CSC240 Winter 2021 Homework Assignment 10

due Tuesday April 6, 2021

For any language $L \subseteq \Sigma^*$, let

$$mutate(L) = \{x \cdot a \cdot y \cdot b \cdot z \mid x, y, z \in \Sigma^*, a, b \in \Sigma, a \neq b, \text{ and } x \cdot b \cdot y \cdot a \cdot z \in L\}$$

be the set of strings that can be obtained from strings in L by interchanging two different letters. For example, if $L = \{0011\}$ then $mutate(L) = \{1001, 1010, 0101, 0110\}$.

Prove that, if L is a regular language, then $mutate(L)$ is regular, as follows.

1. Given any deterministic finite automaton $M = (Q, \Sigma, \delta, q_0, F)$, explain how to construct a finite automaton M' such that $L(M') = mutate(L(M))$.
2. Briefly describe how M' works.
3. Prove that $L(M') = mutate(L(M))$.

Assignment Project Exam Help

https://powcoder.com

Add WeChat powcoder