



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

ASSIGNMENT:- 05

*SCHOOL OF COMPUTING
FACULTY OF ENGINEERING
SUBJECT:-DISCRETE STRUCTURE
SUBJECT CODE:-SECI1013-08*

Group-08

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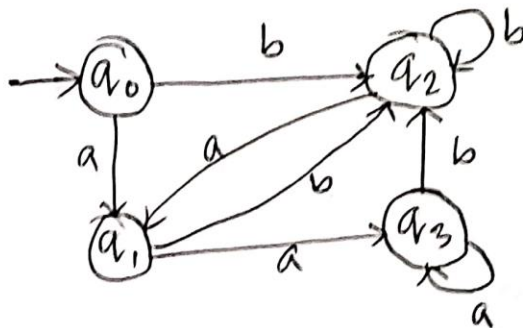
Ans to the Ques. NO.01.

i)

Transition table (fs),

	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

For justification, DFA may 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.

Again, the DFA can be used to determine whether password is valid or not. to determine the length of the password and it needs numbers and alphabets to be checked valid.

Ans to the question No: 02

①

Current state	Next state	
	Current Input a	Input 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

② a

Given that,

$$w = aaaaaa$$

$$s_0 \xrightarrow{a} s_2 \xrightarrow{a} s_4 \xrightarrow{a} s_2 \xrightarrow{a} s_4 \xrightarrow{a} s_2 \xrightarrow{a} s_4$$

input is not accepted by DFA.

② ①⑥ Given that,
 $w = ababab$

$s_0 \xrightarrow{a} s_2 \xrightarrow{b} s_3 \xrightarrow{a} s_3 \xrightarrow{b} s_3 \xrightarrow{a} s_3 \xrightarrow{b} s_3$

input is accepted by DFA.

Ans. to the Ques. NO.03.

if a. components of S, I, q_0, F ,
Here,

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

$$I = \{0, 1\}$$

$$q_0 = \{s_0\}$$

$$F = \{s_0, s_1, s_5\}$$

Ans.

b. Sequence of configurations and states:

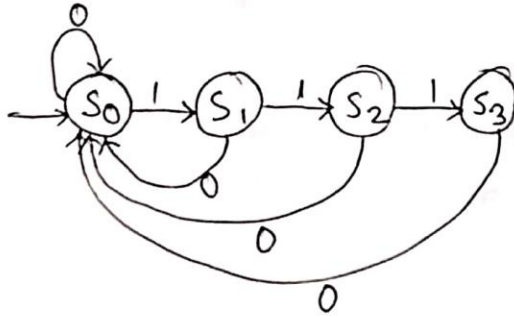
given (strings) 0011101100.

$$\begin{aligned} d(s_0, \overset{\downarrow}{0}011101100) &= d(s_0, \overset{\downarrow}{0}11101100) = d(s_0, \overset{\downarrow}{1}1101100) \\ &= d(s_1, \overset{\downarrow}{1}101100) = d(s_2, \overset{\downarrow}{1}01100) = d(s_3, \overset{\downarrow}{0}1100) \\ &= d(s_5, \overset{\downarrow}{1}100) = d(s_5, \overset{\downarrow}{1}00) = d(s_5, \overset{\downarrow}{0}) \\ &= d(s_4, \overset{\downarrow}{0}) = s_4 \text{ (non final state)} \end{aligned}$$

$\therefore$ The given string (0011101100) is not accepted
by DFA.

Ans.

ii) DFA with three consecutive 1s,



Now,

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

Ans.

Ans to the question No: 4

Given that,

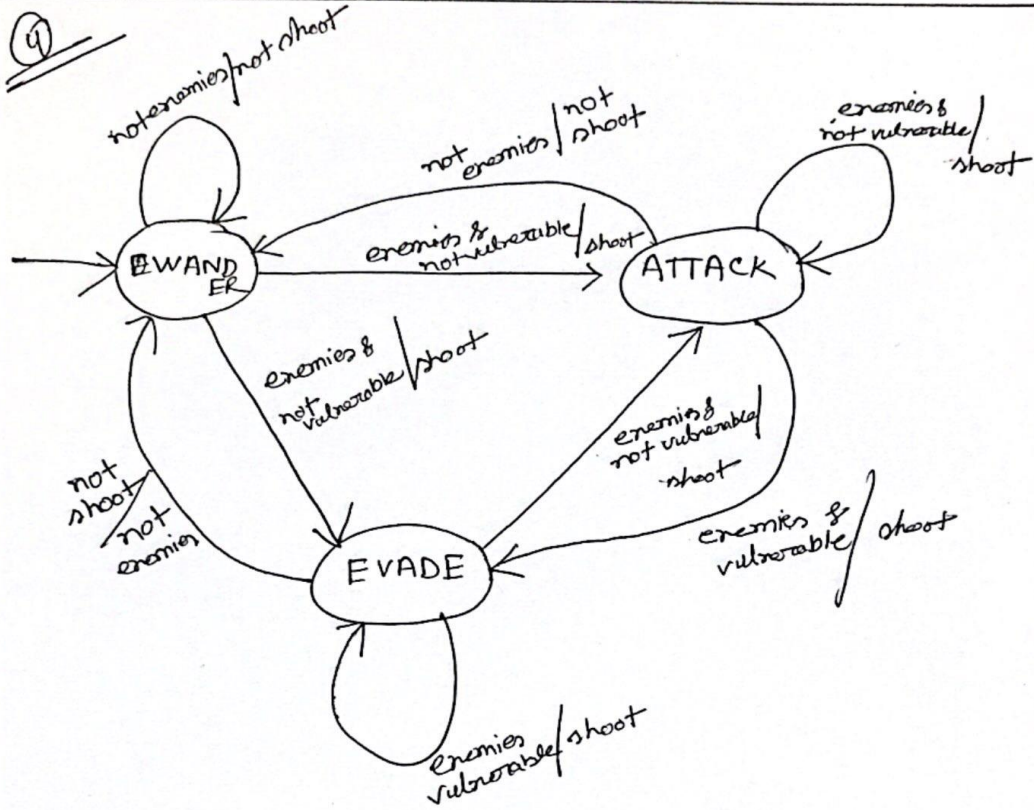
$$S = \{ \text{WANDER, EVADE, ATTACK} \}$$

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

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

initial state = WANDER

S	b_s	b_s	b_s	b_o	b_o	b_o
S	not enemies	enemies & not vulner	enemies & vulnerable	not enemies	enemies & not vulner	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



Answer of the question No.5

