Automata

Course Work 1.3
F29LP

Submitted by

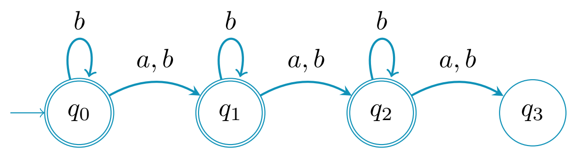
Yoav Levi
H00347035

1 $/(ab)*/$

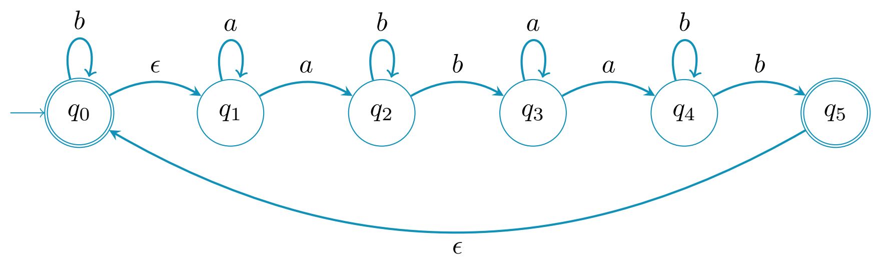
2 $/(b*a)+a+b[ab]*/$

3 NFA

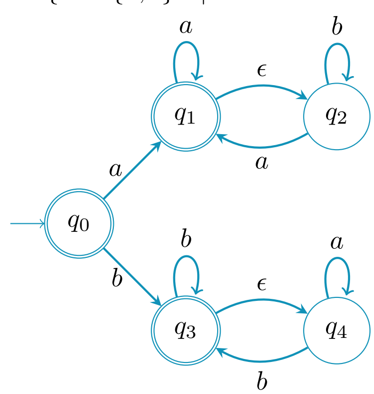
1. $L = \{w \in \{a, b\} * |$w contains at most two a's$\}$



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



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



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

5

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

6 Unmarked, N/A

7

1.

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

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

(I)

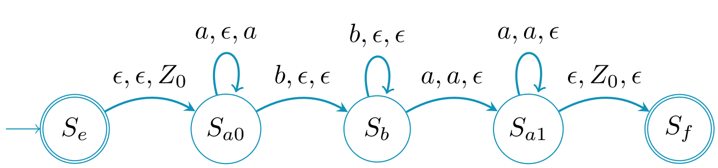
Rule	Result
$S \to aA$	a
$A \to aA$	aa
$A \to aA$	aaa
$A \to aA$	aaaa
$A \to \epsilon$	<u>aaaa</u>

(II)

Rule	Result
$S \to aA$	a
$A \to aB$	aa
$B \to aS$	aaa
$S \to aA$	aaaa
$A \to \epsilon$	<u>aaaa</u>

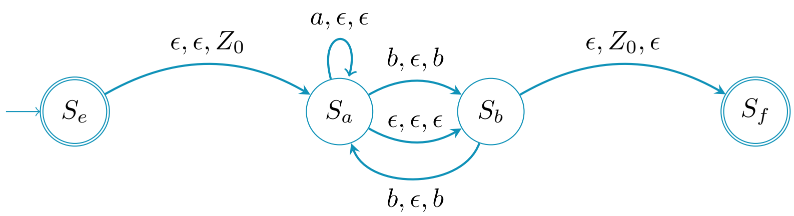
8 The CFG is used to create a number of a's with an equivalent number of b's, in any order.

9 $L = \{a^m b^n a^m | m, n \geq 0\}$, alphabet $= \{a, b, Z_0\}$, Empty stack acceptance

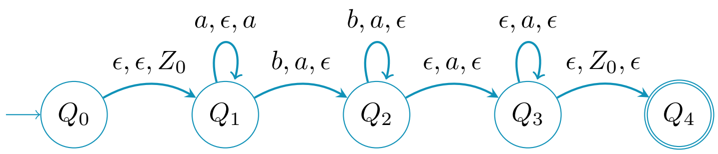


10 **Not possible as DFA express regular languages, and $a^m b^n a^m$ is a only expressible as a context-free language.**

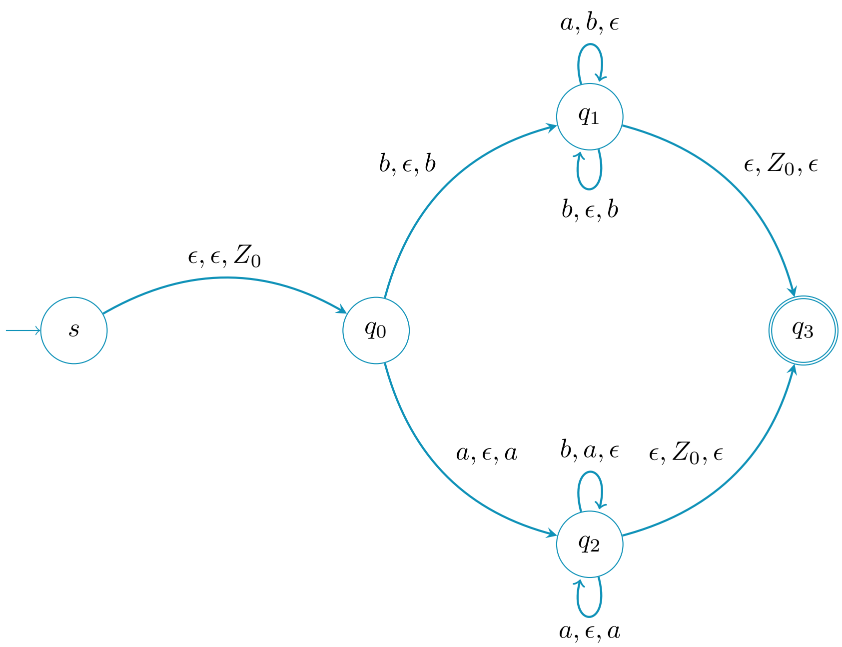
11 **L=$\{a^m b^{2n} | m, n \geq 0\}$, Empty stack acceptance**



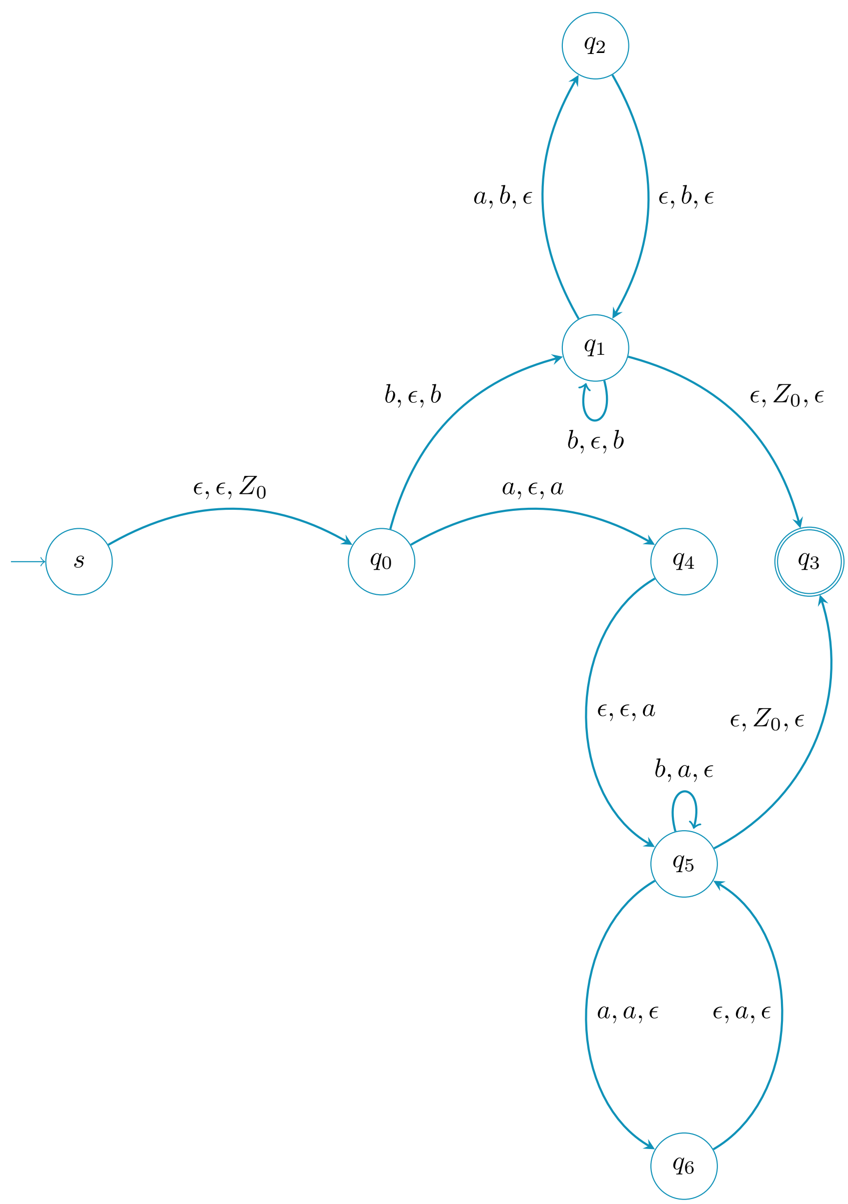
12 **L=$\{a^m b^n | m > n > 0\}$, Empty stack acceptance**



13 $L = \{W | \#_a W = \#_b W\}$, Empty stack acceptance



14 L=$\{W | \#_a W = 2\#_b W\}$, Empty stack acceptance



15 $L = \{W | \#_a W \neq \#_b W\}$, Full stack acceptance