

Breakout Room Problems

① Give a more detailed description of a universal TM, i.e. that given $\langle M, w \rangle$ can "simulate" M 's computation on input w .

② Given that A_{TM} is undecidable,

show that $HALT_{TM} = \left\{ \langle M, w \rangle \mid \begin{array}{l} M \text{ halts} \\ \text{on input } w \end{array} \right\}$

is undecidable

(halt means reaches either q_{accept} or q_{reject}).

③ If L is undecidable and recognizable show that $L^{comp} = \Sigma^* \setminus L$ is unrecognizable