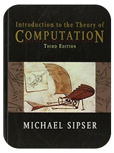
Exercício 23

Capítulo 1, Página 87



Introduction to the Theory of Computation

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Índice

Solução

Certificado

Passo 1

1 de 2

We know that B^+ is a shorthand for BB^*, i.e. $B^+ = B^* \setminus \{\varepsilon\}$.

Let's now suppose that $BB \subseteq B$. This implies that for any two $w_1, w_2 \in B$ we have $w_1 w_2 \in B$ as well. We will call this fact closure of B under concatenation.

From definition we always have $\boxed{B \subset B^+}$. To prove the other direction, take any $w \in B^+$. There must be $n \in \mathbb{N}$ such that $w \in B^n$. This means that there are words $w_1, w_2, \ldots, w_n \in B$ such that $w = w_1 w_2 \ldots w_n$.

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Now using mathematical induction, we prove that $w \in B$. If $n

Now assume that for $n$ the claim holds. Take any word $w = w_1 w
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$$w = \underbrace{w_1 w_2 \ldots w_n}_{\in B} \underbrace{w_{n+1}}_{\in B} \in B$$

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as well, which proves the claim.
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Resultado

2 de 2

Proof using mathematical induction.

Avaliar esta solução

Exercício 22 Exercício 24