

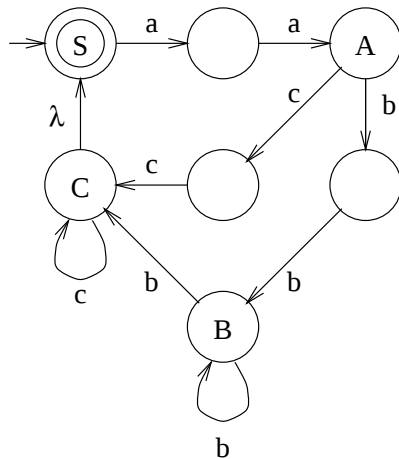
Automata Theory: Solutions 4

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Problem 1

Draw an NFA that accepts the language defined by the following grammar:

$$\begin{aligned}
 S &\rightarrow aaA \mid \lambda \\
 A &\rightarrow bbB \mid ccC \\
 B &\rightarrow bB \mid bC \\
 C &\rightarrow cC \mid S
 \end{aligned}$$



Problem 2

Give a right-linear grammar for the following language:

$$\{b^n ab^m a : n \geq 2, m \geq 2\}$$

$$S \rightarrow bbA$$

$$A \rightarrow bA \mid abbB$$

$$B \rightarrow bB \mid a$$

Problem 3

Prove or disprove the following statement:

For every regular language L , its star-closure L^* is also regular.

Since L is a regular language, we can describe it by some regular expression r . Then, r^* is a regular expression that corresponds to the language L^* . Since L^* is described by a regular expression, it is a regular language. We conclude that, if L is regular, then L^* is also regular.