

(1)

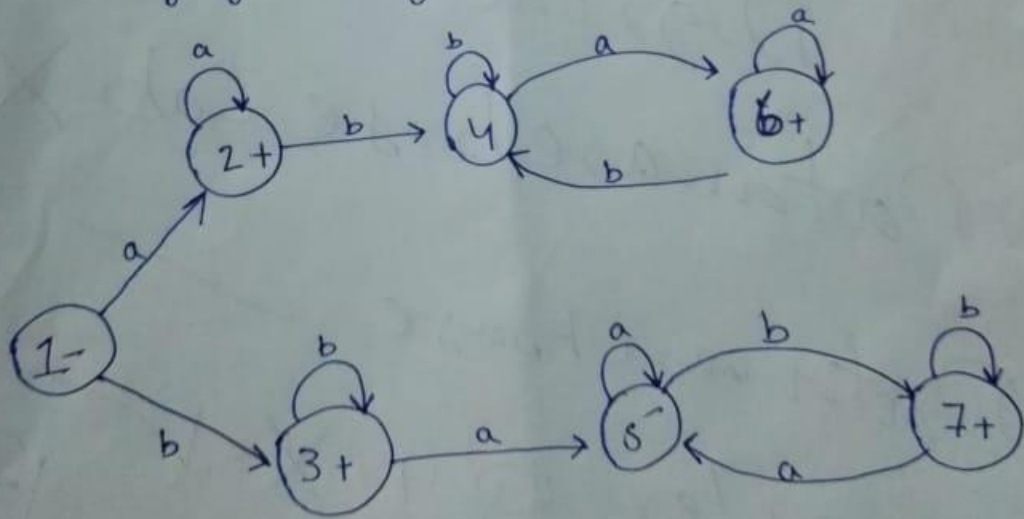
Name: Shahab-ud-din ID: 13791
Compiler Construction

Q1 Build an FA accepting the language L of strings, defined $\Sigma = \{a, b\}$, beginning with and ending in same letters.

Ans: The language "L" may be expressed by the following Regular expression:-

$(a+b)^* a (a+b)^* a + (a+b)^* b (a+b)^* b$

This language L may be accepted by the following

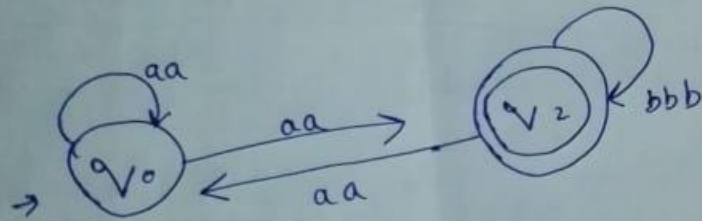


(2)

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Q2 Build an FA accepting the Language L of strings, defined over $\Sigma = \{a, b\}$, having quadruple a's or triple b's.

Ans: FA which has quadruple a's or triple b's.



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ID:- 13791

Q3 Construct regular expression defining each of the following language over the alphabet $\Sigma = \{a, b\}$.

(i) All words having even length.

Ans $((a+b)(a+b))^*$

(ii) All words having at least three a and two b.

Ans $(a+b)^*(aaa)^+(bb)^+(a+b)^*$

(iii) All words having at least double a or triple b.

Ans $(a+b)^*(aaa)^+(a+b)^* + (a+b)^*$

(iv) All words ~~having~~ starts with double a or quadruple b.

b. $aa(a+b)^* + bbbb(a+b)^*$

Ans

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Q₄ Distinguish b/w Moore and Mealy machine and convert the following Mealy machine to Moore in figure 1.

Ans:

Moore

- (i) O/Ps depend only on the Present state.
- (ii) Since the O/Ps change when the state changes and the state change is synchronous with the enabling clock edge O/Ps change synchronously with this clock edge.
- (iii) A Counter is a Moore Machine.

Mealy

- (i) O/Ps depend on the present state and present I/Ps.
- (ii) The O/P change asynchronously with the enabling clock edge.
- (iii) A counter is not a Mealy Machine.

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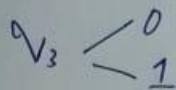
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Converting following Mealy to Moore machine:

Name:

	state	O/P	state	O/P
q_0	q_1	0	q_3	0
q_1	q_3	1	q_2	1
q_2	q_3	0	q_3	0
q_3	q_3	1	q_0	1

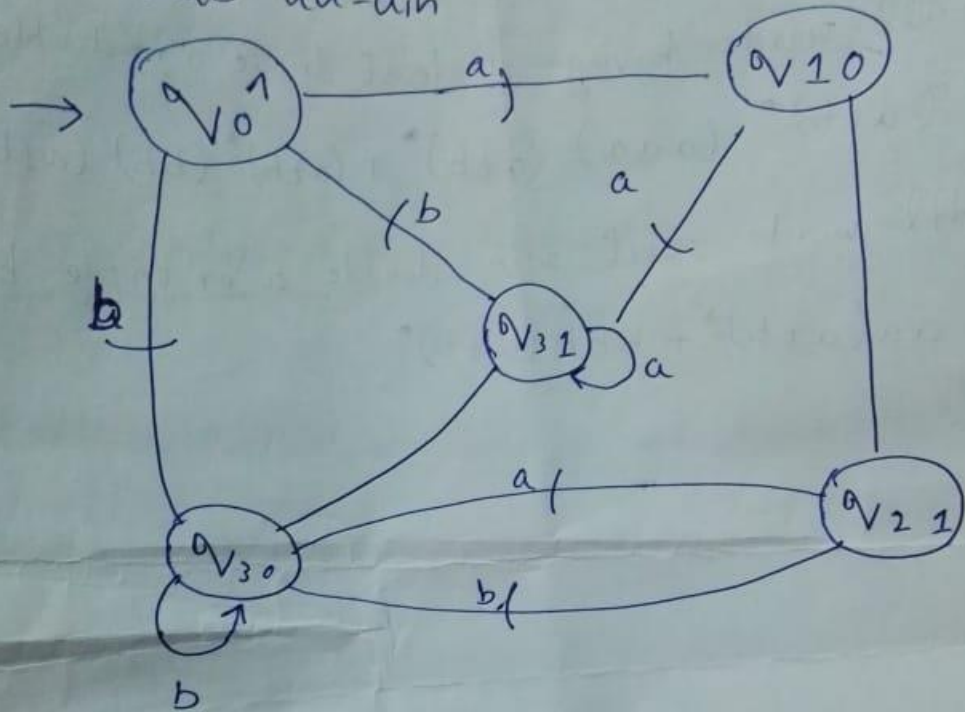


Moore transition table

Moore	a	b	O/P
q_0	q_{10}	q_{30}	—
q_1	q_{31}	q_{21}	—
q_2	q_{30}	q_{01} q_{30}	—
q_{30}	q_{31}	q_{01}	0
q_{31}	q_{31}	q_{01}	1

Name: Shahab-ud-din ⁽⁶⁾

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9+	γ	γ
10	γ	11+
11+	γ	γ
x	x	x
γ	γ	γ

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Q 6 Draw a transition table for the diagram given in fig 2. (-) is the starting state and (+) is the ending state.

states	a	b
1-	2	6
2	3+	x
3+	x	4
4	x	5+
5+	10 x	x
6	10	7
7	8 y	8
8	8 9+	y
9+	y	y
10	y	11+
11+	y	y
x	x	x
y	y	y