Exercício 2

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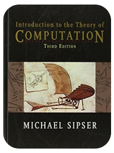

Introduction to the Theory of Computation

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Solução

Certificado

Passo 1

1 de 2

We want to prove that $\overline{EQ_{CFG}}$ is Turing-recognizable.

Let's construct a TM for $\overline{EQ_{CFG}}$.

The first step will definitely be:

- If the input is something not representing two CFGs, accept

and it will finish(either accept or just continue to the next step).

Now the harder part is constructing a TM for $L = \{\langle G_1, G_2 \rangle | G_1, G_2\ are\ CFGs, L(G_1) \neq L(G_2)\}$.

We can enumerate strings in Σ^*, let's say lexicographly(or in any way...): $\{s_1, s_2, ...\}$ and our TM will go throught the strings one by one, and when on s_i it will check if it is in $L(G_1)$ and $L(G_2)$. If it is in both or neither language, it continues to s_{i+1}. Otherwise it accepts(since it means that $L(G_1) \neq L(G_2)$.

Therefore, the next steps of our machine are:

- Go through strings s_i one by one. For each string s check if $s \in G_1$ and $s \in G_2$. If it's in both or neither language, continue to the next string, otherwise accept.

This way, we've shown that there's a TM for $\overline{EQ_{CFG}}$ so it's Turing-recognizable.

Resultado

2 de 2

Prove that $\overline{EQ_{CFG}}$ is Turing-recognizable by costructing a TM for it, which will first accept all inputs which are not of the form $\langle G_1, G_2 \rangle$ and then you construct a TM for $L = \{\langle G_1, G_2 \rangle | G_1, G_2\ are\ CFGs, L(G_1) \neq L(G_2)\}$ and use it.

Avaliar esta solução

‹ Exercício 1

Exercício 3 ›