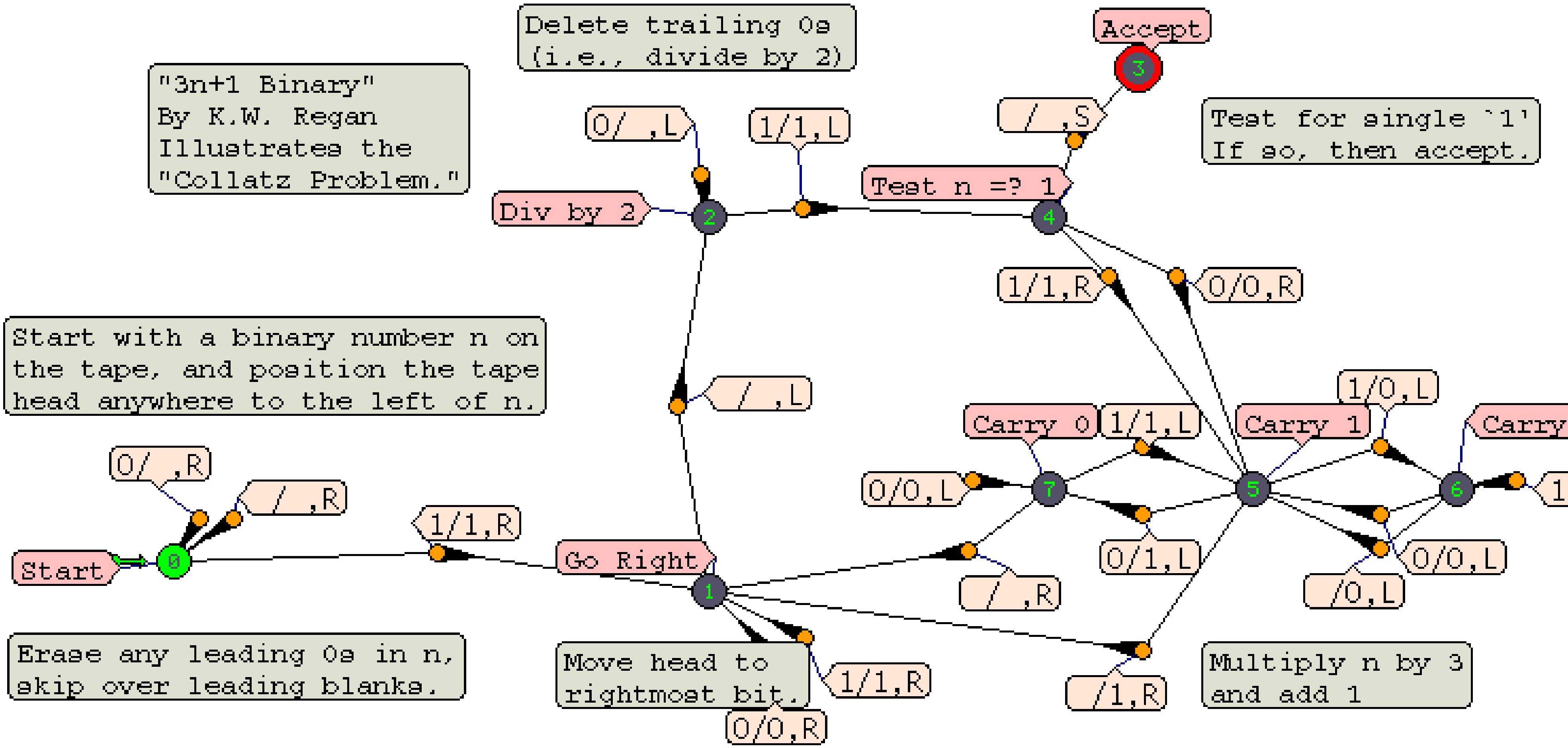

This Turing machine M begins with a number n >= 1 written in binary on its tape.
If n=1, the machine accepts. If n is even, M divides it by 2.
If n is odd, M multiplies n by 3 and adds 1.
This process continues, and halts if and only if n becomes 1.

Mathematicians /believe/ that every number n >= 1 eventually becomes 1,
but no one has /proved/ it yet. Hence here is a simple Turing machine for which
nobody knows whether it halts for all inputs, or not! It is not even known whether
L(M) is recursive, although of course L(M) is believed to be all of N.