CS 3530: Assignment 1b

Fall 2014

Name: Eric Beilmann

Exercises

Note: In each of the following, you should show and describe the simpler DFAs as well as the final NFA that you construct. You must follow the steps of each construction precisely. Do not take shortcuts or simplify the results. You do not need to show intermediate steps.

If a DFA is called for, an NFA is not acceptable. Be sure to include *all* states of a DFA.
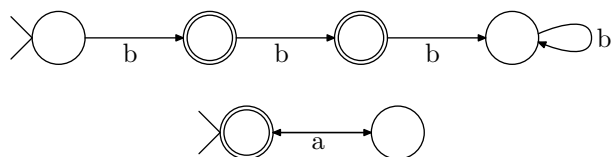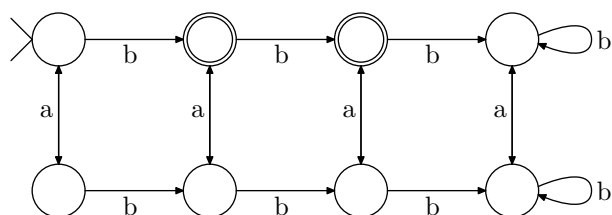
Exercise 1.4c (7 points)

Problem

Each of the following languages is the intersection of two simpler languages. In each part, construct DFAs for the simpler languages, then combine them using the construction discussed in footnote 3 (page 46) to give the state diagram of a DFA for the language given. In all parts $\Sigma = \{a, b\}$.

c. Language: $\{w : w$ has an even number of a's and one or two b's$\}$
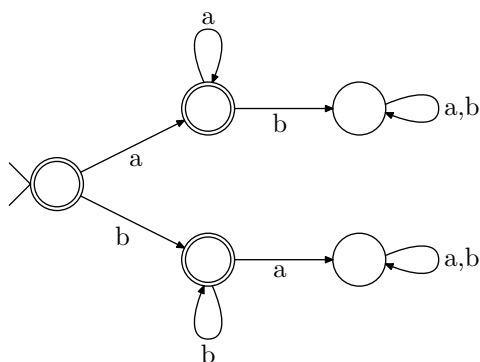
Solution DFAs

Solution Intersection

Exercise 1.5c (7 points)

Problem

Each of the following languages is the complement of a simpler language. In each part, construct a DFA for the simpler language, then use it to give the state diagram of a DFA for the language given. In all parts $\Sigma = \{a, b\}$.

c. Language: $\{w : w$ contains neither the substrings ab nor $ba\}$

Solution

Exercise 1.7c (6 points)

Problem

Give state diagrams of NFAs with the specified number of states recognizing each of the following languages. In all parts the alphabet is $\{0, 1\}$.

    c. Language: $\{w : w$ contains an even number of 0's, or contains exactly two 1's$\}$ with six states

Solution