

A. Let  $M_1$  and  $M_2$  be DFAs. Let  $p_1$  and  $p_2$  be their numbers of states. Suppose that  $M_1$  and  $M_2$  agree on all strings of length less than  $p_1p_2$ . (“Agree on a string” means that both machines accept the string, or both machines reject the string.) Prove that  $M_1$  and  $M_2$  agree on all strings.

B. Let  $EQ_{DFA} = \{\langle A, B \rangle : A \text{ and } B \text{ are DFAs, and } L(A) = L(B)\}$ . Describe a Turing machine that decides  $EQ_{DFA}$ , using Problem A.

C. Problem 4.12.