

## Assignment 2

due Wednesday, October 18, 2023

1. Use the conversion of a regular expression to an NFA in the text (Theorems 1.45, 1.47, and 1.49 and Example 1.56 in the 3rd ed of the text) to give an NFA for each of the following:

(a)  $(\epsilon \cup 1)(01)^*(\epsilon \cup 0)$

(b)  $((0 \cup 1)(0 \cup 1))^*$

You can also see section 4.6 of *Er*.

2. Using the procedure from the text, convert the NFA in Figure 1 to an equivalent DFA.
3. Using the procedure from the text, convert the NFA in Figure 2 to an equivalent DFA.
4. Using the GNFA procedure from the text, derive an equivalent regular expression for the NFA in Figure 1.

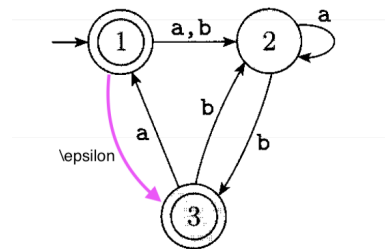


Figure 1: (*problem 2*) convert to DFA, (*problem 4*) derive regular expression

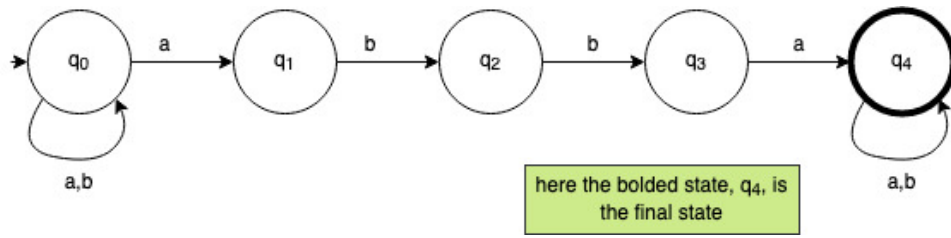


Figure 2: (problem 3) convert to DFA

Note: the relevant portion supplement *Er* mentioned above is <https://jeffe.cs.illinois.edu/teaching/algorithms/models/04-nfa.pdf>