FSM

20 September 2023 12:35

Mealy M/C

$Z(t) = f(q(t), x(t))$

Moore M/C

$Z(t) = f(q(t))$

Def": $(Q, \Sigma, \Delta, \delta, \lambda, q_0)$

Σ : i/p, Δ : o/p, δ : o/p fn

Moore M/C: $\lambda : Q \longrightarrow \Delta$

Mealy M/C: $\lambda : Q \times \Sigma \rightarrow \Delta$

Eg: Moore M/C

Present state	Next state δ		o/p λ
	a=0	a=1	
$\rightarrow q_0$	q_3	q_1	0
q_1	q_1	q_2	1
q_2	q_2	q_3	0
q_3	q_3	q_0	0

0 1 1 1

$q_0 \xrightarrow{0} q_3 \xrightarrow{1} q_0 \xrightarrow{1} q_1 \xrightarrow{1} q_2$

0 0 0 0 0

0 1 1 1 ⟶ 0 0 0 1 0 (o/p)

i/p

$n \rightarrow n+1$

Melay M/C

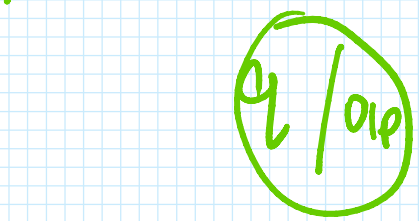
P.S.	Next state, a=0	o/p	Next state, a=1	o/p
→ q_1	q_3	0	q_2	0
q_2	q_1	1	q_4	0
q_3	q_2	1	q_1	1
q_4	q_4	1	q_3	0

0 1 1 1

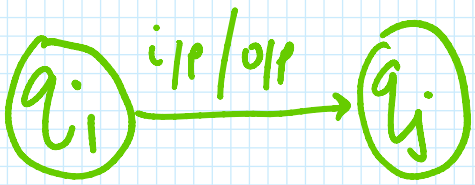
$q_1 \xrightarrow[0]{0} q_3 \xrightarrow[1]{1} q_1 \xrightarrow[0]{1} q_2 \xrightarrow[0]{1} q_4$

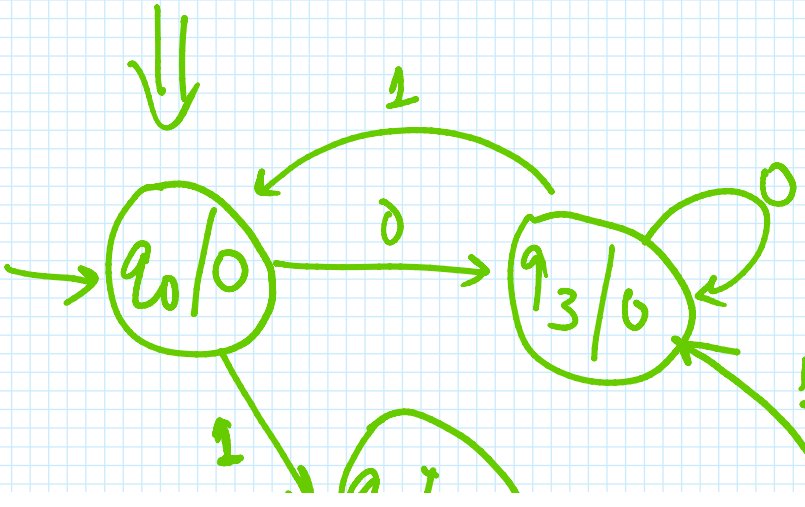
n → n

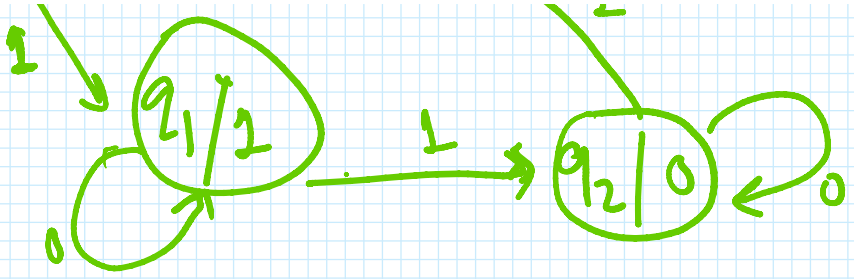
Moore M/c



Melay







Transforming Moore M/c to Mealy M/c

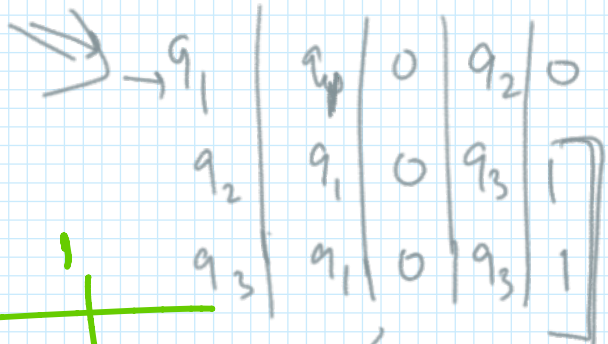
Equivalent Mealy M/c from ex.

P.S.	next state, $a=0$	O/P	next state, $a=1$	O/P
→ q_0	q_3	0	q_1	1
q_1	q_1	1	q_2	0
q_2	q_2	0	q_3	0
q_3	q_3	0	q_0	0

Eg: Moore M/c

	0	1	O/P
→ q_1	q_1	q_2	0
q_2	q_1	q_3	0
q_3	q_1	q_3	1

→ Mealy M/c?



	0		1	
→ q_1	q_1	0	q_2	0

→ q_1	q_1	0	q_2	0
q_2	q_{11}	0	q_{21}	1

Transforming Delay M/c into Moore M/c

Ex:

	a=0	a=1	
→ q_1	q_3	0	q_2	0
q_2	q_1	1	q_4	0
q_3	q_2	1	q_1	1
q_4	q_4	1	q_3	0

split q_2 as q_{20} & q_{21}

also split q_4 as q_{40} & q_{41}

Moore M/c

	a=0	a=1	q_P
→ q_1	q_3	q_{20}	1
q_{20}	q_1	q_{40}	0
q_{21}	q_1	q_{40}	1
q_3	q_{21}	q_1	0
q_{40}	q_{41}	q_3	0
q_{41}	q_{41}	q_3	1