Fa', 'Lb', etc.)

Variable: length = length that the cursor (or turtle) will move when moving forward

Initialize N to some integer, like 10

For i an integer from 0 to N

    For some char in Do

        If char is the letter 'a'

            Do is now Do with all of its a's replaced by 'aRbFR'

        If char is the letter 'b'

            Do is now Do with all of its b's replaced by 'LFaLb'

    For ii an integer from 0 to the length of Do

        if the letter whose index is ii is the letter 'R'

            the cursor turns 90 degrees to the right

        if the letter whose index is ii is the letter 'F'

            the cursor moves forward the length decided previously

        if the letter whose index is ii is the letter 'L'

            the cursor turns 90 degrees to the left

I was able to create the graphics by utilizing the turtle package. In the second for-loop, I utilized the package and for every R, L, or F, the graph would move right, left, or forward, respectively.

The following 2 questions could be asked about the Highway Dragon:

1. Do certain number of iterations produce similar shapes, such as the powers of 2?

While I do not have the math to back up why the shapes are different, they are. I looked at 2, 4, 8, and 16.

2. Do the number of hooks (the way the graph curves) depend on the number of iterations?

When looking at other dragon curves, it is obvious that mine doesn't form the proper way. If I had more time to perfect the graphics of the curve, I would be able to evaluate the number of hooks in the curves and the number of iterations causing them. My curves don't actual form a curve.