University of Waterloo
CS 462 — Formal Languages and Parsing
Winter 2020
Problem Set 5

Distributed Friday, February 7 2020. Due Friday February 14 2020 at 5 PM. Submit via LEARN.

All answers should be accompanied by proofs.

1. [10 marks] Describe, with proof, all the equivalence classes for the Myhill-Nerode equivalence relation on the language $L = \{\mathtt{a}^n\mathtt{b}^n\mathtt{c}^n \ : \ n \geq 1\}$.

2. [10 marks] Let L be regular. Show that the number of final states in *any* DFA accepting L is at least the number of final states in the minimal DFA for L.

3. [10 marks] Let $L = \{x \in \Sigma^* \ : \ x = x^R\}$, the language of palindromes over the alphabet $\Sigma = \{0, 1\}$. Show that every word of Σ^* is in a Myhill-Nerode equivalence class by itself.