

## LINDENMAYER SYSTEMS

WRITTEN BY: Donald Kiel, Department of Math and Computer Science, Cal State, Los Angeles ([dkiel@neptune.calstatea.edu](mailto:dkiel@neptune.calstatea.edu))

CATEGORY: Fractals

APPLICATION:

Lindenmayer systems allow the definition of natural looking objects(sometimes called "graftals") to be described in formal language. For example, one simple "axiom" and one relatively short production rule can be used to generate a bush. For example, the default Axiom is F, the rule is  $F[+F]F[-F]F$ , and the angle is  $\pi/7$ . At the first level every F is replaced by the rule  $F[+F]F[-F]F$ . This would be drawn as one step forward(the first F, the size of which depends on the scale), then a branch drawn one step forward at an angle of  $\pi/7$ (the  $[+F]$ ), then back to the trunk and one step forward, then a branch to the left ( the  $[-F]$  ), and finally one step forward again. To get the second level, each F in the derived formula is replaced by rule and the resulting formula is drawn.

The user can construct new rules or can elect one of the choices in the Examples menu. The choices include other bushes, the Koch snowflake, and the Koch island.

USES: Graphics and automata classes.

DEVELOPMENT :NeXTSTEP 2.0