

CW 1.3, Automata.
F29LP

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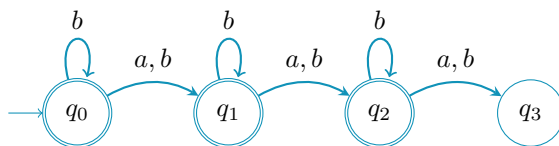
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1 $/(ab)^*/$

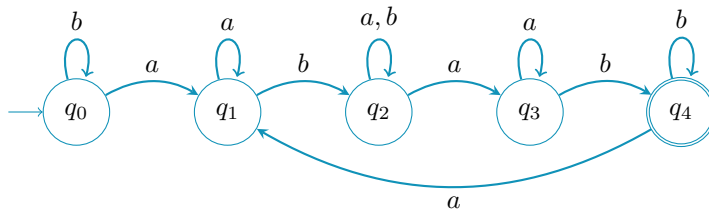
2 $/(b^*a) + a + b[ab]^*/$

3 NFA

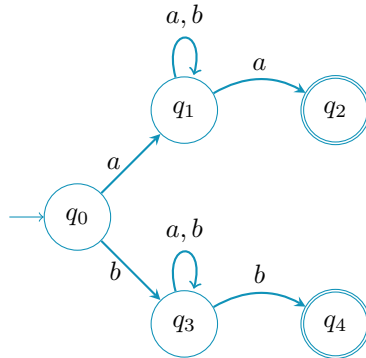
1. $L = \{w \in \{a, b\}^* \mid w \text{ contains at most two } a\text{'s}\}$



2. $L = \{w \in \{a, b\}^* \mid w \text{ contains an even number of occurrences of } ab \text{ as a subword}\}$



3. $L = \{w \in \{a, b\}^* \mid \text{the first and the last letter of } w \text{ are identical}\}$



4 $/a * (ba\{2, \})*/$

5

$$\begin{aligned}
 S &\rightarrow aA \\
 A &\rightarrow aB \\
 B &\rightarrow aS|aC \\
 C &\rightarrow S|\epsilon
 \end{aligned}$$

6 Unmarked, N/A

7

- 1.

$$\begin{aligned}
 S &\rightarrow aA|bB \\
 A &\rightarrow aA|bS|aB|\epsilon \\
 B &\rightarrow aS
 \end{aligned}$$

2. Is ambiguous as "aaaa" can be constructed in two ways

	Rule	Result		Rule	Result
(I)	$S \rightarrow aA$	a	(II)	$S \rightarrow aA$	a
	$A \rightarrow aA$	aa		$A \rightarrow aB$	aa
	$A \rightarrow aA$	aaa		$B \rightarrow aS$	aaa
	$A \rightarrow aA$	aaaa		$S \rightarrow aA$	aaaa
	$A \rightarrow \epsilon$	<u>aaaa</u>		$A \rightarrow \epsilon$	<u>aaaa</u>

- 8 The CFG is used to create a number of a's with an equivalent number of b's, in any order.