Theory of Automata and Formal Language

Lecture-16

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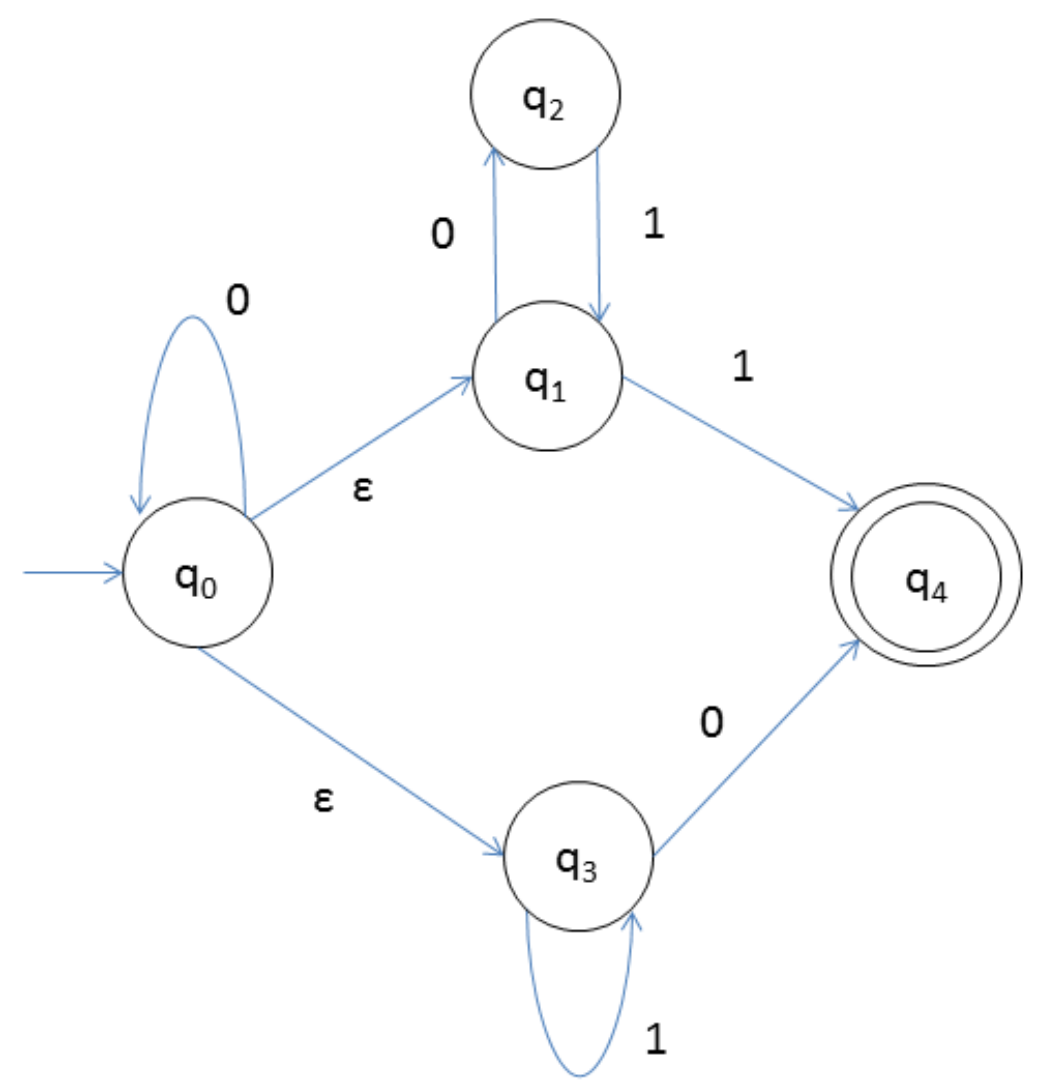
April 21, 2021

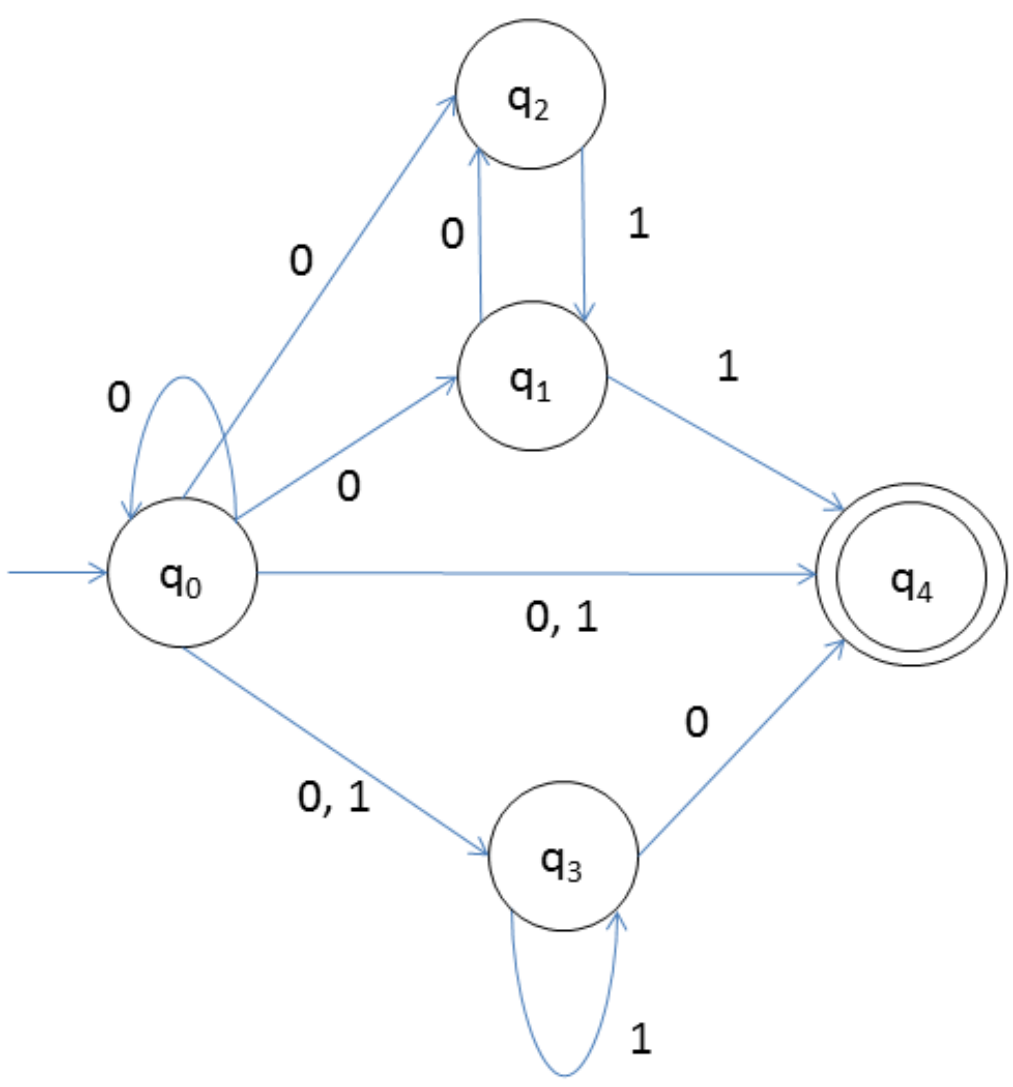
Finite Automata (FA)

Examples: Consider the following NFA with $\epsilon - move$:-



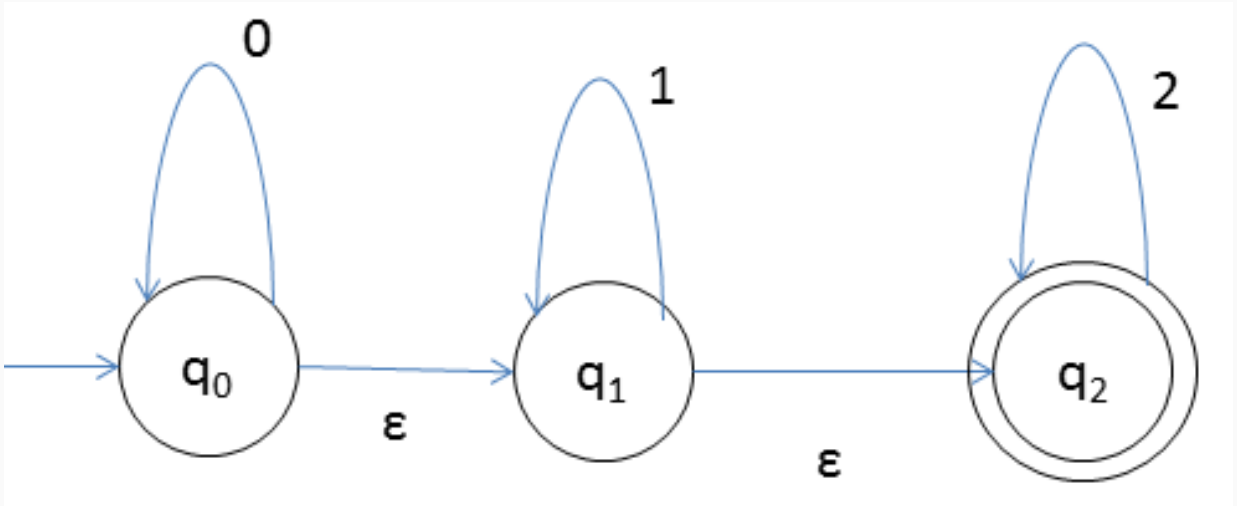
Finite Automata (FA)

Solution:



Finite Automata (FA)

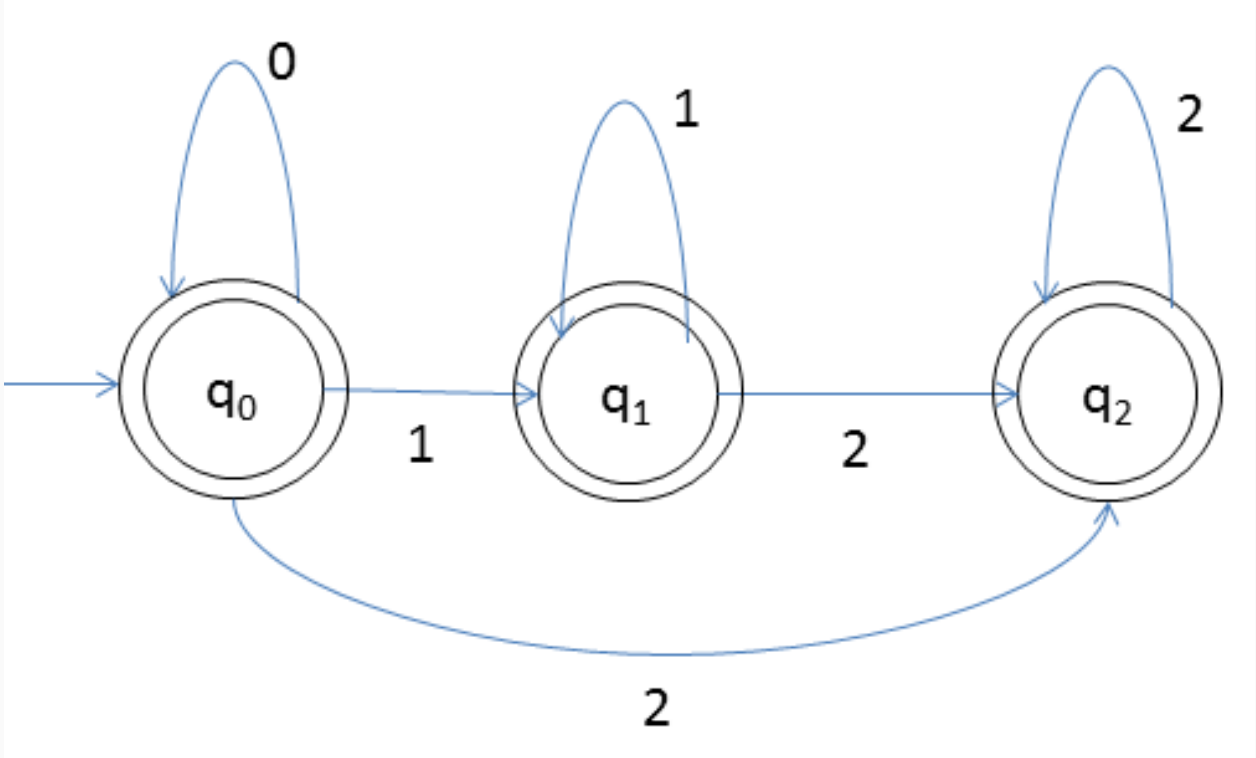
Examples: Consider the following NFA with $\epsilon - move$:-



Construct DFA equivalent to this.

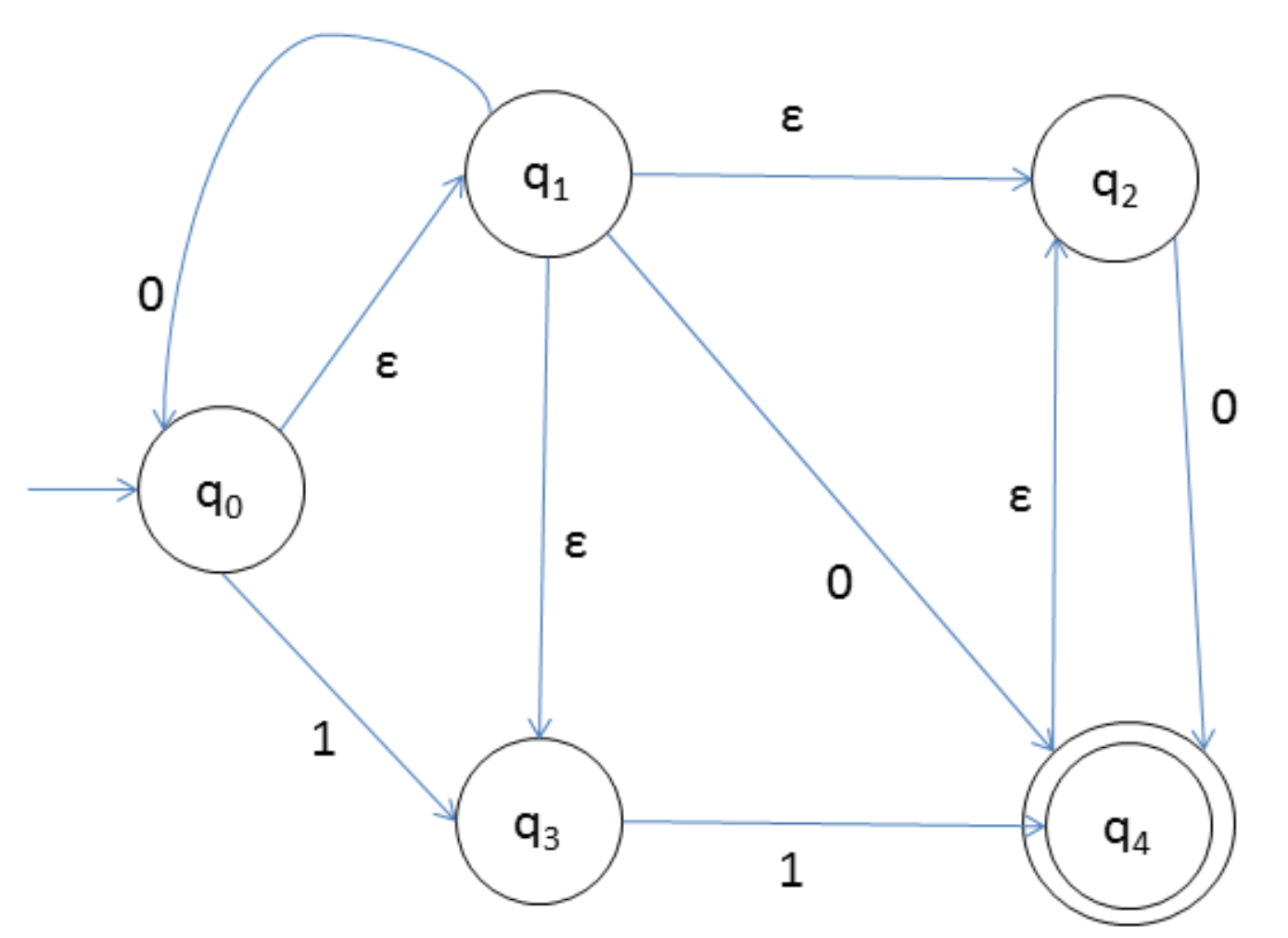
Finite Automata (FA)

Solution:



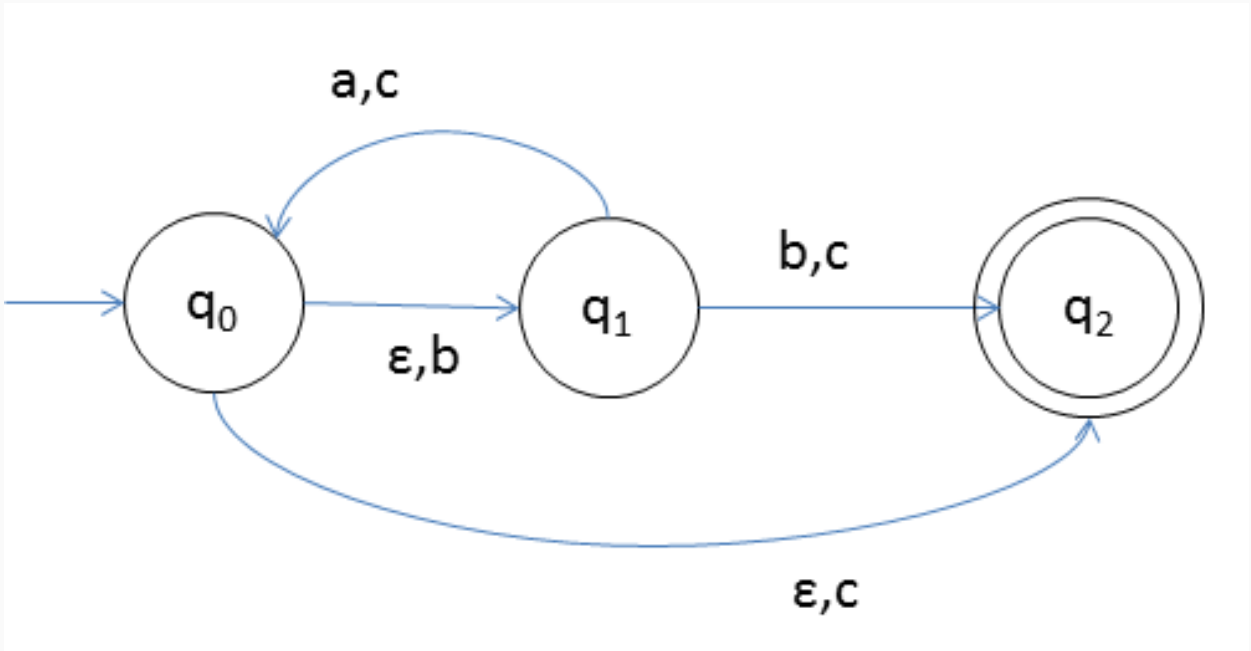
Finite Automata (FA)

Examples: Consider the following NFA with $\epsilon - move$:-



AKTU Examination Questions

1. Design a FA to accept the string that always ends with 101.
2. What do you mean by $\epsilon - \textit{Closure}$ in FA?
3. Construct a minimum state DFA for the given FA:-



Finite Automata (FA)

4. Design FA for ternary number divisible by 5.

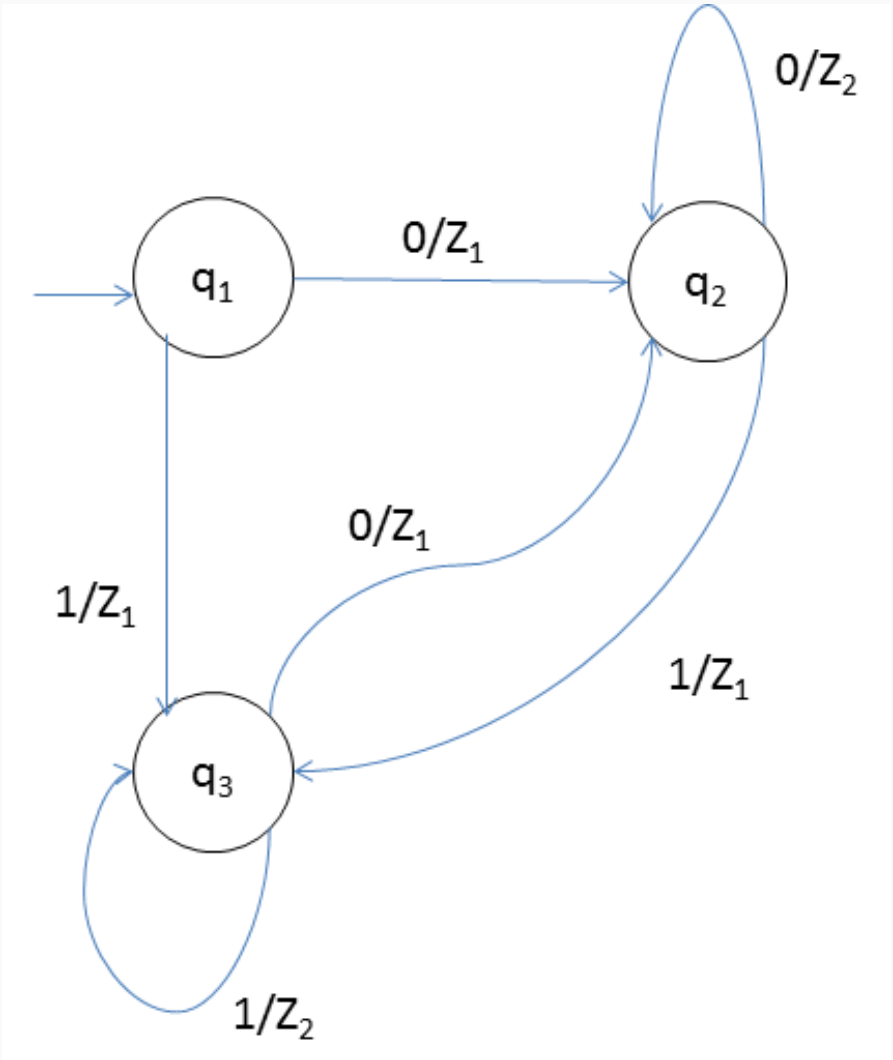
5. Explain Myhill-Nerode Theorem using suitable example.

6. Design a NFA that accepts all the strings for input alphabet {a,b} containing the substring abba.

7. Define Deterministic Finite Automata(DFA)and design a DFA that accepts binary numbers whose equivalent decimal number is divisible by 5.

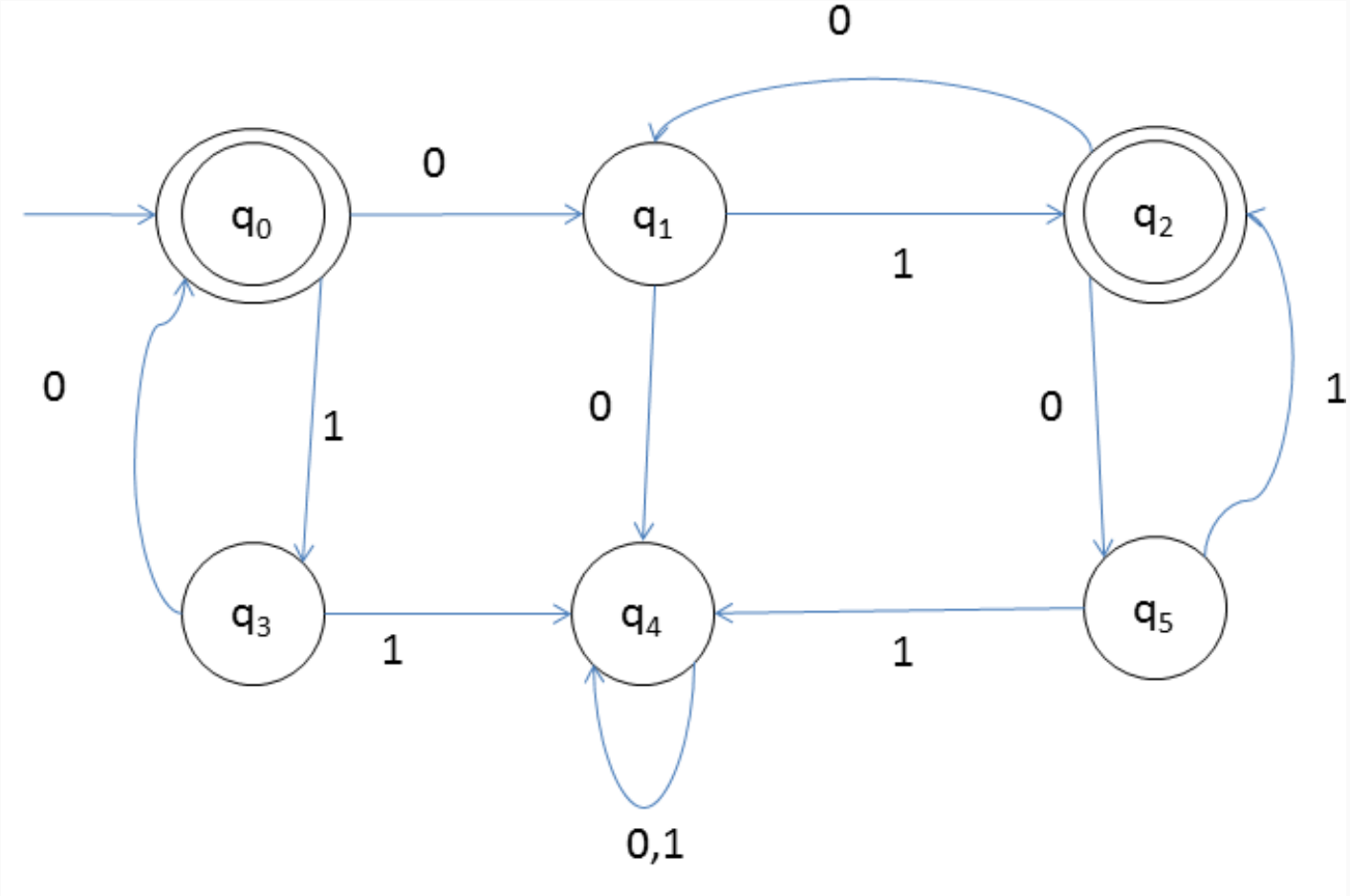
Finite Automata (FA)

8. Describe Mealy and Moore machine. Convert the following Mealy machine into Moore machine:-



Finite Automata (FA)

9. Construct minimum state automata equivalent to the following DFA:-



Finite Automata (FA)

10. Explain the applications and limitations of finite automata.

11. What is extended transition function δ^*? Explain with example.

12. Give the difference between Mealy and Moore machine.

13. Design DFA to accept all string over $\{0, 1\}$ not ending with 10.

14. Give finite automata for:
    (i) L $= \{a^n b^{2m} c^{3l}$! n, m, l $\geq 0\}$.
    (ii) L $= \{a^n b^{2m}$! $0 < n < 3, m \geq 0\}$.