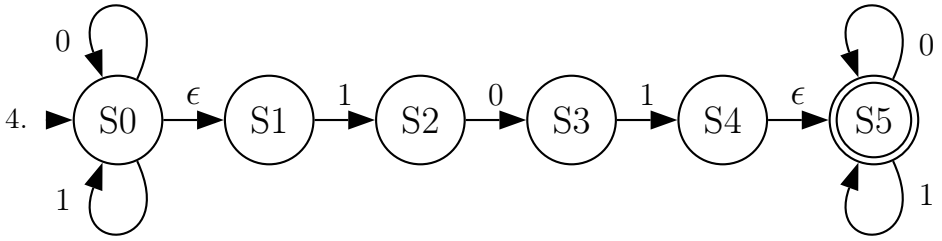
Of course automata are not unique, so the ones you create for some parts could be different.

1. If there any path for the string that ends at a final state of the NFA.

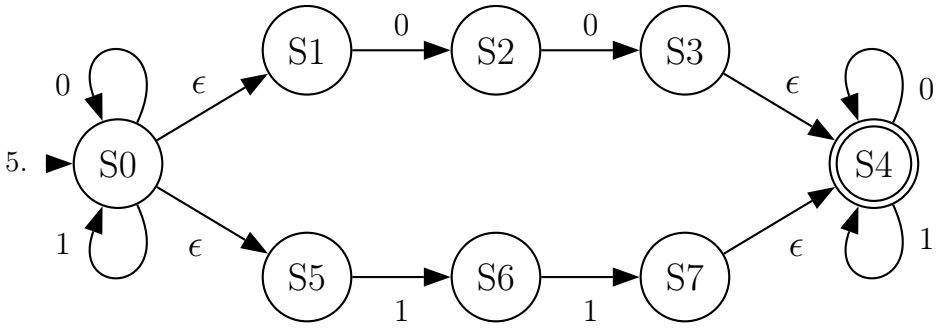
2. 2^n

3. $(010)^*(0 \mid)$

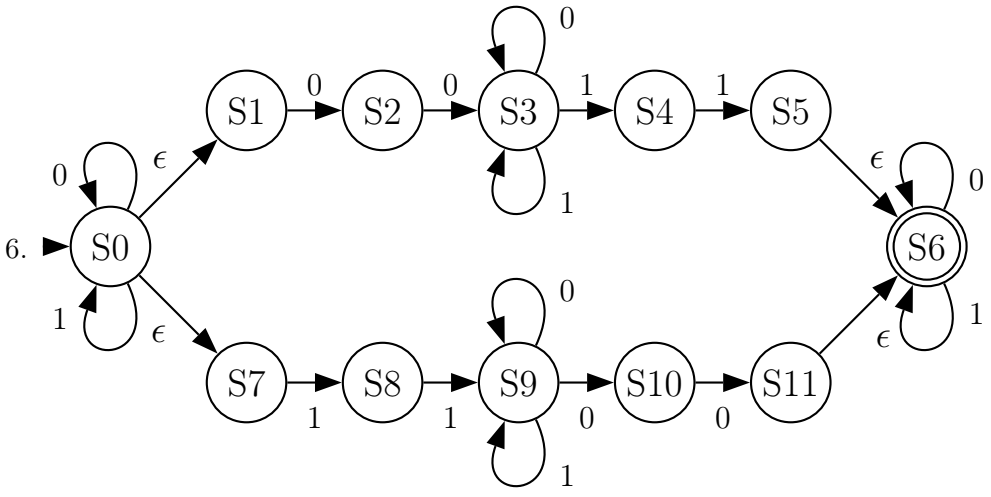
4.



5.



6.



7. If you wrote different NFAs (or even used different state names) your results could vary.

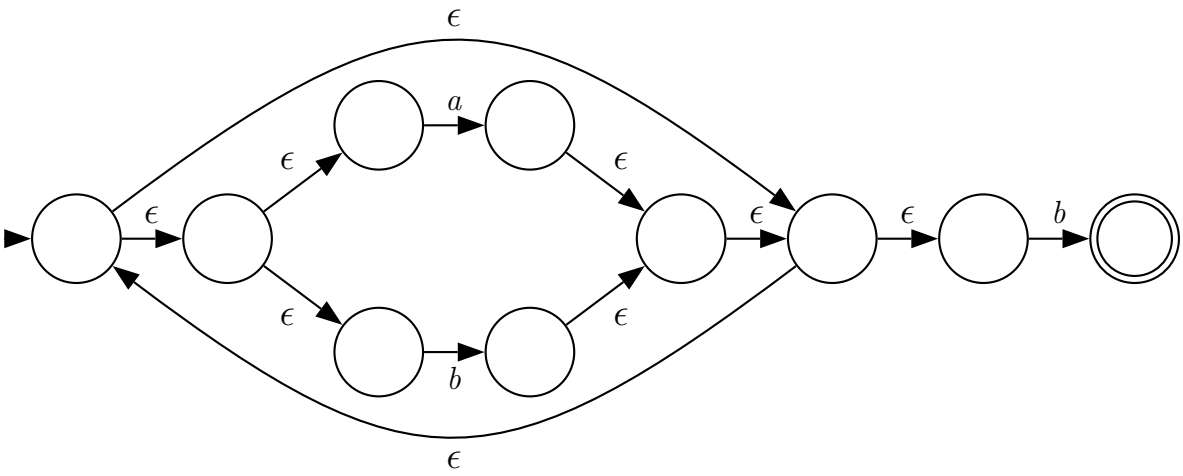
   a. For the start state of the NFA in question 3, $\epsilon-closure(\text{S0}) = \{\text{S0}, \text{S3}\}$

   b. For the start state of the NFA in question 4, $\epsilon-closure(\text{S0}) = \{\text{S0}, \text{S1}\}$

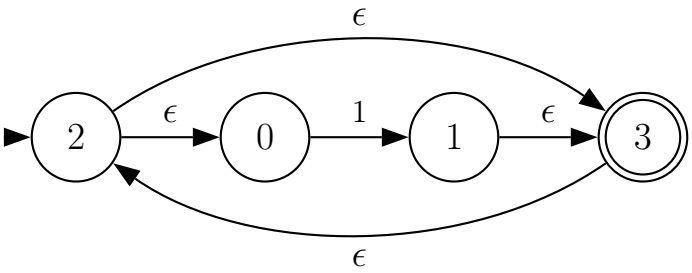
c. For the start state of the NFA in question 5, $\epsilon-closure(\text{S0}) = \{\text{S0}, \text{S1}, \text{S5}\}$

d. For the start state of the NFA in question 6, $\epsilon-closure(\text{S0}) = \{\text{S0}, \text{S1}, \text{S7}\}$

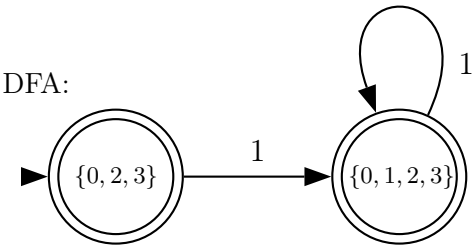
8.



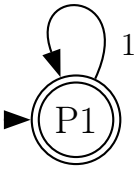
9. a. NFA (states are numbered in the order that we added them):



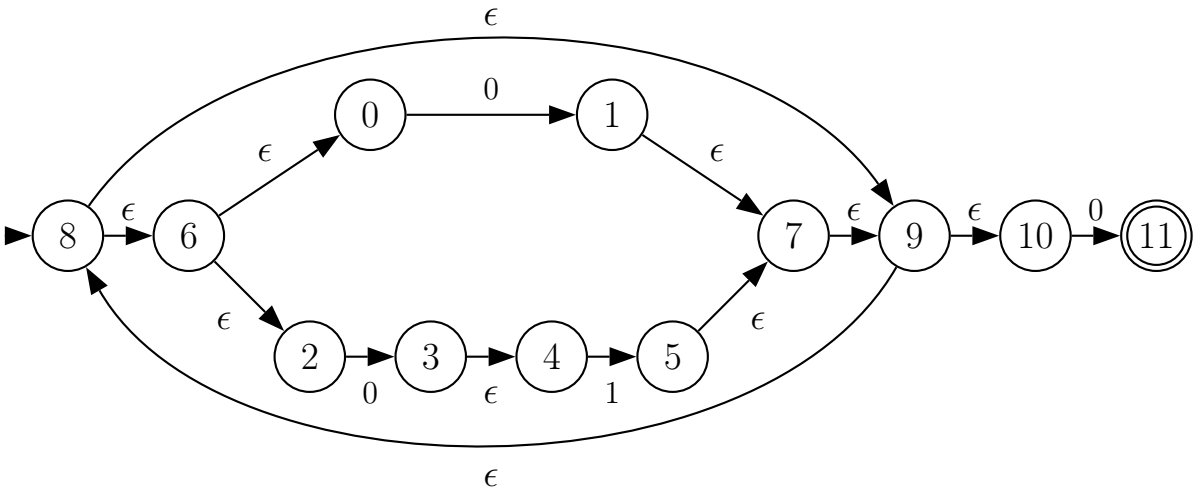
b. DFA:



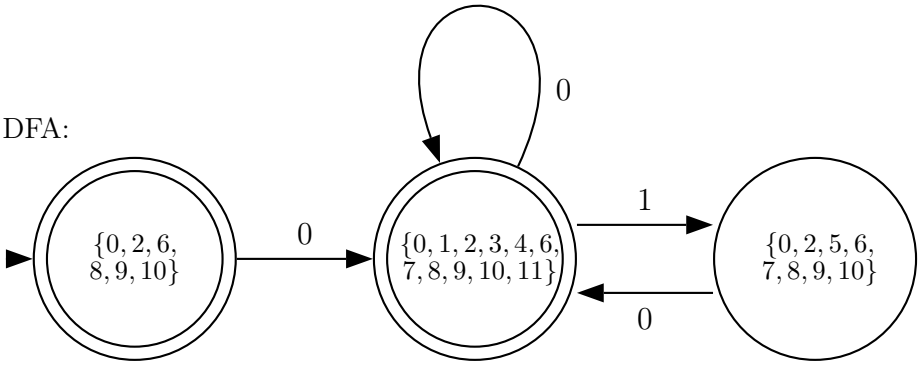
c. Minimal DFA:



10. a. NFA (states are numbered in the order that we added them):



b. DFA:



c. Minimal DFA: