CSE 322 Winter 2004
Assignment #1

Due: Friday, January 16, 2004

Reading assignment: Read Sipser's book, sections 1.1 and 1.2; you should already have read Chapter 0.

Problems:

1. We have only informally defined the reversal w^R of a string w. Formally, we can give the following inductive definition:

   Base case If $w = \epsilon$ then $w^R = \epsilon$.

   Inductive step If $w = va$ for $v \in \Sigma^*$ and $a \in \Sigma$ then $w^R = av^R$.

   Prove by induction on the number of characters in y that for all strings $x, y \in \Sigma^*$, $(xy)^R = y^R x^R$.

2. Sipser's book page 84, Exercise 1.3

3. Sipser's book page 84, Exercise 1.4. Parts (a), (b), (c), (d), (e), (f), (i), (l).

   As documentation for your DFAs, for each state write a very brief description of the set of strings that reach each state.

4. Do the same as Exercise 1.4 Part (d), but do it for those strings that have a 0 in the third from last position rather than in the third position.

5. For Example 1.4 in the text, write out the sequence of states that machine M_4 goes through in computing on input string $abaab$ and for input string $bbaab$.