CIT 596 Homework 3

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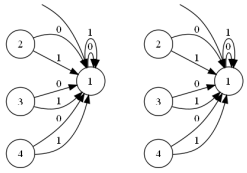
1 Exercise 1.13

Give a DFA that recognizes the language F where F is the language of all strings over $\{0, 1\}$ that do not contain a pair of 1s which are separated by an odd number of symbols.



(a) The NFA A accepts $\overline{F}$ (b) The DFA B accepts F

Figure 1: DFA for Exercise 1.13

2 Exercise 1.16b

Convert the given NFA (omitted) to a DFA.

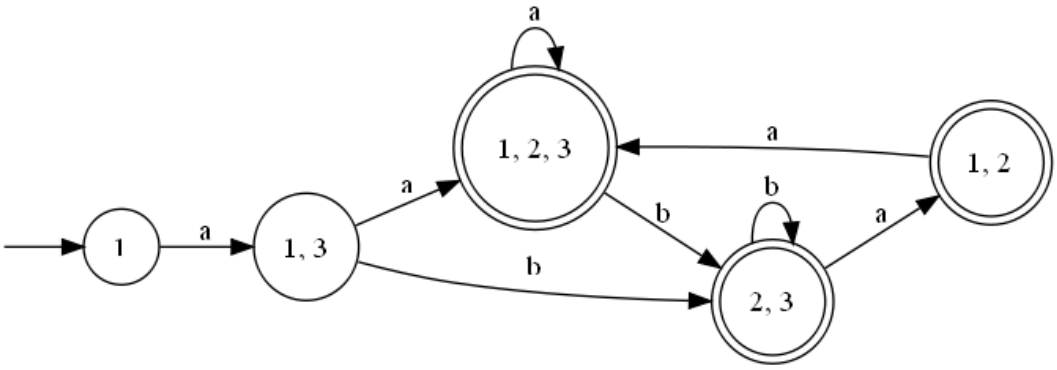


Figure 2: DFA for Exercise 1.16b

3 Exercise 1.17a

Give an NFA recognizing the language $(01 \bigcup 001 \bigcup 010)^\star$.

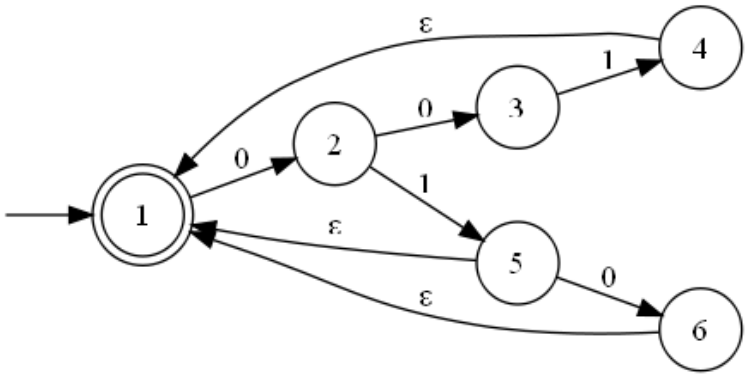


Figure 3: DFA for Exercise 1.17a

4 Exercise 1.17b

Convert the NFA from Exercise 1.17a to an equivalent DFA.

TODO

5 Exercise 1.19b

Convert the following regular expression to an NFA: $(((00)^\star(11)) \bigcup 01)^\star$.

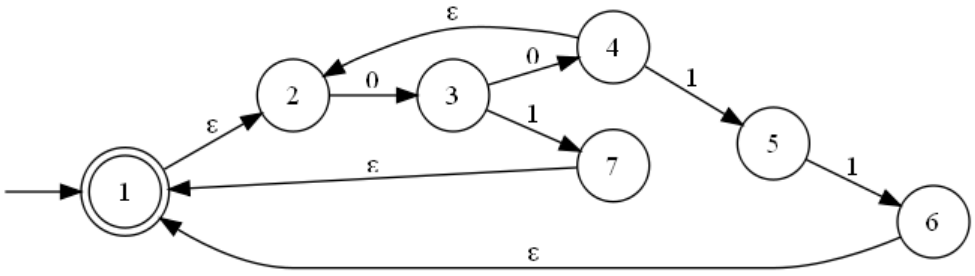


Figure 4: DFA for Exercise 1.19b

6 Exercise 1.21b

Convert the following NFA to a regular expression.

TODO

7 Exercise 1.28c

Convert the regular expression $(a \bigcup b^+)a^+b^+$ to an NFA, given that $\Sigma = \{a, b\}$.

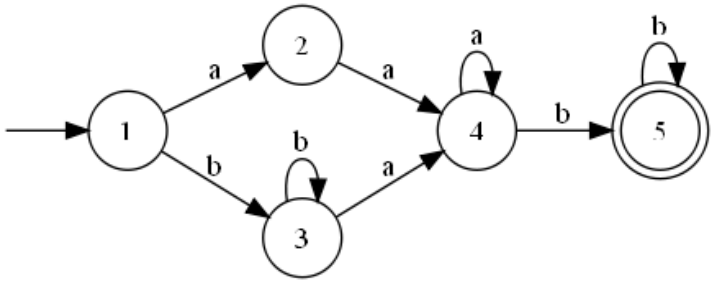


Figure 5: DFA for Exercise 1.28c

8 Exercies 1.29b

Use the pumping lemma to show that the language $A_2 = \{\omega\omega\omega \mid \omega \in \{a, b\}^\star\}$ is not regular.

TODO