

CS151 Spring 2013

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L-Systems Project 9

The goal of these notes is to help you understand the stochastic L-systems that are supplied as part of Lab 9.

Symbols in `drawString`

To make `sysTree2.txt` and `sysTree3.txt` work, we need the following symbols supported by `Interpreter.drawString`.

- F and f must both mean “forward by the (modified) distance”
- L must draw a leaf whose size can be scaled by a modifier.
- ! must handle the width. If there is no modifier, then it should decrease the width by 1 (being careful not to reduce it below 1). If there is a modifier, then it should set the width to the value of the modifier.

To draw these trees, a good value for distance is 1.

Understanding sysTree3.txt

Here is the first example L-system:

```
base (50)F
rule F (50) f [!(30) - F<g(5)L>] [!(40) + F<g(5)L>] !F
rule (x) f (1.5*x) f (1.25*x) f (1.7*x) f
rule (x) - (x*1.2) - (x*0.8) - (x*1.05) - (x*1.0) - (x*0.95) - (x*0.87) - (x*1.12) -
rule (x) + (x*1.2) + (x*0.8) + (x*1.05) + (x*1.0) + (x*0.95) + (x*0.87) + (x*1.12) +
```

And the observations we made about it:

- Turns, forwards, and leaf-sizes are modified by modifiers.
- The structure of the tree is deterministic (we always move forward and make two branches (or subtrees) to the left and right, and the grown the branch (or subtree) up.
- Distances and angles are stochastic
- The scales in front of F and f should be of comparable sizes.

Understanding sysTree2.txt

Here is the second example L-system:

```
base (5)!(100)F
rule (x)F (x)F[!(2*x/3)F<g(5)L>] [!(2*x/3)F<g(5)L>] (x)F[!(2*x/3)F<g(5)L>]!(1*x/2)
```

And the observations we made about it:

- Turns, forwards, leaf-sizes, and widths are modified by modifiers.
- The structure of the tree is stochastic (we branch forward and left, or forward and right, or left and right).
- Distances are decreased as we branch.