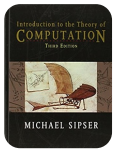
Exercício 1

Capítulo 4, Página 210



Introduction to the Theory of Computation

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Índice

Solução

Certificado

Passo 1 1 de 2

Part a.

First remember that A_{DFA} is the language of encodings of pairs (B, w), where B is a DFA which **accepts** string w. In other words,

$$A_{\text{DFA}} = \{ \langle B, w \rangle \mid B \text{ is a DFA that accepts input string } w \}.$$

Now we see that question whether $\langle M, \texttt{0100} \rangle \in A_{\text{DFA}}$ is actually a question whether DFA M from the image accepts string $\texttt{0100}$, i.e. whether $\texttt{0100} \in L(M)$.

So now we do the obvious thing, of course, and that is to run the machine M with $\texttt{0100}$ and see what happens. Enter the initial state, then hop-hop-hop-hop along the appropriate arrows and we are back in the initial state! Incidentally, initial state is also an accepting one, hence we conclude that $\texttt{0100} \in L(M)$, which means $\langle M, \texttt{0100} \rangle \in A_{\text{DFA}}$.

Part b.

After discussion in previous part, we simply answer: no, it is **not true** that $\langle M, \texttt{011} \rangle \in A_{\text{DFA}}$.

Part c.

The input is not even in right format! We said that in language A_{DFA} are encodings of pairs (B, w), but here we have just encoding of the machine. Hence we conclude that $\langle M \rangle \notin A_{\text{DFA}}$.

Part d.

Language A_{REX} contains all encodings of pairs (R, w), where R is a **regular expression** which generates string w. Notice the catch? That's right, M is not a regular expression! Hence we can immediately conclude $\langle M, \texttt{0100} \rangle \notin A_{\text{REX}}$.

Part e.

E_{DFA} contains encodings of all DFAs which **do not** accept any string. In **part a** we saw that M accepts string $\texttt{0100}$, hence $\langle M \rangle \notin E_{\text{DFA}}$.

Part f.

Since EQ_{DFA} contains encodings of pairs of DFAs which recognize exactly the same language, it is obvious that $\langle M, M \rangle \in EQ_{\text{DFA}}$.

Resultado 2 de 2

We clarify each symbol and write answers.

Avaliar esta solução

‹ Exercício 22 Exercício 2 ›