

Homework 3

CS 450
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co- \mathcal{RE} is the class of languages $L \subseteq \Sigma^*$ whose complements are recursively enumerable;

$$\text{co-}\mathcal{RE} = \{ L \subseteq \Sigma^* \mid \bar{L} \in \mathcal{RE} \}.$$

Prove or disprove the following theorems.

- 1 **Theorem.** $L \in \mathcal{RE} \implies L$ is accepted by a DTM in which every accepting configuration is a halting configuration and every halting configuration is an accepting configuration.
- 2 **Theorem.** $\mathcal{REC} = \mathcal{RE} \cap \text{co-}\mathcal{RE}$.
- 3 **Theorem.** $L_{PCP} \in \mathcal{RE}$, where L_{PCP} is a language representing Post's Correspondence Problem.