

CSE 322: Introduction to Formal Models in Computer Science
Assignment #2
October 6, 2005
due: Friday, October 13

1. Exercise 1.7, parts c, e, g [1st Ed: Exercise 1.5, parts c, e, f].
2. Exercise 1.14(b) [1st Ed: Exercise 1.10(b)]. Let M' be the NFA that results from swapping the accept and nonaccept states of M . For your example, state precisely what $L(M)$ and $L(M')$ are, and why these languages are not complementary.
3. Exercise 1.16(b) [1st Ed: Exercise 1.12(b)]. You need only give the state diagram, and just that portion of it reachable from its start state.
4. In Example 1.33 [1st Ed: Example 1.15] on page 52, label the start state q , the two states at the top of the diagram r_0 and r_1 from left to right, and the three states at the bottom s_0 , s_1 , and s_2 starting with the accept state and going clockwise around the cycle.
 - (a) Use the construction given in Theorem 1.39 [1st Ed: Theorem 1.19] to convert this NFA into an equivalent DFA. You need only give the state diagram, and just that portion of it reachable from its start state.
 - (b) Explain how your DFA from part (a) relates to the construction given in the proof of Theorem 1.25 [1st Ed: Theorem 1.12]. What does Example 1.33 [1st Ed: Example 1.15] have to do with the union operation?
5. Problem 1.31 [1st Ed: Problem 1.24]. This is the result you used without proof in a problem on Assignment 1. Hint: Design an NFA for A^R . Why is an NFA convenient for this?