



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

SCHOOL OF COMPUTING
Faculty of Engineering

ASSIGNMENT 5

DISCRETE STRUCTURE (SECI 1013)
SEMESTER I, SESSION 2020/2021

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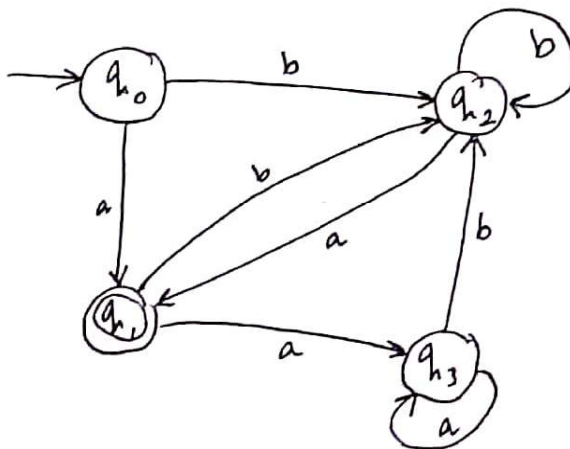
Section: 07

Q1)

i) (F_3) transition table :

	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

Transition diagram :



ii)

As a justification, DFA can be used to match email and the password can be matched with the e-mail because it is stored to be referred for the email chosen.

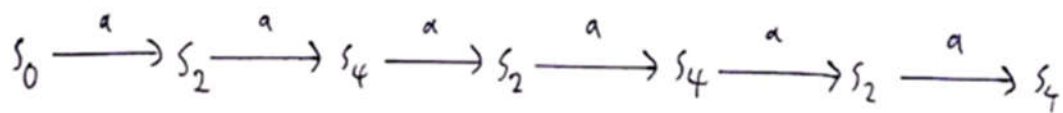
Also, DFA can be used to determine if the password used is valid to use or not, for instance, to determine the length of the password, and if it needs numbers and alphabet to be created or valid.

Question 2

i)

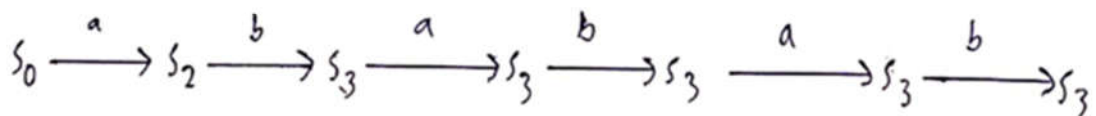
Current State	Next state	
	Current Input a	b
s_0	s_2	s_1
s_1	s_3	s_1
s_2	s_4	s_3
s_3	s_3	s_3
s_4	s_2	s_3

ii) a) $w = aaaaaa$



input is not accepted by the DFA

b) $w = ababab$



input is accepted by the DFA

Question-3

(i)

(a) here,

$$S = \{s_0, s_1, s_2, s_3, s_4, s_5\} \rightarrow \text{states}$$

$$I = \{0, 1\} \rightarrow \text{Inputs.}$$

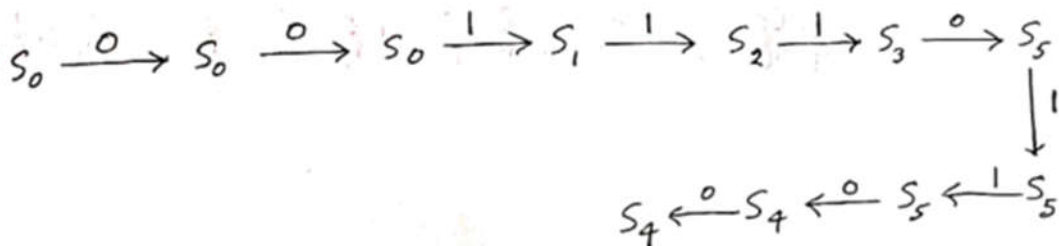
$$q_0 = \text{initial state} \rightarrow s_0$$

$$F = \{s_0, s_1, s_5\} \rightarrow \text{final states.}$$

(Ans.)

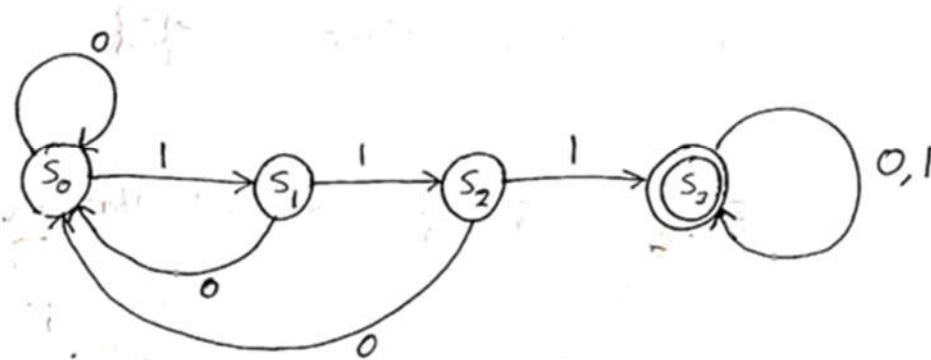
(b)

input string $\rightarrow 0011101100$



here, s_4 is not the final state so,
the string 0011101100 is not
accepted.

(ii) DFA that accepts the set of all bit strings that contain three consecutive 1s is given below -



here, DFA is,

$$M = \{s_0, s_1, s_2, s_3\}, \{0, 1\}, \{s_0\}, \{s_3\}$$

(Ans.)

Question 4

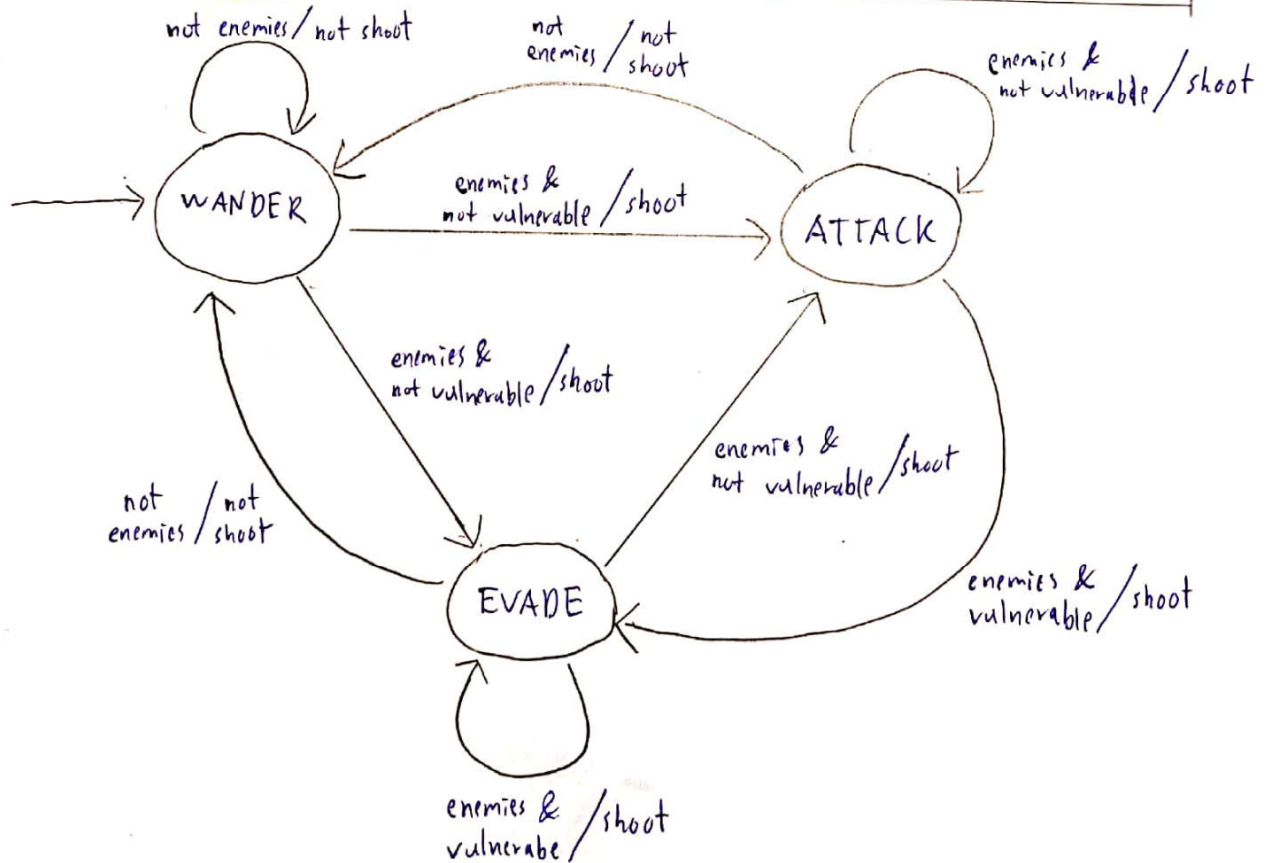
$S = \{WANDER, EVADE, ATTACK\}$

$I = \{\text{not enemies, enemies \& not vulnerable, enemies \& vulnerable}\}$

$O = \{\text{shoot, not shoot}\}$

initial state = WANDER

S	f_s			f_o		
	not enemies	enemies \& not vulnerable	enemies \& vulnerable	not enemies	enemies \& not vulnerable	enemies \& vulnerable
WANDER	WANDER	ATTACK	EVADE	not shoot	shoot	shoot
EVADE	WANDER	ATTACK	EVADE	not shoot	shoot	shoot
ATTACK	WANDER	ATTACK	EVADE	not shoot	shoot	shoot



Question 5)

