

# Functions and Fractals - Recursive Trees

## Problem Statement

[illegible]

## Creating a Fractal Tree from Y-shaped branches

This challenge involves the construction of trees, in the form of ASCII Art. The restriction is, that you need to accomplish this with functional programming, and you cannot declare even local variables!

We have to deal with real world constraints, so we cannot keep repeating the pattern infinitely. So, we will provide you a number of iterations, and you need to generate the ASCII version of the Fractal Tree for only those many iterations (or, levels of recursion). A few samples are provided below.

## Iteration #1

In the beginning, we simply create a Y. There are 63 rows and 100 columns in the grid below. The triangle is composed of underscores and ones as shown below. The vertical segment and the slanting segments are both 16 characters in length.

The image shows a full page of white paper with horizontal blue ruling lines. The lines are evenly spaced and extend across the width of the page. At the bottom center, there is a small, faint, and partially obscured logo or watermark. It appears to be a stylized 'V' or 'W' shape, possibly a brand mark, but it is too light to read clearly. The rest of the page is empty.

[illegible]

## Iteration #2

At the top of the left and right branches of the first Y, we now add a pair of Y-shapes, which are half the size of the original Y.

A fractal tree diagram with 16 levels. The root node is labeled '1'. It branches into two nodes, each labeled '1'. This process repeats for 15 levels, resulting in a total of 16 levels of nodes. The nodes are arranged in a symmetrical, branching pattern, resembling a tree or a fractal structure. The nodes are labeled '1' and are connected by lines. The diagram is centered on the page.

	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1

**Input Format**  
A single integer, N.

**Constraints**  
N <= 5  
And, you need to accomplish this without directly defining any local variables. For example, var and val have been blocked in Scala; def and defn are blocked in Clojure.

**Output Format**  
The N<sup>th</sup> iteration of the Fractal Tree, as shown above. It should be a matrix of 63 rows and 100 columns. (i.e. 6300 printable characters) It should be composed entirely of underscores and ones, in a manner similar to the examples provided. Do not include any extra leading or trailing spaces.