

Assignment 3

Due: October 20th

Problem 1 Prove or disprove the following: Let D be a DFA with $|Q| = k$. If $|L(D)|$ is finite then there exists a string w of length at most $k - 1$ such that $w \notin L(D)$.

Problem 2 (Sipser 1.46 a,c) Prove that the following languages are not regular. You may use the pumping lemma and the closure of the class of regular languages under union, intersection, and complement.

1. $A = \{0^n 1^m 0^n \mid m, n \geq 0\}$
2. $B = \{w \mid w \in \{0, 1\}^* \text{ is not a palindrome}\}$