

CSE 725 - Problem Set 1

Due lecture on April 18th

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. 3.15 b

(The concatenation of two languages L, M is the language $\{vw : v \in L, w \in M\}$)

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

4. 3.19

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

6. * 4.17