1. Section 13.4 [6th ed.: Section 12.4], exercise 22: the “pumping lemma”. Let \( L \) be a regular language accepted by a finite state automaton with \( p \) states. Then any string \( x \in L \) of length at least \( p \) can be written as \( x = uvw \) satisfying the following conditions:

(a) \(|v| \geq 1\),
(b) \(|uv| \leq p\), and
(c) for all nonnegative integers \( i \), \( uv^i w \in L \).

2. Section 13.4 [6th ed.: Section 12.4], exercise 25: Show that the set of palindromes over \( \{0, 1\} \) is not regular, using the pumping lemma. (Hint: consider palindromes of the form \( 0^N10^N \).)