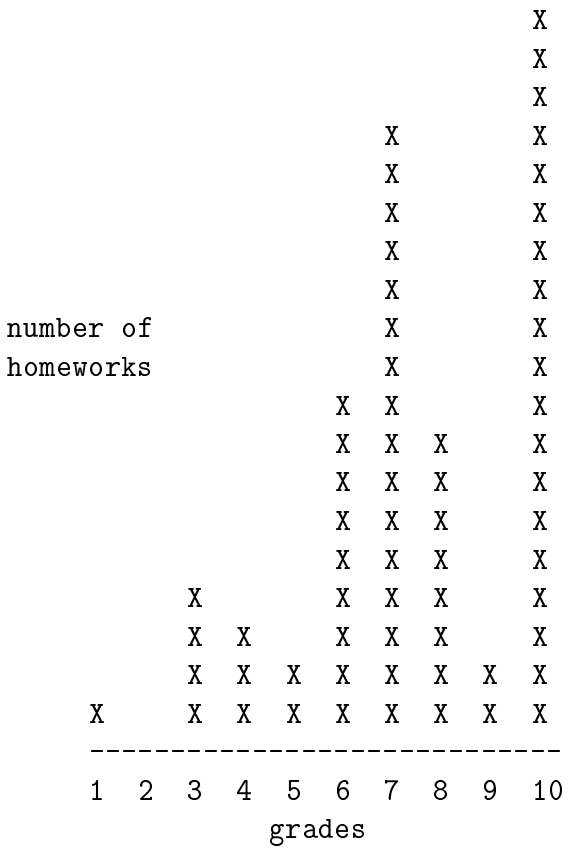
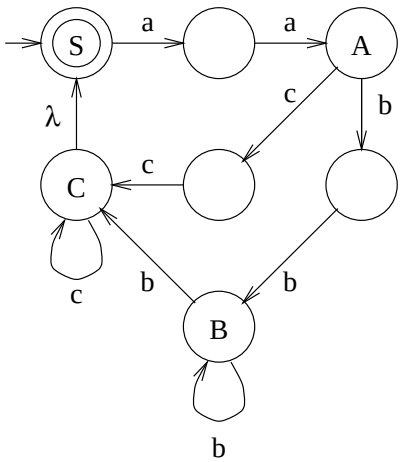
Automata Theory: Solutions 4



Problem 1
Draw an NFA that accepts the language defined by the following grammar:

$S \to aaA \mid \lambda$
$A \to bbB \mid ccC$
$B \to bB \mid bC$
$C \to cC \mid S$



Problem 2
Give a right-linear grammar for the following language:

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

$S \to bbA$
$A \to bA \mid abbB$
$B \to bB \mid a$

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.