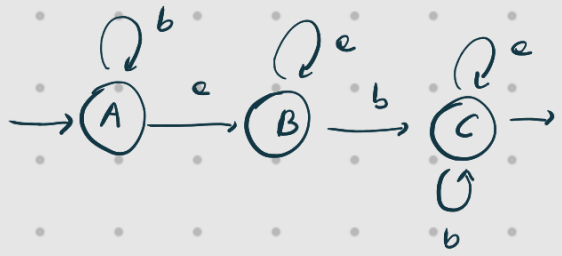
Exercícios

a)



$A \supseteq bA \cup aB$

$B \supseteq aB \cup bC$

$C \supseteq aC \cup bC \cup \varepsilon$

$\Downarrow$

$C \supseteq (a \cup b)^*$

$\Downarrow$

$B \supseteq aB \cup b(a \cup b)^*$

$B \supseteq a^* b (a \cup b)$

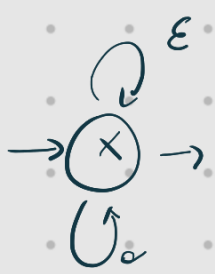
$\Downarrow$

$A \supseteq bA \cup a(a^* b(a \cup b)^*)$

$= b^* a (a^* b (a \cup b)^*)$

$= b^* a a^* b (a \cup b)^*$

b)



$X \supseteq \varepsilon X \cup aX \cup \varepsilon$

$X \supseteq \varepsilon^* (aX \cup \varepsilon)$

$(\varepsilon^* = \varepsilon$

$X \supseteq aX \cup \varepsilon$

$= a^* \varepsilon$

$X \supseteq a^*$

Lema de Arden

$X \supseteq RX \cup S$

$\Rightarrow$

$X \supseteq R^* S$

E se invertermos?

$\Downarrow$

$A \supseteq a^* b^*$

↓ Arden reverso

$A \supseteq aA \cup b^*$

↓

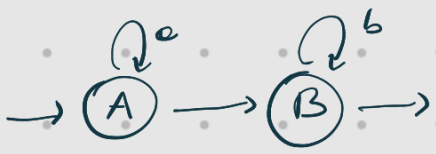
$A \supseteq aA \cup B$

$B \supseteq b^*$

↓ Arden inverso

$A \supseteq aA \cup B$

$B \supseteq bB \cup \varepsilon$



E se tivermos $A \geq (a^* \cup b^*)^*$?

$A \geq (a^* \cup b^*) A \cup \varepsilon$

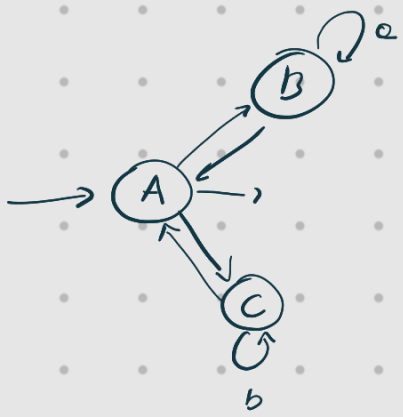
$A \geq a^* A \cup b^* A \cup \varepsilon$

$A \geq B \cup C \cup \varepsilon$

$B \geq a^* A$ $\Rightarrow$ $A \geq B \cup C \cup \varepsilon$

$C \geq b^* A$ $B \geq aB \cup A$

$C \geq aC \cup A$



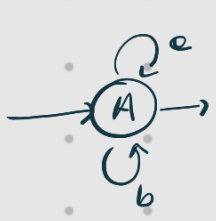
Porém temos como **otimizar** esse autômato.

$A \geq aB \cup bC \cup A \cup \varepsilon$
$B \geq aB \cup bC \cup A \cup \varepsilon$
$C \geq aB \cup bC \cup A \cup \varepsilon$

} como lado direito são iguais, $A = B = C$

$\Downarrow$

$A \geq aA \cup bA \cup \varepsilon$

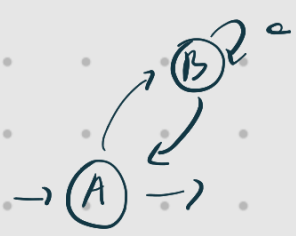


$(a \cup b)^*$

~h~

(3) - $A \geq (a^*)^* \Rightarrow A \geq a^* A \cup \varepsilon \Rightarrow A \geq B \cup \varepsilon$

$B \geq a^* A$



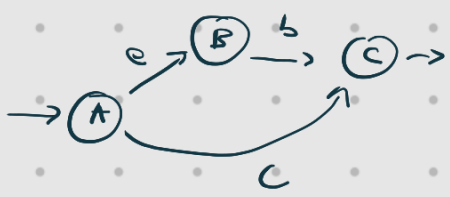
$A \geq B \cup \varepsilon$

$B \geq aB \cup A$

(0) - $A \geq ab \cup c \Rightarrow A \geq aB \cup cC$

$B \geq bC$

$C \geq \varepsilon$



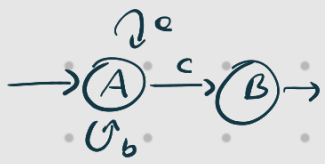
(2) $A \geq (a \cup b)^* c$

$= (a \cup b) A \cup c$

$= aA \cup bA \cup c$

$\Rightarrow$ $A \geq aA \cup bA \cup cB$

$B \geq \varepsilon$



① - $A \supseteq ab(c^*) \Rightarrow A \supseteq abC$

$C \supseteq c^*$

$L = cC \cup \varepsilon$

$A \supseteq aB$

$B \supseteq bC$

$C \supseteq cC \cup \varepsilon$