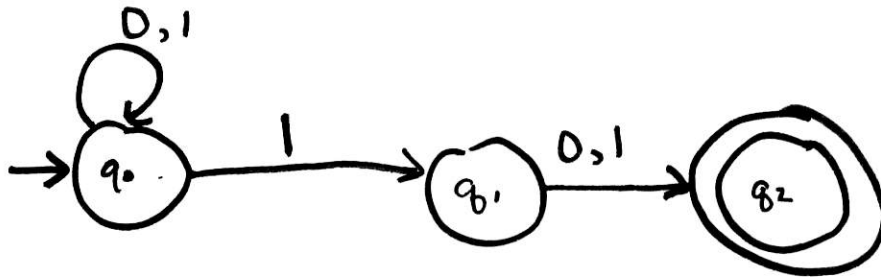


Slide 10

$A = \{ w \in \{0,1\}^* \mid \text{the second symbol from the right is one.} \}$

N s.t. $A = L(N)$

N :

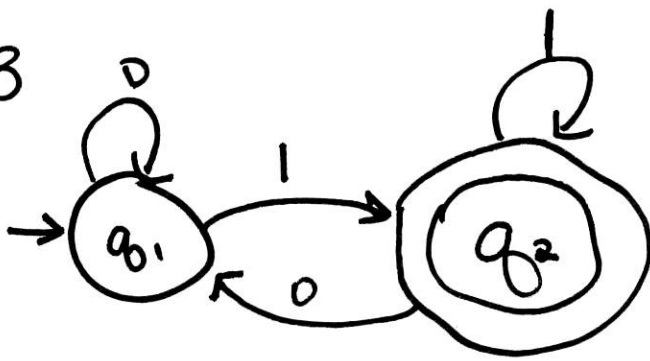


Δ :

	0	1
q_0	$\{q_0\}$	$\{q_0, q_1\}$
q_1	$\{q_2\}$	$\{q_2\}$
$*q_2$	\emptyset	\emptyset

Ex: 110

Slide 13



DFA : $(Q, \Sigma, \delta, s, F)$

- $Q = \{q_1, q_2\}$
- $\Sigma = \{0, 1\}$
- $\delta : \{q_1, q_2\} \times \{0, 1\} \rightarrow \{q_1, q_2\}$
- $s = q_1$
- $F = \{q_2\}$

NFA

- Q - same!
- Σ - same!
- $\Delta : \{q_1, q_2\} \times \{0, 1\} \rightarrow 2^Q$
- $S = \{q_1\}$
- F - same!

δ :

	0	1
$\rightarrow q_1$	q_1	q_2
$* q_2$	q_2	q_1

$2^Q : \{ \emptyset, \{q_1\}, \{q_2\}, \{q_1, q_2\} \}$

Δ (technically):

	0	1
$\rightarrow q_1$	$\{q_1, \emptyset\}$	$\{q_2, \emptyset\}$
$* q_2$	$\{q_2, \emptyset\}$	$\{q_1, \emptyset\}$

$$N = (Q, \Sigma, \Delta, S, F)$$

$$M_{DFA} = (Q, \Sigma, \delta, s, F')$$

$$Q = \{q_0, q_1, q_2\}$$

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

$$\Delta: Q \times \Sigma \rightarrow 2^Q$$

$$S = \{q_0\}$$

$$F = \{q_2\}$$

~~$$F = \{q_2\}$$~~

$$s = \{q_0\}$$

$$\delta = Q \times \Sigma \rightarrow Q$$

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

$$Q_1 = Q_0 = \{\emptyset, \{q_0\}, \{q_1\}, \{q_2\}, \{q_0, q_1\}, \dots\}$$

$$\delta:$$

	0	1
$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$
$\{q_0, q_1\}$	$\{q_0, q_1\}$	$\{q_0, q_1, q_2\}$
$\{q_0, q_2\}$	$\{q_0, q_2\}$	$\{q_0, q_1, q_2\}$
$\{q_0\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$
$\{q_1\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$
$\{q_2\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$
\emptyset	\emptyset	\emptyset
$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$
$\{q_0, q_1\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$
$\{q_0, q_2\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$
$\{q_0\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$
$\{q_1\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$
$\{q_2\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$
\emptyset	\emptyset	\emptyset

$$\Delta(q_0, 0) = \{q_0\}$$

$$\Delta(q_1, 0) = \{q_0, q_2\}$$

- Union transitions

$$\delta(\{q_0, q_1\}, 0) = \{q_0, q_1\} \cup \{q_2\}$$

$$= \{q_0, q_1, q_2\}$$

$$\{q_0, q_1, q_2\}$$

$$\{q_0, q_1, q_2\}, \{q_0, q_1, q_2\}, \{q_0, q_1, q_2\}, \dots$$

Slide 14 cont.

