




Sketch of solutions for HW6 pts 350.


1. Presented in class. you need run topological sort and design a forward-propagation algorithm.
2. you need run topological sort and carefully design a forward propagation scheme while each node is equipped with an auxiliary data structure to record the number of paths with i yellow's and j green's, for all $0 \leq i, j \leq n$, where n is the # of nodes in G .

3. This prob is hard!

I first build a graph M_G (a FA)
that is identical to G . Then I
label u as init, ~~v as~~
~~accepting~~, and for each edge
from  \rightarrow , if


the color of  is c , then
I label the edge with color c :



Finally, for the node v , I
add a new state , and an
edge



being the color of u .

Now,  is my accepting state of M_G .

Next, I construct a FA M_r from regExp r . Then, I do Cartesian product

$$M_G \times M_r = M$$

Finally, I use the alg in Prob to count the # of paths from init to accepting in M , which is a graph, if the count is finite. Otherwise, return $+\infty$. // How to know the count is ∞ or not? use SCC and see if there is a walk from init to accepting that passes a looping SCC.

4. Super hard, you need Google and read!

5. you must write a mini paper
(a good practice if you
want to be in Grad School).