CIT 596 Homework 1

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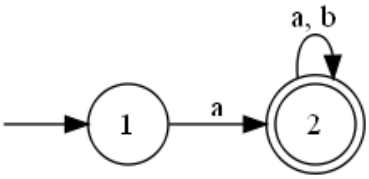
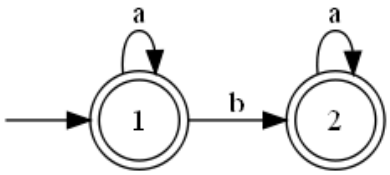
1 Exercise 1.4

1.1 Exercise 1.4 e

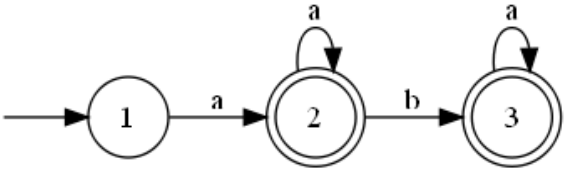
Create a DFA that accepts the language $\{\omega \mid \omega$ starts with an a and has at most one $b\}$.



(a) A accepts $\{\omega \mid \omega$ starts with an $a\}$



(b) B accepts $\{\omega \mid \omega$ has at most one $b\}$

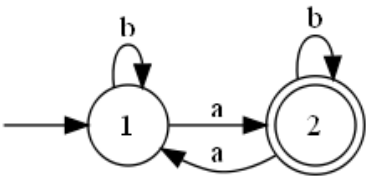


(c) DFA that accepts AB

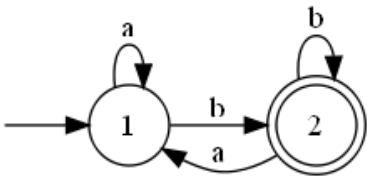
Figure 1: DFA for Exercise 1.4e

1.2 Exercise 1.4 f

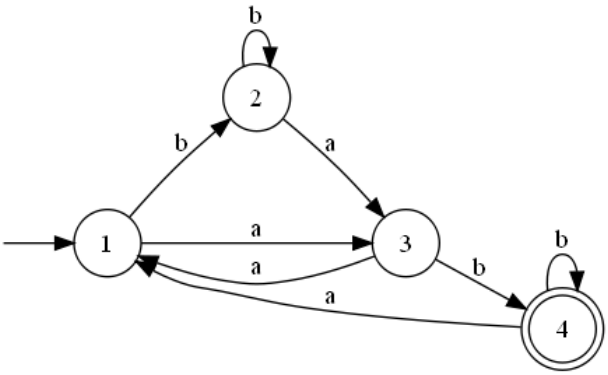
Create a DFA that accepts the language $\{\omega \mid \omega$ has an odd number of a and ends with a $b\}$.



(a) A accepts $\{\omega \mid \omega$ has an odd number of $a\}$



(b) B accepts $\{\omega \mid \omega$ ends with a $b\}$

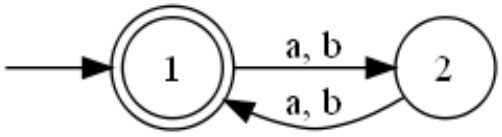


(c) DFA that accepts AB

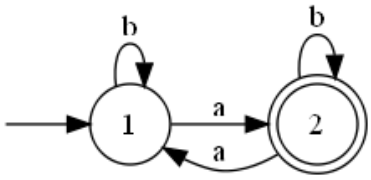
Figure 2: DFA for Exercise 1.4f

1.3 Exercise 1.4 g

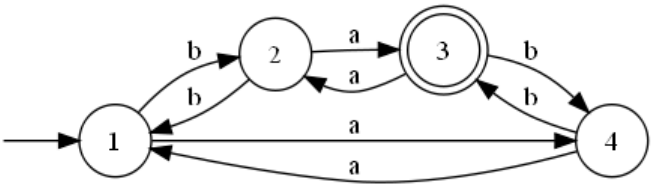
Create a DFA that accepts the language $\{\omega \mid \omega$ has an even length and an odd number of $a\}$.



(a) A accepts $\{\omega \mid \omega$ has an even length$\}$



(b) B accepts $\{\omega \mid \omega$ has an odd number of $a\}$



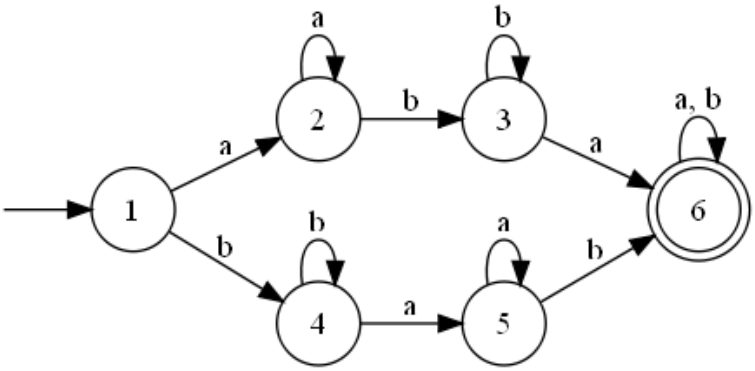
(c) DFA that accepts AB

Figure 3: DFA for Exercise 1.4g

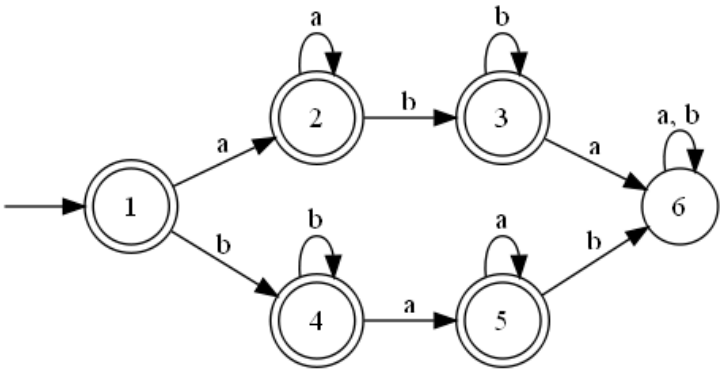
2 Exercise 1.5

2.1 Exercise 1.5 c

Create a DFA that accepts the language $\{\omega \mid \omega \text{ does not contain } ab \text{ nor } ba\}$.



(a) A accepts $\{\omega \mid \omega \text{ contains } ab \text{ and } ba\}$



(b) DFA that accepts $\overline{A}$

Figure 4: DFA for Exercise 1.5c

2.2 Exercise 1.5 e

Create a DFA that accepts the language $\{\omega \mid \omega \text{ is any string in } (ab^\star)^\star\}$.

TODO