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Discrete Structure

ASSIGNMENT 5

Group 15

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Discrete Structure Assignment V

Question 1

Let $M = \{S, I, q_0, f_s, F\}$

$S = \{q_0, q_1, q_2, q_3\}$

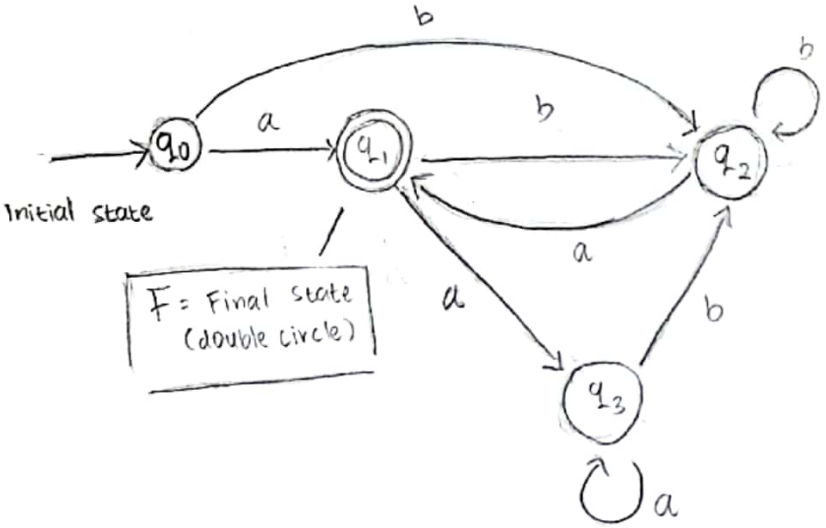
$I = \{a, b\}$

$F = \{q_1\}$

f_s is given by:

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

i. State transition diagram of the DFA:



ii. DFA can be applied for verification of email password. Justify why DFA is suitable for verification?

→ DFA

Deterministic

It refers to the uniqueness of the computation

Finite Automata

The Finite Automata are called deterministic finite Automata if the machine reads an input string one at a time

◇ Thus it can be applied due to its machine that can read specific input from the current state to the next state, it also cannot change state without any input character

Ans. to the ques no 2.

i) Required state transition table :-

δs	a	b
$\rightarrow S_0$	S_2	S_1
S_1	S_3	S_1
S_2	S_4	S_3
S_3	S_3	S_3
$*S_4$	S_2	S_3

ii) Given,

a) ω = a a a a a a ; transition state diagram :-

Here, the transition stops at S_4 for final input, but it is not a final state. ∴ The input string cannot be accepted by the DFA for this.

b) ω = a b a b a b ; transition state diagram :-

Here, the transition stops at S_3 for final input which is a final state. ∴ The input string is accepted by the DFA.

Question 3)

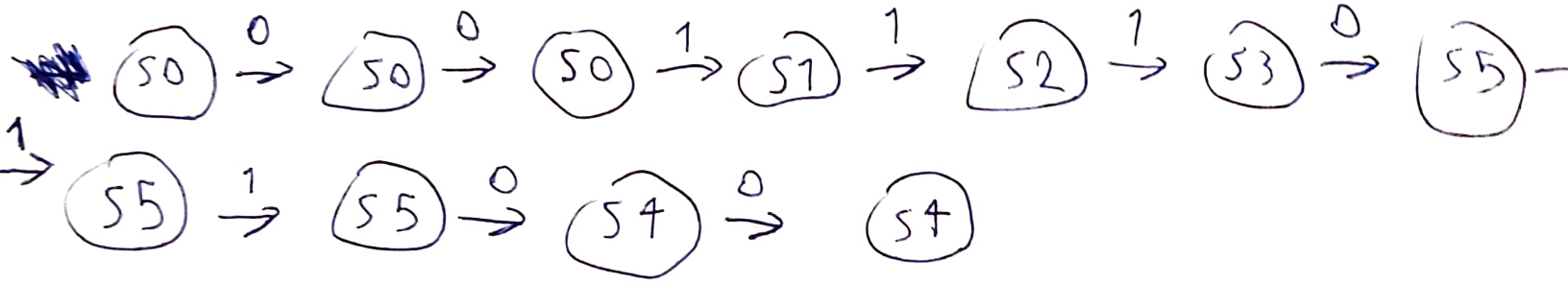
i. a) $S = \{S0, S1, S2, S3, S4, S5\}$

$I = \{0, 1\}$

q_0 = initial state (S0)

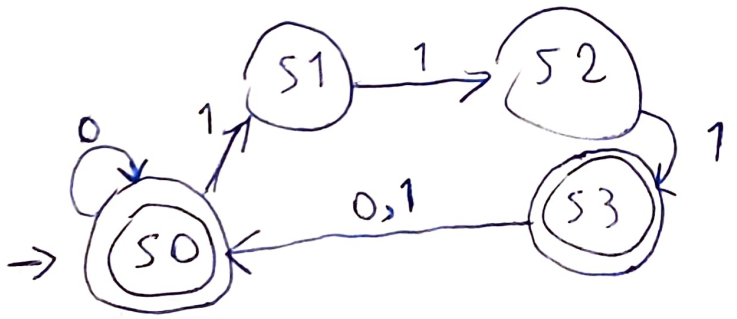
$F = \{S0, S1, S5\}$

b) w = 0011101100;



Transition stops at S4, but it's not a final state. So, the string is not accepted by the DFA.

ii.



No :

Date :

Ans. to the ques. no 4

Let, WANDER = x.

EVADE = y.

ATTACK = z.

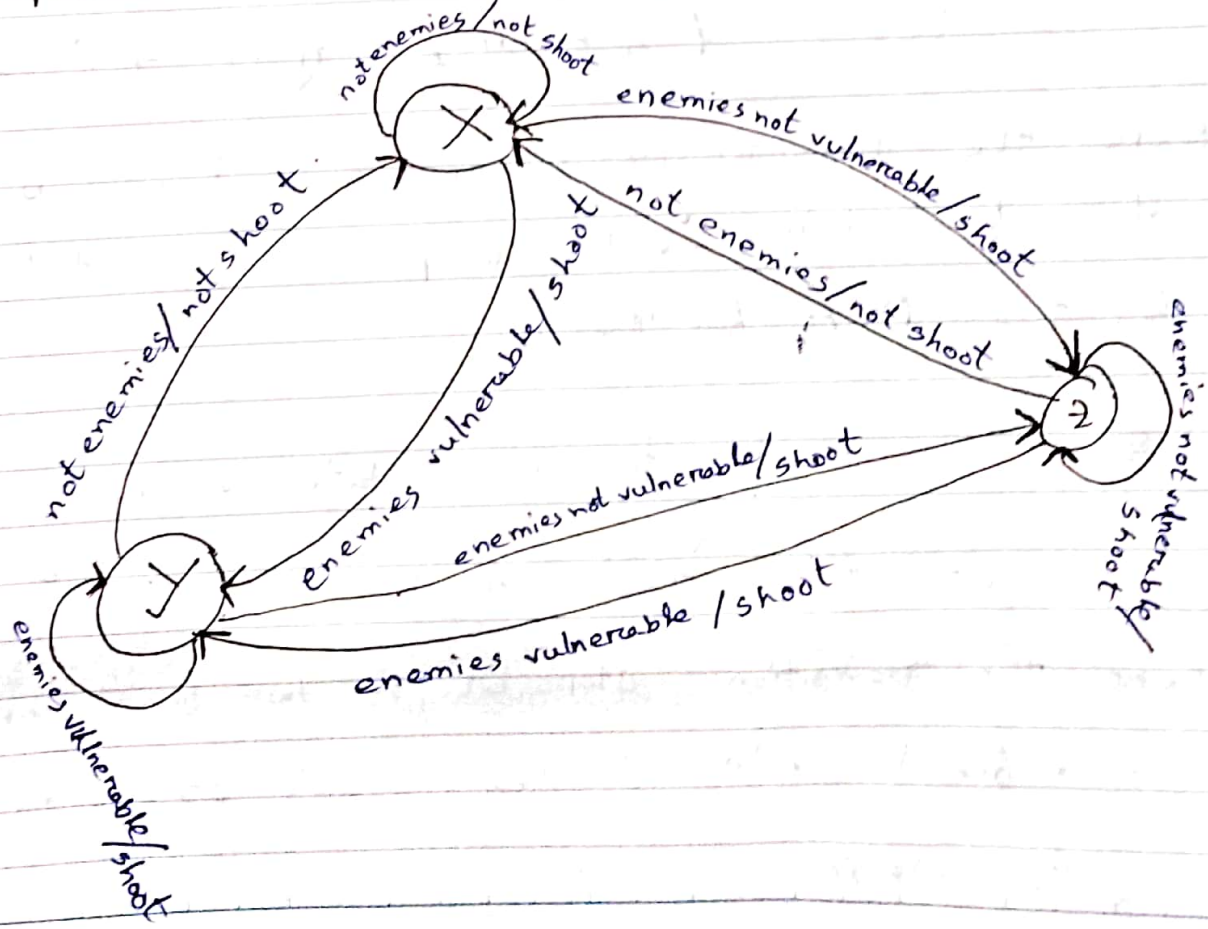
∴ S = {x, y, z}

Initial situation be X.

~~Input, I = {~~ Input, I = {not enemies, enemies & not vulnerable, enemies & vulnerable}

Output, O = {shoot, not shoot}

Required finite state diagram.



Date :

Question 5