1 DFA

A deterministic finite automaton (DFA) is a tuple

\[ A = (Q, \sigma, \delta, q_I, F) \]

where

- \( Q \) is a finite set of states,
- \( \Sigma \) is a finite alphabet,
- \( \delta : Q \times \Sigma \rightarrow Q \) is the (total) transition function,
- \( q_I \in Q \) is the initial state, and
- \( F \subseteq Q \) is the set of final states.

Example:

\[ A_1 = (Q, \sigma, \delta, q_I, F) \]

- \( Q : \{0, 1, 2, 4\} \)
- \( \Sigma : \{0, 1\} \)
- \( \delta \) : see diagram below
- \( q_I : 0 \)
- \( F : \{3\} \)
Figure 1: Automaton $A_1$

Example:
Figure 2: Automaton $A_2$