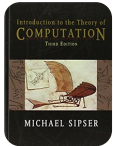


Ciências / Ciência da computação / Introduction to the Theory of Computation (3rd Edition)

**Exercício 21**

Capítulo 1, Página 86



Introduction to the Theory of Computation

ISBN: 9781133187790

[Índice](#)**Solução** Certificado**Passo 1**

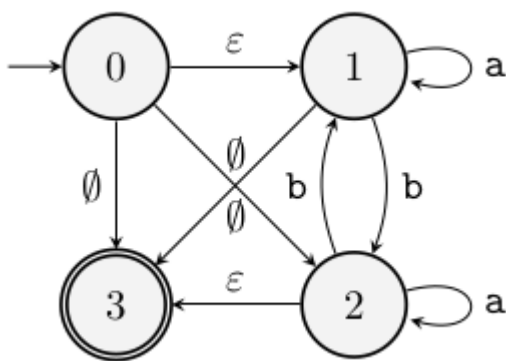
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**Part a.**

First we construct the equivalent generalized NFA, in this case by just adding new initial and accept states with appropriate  $\epsilon$ -arrows. We also add  $\emptyset$ -arrows to bring this GNFA in special form, introduced after **Lemma 1.60**.

**Passo 2**

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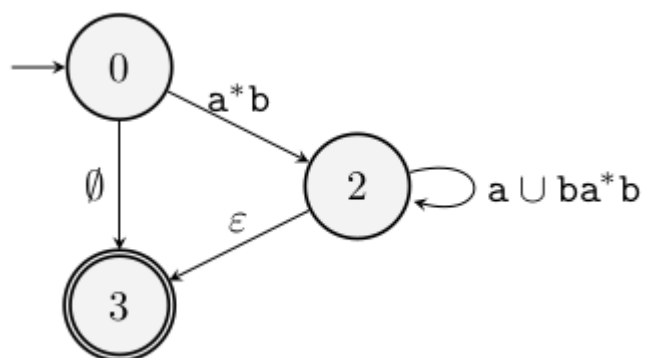
**Passo 3**

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Then we follow algorithm CONVERT from page 73 to, well, convert this GNFA to equivalent one having only initial and accept state. First we get rid of state 1, who needs it anyway?

**Passo 4**

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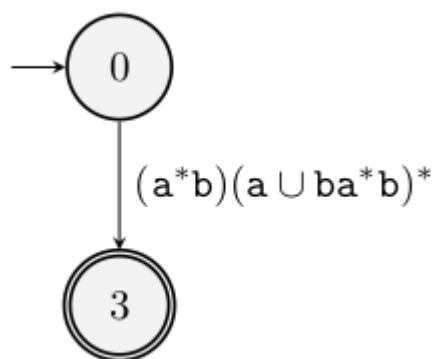
**Passo 5**

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We'll also say our last farewell to state 2.

**Passo 6**

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**Passo 7**

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Now we read from only arrow that regular expression for this finite automata is no more or less than:

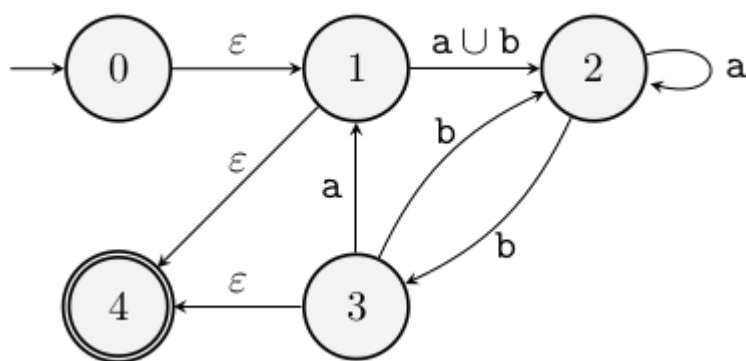
$$(a^*b)(a \cup ba^*b)^* .$$

**Passo 8**

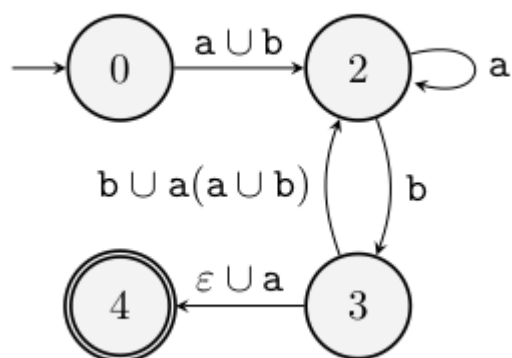
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**Part b.**

A picture is worth a thousand words, they say. We omit arrows labeled with  $\emptyset$ , not only because we are reluctant to draw them, but also because they do not contribute to final expression.

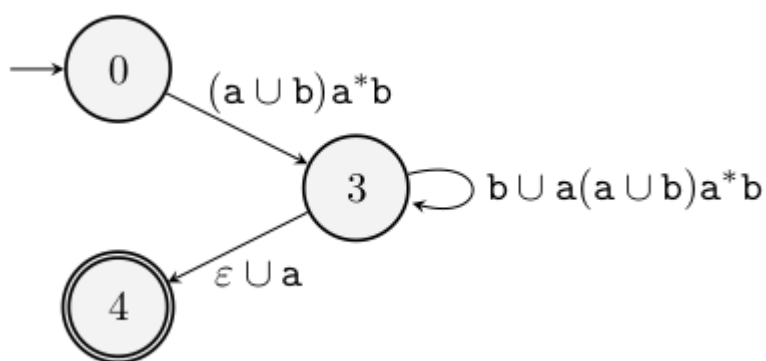
**Passo 9**

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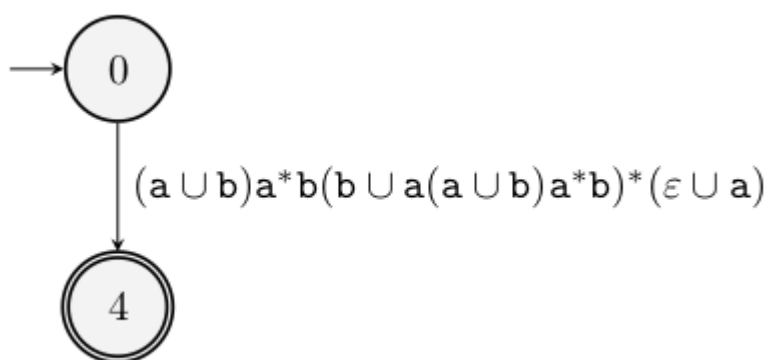


**Passo 10**

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**Passo 11**

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**Passo 12**

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It seems that final regular expression is formidable:

$$(a \cup b)a^*b(b \cup a(a \cup b)a^*b)^*(\epsilon \cup a) .$$

**Resultado**

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We describe the procedure in details, and draw a lot of diagrams.

**Avaliar esta solução**

< Exercício 20



Exercício 22 >

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