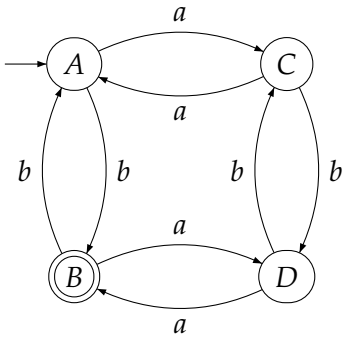
CS 310, Assignment 2

Due on 9 February in class

1. Let $\Sigma = \{a, b\}$ and consider the following state-transition diagram:



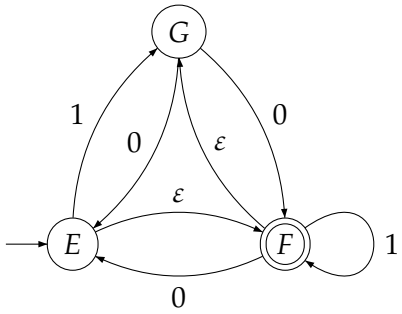
   (a) Give three examples of strings that are accepted by the transition diagram and three examples of strings that are not accepted by the transition diagram.

   (b) Write explicitly the transition function δ that defines the transitions of the diagram.

   (c) Is the transition diagram deterministic or nondeterministic? Explain briefly.

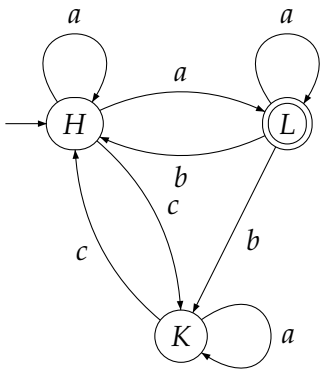
   (d) What is the language recognized by the state transition diagram? Describe (using set notations or in English) the conditions that characterize exactly all the strings in the language and provide a brief justification.

2. Let $\Sigma = \{0, 1\}$ and consider the following nondeterministic state transition diagram with ε-transitions:



Using the systematic method described in class (and in the text), convert the transition diagram into an equivalent (non)deterministic transition diagram without ε-transitions. Do not modify or simplify the resulting diagram any further.

3. Let $\Sigma = \{a, b, c\}$. Using the systematic method described in class and textbook convert the following nondeterministic state transition diagram into a deterministic transition diagram:



Describe how the deterministic transition diagram is obtained from the nondeterministic one as follows: label the states of the deterministic diagram by sets of states of the nondeterministic diagram (like we did in class).

Make sure you review the submission guidelines posted on the course's Web site.