CSE 725 - Problem Set 1
Due lecture on February 2nd

Problem numbers are from the second edition of Sipser's book. If unsure about which problem to solve, ask. Collaboration is permitted; looking for solutions from external sources (books, the web, material from previous years, etc.) is prohibited.

1. Give an implementation-level description and a formal description (i.e. including the state diagram of the transition function) of a TM that recognizes

$$\{u\#v : u, v \in \{0, 1\}^* \text{ and } u \text{ is } v \text{ reversed}\}$$

2. * Show that a language is decidable iff there is an enumerator that prints it out in lexicographic order.

3. 3.15 d e

4. Prove that the union of countably many countable sets is countable.

5. (extra credit) * 4.17

6. * 4.28