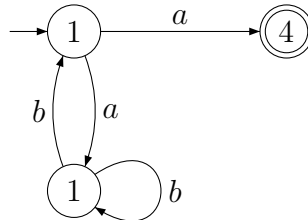


NON-DETERMINISTIC FINITE AUTOMATA

Questions:**Question 1**

Given the automaton:



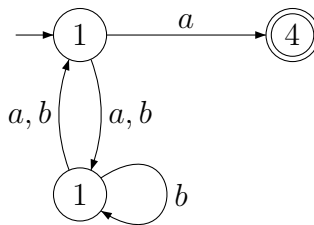
enumerate the first ten words in canonical order of the language it accepts.

Solución:

a, aba, abba, ababa, abbba, ababba, abbaba, abbbba, abababa, ababbba

Question 2

Given the automaton:



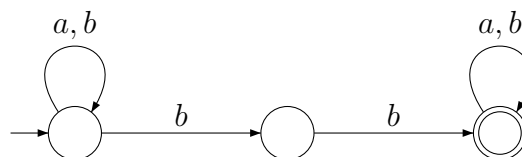
enumerate the first ten words in canonical order of the language it accepts.

Solución:

a, aaa, aba, baa, bba, abaa, abba, bbba, bbaa, bbbba

Question 3

Provide a description (the shorter the better) of the language accepted by the following automaton:

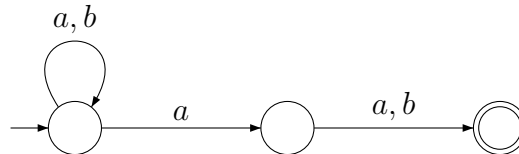


Solución:

$$L(A) = \{x \in \{a, b\}^* : bb \in \text{Seg}(x)\}$$

Question 4

Provide a description (the shorter the better) of the language accepted by the following automaton:

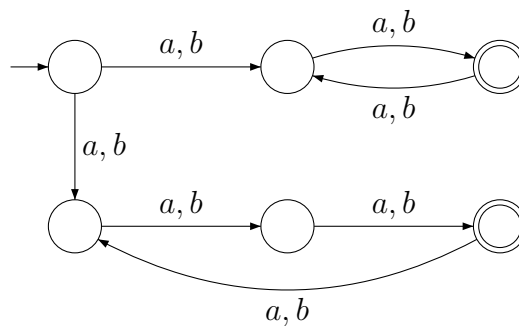
**Solución:**

The automaton accept the words over $\{a, b\}$ whose second symbol from the end is a .

Formally, $L(A) = \{a, b\}^* \{a\} \{a, b\}$.

Question 5

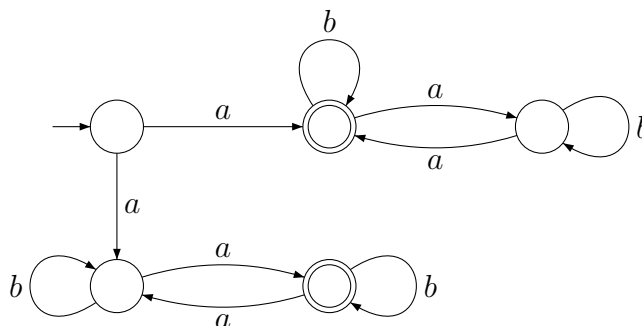
Provide a description (the shorter the better) of the language accepted by the following automaton:

**Solución:**

$$L(A) = \{x \in \{a, b\}^* : |x| \equiv 0 \pmod{2} \vee |x| \equiv 0 \pmod{3}\}.$$

Question 6

Provide a description (the shorter the better) of the language accepted by the following automaton:



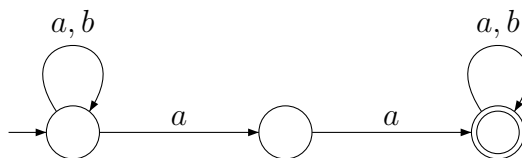
Solución:

$$L(A) = \{ax : x \in \{a, b\}^*\}.$$

Question 7

Provide a NFA to accept the language $L = \{x \in \{a, b\}^* : aa \in \text{Seg}(x)\}$

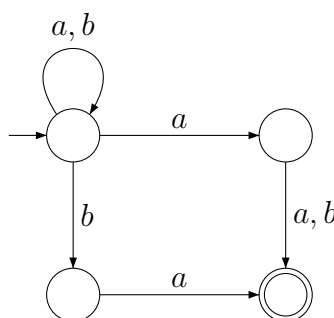
Solución:



Question 8

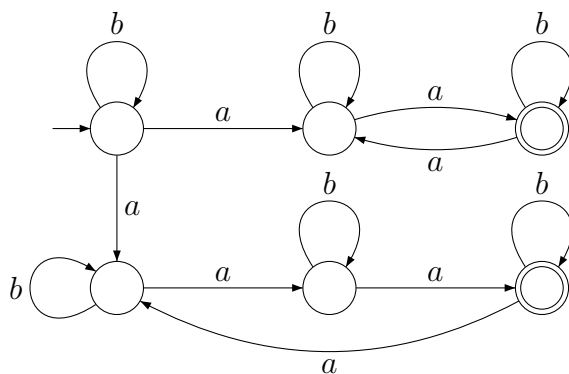
Provide a NFA to accept the language $L = \{x \in \{a, b\}^* : |x| \geq 2 \wedge bb \notin \text{Suf}(x)\}$

Solución:



Question 9

Provide a NFA to accept the language $L = \{x \in \{a, b\}^* : |x|_a \equiv 0 \pmod{2} \vee |x|_a \equiv 0 \pmod{3}\}$

Solución:**Question 10**

Given the language $L = \{xb : x \in \{a,b\}^*\}$, provide three different automata that accept L .

Solución: