Automata

Take Home Assignment

Index: 16001354

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Question1

For M1:

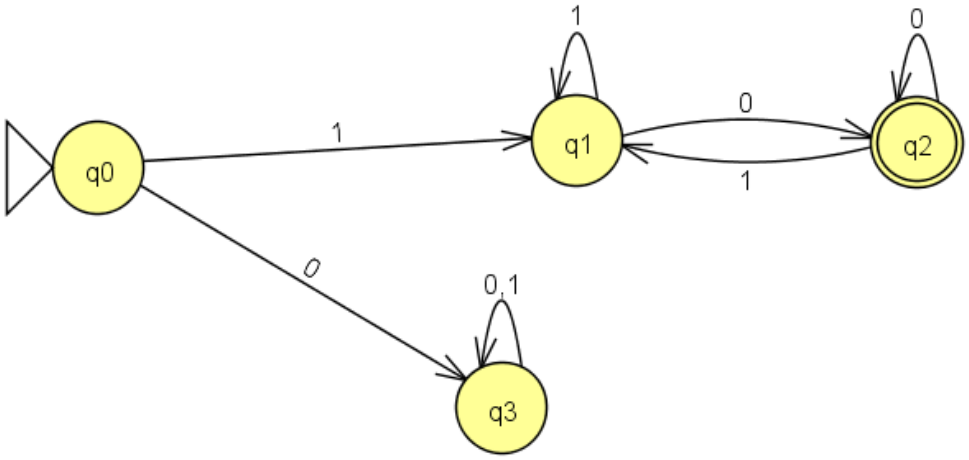
a) Start state: q1
b) Accept state: q2
c) q1->q2->q3->q1->q1
d) No
e) No

For M2:

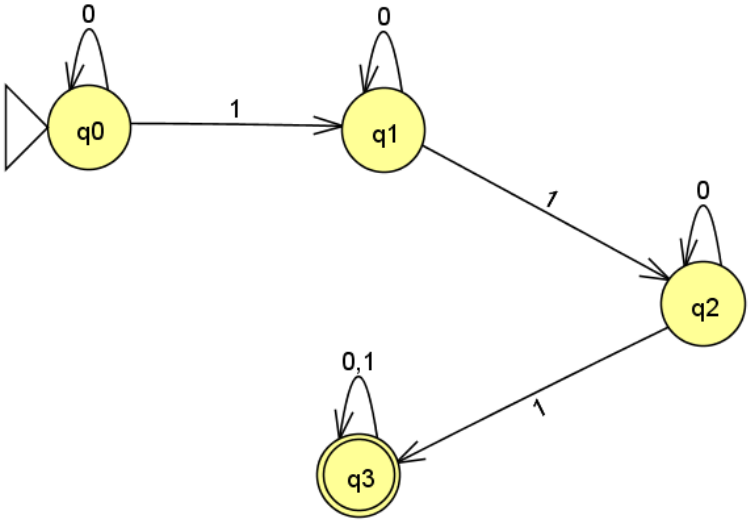
a) Start state:q1
b) Set of Accept states:{q1,q4}
c) q1->q1->q2->q4
d) Yes
e) Yes

Question2

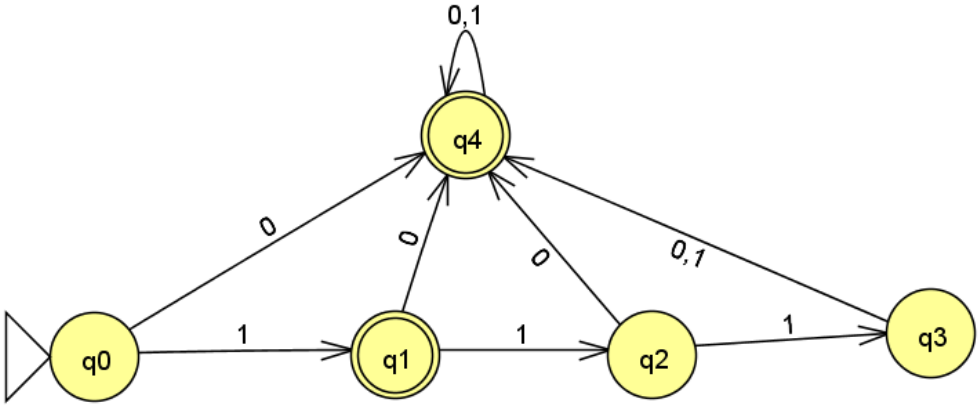
1. 1(1)* (1+0)* 0(0)*



2) (0+1)* 1(1)* (0+1)* 1(1)* (0+1)* 1(1)* (0+1)*

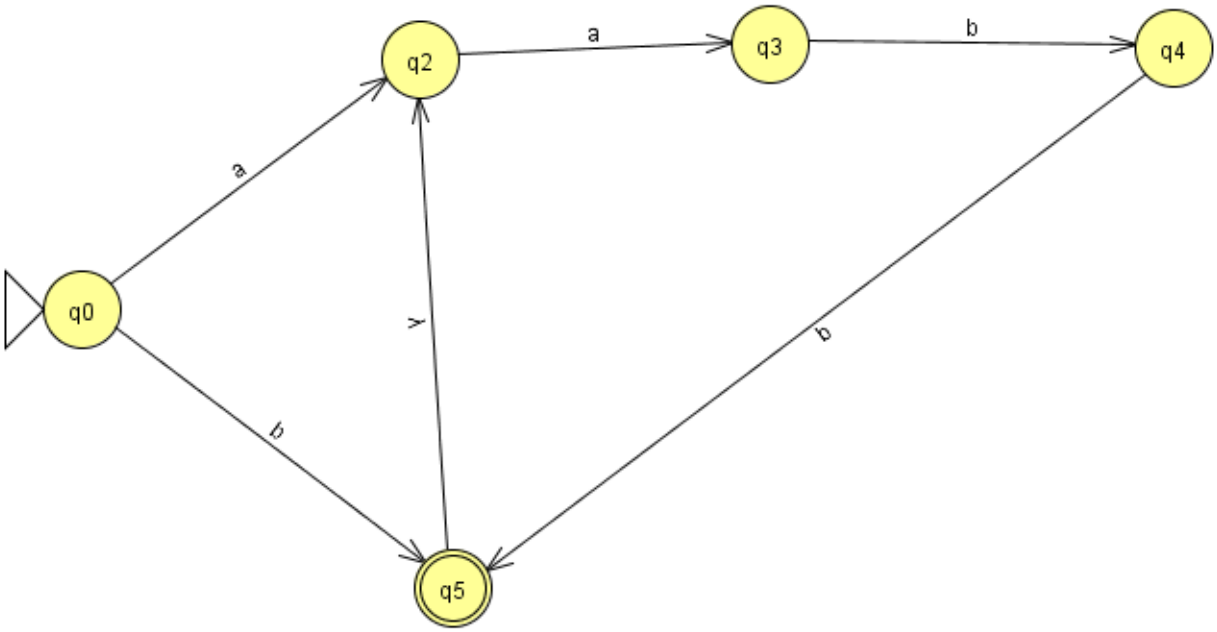


3) 0+(1(0+(1(0+(1(0+1)))))) (0+1)*

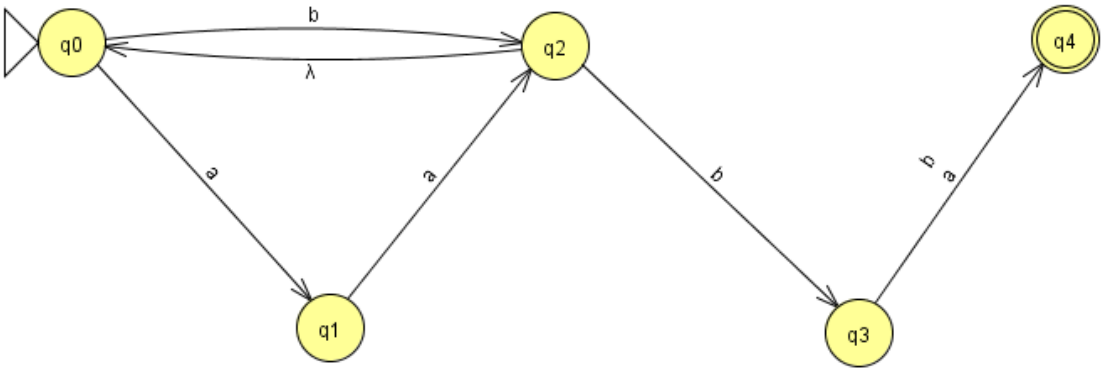


Question3

1)



2)



Question 04

Question 4

$L = \{ 0^m 1^m 2^m \mid m >= 0 \}$.

assume L is regular.

Since L is infinite, we can use pumping Lemma

let's take k as integer;

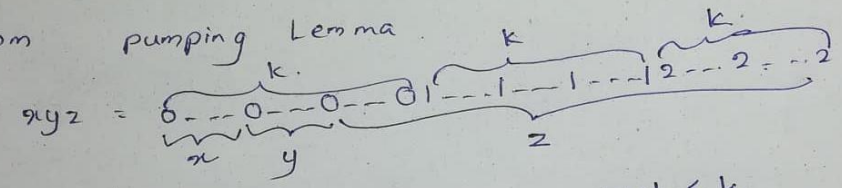
$w = 0^k 1^k 2^k$

$w \in L$. Since w is regular $0^k 1^k 2^k = xyz$

$|xy| \leq k$ $|y| \geq 1$.

$xyz = 0^k 1^k 2^k$

from pumping Lemma



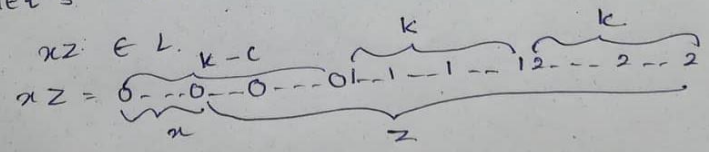
$y = 0^c$ $c \geq 1$ $|xy| \leq k$.

from pumping Lemma

$xy^i z \in L$ $i = 0, 1, 2, \ldots$

let's take $i = 0$.

$xz \in L$. $k - c$



Thus: $0^{k-c} 1^k 2^k \in L$ $k \geq 0$.

But $L = \{ 0^m 1^m 2^m : m \geq 0 \}$.

$0^{k-c} 1^k 2^k \notin L$ #

$\therefore L = \{ 0^m 1^m 2^m : m \geq 0 \}$ is not a regular language

Question5

1. S ->0A0|1A1
   A ->0A|1A|Ɛ

2. S ->0T|1T
   T ->0S|1S| Ɛ