

Homework 1

Due midnight, Thursday, 1/31/2013

Please submit your homework solutions online at <http://www.dci.pomona.edu/tools-bin/cs081upload.php>. Please turn in the homework as a single file.

Problems from the texts are given in the form c.n where c is the chapter and n is the problem number. Thus problem 2.7 is problem 7 from Chapter 2.

1. (10 points) **Strings and Induction**

Read section 2.1.2 of Rich before doing this problem. Give a careful proof by induction on i that for all $i \geq 0$, and all strings $w \in \Sigma^*$, $(w^R)^i = (w^i)^R$, where w^R is the reverse of string w . Use the definition of the reverse of a string given on page 9 of Rich. You may also use Theorem 2.1 on the bottom of page 9 of Rich in your proof.

2. (13 points) **Set Operations**

Problem 2.8 from Rich.

3. (5 point) **Deterministic FSM**

Problem 5.2g from Rich

4. (5 points) **Nondeterministic FSM**

Problem 5.7 from Rich

5. (10 points) **NDFSM \rightarrow DFSM**

Problem 5.9ac from Rich