1. Draw the following DFA using table filling algorithm where A is the start state. The states C, F & I are the final states.

δ	0	1
A	B	E
B	C	F
*C	D	H
D	E	H
E	F	I
*F	G	B
G	H	B
H	I	C
*I	A	F

	A	B	*C	D	E	*F	G	H
B	X							
*C	X	X						
D		X	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	X

Step 1: Cross combination of final & non-final states

* Combination of A & B:

	0	1	
A	B	E	(NF, NF)
B	C	F	(F, F)

* Combination of A & D:

	0	1	
A	B	B	(NF, NF)
D	E	H	(NF, NF)

* Combination of A & G:

	0	1	
A	B	E	(NF, NF)
G	H	B	(F, F)

* Combination of A & H:

	0	1	
B	B	E	(NF, NF)
D	I	C	(F, F)

	0	1	
B	C	F	F F
D	E	H	NF NF

	0	1	
A	B	F	(NF , NF)
D	E	H	(NF , NF)

	0	1	
A	B	E	(NF NF)
G	H	B	(NF NF)

	0	1		
(X) A	B	E	NF	NF
H	J	C	F	F

	0	1	
(X) B	C	F	(F F)
D	E	H	(NF NF)

	0	1	
B	B	E	(NF NF)
G	H	B	(NF NF)

	0	1	
(X) B	B	E	(NF NF)
H	I	C	(F F)

	0	1	
C	D	H	(NF NF)
F	G	B	(NF NF)

	0	1	
C	D	H	(NF NF)
I	A	E	(NF NF)

	0	1	
(X) D	E	H	(NF NF)
E	F	I	(F F)

	0	1	
D	E	H	(NF NF)
G	H	B	(NF NF)

	0	1	
(X) D	E	H	(NF NF)
H	I	C	(F F)

	0	1	
(X) E	F	I	(F F)
G	H	B	(NF NF)

	0	1	
E	F	I	(F F)
H	I	C	(F F)

	0	1	
G	H	B	(NF NF)
H	F	C	(F F)

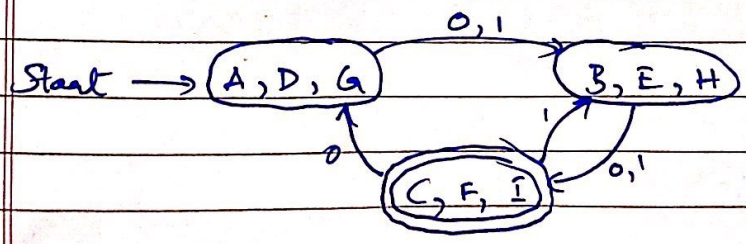
Pairs

(A, D) (A, G) (D, G) ⇒ (A, D, G)

(B, H) (B, E) (E, H) ⇒ (B, H, E)

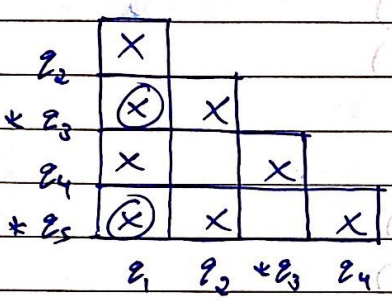
(C, E) (C, F) (F, I) ⇒ (F, C, I)

(D, H) ⇒ (D, H)



2) Consider the DFA given by the transition table.

δ	0	1
$\to q_1$	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_2	q_3	q_5	F	F
q_4	q_3	q_5	F	F

	0	1		
q_1	q_2	q_3	NF	F
q_4	q_3	q_5	F	F

$\Longrightarrow$

	0	1	X	
q_1	q_2	q_3	NF	F
q_2	q_3	q_5	F	F

	0	1		
✓ q_3	q_4	q_3	NF	F
q_5	q_2	q_5	NF	F

(q_2, q_4) is required because they reach same destination.