

Assignment # 2

# Compiler Construction

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## Question no 1

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

Ans) The language L can be expressed by the following regular expression;

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

This language L may be expressed by the following FA;

5

A

B

B

6+

A

A

7+

B

B

A

1-

4

B

5

A

B

A

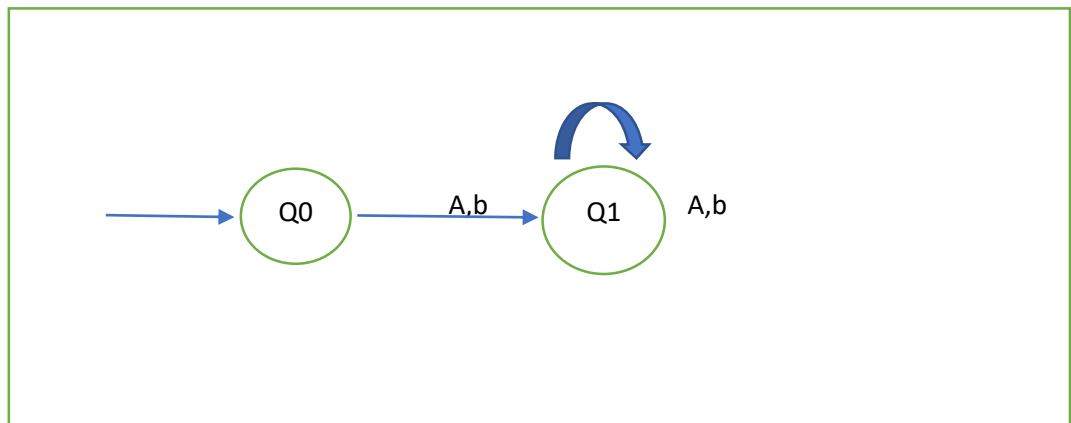
2+

3+

A

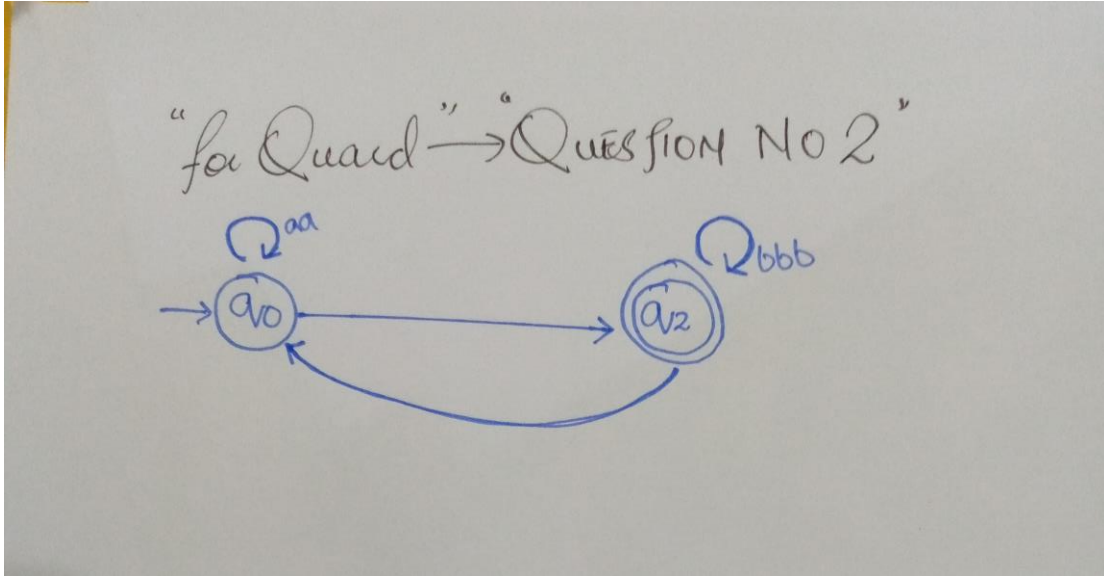
B

6



## Question no 2

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



Ans)

## Question no 3

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

- All words having even length
- All words having at least three a and two b
- All words having at least double a or triple b
- All words starts with double a or quadruple b.

Ans) All words having even length

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

- All words having at least three a and two b

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

- All words having at least double a or triple b

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

- All words starts with double a or quadruple b.

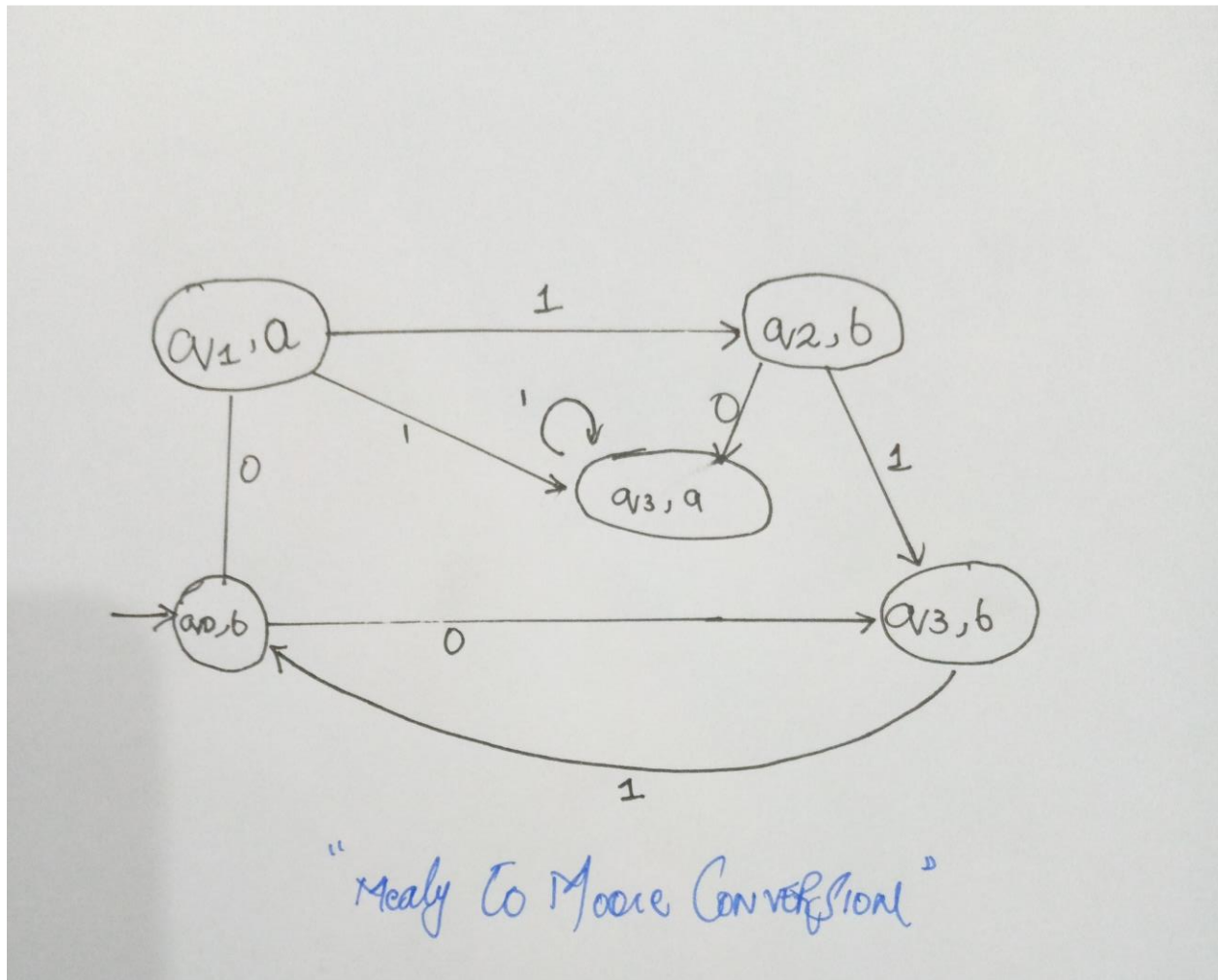
$$aa+bbb(a+b)$$

## Question no 4

Q4. Distinguish between Moore and Mealy machine and convert the following Mealy machine to Moore in figure 1.

Ans ) Difference between moore and mealy :

Mealy machine is a finite-state machine whose output values are determined both by its current state and the current inputs. This is in contrast to a Moore machine, whose (Moore) output values are determined solely by its current state.



## Question no 6

Q6. Draw a transition table for the diagram given in figure 2. (-) is the starting state and (+) is the ending state.

Ans)

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