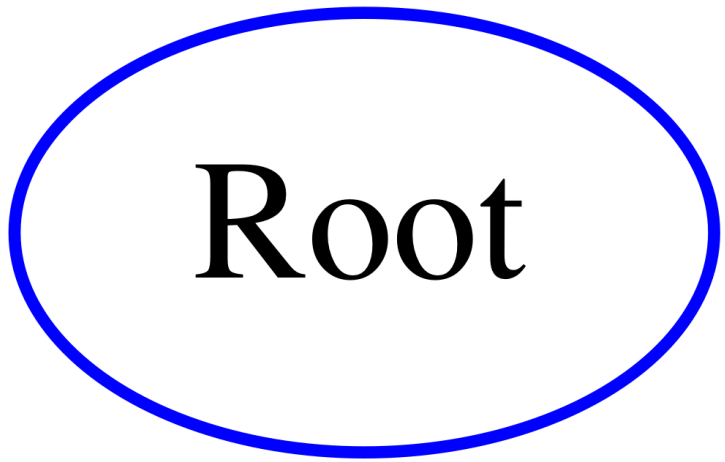
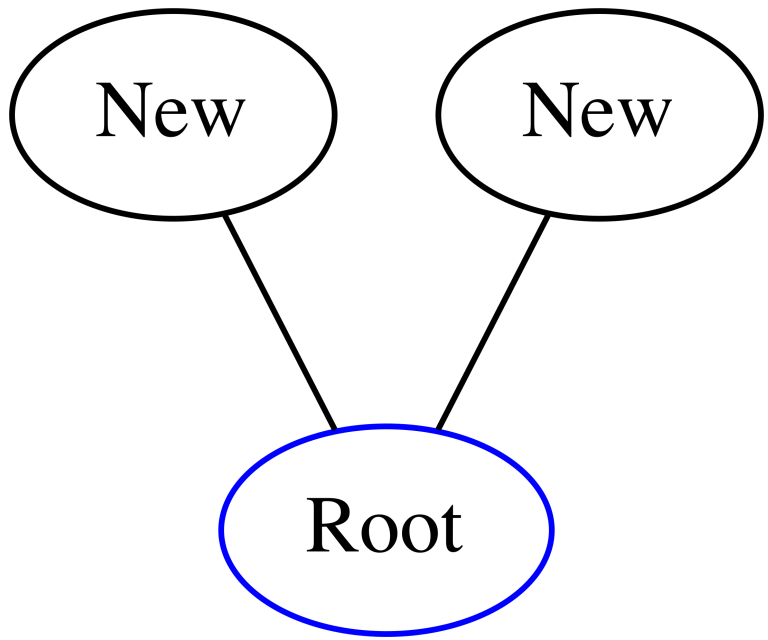
Every Tree Starts with a Root

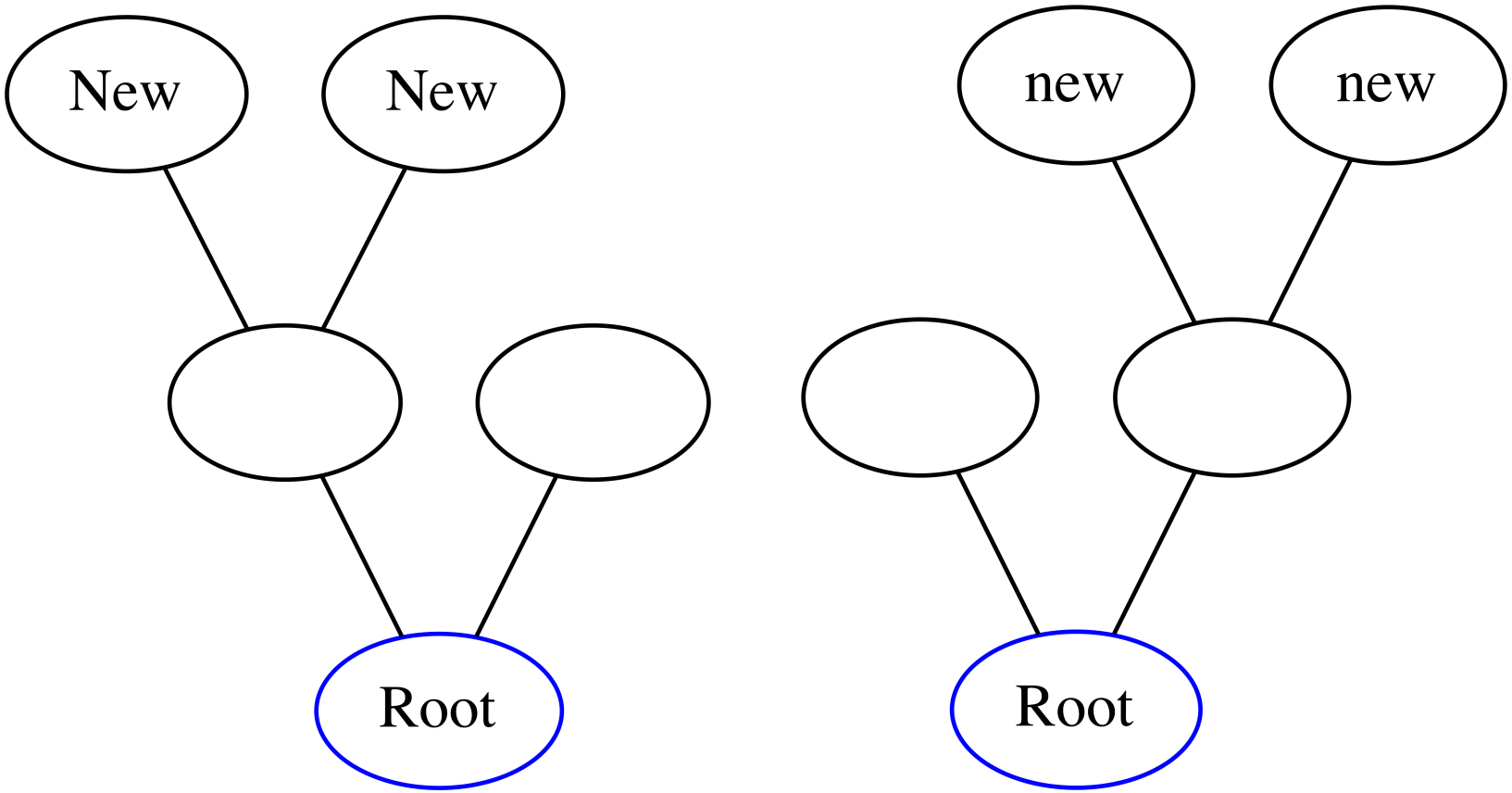


Trees Grow From A Root Following These Rules

1. The root gets left alone.
2. Every new dot you add gets connected to a dot that's already in the tree by an edge.
3. You always add dots in pairs, with each of the new dots connected to the same dot that's already in the tree.

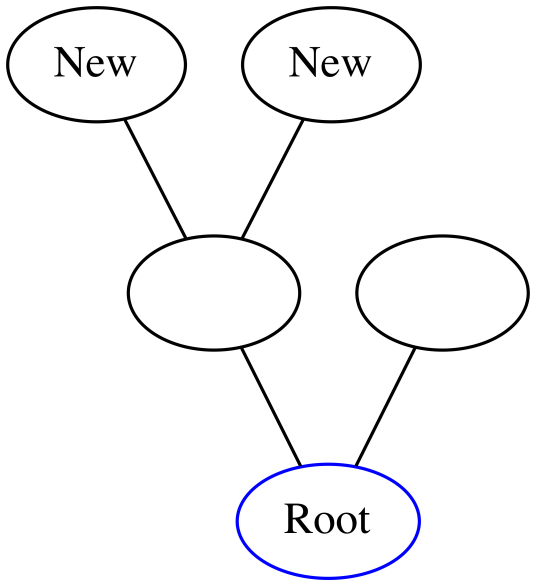


Two trees with 5 dots and 4 lines

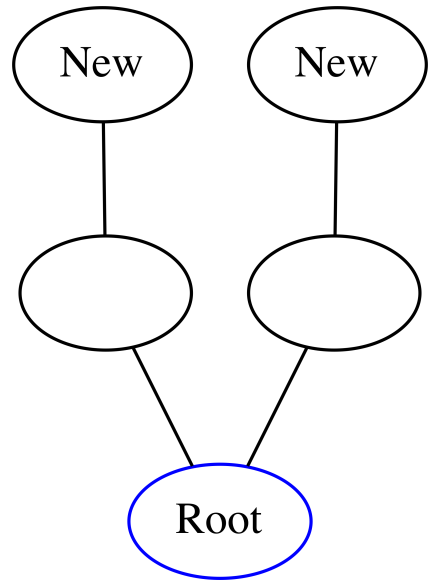


Every Tree Always Satisfies These Rules

1. A tree has a root dot at the bottom and either zero or two lines connected to it.
2. Every dot in a tree except for the root has either three lines connected to it, or one.



This is good!



This breaks the rules!

The BIG QUESTIONS

How many *DIFFERENT* trees are there with 3 dots? (we'll talk about this)

How many *DIFFERENT* trees are there with 5 dots? (we'll talk about this)

How many *DIFFERENT* trees are there with 7 dots? (this is for you!)

How many *DIFFERENT* trees are there with 9 dots? (this is, too – and it's tricky!)