

Homework 5

Posted: November 25, 2024

Due: December 11, 2024

1. Show that the function $f(u, v) = uv$ is computable in \mathcal{S}_n . Recall that uv denotes the concatenation of the words u and v .
2. Let $A = \{s_1, \dots, s_n\}$ and let $P(x)$ be the predicate on A^* that is TRUE just when x has an even number of symbols. Show that $P(x)$ is computable in \mathcal{S}_n .
3. Define $\text{HALT}_n(x, y)$ as the predicate that is TRUE if and only if the \mathcal{S}_n program y eventually halts on input x . Show that $\text{HALT}_n(x, y)$ is not computable in \mathcal{S}_n .
4. Construct a Post-Turing program that computes strictly the function $f(u, v) = uv$.
5. Construct a Turing machine that computes the function $f(x) = x^R$.