SCHOOL OF COMPUTING
Faculty of Engineering

SECI1013 DISCRETE STRUCTURE

Assignment 5

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Section 07

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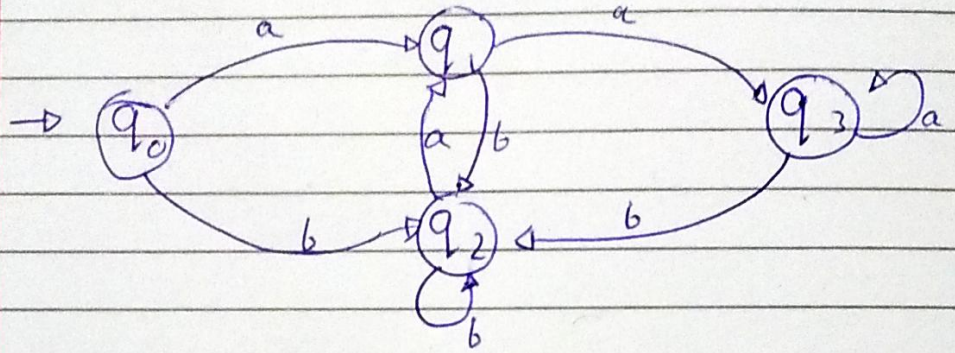
Q1 (i) $f_s(q_0, a) = a$.



(ii) Email verification can be done by using DFA Because if we want to check if an email address is grammatically correct form we can use a regular expression

Q2 (i)

	a	b
→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

Q2 (ii)

a) w = aaaaaaa

Transition function for the string w

$\delta(S_0, a) \rightarrow S_2$
$\delta(S_2, a) \rightarrow S_4$
$\delta(S_4, a) \rightarrow S_2$
$\delta(S_2, a) \rightarrow S_4$
$\delta(S_4, a) \rightarrow S_2$
$\delta(S_2, a) \rightarrow S_4$

w = aaaaaaa can't be accepted by DFA because after execution of input string DFA reach to the S_4 state which is not final state

b) w = ababab

transition function for the string w

$\delta(S_0, a) \rightarrow S_2$
$\delta(S_2, b) \rightarrow S_3$
$\delta(S_3, a) \rightarrow S_3$
$\delta(S_3, b) \rightarrow S_3$
$\delta(S_3, a) \rightarrow S_3$
$\delta(S_3, b) \rightarrow S_3$

w = ababab can be accepted by DFA → because after execution of input string DFA reach to the S_3 state which is a final state

Subject: Date:

Ans to the Ques No-3

i) a) Components of DFA

Q (States) $\Rightarrow \{S_0, S_1, S_2, S_3, S_4, S_5\}$

I (Input symbols) $\Rightarrow \{0, 1\}$

q_0 (Initial states) $\Rightarrow \{S_0\}$

F (Final states) $\Rightarrow \{S_0, S_1, S_5\}$

b) Sequence of config and states:-

of given string 0011101100

$= S(S_0, 0011101100) = S(S_0, 11101100) = S(S_0, 11101100)$

$= S(S_1, 1101100) = S(S_2, 101100) = S(S_3, 01100)$

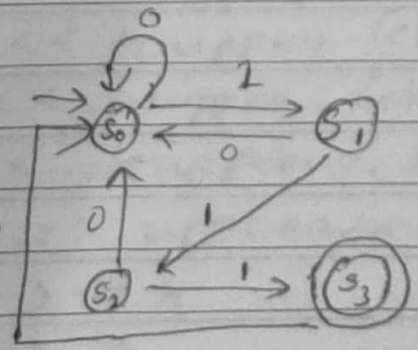
$= S(S_5, 1100) = S(S_5, 100) = S(S_5, 00)$

$= S(S_4, 0) = S_4$ (No final state)

S_0, Given string is not acceptable by DFA

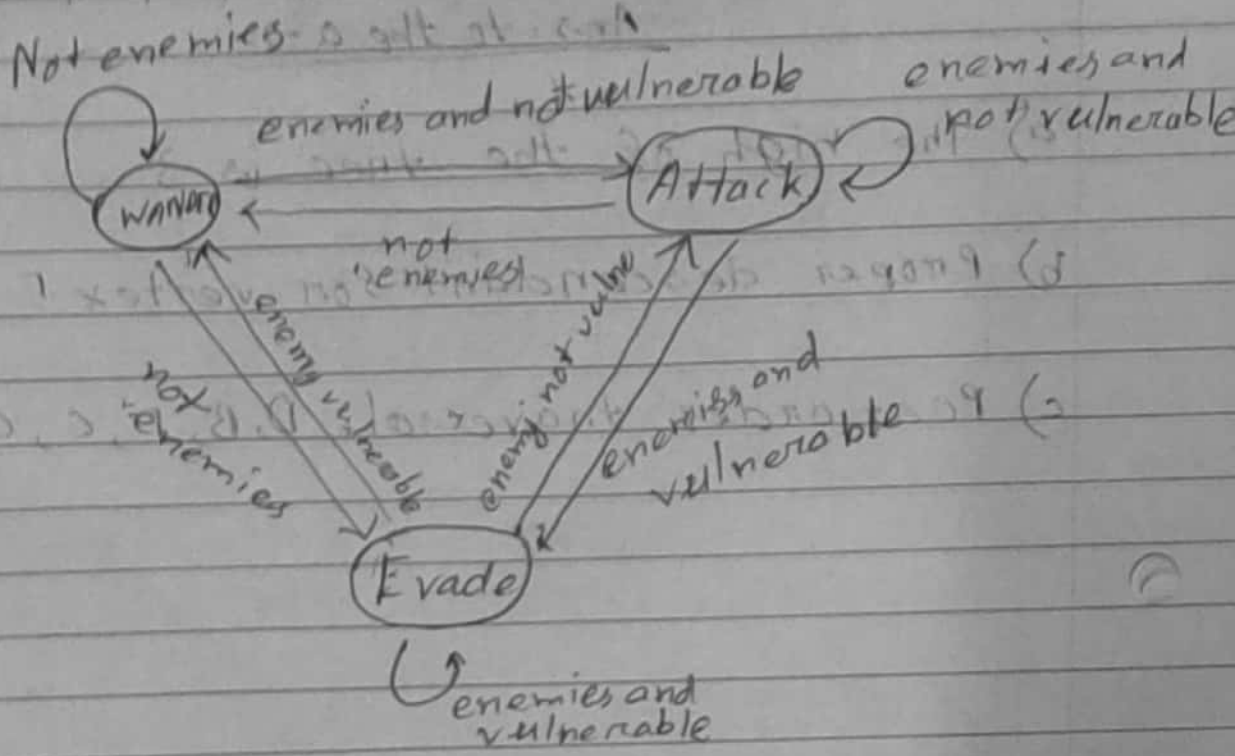
ii) DFA that accepts the set of all bits strings that contain three consecutive once

Now



Here DFA = $(\{S_0, S_1, S_2 S_3\}, \{0, 1\}, \{S_1\}, \{S_3\})$

Subject: Ans to the Ques No-9 Date:



The finite state diagram have nodes and arcs. They represent the state of hero

The arcs represent the change of state of hero. Note that hero can remain in only one of the states of a time

The three states are: WANDER, ATTACK and EVADE. The ~~arcs represent the change of state of hero~~

Here the diagram, the inputs are shown as arcs. The hero may go from one states to another on some input, which is shown by an arc from one states to another. He may also stay in the some inputs, which are shown by a self loop arc,

Question 5