1. [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 $L$.

2. [10 marks] Describe, with proof, all the equivalence classes for the Myhill-Nerode equivalence relation on the language $L = \{a^n b^n c^n : n \geq 1\}$.

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 $\Sigma^*$ is in a Myhill-Nerode equivalence class by itself.