

Start Time:

Your name:

Stop Time:

Integrity signature:

Suggested time limit 15 minutes, not counting download and upload. Please add explanation if over 20 minutes.

Definition: Recall that for v and w strings, $v \circ w = vw$ is the concatenation of v and w . Let the concatenation $R \circ S$ of two sets R and S of strings in Σ^* be the set of strings

$$R \circ S = \{v \circ w : v \in R \text{ and } w \in S\}.$$

For example, $\{00, 111\} \circ \{0, 1\} = \{000, 001, 1110, 1111\}$.

1. Let $\Sigma^* = \{0, 1\}$. Suppose R and S are subsets of Σ^* (i.e., they are unary relations.) Further suppose R and S are computably enumerable. Prove that $R \circ S$ is computably enumerable either by giving an algorithm that enumerates $R \circ S$ or by giving an algorithm that semidecides $R \circ S$.