

CMPE 350 - Spring 2019

PS 12 - 13.05.19

4.30 Let A be a Turing-recognizable language consisting of descriptions of Turing machines, $\{\langle M_1 \rangle, \langle M_2 \rangle, \dots\}$, 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 .)

- Show that the set of undecidable languages are closed under complementation.
- 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.
- Let M be a Turing machine which loops on all strings of the form $w^r w$. Is M a decider? Is the language recognized by M decidable?