PES UNIVERSITY, Bangalore

(Established under Karnataka Act No. 16 of 2013)

Department of Computer Science & Engineering

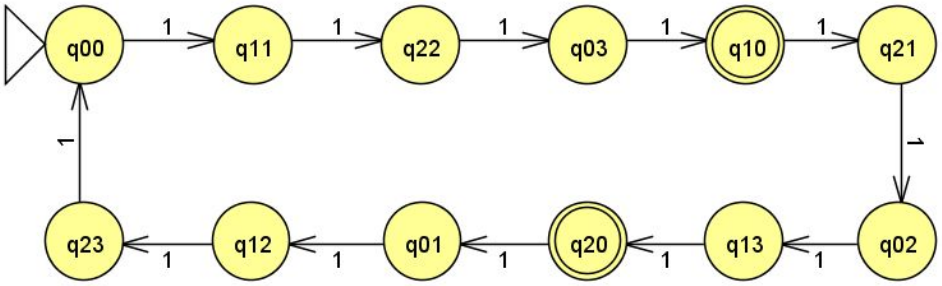
Automata Formal Languages & Logic

Q&A

NFA/ λ-NFA

1) Consider the unary number system with the alphabet {1} where a number *n* is represented by a string of *n* 1 s, for example, 4 is 1111 and 7 is 1111111. Construct a finite automaton that accepts all unary numbers that are divisible by 4 but not divisible by 3.

   Solution :



2) Describe the language (i.e., set of all strings) accepted by the following automaton:

State	Input = *a*	Input = *b*
$\rightarrow q_0$	q_2	q_1
q_1	q_1	q_1
q_2	q_3	q_2
$^*q_3$	q_3	q_2

Solution: The DFA accepts the set of all strings that begin with *a* and end with *a*.

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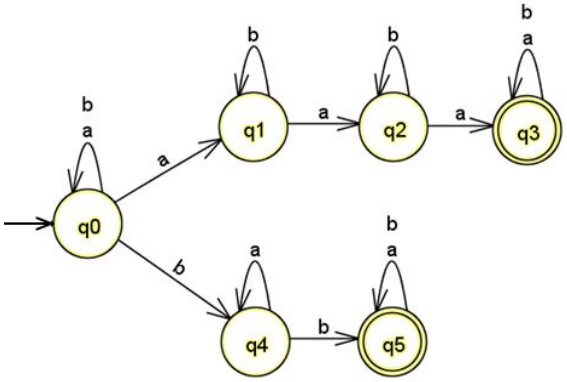
8) Construct a NFA that accepts strings over {*a, b*} that contain at least three *a* s or at least two *b* s.

Solution:



9) Construct a NFA that accepts Binary strings of any length with alternating 0 s and 1 s. The NFA must have just three states (not including reject states). How many states does an equivalent minimal DFA have?

Solution: