

Problem Set 3 — Due April 22, 2004

Problem 1. Page 85, Exercise 1.12.

Problem 2. Page 86, Exercise 1.16.

Problem 3. Page 90, Exercise 1.41.

Problem 4. Prove that the regular languages are closed under reversal.

Problem 5. Find a simple, nontrivial characterization of the language $\{111\}^*\{11111\}^*$, and prove correct your characterization.

Problem 6. Let $L_n = \{0, 1\}^*1\{0, 1\}^n$. Find the smallest DFA and the smallest NFA for the languages for L_n . Prove your results.

Problem 7. (*Very difficult—no solution to be given—for whiz-kids only*) Prove that if $L \subseteq \{0\}^*$ then L^* is regular.