CSE355 Fall 2016–Recitation Quiz 1 (Solutions)

Name: _____ ASU ID: _____

1. For the DFA below, answer the following questions.
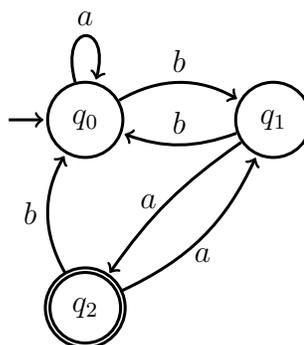
   (a) Is this a valid DFA? Yes, assuming part (c)'s answer. Notice that there is a transition on a, b from every state. Since we did not give a formal description of the machine, it could be valid or invalid (e.g., letting $\Sigma = \{a, b, c\}$)!

   (b) What is Q? It is $\{q_0, q_1, q_2\}$.

   (c) What is Σ? It is $\{a, b\}$.

   (d) What is the start state? It is q_0 (the incoming start arrow from no state).

   (e) What are the final states? There is only 1 final state, which is q_2.

   (f) Write a string of length at least 5 that M accepts (other than the one in Question 2), and another of length at least 5 that M rejects. There are infinitely many possible answers. An example string that is accepted is *aabaaa*, and an example that is rejected is *aaaaa*.

2. My friend says that the DFA shown above has language equal to the set of all strings that start with 0 or more a's, followed by an odd number of b's, and then followed by an odd number of a's. For example, *aabbba* is indeed accepted by M. Is my friend right? How could you show that your answer is correct?

   My friend is wrong. The reasoning is the transition $q_2 \xrightarrow{b} q_0$: if this transition did not exist, my friend would be right. However, this shows that the string *ababba* is accepted, a string that is not described by my friend.

TA use only! Quiz has been recorded: ☐