CMPE 350 - Spring 2018

PS 11 - 30.04.18

4.10 $\text{INFINITE}_{\text{DFA}} = \{\langle A \rangle | \text{ is a DFA and } L(A) \text{ is an infinite language}\}$. Show that $\text{INFINITE}_{\text{DFA}}$ is decidable.

4.21 Let $S = \{< M > | M \text{ is a DFA that accepts } w^R \text{ whenever it accepts } w\}$. Show that S is decidable.

4.24 A useless state in a pushdown automaton is never entered on any input string. Consider the problem of determining whether a pushdown automaton has any useless states. Formulate this problem as a language and show that it is decidable.

4.26 Let $\text{PALDFA} = \{\langle M \rangle | M \text{ is a DFA that accepts some palindrome}\}$. Show that PALDFA is decidable. (Hint: Theorems about CFLs are helpful here.)

• Let L be the language of all Turing machine descriptions $\langle M \rangle$ such that there exists some input on which M makes at least 5 moves. Show that L is decidable.

• Disprove: Every countable language is decidable.