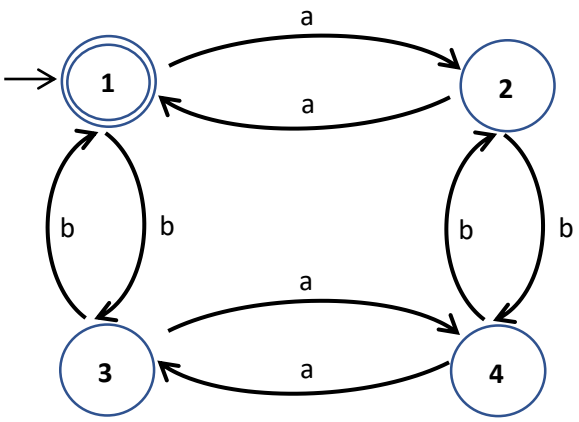
Ex: Build an FA that accepts only the language of all words that must have (even-even) from the alphabet a, b?

L={w|w has even no. of a's and even no.of b's}

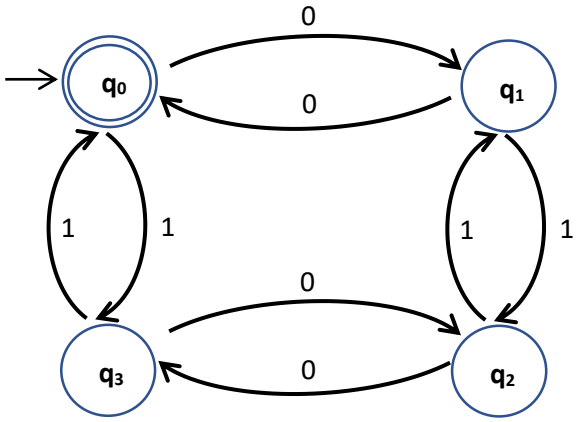
Σ= {a, b}



Find the following:

- (even a-odd b)
- (odd a-even b)
- (odd a-odd b)

Ex: let a transition follow:



Find FSA acceptor and check if the string (110101) is an input string to M acceptor or not?

Sol:

M= < Q, Σ, S, F, δ >

Q= {q_0 , q_1 , q_2 , q_3 }

Σ= {0, 1}

S= q_0

F={q_0}

δ (q_0 ,0) = q_1

δ (q_0 ,1) = q_3

δ (q_1 ,0) = q_0

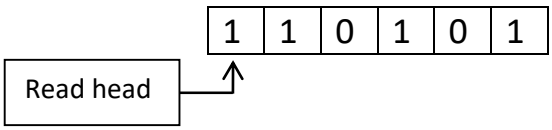
δ (q_1 ,1) = q_2

δ (q_2 ,0) = q_3

δ (q_2 ,1) = q_1

δ (q_3 ,0) = q_2

δ (q_3 ,1) = q_0



δ (q_0 ,1) = q_3

δ (q_3 ,1) = q_0

δ (q_0 ,0) = q_1

δ (q_1 ,1) = q_2

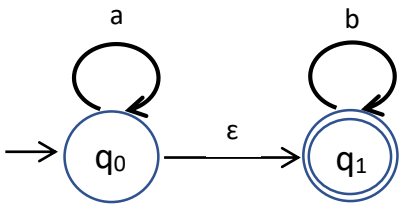
δ (q_2 ,0) = q_3

δ (q_3 ,1) = q_0 the final state

.: this string is the acceptor.

Ex: Construct a machine for the following language: L={ a*b* }

Sol:



M= < Q, Σ, S, F, δ >

Q= { q_0, q_1 }

Σ= {a, b, ε }

S= q_0

F= { q_1 }

$\delta(q_0, a) = q_0$

$\delta(q_0, \varepsilon) = q_1$

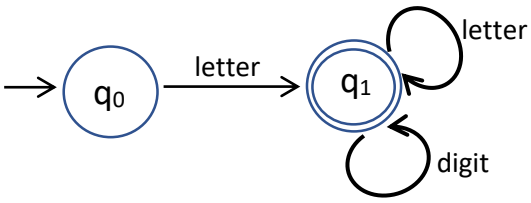
$\delta(q_1, b) = q_1$

δ- table

	a	b	ε
q_0	q_0	ø	q_1
q_1	ø	q_1	ø

Ex: Build DFSA for identifier?

Sol:



M= < Q, Σ, S, F, δ >

Q= { q_0, q_1 }

Σ= {letter, digit }

S= q_0

F= { q_1 }

$\delta(q_0, \text{letter}) = q_1$

$\delta(q_1, \text{letter}) = q_1$

$\delta(q_1, \text{digit}) = q_1$

δ- table

	letter	digit
q_0	q_1	ø
q_1	q_1	q_1

- Prove that string (as1) is accepted by the FSA?

$\delta(q_0, a) = q_1$

$\delta(q_1, s) = q_1$

$\delta(q_1, 1) = q_1$

.: the string is accept.

- Which of the strings is accepted by the above identifier machine?
  1. ab
  2. ab2
  3. 1ab
  4. a1b