Problem

Use the procedure described in Lemma 1.55 to convert the following regular expressions to nondeterministic finite automata.

a. $(0 \cup 1)^* 000 (0 \cup 1)^*$

b. $(((00)^*(11)) \cup 01)^*$

c. $\emptyset^*$

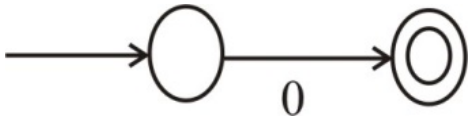
Step-by-step solution

Step 1 of 4

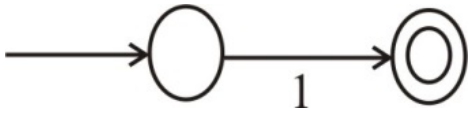
a. Consider the regular expression $R = (0 \cup 1)^* 000 (0 \cup 1)^*$.

Now, construct an NFA from this regular expression in the following procedure:

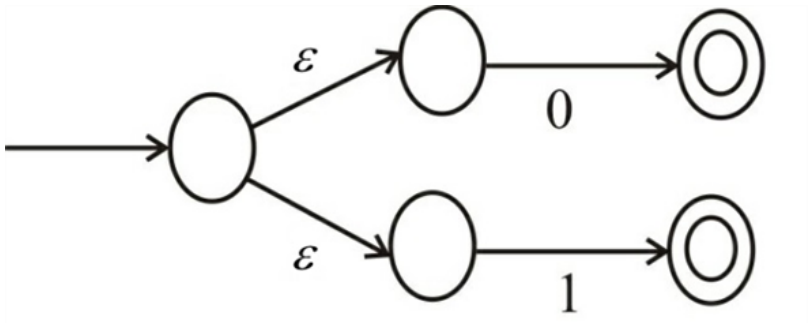
0



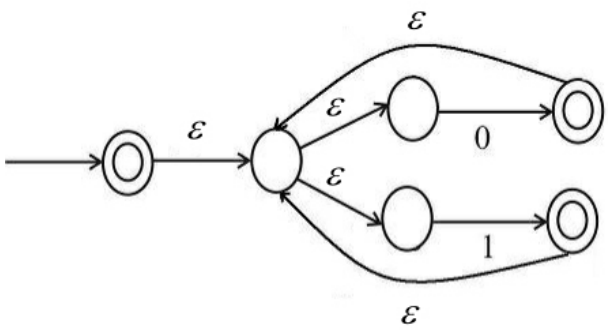
1



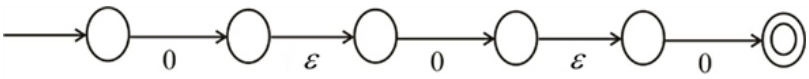
$0 \cup 1$



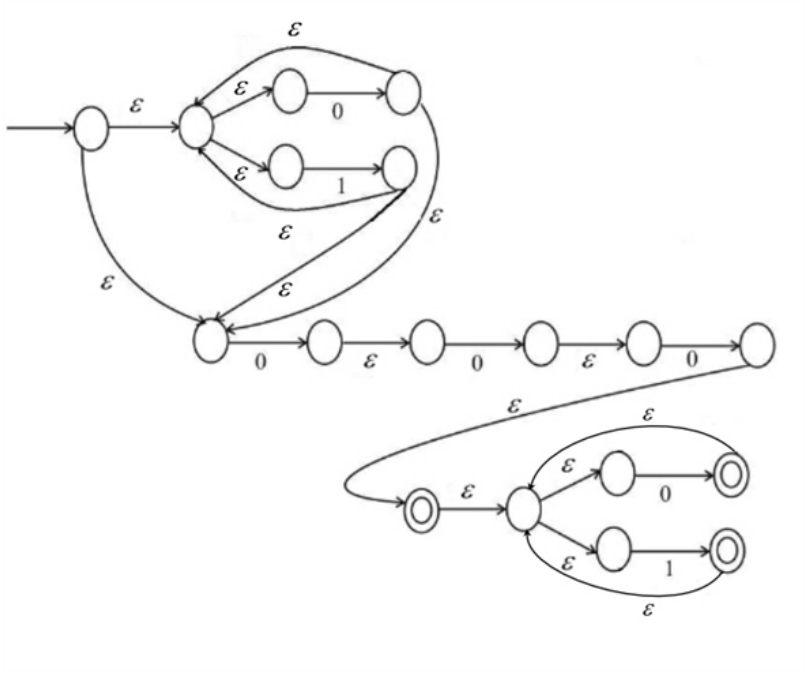
$(0 \cup 1)^*$



000



$(0\cup1)*000(0\cup1)*$



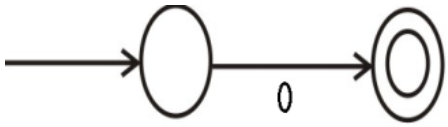
Comments (12)

Step 2 of 4

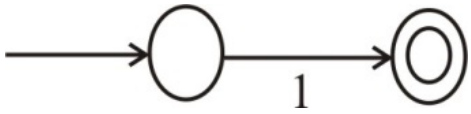
b. Consider the regular expression $R=\left(((00)*(11))\cup01\right)*$.

Now, construct the NFA from this regular expression in the following procedure:

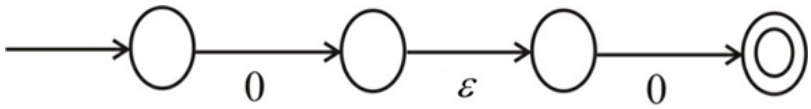
0



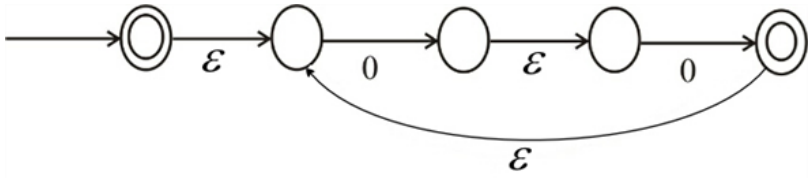
1



00



$(00)*$

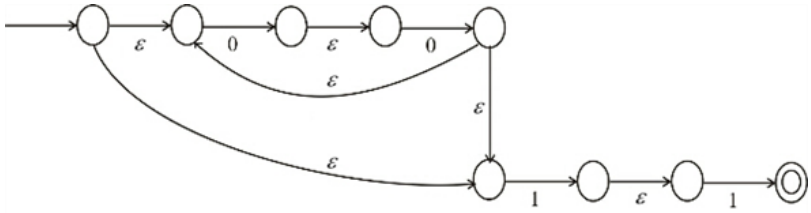


Comment

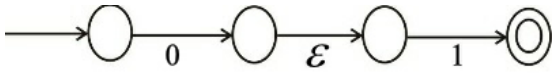
Step 3 of 4

11

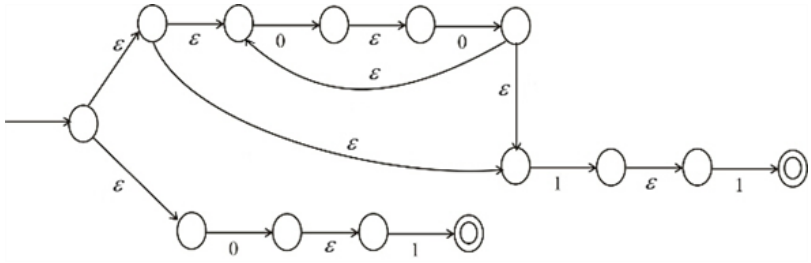
$(00)^*11$



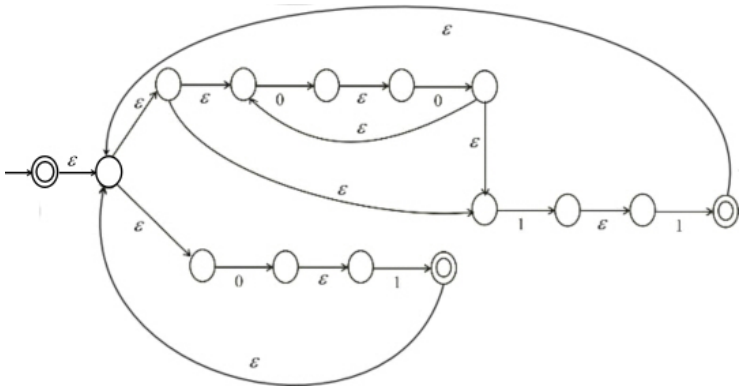
01



$(((00)^*(11))\cup(01))$



$(((00)^*(11))\cup(01))^*$



Comments (2)

Step 4 of 4

c. Consider the regular expression $R = \phi^*$.

The closure of an empty set is an empty string i.e., $\phi^* = \{\varepsilon\}$. The NFA for the regular expression is as follows:

Comment