# L-Systems and Sharp Pencils

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# TREES (and others)

# Lindenmayer-Systems (L-Systems)

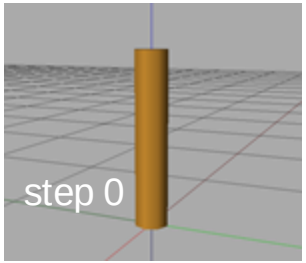
- Alphabet of symbols (plant modules)
- Constants
- Axiom (starting state)
- Production rules (growth)

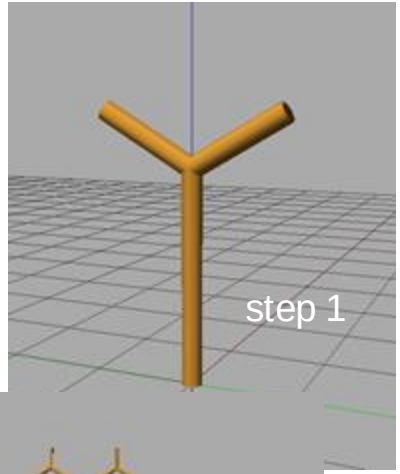
- Alphabet of symbols: **F**, **X**
- Constants:
- Axiom (starting state): **X**
- Production rules: **X** → **F[-X][+X]**

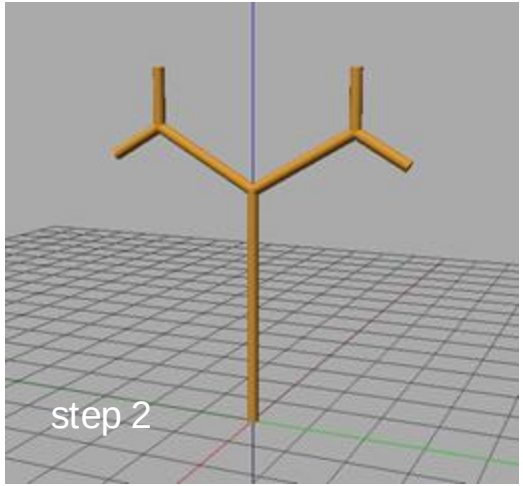
X ⟹ F[-X][+X] ⟹ FF[-F[-X][+X]][+F[-X][+X]]

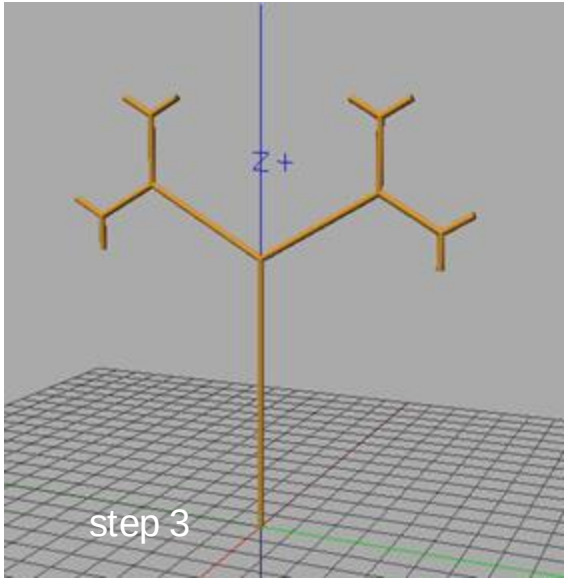
FFFF[-FF[-F[-X][+X]][+F[-X][+X]]][+FF[-F[-X][+X]][+F[-X][+X]]]

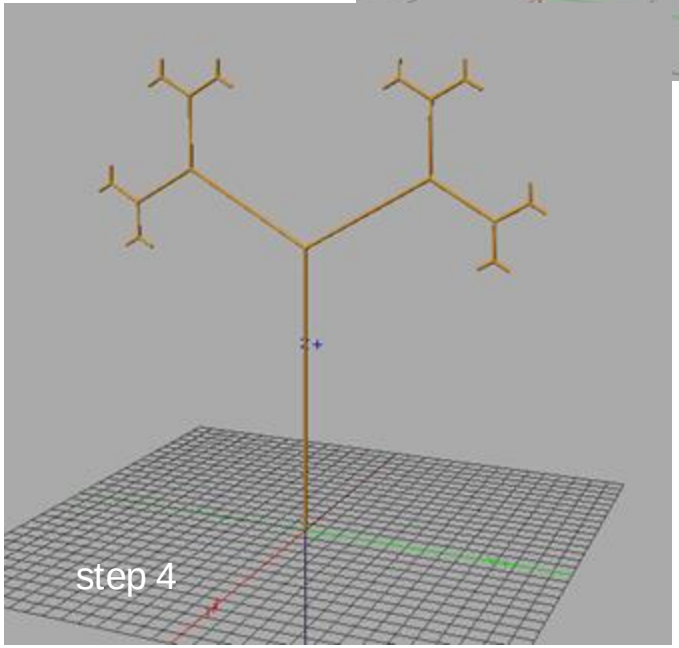
# L-Py



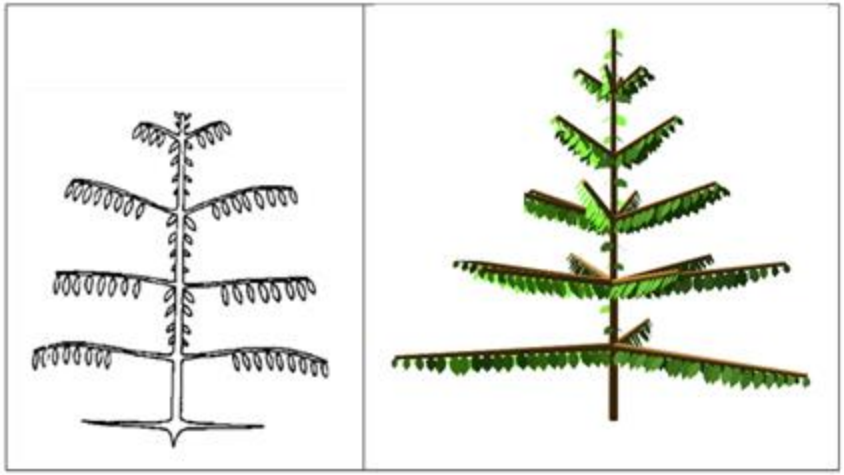



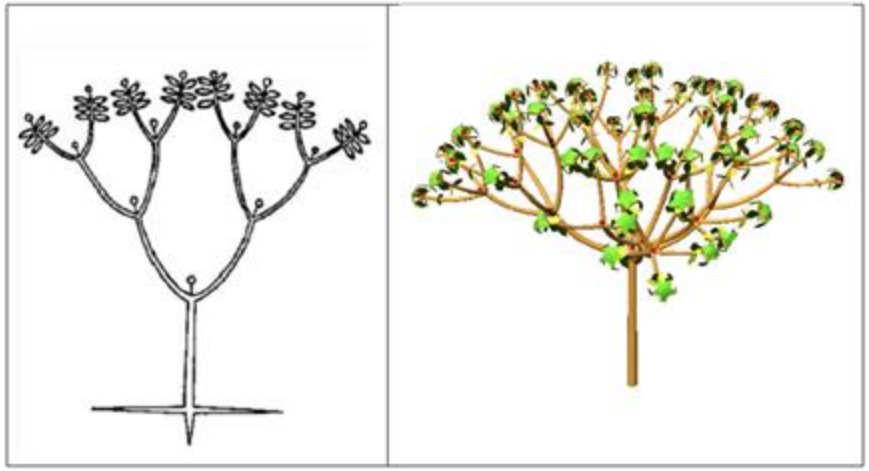



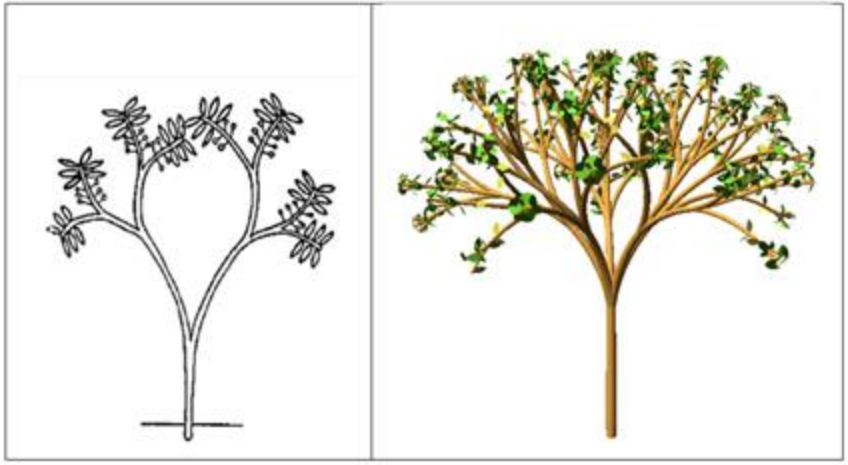



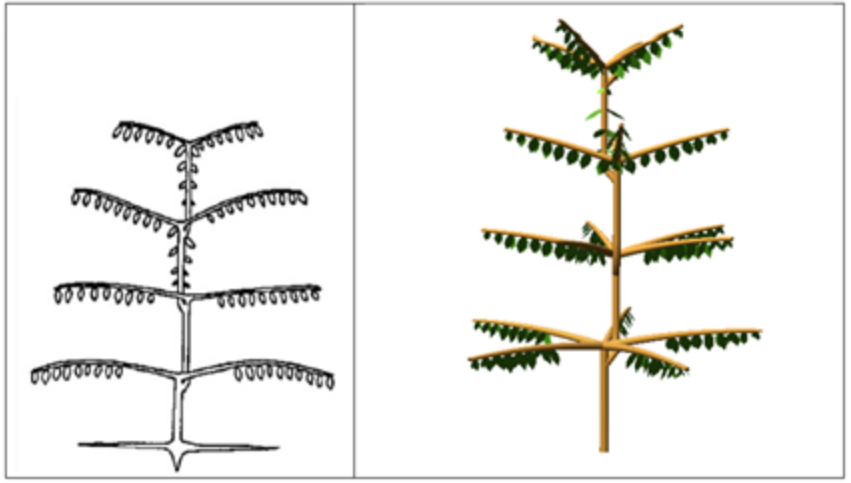

```
1   Axiom: X
2
3   derivation length: 4
4   production:
5   X --> F[-X][+X]
6   F --> FF
7
8   interpretation:
9
10
11  endlsystem
12
```

# TREES

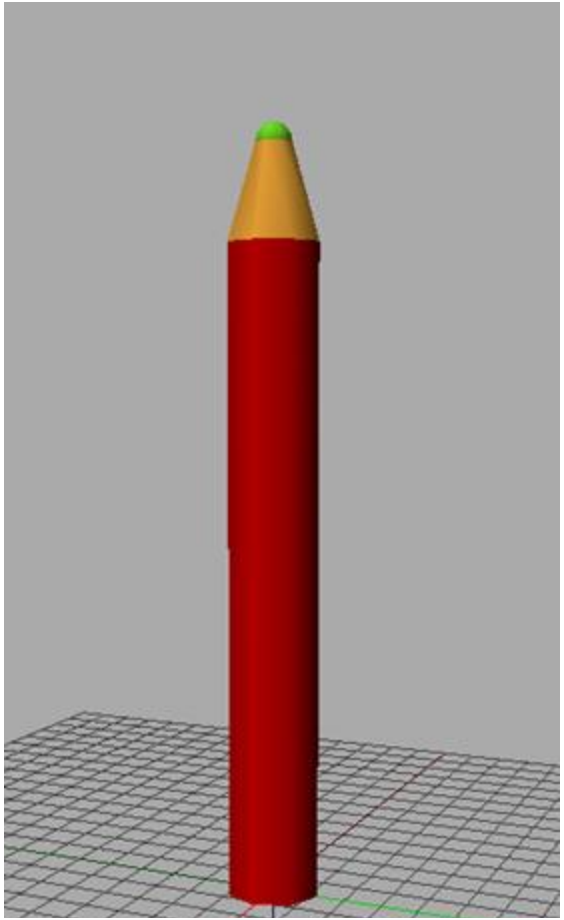






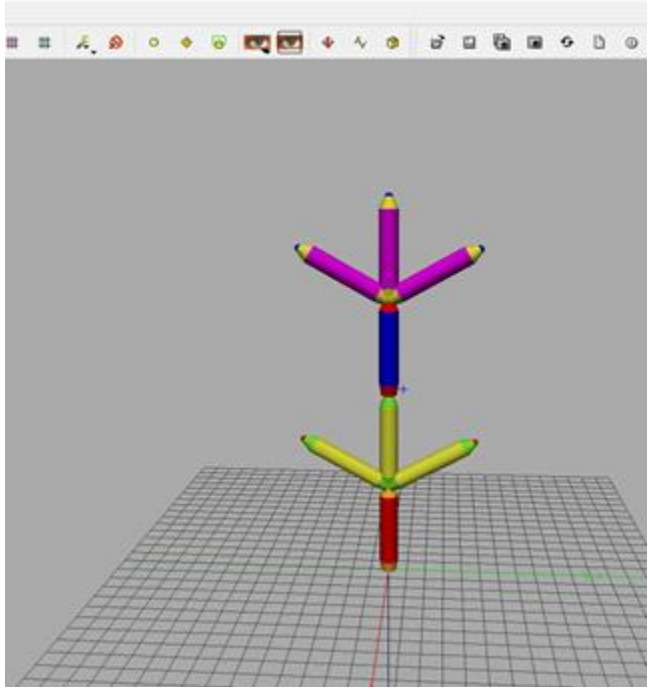


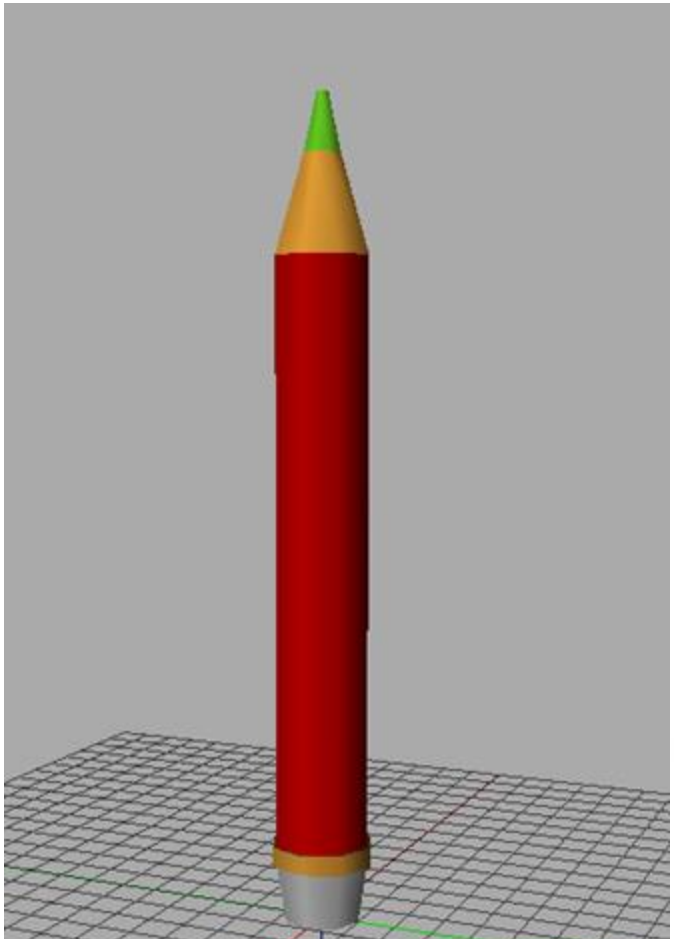
# PENCILS



```
1    #kid's pencil
2    Axiom: ;;_(2.5)F(4, 2.5)_(2.5)F(30),,F(5, 1);@O(1)
```

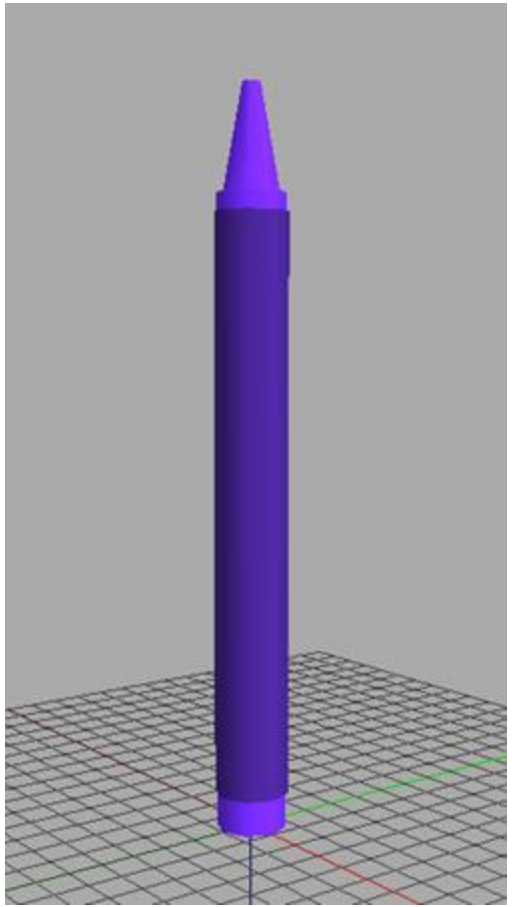
# MORE PENCILS





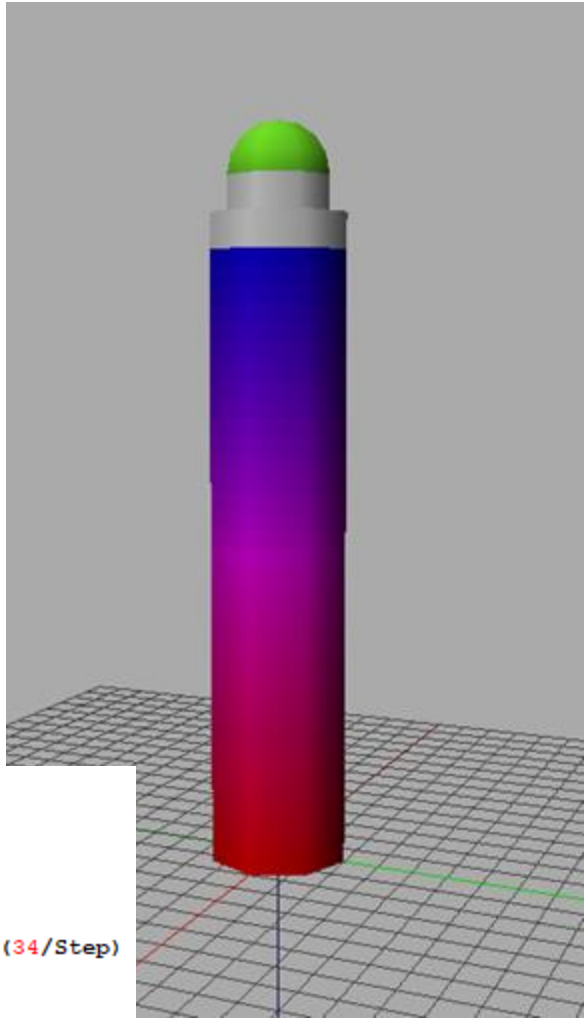

```
8       #normal pencil
9       Axiom: ,_(2)F(3, 2.5)_(2.7);F(1, 2.7);;_(2.5)F(30),,F(5, 1);F(3, 0.3)
10
```

# CRAYONS

```
3   #crayola
4   Axiom: SetColor(89, 33, 209)_(2)F(2)SetColor(55, 28, 115)_(2.1)F(33)SetColor(89, 33, 2
```

# STOMPERS

```
#bingo stomper (fancy colour)
Step = 34
DIncr = 1.0 / Step
Axiom:
  d = 0.0
  for i in range(Step):
    nproduce InterpolateColors(3, 5, d) _(4)F(34/Step)
    d += DIncr
  produce ,F(2, 4)_(3)F(2, 3);;@O(3)
```

# CACTUS