CSE 322 Winter 2004
Assignment #4

Due: Friday, Feb 6, 2004

Reading assignment: Read the NFA to Regular Expression, Myhill-Nerode Theorem, and Minimizing DFAs handouts and finish section 1.4 of Sipser's text.

Problems:

1. Sipser's text page 86, Exercise 1.16 part (a).

2. Use the pumping lemma to prove that the languages from Sipser's text Exercise 1.17 are not regular.

3. Use the method from the Myhill-Nerode handout to prove that the languages from Sipser's text Exercise 1.17 are not regular.

4. Show that the language

$$\{a^i b^j c^k \ : \ i, j, k \geq 0, \text{ and if } i = 1 \text{ then } j = k\}$$

   satisfies the conclusion of the pumping lemma (and therefore the pumping lemma cannot prove that it is not regular). Show that it is not regular using another method. Explain why this does not contradict the pumping lemma.

5. Apply the state minimization algorithm to the DFA in the figure on the back of this page. Show each of your steps as in the example on the minimization handout.

6. (Bonus) Sipser's text page 90, Problem 1.42

7. (Bonus) Sipser's text page 90, Problem 1.40