

1. Draw an NFA that accepts the language $\{w \mid \text{there is exactly one block of 0s of even length}\}$. (A “block of 0s” is a maximal substring of 0s.)
2. (a) Draw an NFA for the regular expression $(010)^* + (01)^* + 0^*$.
(b) Now using the powerset construction (also called the subset construction), design a DFA for the same language. Label the states of your DFA with names that are sets of states of your NFA.

Solution: 1. The NFA is as presented bellow:

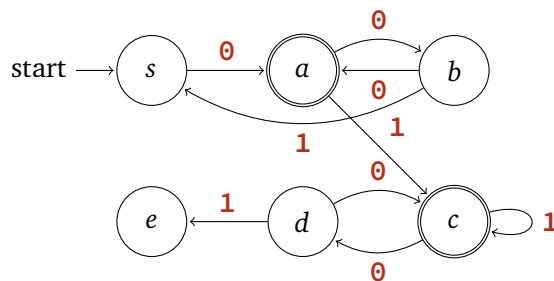


Figure 1. NFA that accepts $\{w \mid \text{there is exactly one block of 0s of even length}\}$

2. (a) Regular expression $(010)^* + (01)^* + 0^*$ accepted by NFA is presented below:

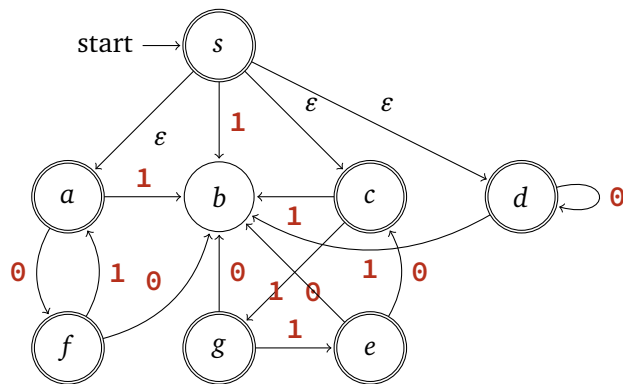


Figure 2. NFA that accepts $(010)^* + (01)^* + 0^*$

(b) Regular expression $(010)^* + (01)^* + 0^*$ accepted by DFA is presented below:

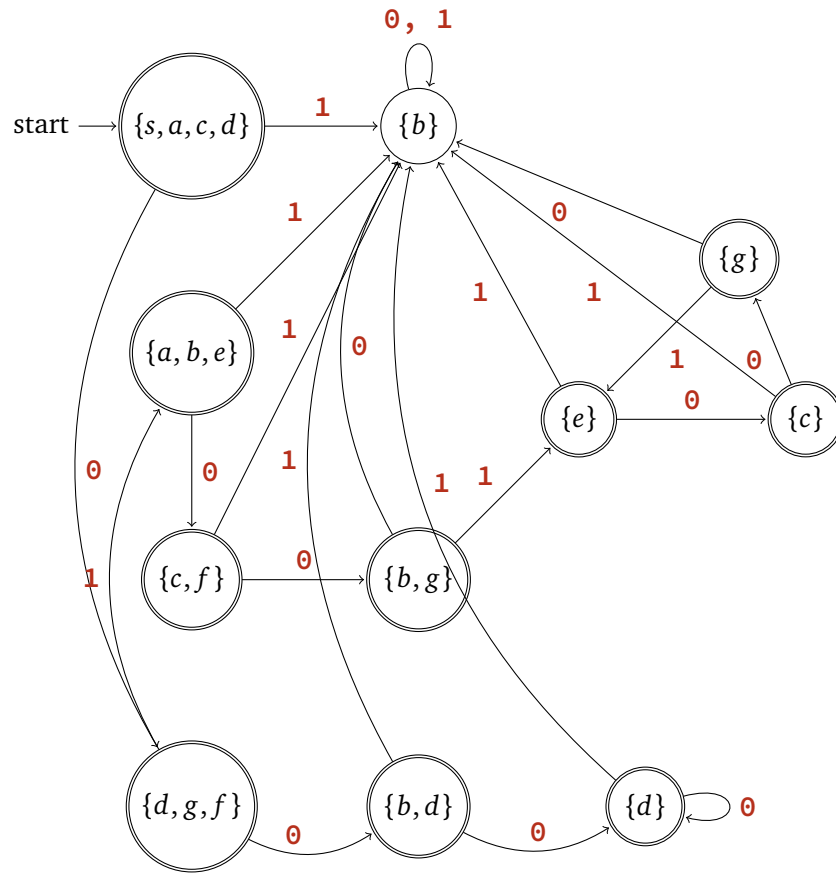


Figure 3. DFA that accepts $(010)^* + (01)^* + 0^*$

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