CS 580 Homework 8

October 25 4:10 PM, 2023

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

2) Prove or disprove: If L is an infinite recursively enumerable language, then there exists some $L' \subseteq L$ such that L' is infinite and recursive.

3) In decimal, what is the index of the string 0101?

4) In human terms, what strings are in $L(M_{10567726669305988391})$?

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 $L(M_i) = \sum^*$?

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