3.6 The Equivalence of DFA and NFA.

Despite their apparent differences, DFAs and NFAs recognize exactly the same set of languages. That is

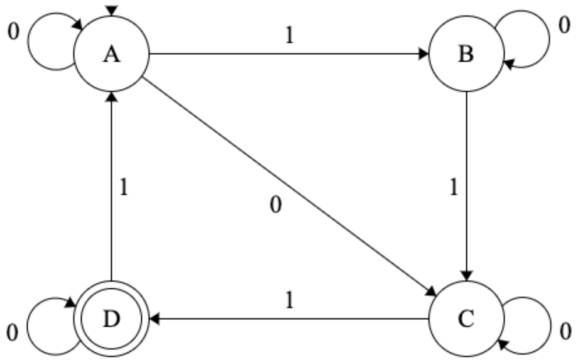
- If the language L is recognized by a DFA M, then there is also and NFA N that recognizes L.
- If the language L is recognized by a DFA N, then there is also and NFA M that recognizes L.

To prove this, we need

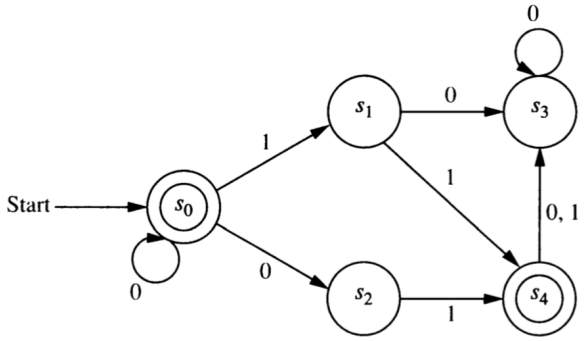
- Algorithm 1: an algorithm that converts DFAs into equivalent NFAs
- Algorithm 2: an algorithm that converst NFAs into equivalent DFAs.

20. One of these two algorithms is super easy. Which one? What is the algorithm?

21. The other direction is more interesting. Let's see if we can figure out a general algorithm for this task by first exploring an example. Consider the following NFA. Create an equivalent DFA, using a method that could be applied to any NFA.



22. Now convert the NFA N_1 into an equivalent DFA. Here's N_1 again.



23. If an NFA has n states and we use this method to convert it to a DFA, what is the most states the DFA might have?