Slide 10

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

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

N:
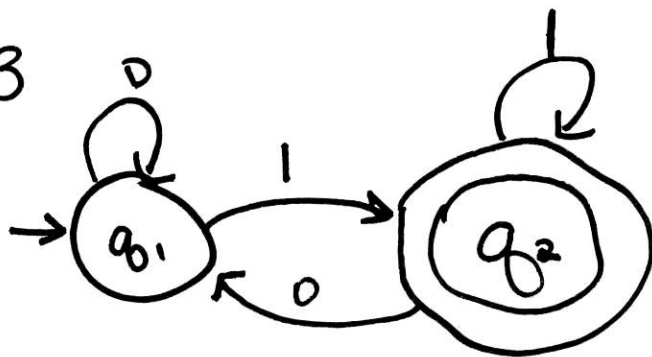

Δ:
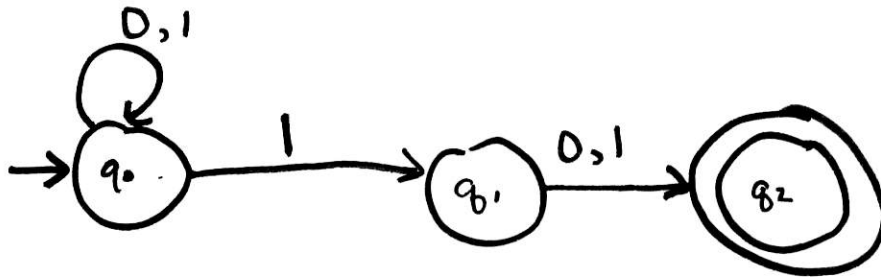
	0	1
$\rightarrow q_0$	$\{q_0\}$	$\{q_0, q_1\}$
q_1	$\{q_2\}$	$\{q_2\}$
* q_2	$\emptyset$	$\emptyset$

Ex: 1 1 0

Slide 13

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

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

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

- $\delta : \{q_1, q_2\} \times \{0, 1\} \rightarrow \{q_1, q_2\}$

- $s = q_1$

- $F = \{q_2\}$

- Q - same!

- Σ - same!

- $\Delta \cdot \{q_1, q_2\} \times \{0, 1\} \rightarrow 2^Q$

- $S - \{q_1\}$

- F - same!

δ:

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

$2^Q : \{ \overset{\phi}{\{\}}, \{q_1\}, \{q_2\}, \{q_1, q_2\} \}$

Δ (technically):

	0	1
$\rightarrow q_1$	$\{q_1\}$	$\{q_2\}$
$* \; q_2$	$\{q_2\}$	$\{q_1\}$

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

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

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

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

$S = \{q_0\}$

$F = \{q_2\}$

DFA

$M = (Q_1, \Sigma, \delta, s, F_1)$

$Q_1 = 2^Q = \{\emptyset, \{q_0\}, \{q_1\}, \{q_2\}...\}$

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

$\delta = Q_1 \times \Sigma \to Q_1$

$s = \{q_0\}$

$F = \{\{\cancel{q_0}\}\}$

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

$\delta:$

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

- <u>Union transitions</u>

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

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

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