

AMIRITE

$AMIRITE_{TM} = \{ \langle M, w, a \rangle \mid M \text{ is a TM, } a \text{ is the action } M \text{ takes on input } w \}$
 $AMIRITE_{TM}$ is undecidable.

Proof:

$HALT_{TM}$ is trivially reducible to $AMIRITE_{TM}$ through the computable function F where:
 $F =$ On input $\langle M, w \rangle$ where M is a TM and w is a string, return $\langle M, w, halt \rangle$.

As such, $\langle M, w \rangle \in HALT \iff F(\langle M, w \rangle) \in AMIRITE$
 $\therefore HALT_{TM} \leq_M AMIRITE_{TM}$.