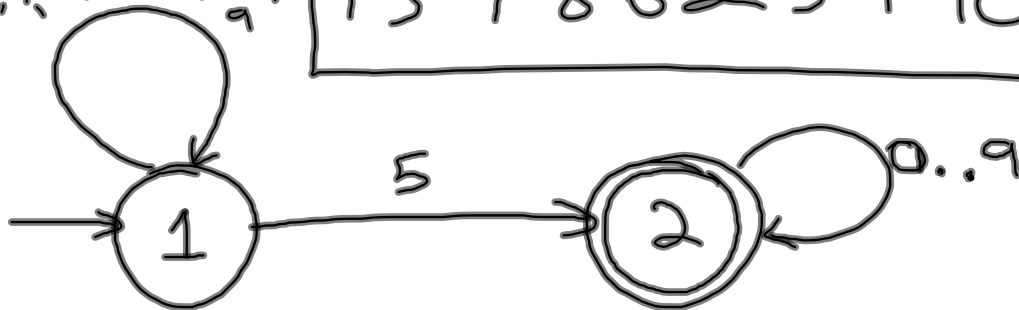


Deterministic Finite Automata (DFA)

- finite memory
- reads input 1 symbol at a time
- can't go back

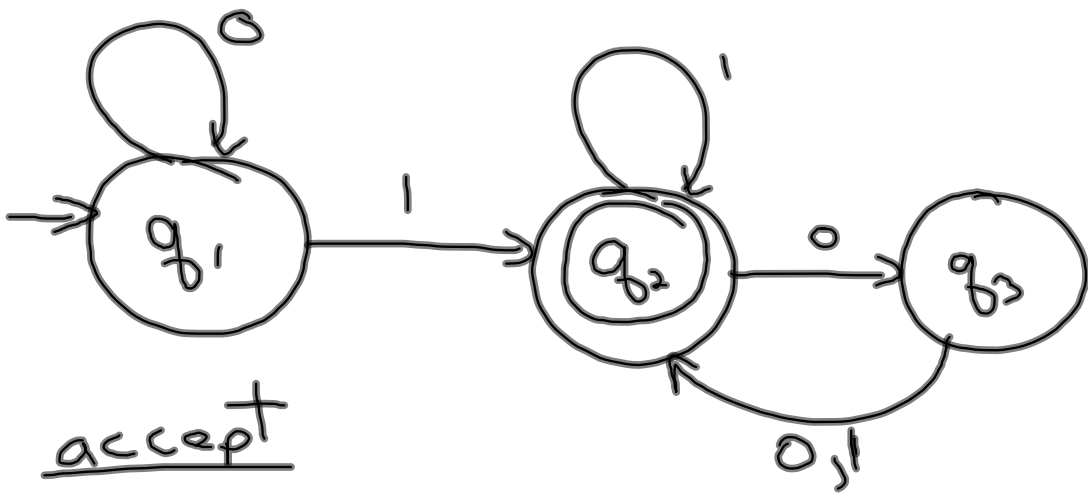
string of digits
0, 1, 2, 3, 4, 5, 6, 7, 8, 9 | 13786254901



have not read 5

string finishes here "rejected"

have read a 5
"accepted"



accept

01
 011
 1100
 11111
 0101
 10000

reject

0
 010
 1000

Formal Definition

1. set of states Q
2. an alphabet Σ
3. transition function $\delta: Q \times \Sigma^+ \rightarrow Q$
4. a start state $q_0 \in Q$
5. a set of final states $F \subseteq Q$

$$(Q, \Sigma, \delta, q_0, F)$$

$$Q = \{q_0, q_1\}$$

$$\Sigma = \{0, 1\}$$

$$\delta$$

	0	1
q_0	q_0	q_1
q_1	q_0	q_1

$$F = \{q_1\}$$

$$A = \{100\}$$

$$B = \{w \mid w \text{ contains } 100\}$$

1100