PRACTICE QUESTIONS

1. Design a FA with ∑ = {0, 1}, which accepts strings which start with 1 and end with 0.
2. Design a FA with ∑ = {0, 1}, which accepts strings which contain three consecutive 0's.
3. Design a FA with ∑ = {0, 1}, which accepts the only input 101.
4. Design a FA with ∑ = {0, 1}, which accepts strings which contain three consecutive 1's.
5. Design a FA with ∑ = {0, 1}, which accepts strings which always end with 101.
6. Draw a DFA for the language accepting strings starting with '101' over input alphabets ∑ = {0, 1}
7. Draw a DFA for the language accepting strings starting with 'ab' over input alphabets ∑ = {a, b}
8. Draw a DFA for the language accepting strings starting with 'a' over input alphabets ∑ = {a, b}
9. Draw a DFA that accepts a language L over input alphabets ∑ = {0, 1} such that L is the set of all stringsstarting with '00'.
10. Construct a DFA that accepts a language L over input alphabets ∑ = {a, b} such that L is the set of allstrings starting with 'aa' or 'bb'.
11. Construct a DFA that accepts a language L over input alphabets ∑ = {a, b} such that L is the set of allstrings starting with 'aba'.
12. Draw a DFA for the language accepting strings ending with '0' over input alphabets ∑={0, 1}.
13. Draw a DFA for the language accepting strings ending with '01' over input alphabets ∑={0, 1}.
14. Draw a DFA for the language accepting strings ending with '00' over input alphabets ∑={0, 1}.
15. Draw a DFA for the language accepting strings ending with '011' over input alphabets ∑ = {0, 1}.
16. Draw a DFA for the language accepting strings ending with '0110' over input alphabets ∑ = {0, 1}.
17. Draw a DFA for the language accepting strings ending with '0011' over input alphabets ∑ = {0, 1}.
18. Draw a DFA for the language accepting strings starting with '0' over input alphabets ∑={0, 1}.
19. Draw a DFA for the language accepting strings starting with '00' or '11' over input alphabets ∑ = {0, 1} ?

20. Consider the finite state machine whose transition function δ is given below in the form of a transition table. Here Q = {q0, q1, q2, q3}, Σ = {0, 1}, Initial state = q0, F = {q0}. Give the entire sequence of states for the input string 110001.

Transition Function Table

State	Input	
	0	1
q0	q2	q1
q1	q3	q0
q2	q0	q3
q3	q1	q2

21. Design a Finite Automaton with ∑ = {0, 1}, which accepts strings which always end with 101.
22. Construct automaton equivalent to M=({q0,q1},{0,1},δ,q0,{q0}), where δ is defined by its state table as follows :

Transition Function Table

State	Input	
	0	1
q0	q0	q1
q1	q1	{q0,q1}

23. Find the Deterministic Automaton equivalent to M=({q0,q1,q2},[a,b},δ,q0,{q2}), where δ is as follows :

Transition Function Table

State	Input	
	a	b
q0	{q0,q1}	q2
q1	q0	q1
q2	∅	{q0,q1}

24. Construct the DFA equivalent to $M=(\{q0,q1,q2,q3\},[0,1\},\delta,q0,\{q3\})$, where δ is as follows :

Transition Function Table

State	Input	
	a	b
q0	{q0,q1}	q0
q1	q2	q1
q2	q3	q3
q3	∅	q2

25. Construct the DFA equivalent to $M=(\{q0,q1,q2,q3\},[0,1\},\delta,q0,\{q3\})$, where δ is as follows :

Transition Function Table

State	Input	
	a	b
q0	{q1,q3}	{q2,q3}
q1	q1	q3
q2	q3	q2
q3	∅	∅

26. $M=(\{q1,q2,q3\},\{0,1\},\delta,q1,\{q3\})$ is a non-deterministic finite automaton, where δ is given by
$\delta(q1,0)=\{q2,q3\}$, $(q1,1)=\{q1\}$, $\delta(q2,0)=\{q1,q2\}$, $\delta(q2,1)=\emptyset$, $\delta(q3,0)=\{q2\}$, $\delta(q3,1)=\{q1,q2\}$.

Construct an equivalent DFA.

27. Construct a minimum state automaton equivalent to the finite automaton described by the following transition table :

Transition Function Table

State	Input	
	0	1
q0	q1	q5
q1	q6	q2
q2	q0	q2
q3	q2	q6
q4	q7	q5
q5	q2	q6
q6	q6	q4
q7	q6	q2

(Initial State : q0 and Final State : q2)

28. Construct a minimum state automaton equivalent to the finite automaton described by the following transition table :

Transition Function Table

State	Input	
	0	1
q0	q1	q2
q1	q1	q3
q2	q3	q4
q3	q1	q5
q4	q4	q2
q5	q5	q5

(Initial State : q0 and Final State : q5)

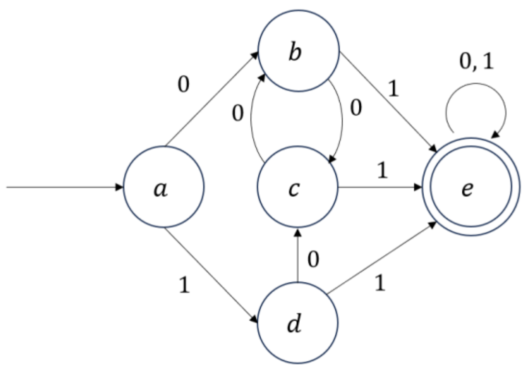
29. Construct a minimum state automaton equivalent to the finite automaton described by the following transition table :

Transition Function Table

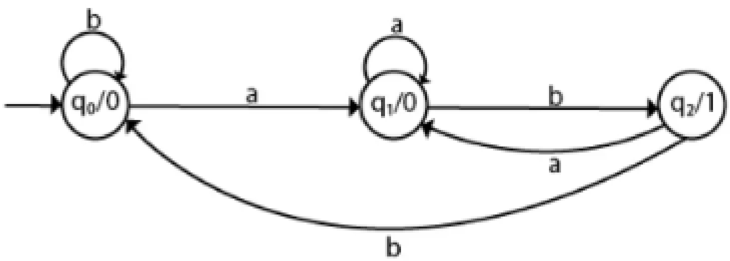
State	Input	
	0	1
q0	q1	q2
q1	q4	q3
q2	q4	q3
q3	q5	q6
q4	q7	q6
q5	q3	q6
q6	q6	q6
q7	q4	q6

(Initial State : q0 and Final States : q3,q4)

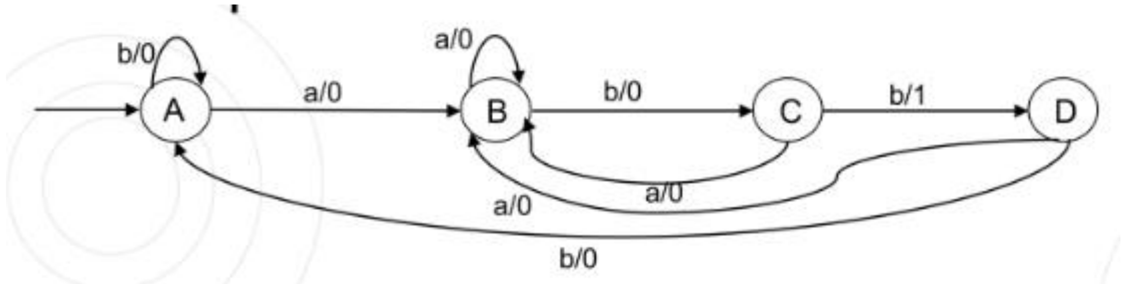
30. Minimize the following DFA :



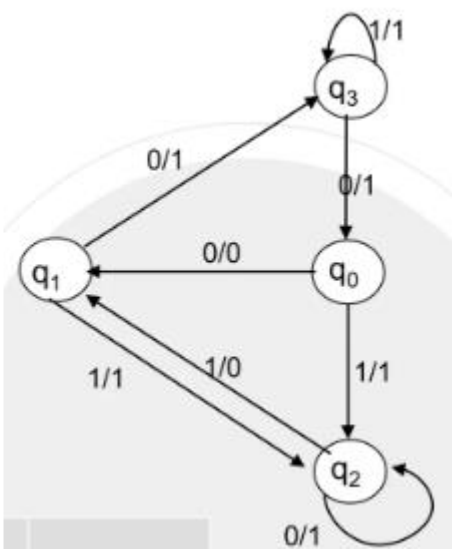
31. Convert the following Moore Machine to equivalent Mealy Machine.



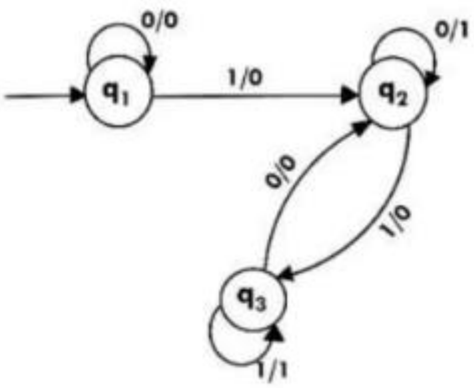
32. Convert the following Mealy Machine to equivalent Moore Machine.



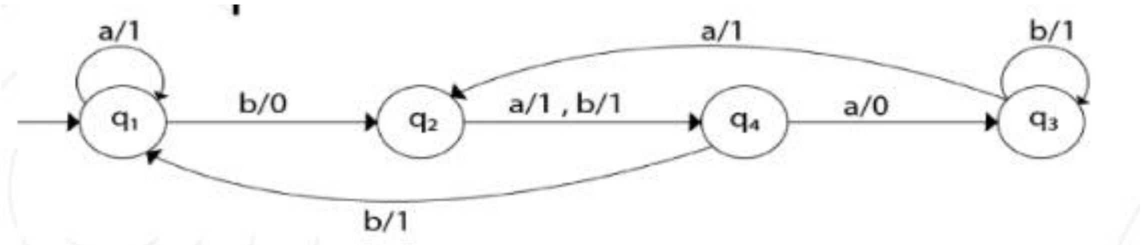
33. Convert the following Mealy Machine to equivalent Moore Machine. (Initial State=q0)



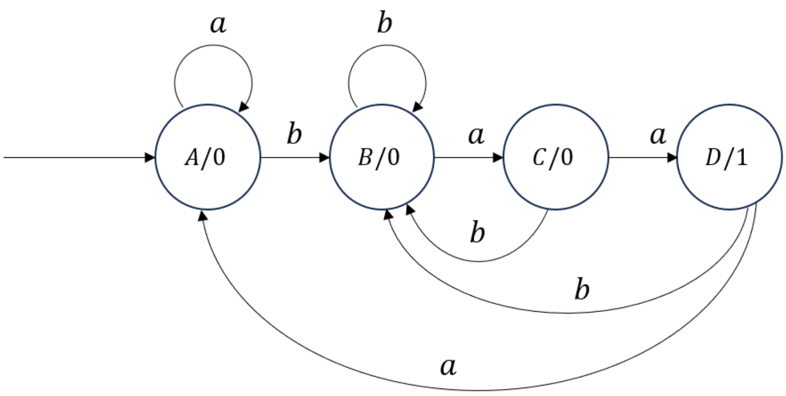
34. Convert the following Mealy Machine into equivalent Moore Machine.



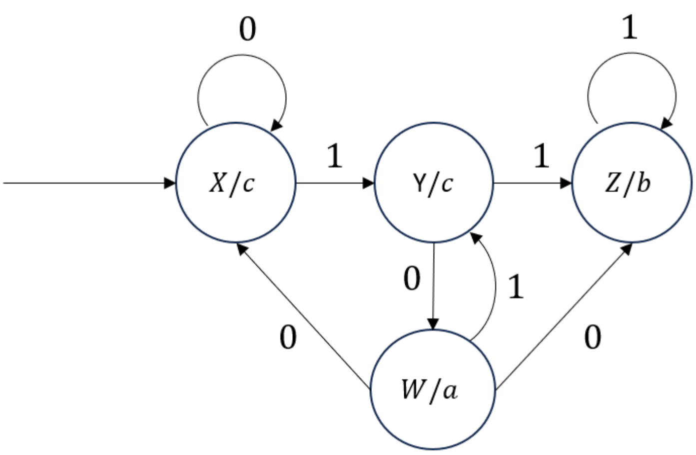
35. Convert the following Mealy Machine into equivalent Moore Machine.



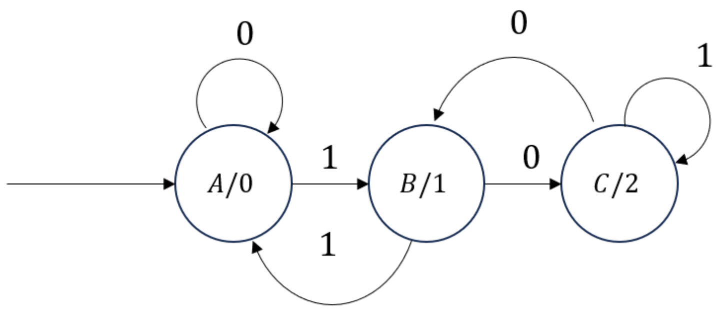
36. Covert the following Moore Machine to equivalent Mealy Machine.



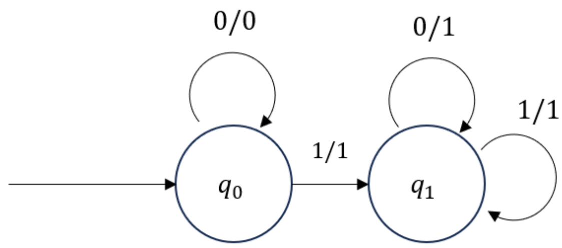
37. Covert the following Moore Machine to equivalent Mealy Machine.



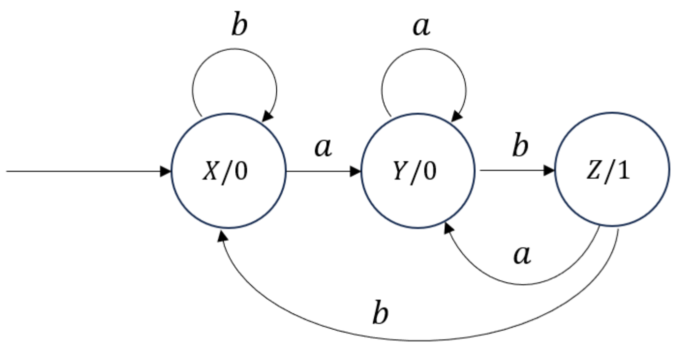
38. Covert the following Moore Machine to equivalent Mealy Machine.



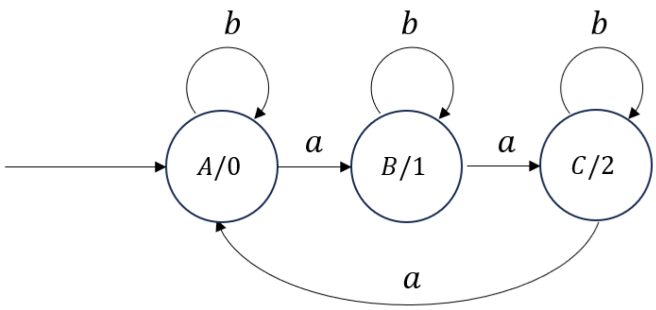
39. Covert the following Mealy Machine to equivalent Moore Machine.



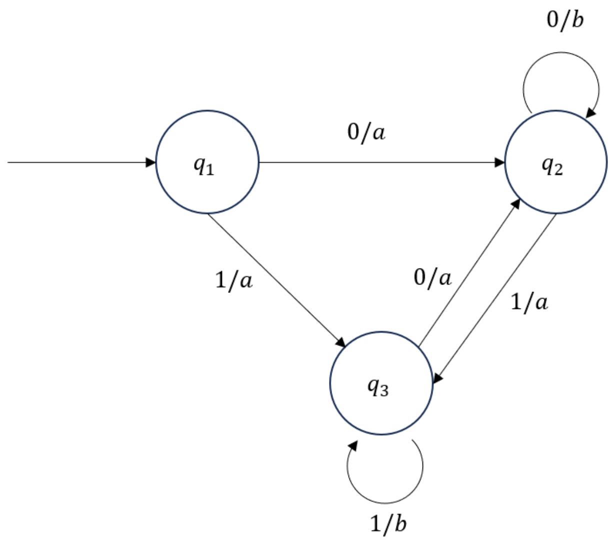
40. Covert the following Moore Machine to equivalent Mealy Machine.



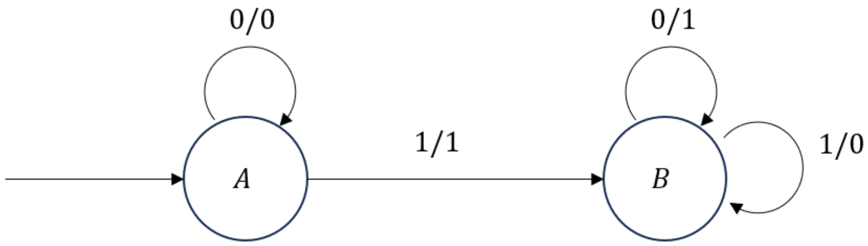
41. Covert the following Moore Machine to equivalent Mealy Machine.



42. Covert the following Mealy Machine to equivalent Moore Machine.



43. Covert the following Mealy Machine to equivalent Moore Machine.



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