

第五次课后作业参考答案

March 29, 2017

必做题

1

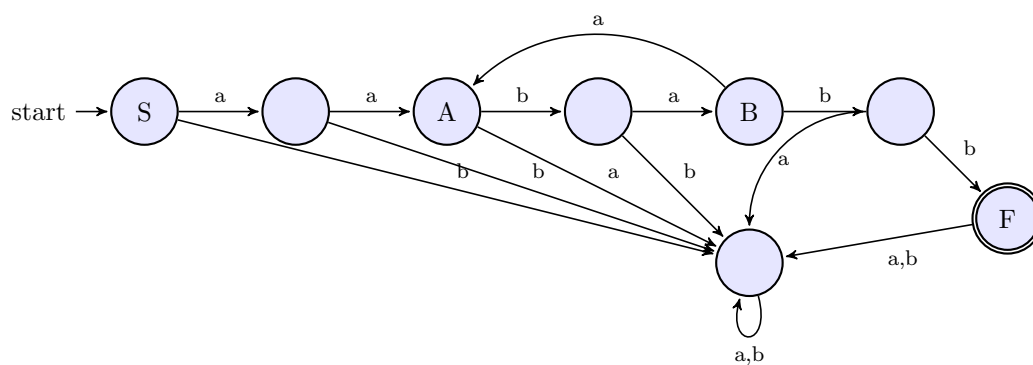
Construct a DFA that accepts the language generated by the grammar

$$S \rightarrow aaA, A \rightarrow baB, B \rightarrow aA|bb$$

For this language construct a left-linear grammar, too.

解答:

DFA:



Left-linear grammar:

$$\begin{aligned} Z &\rightarrow Bbb \\ B &\rightarrow Aba \\ A &\rightarrow Ba|aa|Saa \\ S &\rightarrow \varepsilon \end{aligned}$$

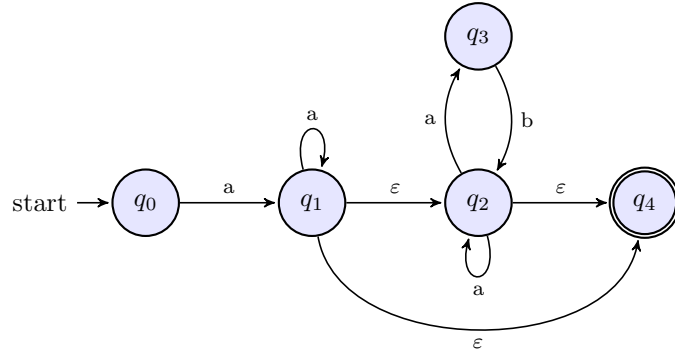
2

Find a regular grammar that generates the language

$$L(aa^*(ab+a)^*)$$

解答:

(a) Constructer a NFA:



(b) Using S for q_0 , A for q_1 , B for q_2 , C for q_3 , a right-linear grammar is:

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

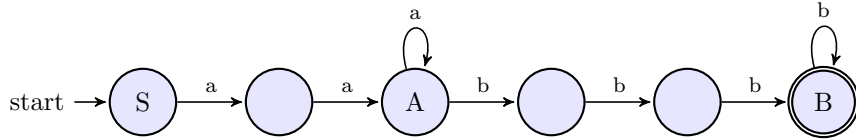
3

Construct a right- and left-linear grammar for the language:

$$L = \{a^n b^m : n \geq 2, m \geq 3\}$$

解答:

(a) Constructer a NFA:



(b) Right-linear grammar:

$$\begin{aligned} S &\rightarrow aaA \\ A &\rightarrow aA|bbbB \\ B &\rightarrow bB|\varepsilon \end{aligned}$$

(c) Left-linear grammar:

$$\begin{aligned} Z &\rightarrow B \\ A &\rightarrow Aa|aa \\ B &\rightarrow Bb|Abbb \end{aligned}$$

4

L_1 and L_2 are regular languages. Using regular grammar to prove that:

1. $L_1 \cup L_2$ is also a regular language.
2. $L_1 L_2$ is also a regular language.

证明:

(略)