CMPE 350 - Spring 2018

PS 12 - 07.05.18

4.30 Let A be a Turing-recognizable language consisting of descriptions of Turing machines, $\{\langle M_1 \rangle, M_2 \rangle, \dots \}$, where every M_i is a decider. Prove that some decidable language D is not decided by any decider M_i whose description appears in A. (Hint: You may find it helpful to consider an enumerator for A.)

- Given an example of a language L such that L is co-Turing recognizable but its complement is not.

- Prove that the language $\{< M, w, q > \mid M$ is a Turing machine which visits state q during its execution when started with input string $w\}$ is undecidable.

- Show that the set of undecidable languages are closed under complementation.

5.9 Let $T = \{\langle M \rangle | M$ is a TM that accepts w^R whenever it accepts $w\}$. Show that T is undecidable.