Ciências / Ciência da computação / **Introduction to the Theory of Computation (3rd Edition)**

Exercício 5

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Introduction to the Theory of Computation

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Solução   ✔ Certificado

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From definition of

$$E_{\mathrm{TM}} = \{\, \langle M \rangle \mid M \text{ is a TM and } L(M) = \emptyset \,\}$$

we see that string s is not its element (i.e. $s \in \overline{E_{\mathrm{TM}}}$) if either s is not an encoding of some TM or $L(N) \neq \emptyset$, where $s = \langle N \rangle$. In second case, this means there is some string w which is accepted by machine N.

Hence the recognizer T for language $\overline{E_{\mathrm{TM}}}$ works as follows:

$T =$ ”On input s:

1. Convert string s to TM N which it encodes; if s is not an encoding of any TM, *accept*.

2. Let w_1, w_2, … be a list of all strings in Σ^*. For each $k = 1, 2, \ldots$ now do the following:

3.   Simulate TM N for k steps on strings $w_1, w_2, \ldots , w_k$; if N accepts any of these strings, *accept*.”

We had to be careful with simulating machine N on every string, since it may not halt on some string, which would be inconvenient.

Resultado   2 de 2

The key is that machines from complement eventually accept some string.

Avaliar esta solução

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