Draw the following DFA using table filling algorithm where A is the start state and C, F and 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	E

STEP-1: Cross down all the combinations of Final and Non-Final states in the table.

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

STEP-2: Check all the '0' and '1' input combinations of the non crossed states

	0	1
A	B	E
B	*C	*F

Non-Final – Non-Final

Final – Final

So, this combination is not possible.

	0	1
A	B	E
D	E	H

Non-Final – Non-Final
Non-Final – Non-Final

So, this combination is possible.

	0	1
A	B	E
E	*F	*I

Non-Final – Non-Final
Final – Final

So, this combination is not possible.

	0	1
A	B	E
G	H	B

Non-Final – Non-Final
Non-Final – Non-Final

So, this combination is possible.

	0	1
A	B	E
H	*I	*C

Non-Final – Non-Final
Final – Final

So, this combination is not possible.

	0	1
B	*C	*F
D	E	H

Final – Final
Non-Final – Non-Final

So, this combination is not possible.

	0	1
B	*C	*F
E	*F	*I

Final – Final
Final – Final

So, this combination is possible.

	0	1
B	*C	*F
G	H	B

Final – Final
Non-Final – Non-Final

So, this combination is not possible.

	0	1
B	*C	*F
H	*I	*C

Final – Final
Final – Final

So, this combination is possible.

	0	1
*C	D	H
*F	G	B

Non-Final – Non-Final
Non-Final – Non-Final

So, this combination is possible.

	0	1
*C	D	H
*I	A	E

Non-Final – Non-Final
Non-Final – Non-Final

So, this combination is possible.

	0	1
D	E	H
E	*F	*I

Non-Final – Non-Final
Final – Final

So, this combination is not possible.

	0	1
D	E	H
G	H	B

Non-Final – Non-Final
Non-Final – Non-Final

So, this combination is possible.

	0	1
D	E	H
H	*I	*C

Non-Final – Non-Final
Final – Final

So, this combination is not possible.

	0	1
E G	*F H	*I B

Final – Final
Non-Final – Non-Final

So, this combination is not possible.

	0	1
E H	*F *I	*I *C

Final – Final
Final – Final

So, this combination is possible.

	0	1
*F *I	G A	B E

Non-Final – Non-Final
Non-Final – Non-Final

So, this combination is possible

	0	1
G H	H *I	B *C

Non-Final – Non-Final
Final – Final

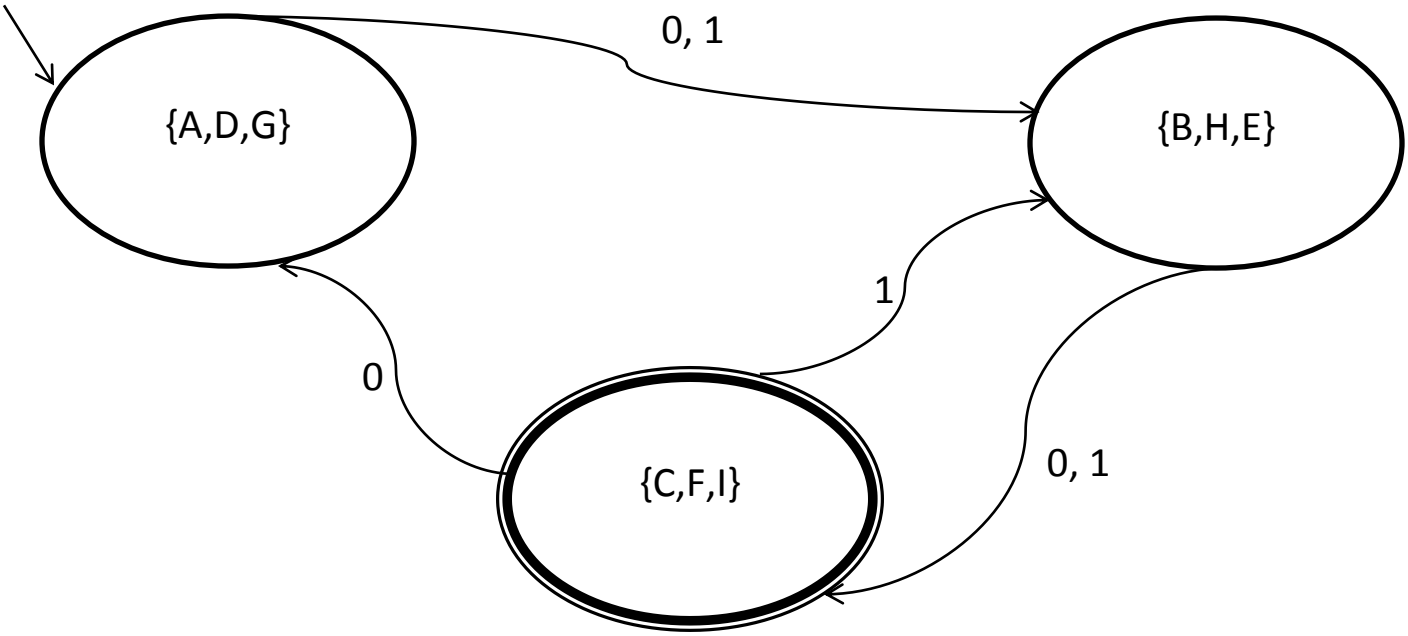
So, this combination is not possible.

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
	A	B	C*	D	E	F*	G	H

STEP 3: List the remaining pairs

{A,D}, {A,G}, {D,G} → {A,D,G}
{B,E}, {B,H}, {E,H} → {B,H,E}
{C,F}, {C,I} , {FI} → {C,F,I}

STEP 4: Transition Diagram



Consider the following transition table and minimize the states.

δ	0	1
→ q1	q2	*q3
q2	*q3	*q5
*q3	q4	*q3
q4	*q3	*q5
*q5	q2	*q5

STEP-1: Cross down all the combinations of Final and Non-Final states in the table.

q2				
q3*	X	X		
q4			X	
q5*	X	X		X
	q1	q2	q3*	q4

STEP-2: Check all the '0' and '1' input combinations of the non crossed states

	0	1
q1	q2	*q3
q2	*q3	*q5

Non-Final – Final

Final – Final

So, this combination is not possible.

	0	1
q1	q2	*q3
q4	*q3	*q5

Non-Final – Final

Final – Final

So, this combination is not possible.

	0	1
q2	*q3	*q5
q4	*q3	*q5

Final – Final

Final – Final

So, this combination is possible.

	0	1
q3 *q5	q4 q2	*q3 *q5

Non-Final – Final

Non- Final – Final

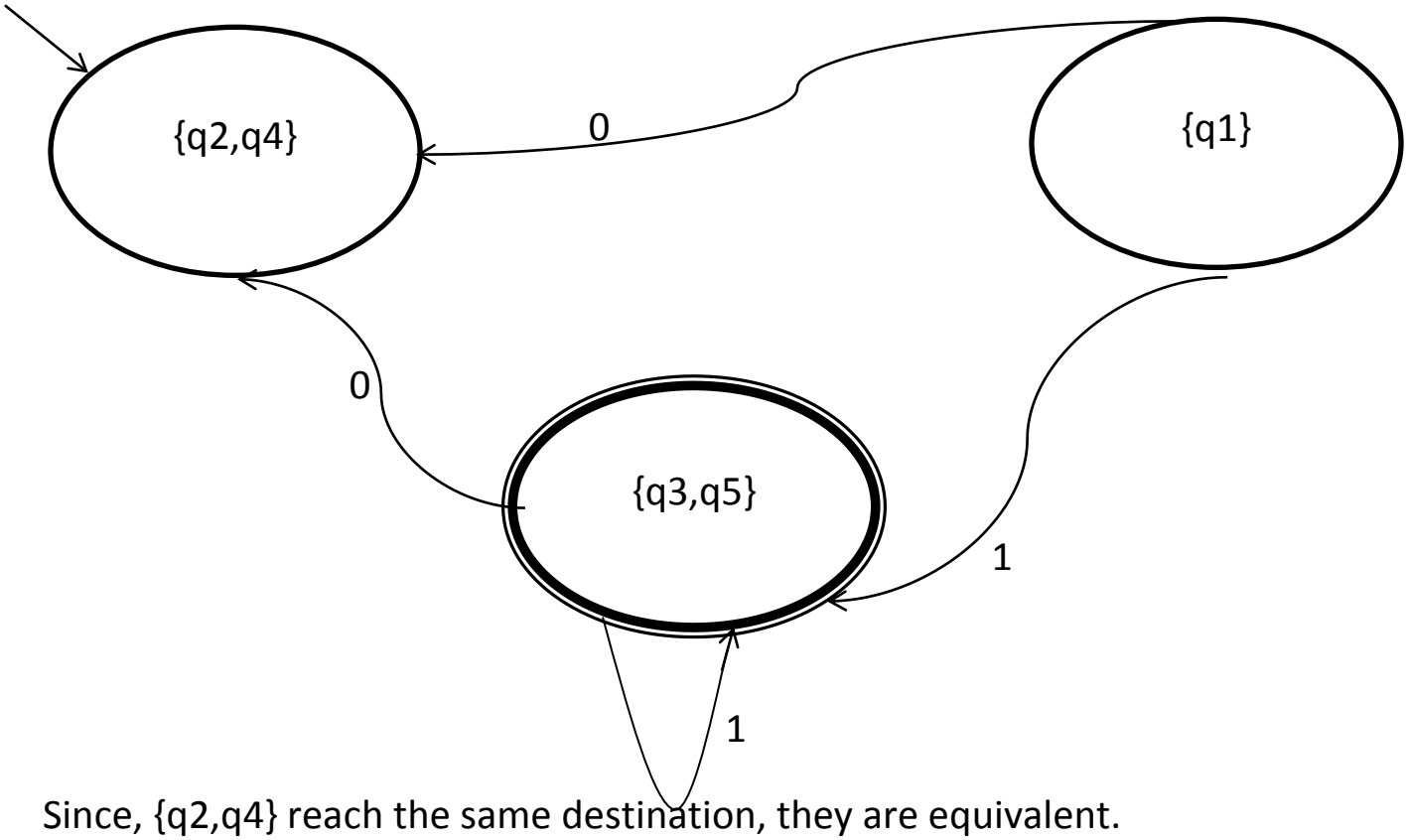
So, this combination is possible.

q2	X			
q3*	X	X		
q4	X		X	
q5*	X	X		X
	q1	q2	q3*	q4

STEP 3: List the remaining pairs

{q2,q4}, {q3,q5}, {q1}

STEP 4: Transition Diagram



Since, {q2,q4} reach the same destination, they are equivalent.

Since, {q3,q5} reach the different destination, they are not equivalent.

Consider the following transition table and minimize the states.

δ	0	1
→ q1	q2	*q6
q2	q1	*q3
*q3	q2	q4
q4	q4	q2
q5	q4	q5
*q6	q5	q4

STEP-1: Cross down all the combinations of Final and Non-Final states in the table.

q2					
q3*	X	X			
q4			X		
q5			X		
q6*	X	X		X	X
	q1	q2	q3*	q4	q5

STEP-2: Check all the '0' and '1' input combinations of the non crossed states

	0	1
q1	q2	*q6
q2	q1	*q3

Non-Final – Final
Non-Final – Final

So, this combination is possible.

	0	1
q1	q2	*q6
q4	q4	q2

Non-Final – Final
Non-Final – Non-Final

So, this combination is not possible.

	0	1
q1	q2	*q6
q5	q4	q5

Non-Final – Final
Non-Final – Non-Final

So, this combination is not possible.

	0	1
q2 q4	q1 q4	*q3 q2

Non-Final – Final
Non-Final – Non-Final

So, this combination is not possible.

	0	1
q2 q5	q1 q4	*q3 q5

Non-Final – Final
Non-Final – Non-Final

So, this combination is not possible.

	0	1
*q3 *q6	q2 q5	q4 q4

Non-Final – Non-Final
Non-Final – Non-Final

So, this combination is possible.

	0	1
q4 q5	q4 q4	q2 q5

Non-Final – Non-Final
Non-Final – Non-Final

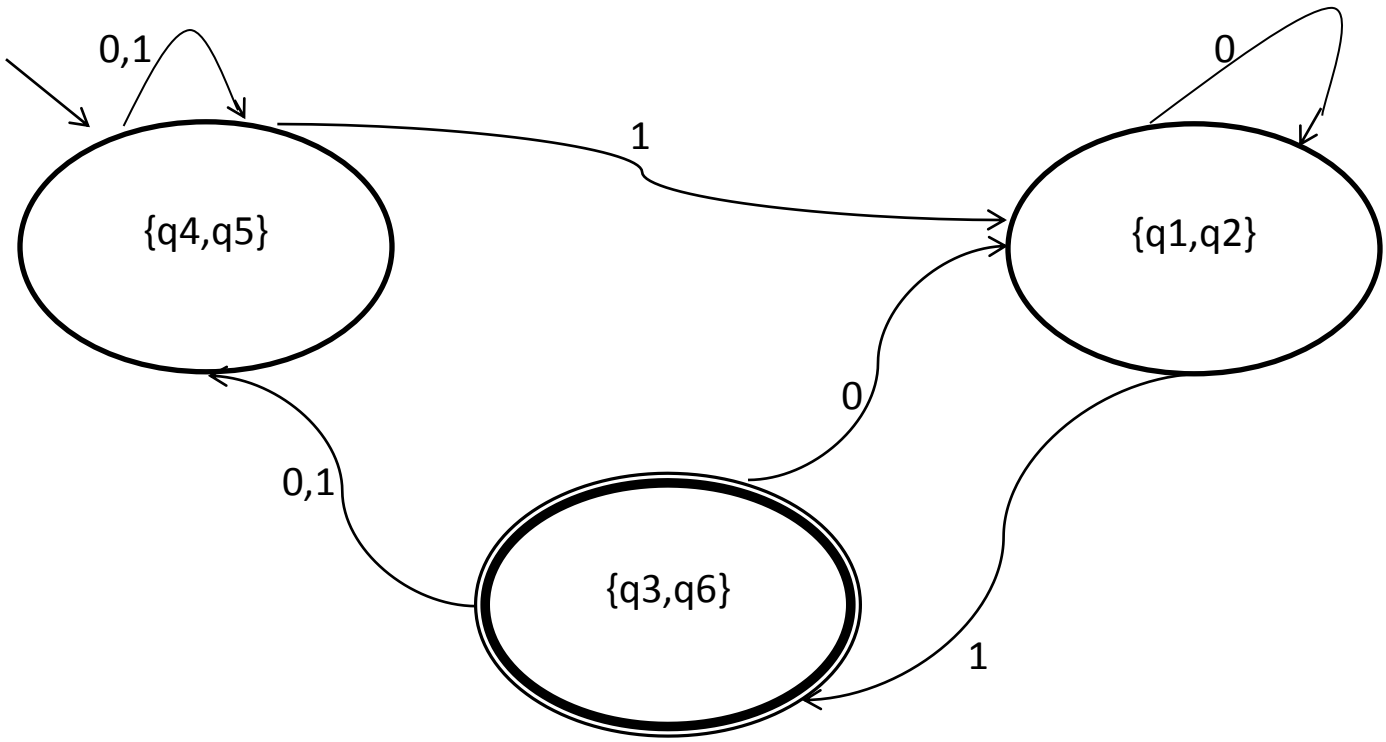
So, this combination is possible.

q2					
q3*	X	X			
q4	X	X	X		
q5	X	X	X		
q6*	X	X		X	X
	q1	q2	q3*	q4	q5

STEP 3: List the remaining steps

{q1, q2}, {q3,q6}, {q4,q5}

STEP 4: Transition Diagram



Since, {q1,q2} , {q4,q5} and {q3,q6} reach the different destination, they are not equivalent.