

δ O I
 → A B E
 C F
 * C D H
 E H
 F I
 * F G B
 H B
 I C
 * I A E

	B	x							
*	C	x	x						
	D			x					
	E	x		x	x				
*	F	x	x		x	x			
	G		x	x		x	x		
	H	x		x	x		x	x	
*	I	x	x		x	x			x
	A	B	C	D	E	F	G	H	

δ	0	1
(A,B)	(B,A)	(E,F)
(A,D)	(B,E)	(E,H)
(A,E)	(B,F)	(E,I)
(A,G)	(B,H)	(E,B)
(A,H)	(B,I)	(E,C)
(B,D)	(C,E)	(F,H)
(B,E)	(C,F)	(F,I)
(B,G)	(C,H)	(F,B)
(B,H)	(C,I)	(F,C)
(D,E)	(E,F)	(H,I)
(D,G)	(E,H)	(H,B)
(D,H)	(E,I)	(H,C)
(E,G)	(F,H)	(I,B)
(E,H)	(F,I)	(I,C)
(G,H)	(H,I)	(B,C)

δ	0	1
(A,D)	(B,E)	(E,H)
(A,G)	(B,H)	(E,B)
(B,E)	(C,F)	(F,I)
(B,H)	(C,I)	(E,C)
(D,G)	(E,H)	(H,B)
(E,H)	(F,I)	(I,C)

From the above table

$A \equiv D$ & $D \equiv G$ & $A \equiv G$

$A \equiv D \equiv G$

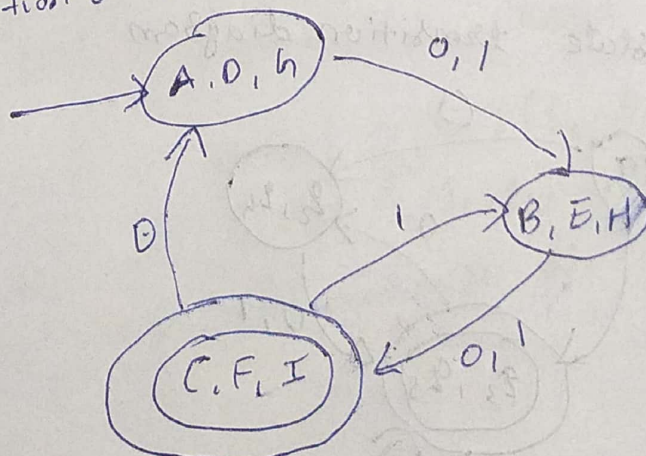
$B \equiv E$ & $E \equiv H$ & $B \equiv H$

$B \equiv E \equiv H$

$C \equiv I \equiv F$

δ	0	1
(A,D,G)	(B,E,H)	(B,E,H)
(B,E,H)	(C,F,I)	(C,F,I)
(C,F,I)	(A,D,G)	(E,B,H)

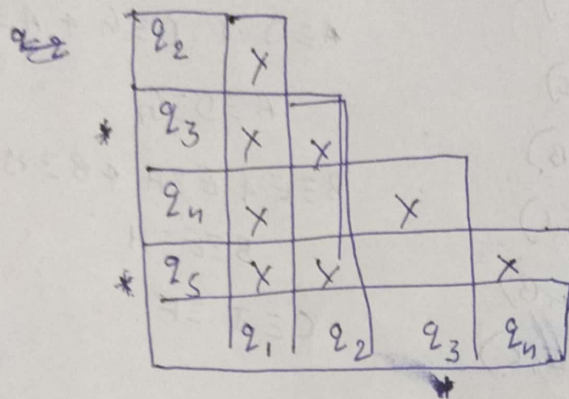
Transition diagram



2) consider the OPA given by transition table

δ	0	1
$\rightarrow q_1$	q_2	q_3
q_2	q_3	q_5
$*q_3$	q_4	q_3
q_4	q_3	q_5
$*q_5$	q_2	q_5

0	1
q_1	$q_2 * q_3$
q_2	$* q_3 * q_5$
q_3	$q_4 * q_3$
q_4	$* q_3 * q_5$
q_5	$q_2 * q_5$



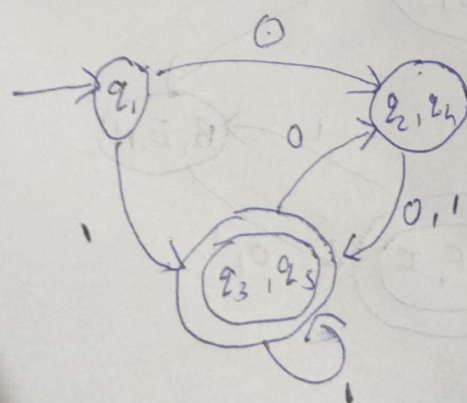
A q_1 0 1 (NF, F)

B q_2 q_3 q_5 (F, F)

(q_1, q_2) (q_1, q_4) will get cancel

(q_2, q_4) & (q_3, q_5) are equivalent

Reduced state transition diagram



Tutorial

Repeat exercise 4.4.1 for the DFA 4.4.2

δ	0	1
$\rightarrow q_1$	q_2	q_6
q_2	q_1	q_3
$* q_3$	q_2	q_4
q_4	q_4	q_2
q_5	q_4	q_5
$* q_6$	q_5	q_4

q_2					
q_3	X				
q_4	X	X	X		
q_5	X	X	X		
q_6	X	X		X	X
	q_1	q_2	q_3	q_4	q_5

	0	1
q_1	q_2	q_6
q_2	q_1	q_3

$\left\{ \begin{array}{l} (NF, F) \\ (NF, F) \end{array} \right.$

1. (q_1, q_2) (q_3, q_6) (q_4, q_5) these ordered pairs should not be crossed

And (q_1, q_4) (q_1, q_3) (q_2, q_4) (q_2, q_5) should be crossed

δ	0	1
q_1	q_2	q_6
q_2	q_1	q_3
q_3	q_2	q_4
q_4	q_4	q_2
q_5	q_4	q_5
q_6	q_5	q_4

(q_2, q_5) was already crossed. Here (q_4, q_5) should also be crossed

BC3 (q_4, q_5) is crossed \Rightarrow cross (q_3, q_6) also
 BC3 (q_3, q_6) is crossed \Rightarrow cross (q_1, q_2) also
 Hence can't reduce or minimise the given DFA