

CIS 511: Spring 2015
Problem Set 1: Due January 28 by 5 PM

1. Exercise 1.4, parts c and g.
2. Exercise 1.21, part b. You can either use Lemma 1.60 or the technique described in class.
3. Problem 1.31.
4. Problem 1.38.
5. Let A be a regular language over the alphabet $\{0, 1\}^*$. Define the language B called even- A as follows:

$$B = \{v = v_1v_2 \cdots v_k : \exists w_1w_2 \cdots w_k : w_1v_1w_2v_2 \cdots w_kv_k \in A\}$$

Prove that B is regular.

6. Problem 1.45.
7. Problem 1.46, parts a and c.
8. Problem 1.51.
9. Let M_1 be a DFA accepting the language L_1 and M_2 a DFA accepting the language L_2 . In terms of the formal definitions of each of these automata, write down a formal definition of a new automaton M that accepts $L_1 \cap L_2$. Prove your answer.