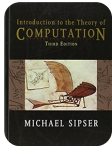


## Exercício 7

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Introduction to the Theory of Computation

ISBN: 9781133187790

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### Passo 1

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#### Part a.

For each occurrence of symbol **a** the PDA puts some symbol on stack, say **?**, and for each occurrence of symbol **b** it pops from stack. It accepts if and only if in final state there is **?** on stack. The stack serves again as a counter.

#### Part b.

Stack serves as a counter, but this time with two symbols, say **+** and **-**, which count the number of occurrences of symbols **a** and **b**. More precisely, if stack is empty, PDA puts **+** if it reads **a** and **-** if it reads **b**. If **+** is on top of stack and PDA reads **a**, it puts another **+** on stack, and otherwise (if it reads **b**) it pops from the stack. After reading the input, PDA accepts if and only if there is **+** or **-** on top of stack.

NOTE: Perhaps simpler would be to slightly modify the PDA which recognizes language  $\{a^n b^n \mid n \geq 0\}$ , try it.

#### Part c.

The PDA first puts symbols it reads until **#** on stack. Then it nondeterministically guesses which substring of  $x$  to try matching with  $w^R$  from the stack.

#### Part d.

Again the PDA nondeterministically guesses which string to match, by collecting each first on stack.

### Resultado

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We explain the PDA-s.

< Exercício 6

Avaliar esta solução



Exercício 8 >

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