ICCS310: Assignment 5

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1: Reject TM

$$\mathsf{REJECT_{TM}} = \{\langle M, x\rangle | \text{ M is a TM that rejects input}\}$$

Show directly (i.e., without resorting to reduction) that $\mathsf{REJECT_{TM}}$ is undecidable.

Proof:

2: Accept vs. Reject

$$\mathsf{REJECT_{TM}} = \{\langle M, x\rangle | \text{ M is a TM that rejects input}\}$$

Show directly (i.e., without resorting to reduction) that $\mathsf{REJECT_{TM}}$ is undecidable.

Proof:

3: Reverse on TM

$$\mathsf{REJECT_{TM}} = \{\langle M, x\rangle | \text{ M is a TM that rejects input}\}$$

Show directly (i.e., without resorting to reduction) that $\mathsf{REJECT_{TM}}$ is undecidable.

Proof:

4: Undecidability

$$\mathsf{REJECT_{TM}} = \{\langle M, x\rangle | \text{ M is a TM that rejects input}\}$$

Show directly (i.e., without resorting to reduction) that $\mathsf{REJECT_{TM}}$ is undecidable.

Proof:

5: Total Is No Harder Than Finite

$$\mathsf{REJECT_{TM}} = \{\langle M, x\rangle | \text{ M is a TM that rejects input}\}$$

Show directly (i.e., without resorting to reduction) that $\mathsf{REJECT_{TM}}$ is undecidable.

Proof:

6: Finite Is No Harder Than Total

$$\mathsf{REJECT}_{\mathsf{TM}} = \{\langle M, x\rangle | \text{ M is a TM that rejects input}\}$$

Show directly (i.e., without resorting to reduction) that $\mathsf{REJECT}_{\mathsf{TM}}$ is undecidable.

Proof:

7: Extra: Undecidability of Nontrivial Properties

$$\mathsf{REJECT}_{\mathsf{TM}} = \{\langle M, x\rangle | \text{ M is a TM that rejects input}\}$$

Show directly (i.e., without resorting to reduction) that $\mathsf{REJECT}_{\mathsf{TM}}$ is undecidable.

Proof: