CS580 Homework 9
Fall 2024
October 23, 2024
(Due 4:10pm, October 30, 2024)

Email homework assignments to ldojcsak@vols.utk.edu by the beginning of class time.

1. Prove of disprove: If S is a set of recursively enumerable languages that partition Σ^*, then every $L \in S$ is recursive.

2. In decimal, what is the index of the string 11011011?

3. In human terms, what strings are in $L(M_{2673664939706530927347882859285459308857191633447})$?

4. Give an encoding of a TM that recognizes $0(11)^+ + 1(00)^+$.

5. In binary, what is the smallest i such that $L(M_i) = \emptyset$?

6. In binary, what is the smallest i such that $L(M_i) \neq \emptyset$?

7. In binary, what is the smallest i such that $L(M_i) = \{\lambda\}$?

8. In binary, what is the smallest i such that $L(M_i)$ is infinite?

9. In binary, what is the smallest i such that $L(M_i) = \Sigma^*$?

10. In binary, what is the smallest i such that $\langle M_i \rangle \in L(M_i)$ (the encoding of M_i is in $L(M_i)$)?