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November 29, 2020

Example 5.23 Convert the following regular grammar into FA:

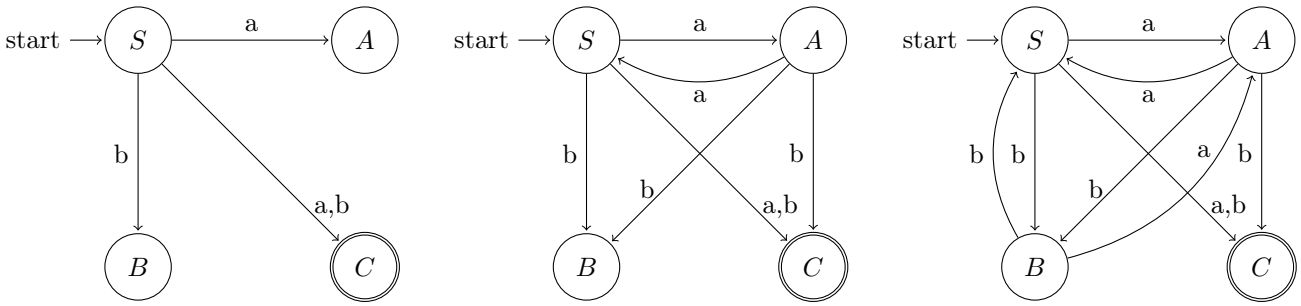
$$S \to aA/bB/a/b$$
$$A \to aS/bB/b$$
$$B \to aA/bS.$$

Solution: In the grammar, there are three non-terminals, namely S, A, and B. Therefore, the numbers of states of the FA is four. Let us name the final state as C.

i For the production $S \to aA/bB/a/b$, the transitional diagram is given in Fig 1a

ii For the production $A \to aS/bB/b$, the transitional diagram including the previous one is given in Fig 1b.

iii For the production $B \to aA/bS$, the transitional diagram including the previous one is given in Fig 1c.



(a) (b) (c)

Example 5.24 Convert the following regular grammar into FA:

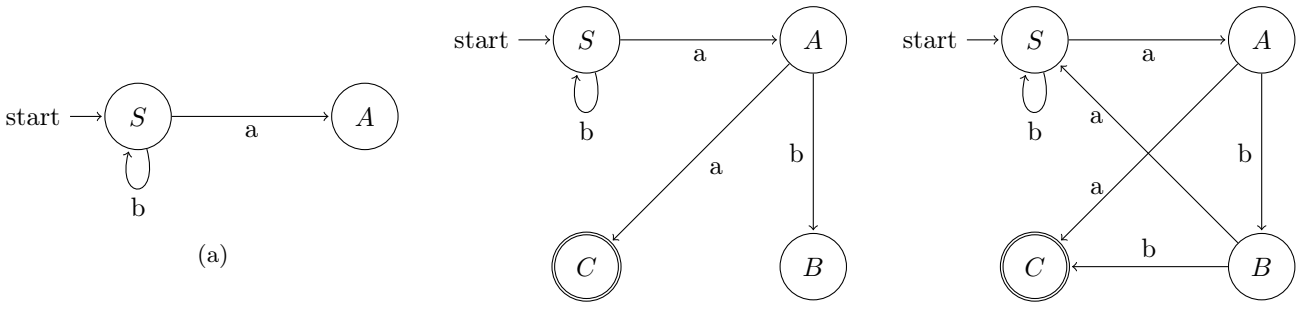
$$S \to aA/bS$$
$$A \to bB/a$$
$$B \to aS/b.$$

Solution: In the grammar, there are three non-terminals, namely S, A, and B. Therefore, the numbers of states of the FA is four. Let us name the final state as C.

i For the production $S \to aA/bS$, the transitional diagram is given in Fig 2a

ii For the production $A \to bB/a$, the transitional diagram including the previous one is given in Fig 2b.

iii For the production$B \to aS/b$, the transitional diagram including the previous one is given in Fig 2c.



(a) (b) (c)