

Exercises for Computability and Complexity, Spring 2014, Sheet 4

Please return your solutions in the Friday lecture on March 14.

Exercise 1 Prove that $H_2 = \{\langle M \rangle; x \mid \text{Code}(\langle M \rangle) \text{ and } \text{Standard}(x) \text{ and there exists some } y \text{ with } \text{Standard}(y) \text{ such that } M(x) = y\}$ from Proposition 6.3 is undecidable.

Exercise 2 (halfway easy to medium) Show that the language

$$L = \{\langle M \rangle \in \{0, 1, \#\}^* \mid M \text{ halts on no input}\}$$

is not recursively enumerable. Hint: as part of your solution approach, consider using Proposition 3.1.