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17/SCI01/020
CSC 304

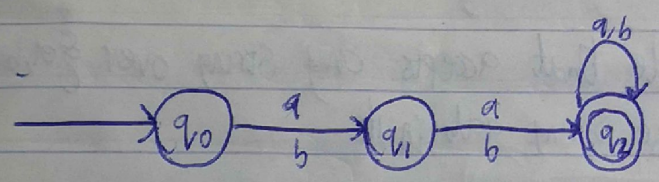
(31)

Automata Theory is the Study of abstract machines and automata, as well as the computational problems that can be solved using them.

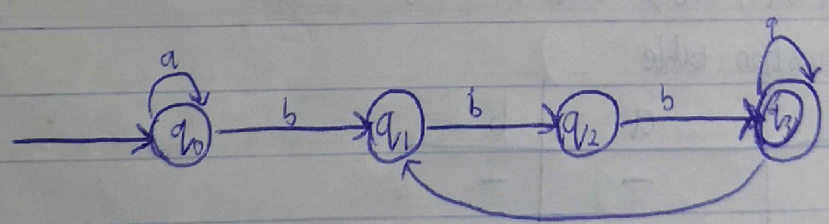
It can be represented using DFA (Deterministic Finite Automata) and NFA (Non-deterministic Finite Automation)

(32)

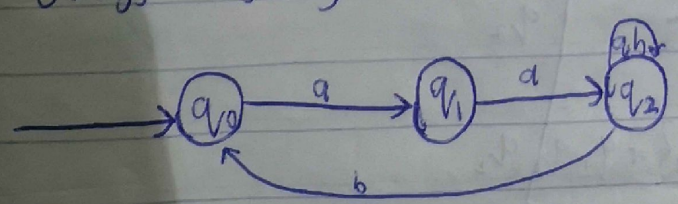
i) Length of the String is 3
{aaa, bbb, abb ....., }



ii) Substrings of Three Consecutive b's
{bbb, abbb, bbba, abbba, bbbb, ...}



iii) Strings beginning with aa



{aa, aaa, aab, aabb, ...}

iv) The transition table for iii)

	a	b
q_0	q_0	q_1
q_1	q_0	q_2
q_2	q_0	q_3
q_3	q_3	q_3

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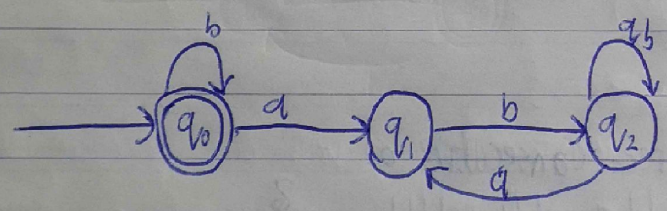
The transition table that accepts any string over $\{a,b\}$ that does not contain the string aab in it



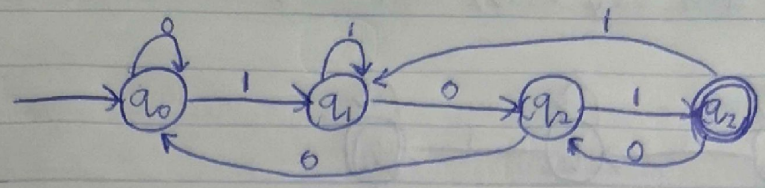
$\{\epsilon, ab, bab, aba, abab, \ldots\}$

The transition table

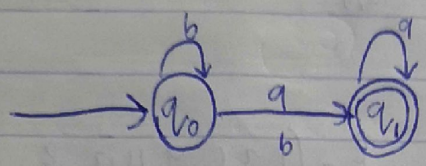
	a	b
q_0	–	–
q_0	q_1	q_0
q_1	–	q_2
q_2	$\{q_2, q_1\}$ or q_2, q_1	q_2

(34)

i) Strings that ends with 101

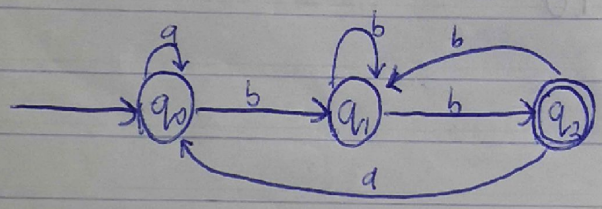


ii) Strings containing the string {aba} in it



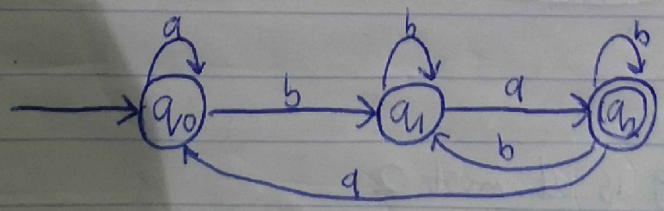
(35)

Strings ending with bb
{bb, abb, bbb, abbb, bbbb.....}



(36)

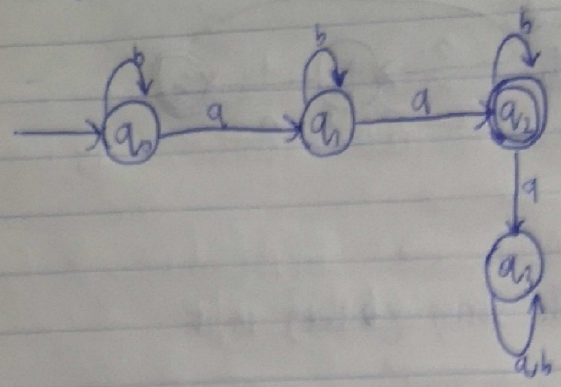
Strings ending ~~with~~ in ba
{ba, aba, bba, ...}



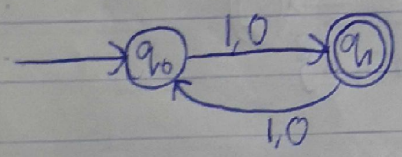
transition table

	a	b
q_0	q_0	q_1
q_1	q_2	q_1
q_2	q_0	q_2 & q_1 or $\{q_2, q_1\}$

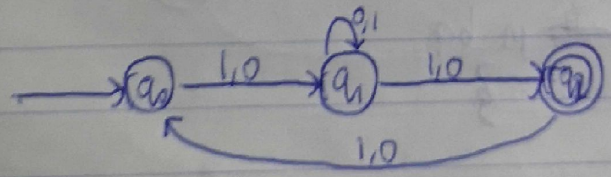
i) Strings contang only 2a's
{aa, aab, baa, baab, aabb, ...}



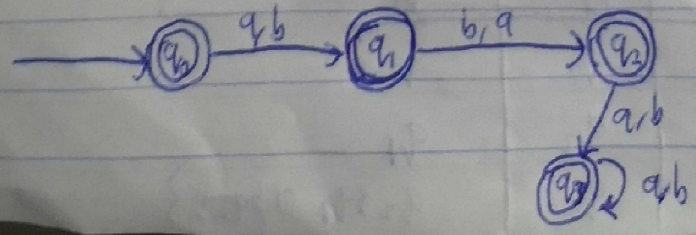
ii) 1 mod 2
L = {1, 0, 101, 010, 01010 ....} = (1, 3, 5, 9, 11, 13 ..}
length 1 length 3 length 5



iii) 1 mod 3
i.e (1, 4, 7, 10, 13 ...)
L_2 {0, 1, 0000, 1111, ...}

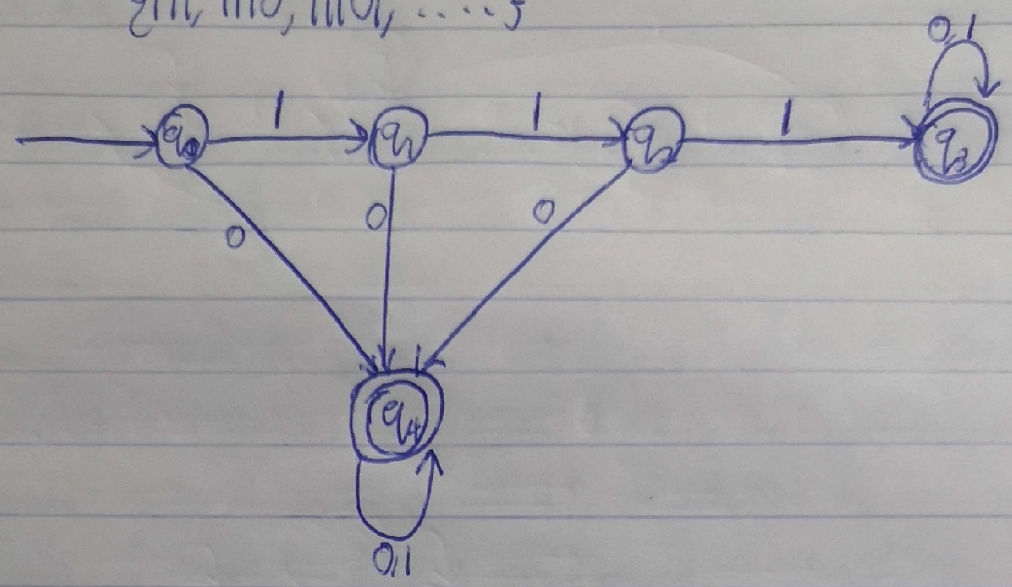


iv) length of string is at most 2
{ε, a, b, aa, ba, ab, bb}



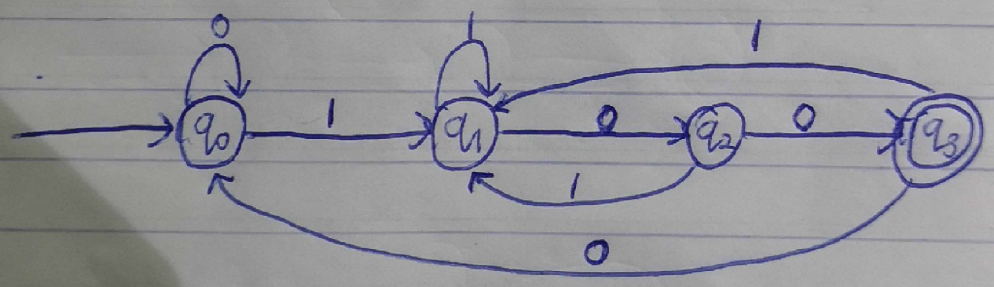
i) Strings that begins with 111

{111, 1110, 11101, ...}

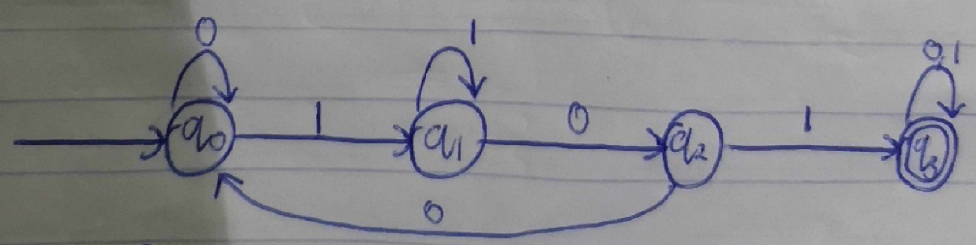


ii) Ends with 100

{0100, 1100, ...}



iii) Strings that contains 101



{0101, 1010, ...}