



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Assignment 5

SECI 1013 SECTION 01
DISCRETE STRUCTURE

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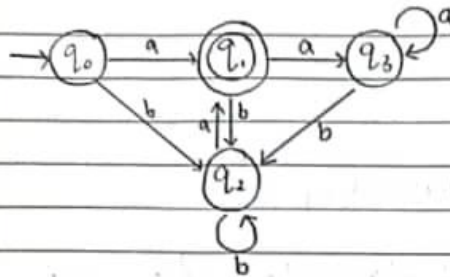
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Semester 1 2020/2021

Question 1

i)



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

ii) DFA can be applied for verification of email password. This is because DFA will read the password and accepts it if it stops in an accepting state. Only the right password will be accepted and reach the final state.

Question 2

i)

f_s	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) $w = a a a a a$

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

$\therefore W$ is not accepted by the DFA since its final state is not s_2 or s_3 .

b) $w = a b a b a b$

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

$\therefore W$ is accepted by the DFA since its final state is s_3 .

Date:

No.:

Question 3

a) $S = \{S_0, S_1, S_2, S_3, S_4, S_5\}$

$I = \{0, 1\}$

$q_0 = \{S_0\}$

$F = \{S_0, S_1, S_5\}$

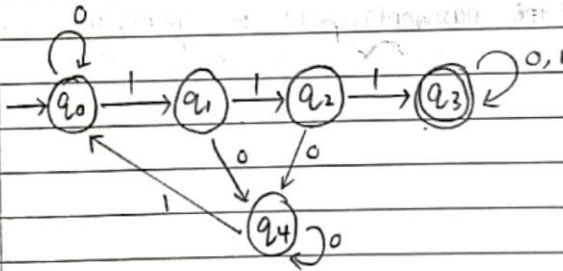
b) if string 0011101100 is accepted by DFA.

$$S_0 \xrightarrow{0} S_0 \xrightarrow{0} S_0 \xrightarrow{1} S_1 \xrightarrow{1} S_2 \xrightarrow{1} S_3 \xrightarrow{0} S_5 \xrightarrow{1} S_5 \xrightarrow{1} S_5 \xrightarrow{0} S_4$$

$$\downarrow 0$$

$$S_4$$

ii)



No.:

Date:

Question 4

 q_0 = WANDER stage q_1 = EVADE stage q_2 = ATTACK stage

a = not enemies

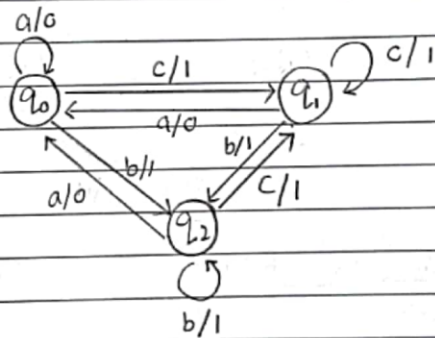
b = enemies and not vulnerable

c = enemies and vulnerable

0 = not shoot

1 = shoot

state	f_s			f_o		
	a	b	c	a	b	c
q_0	q_0	q_2	q_1	0	1	1
q_1	q_0	q_2	q_1	0	1	1
q_2	q_0	q_2	q_1	0	1	1



No.: _____

Date: _____

Question 5

State	f_s										f_o									
	A	B	C	D	E	F	G	H	I	A	B	C	D	E	F	G	H	I		
S_1	S_2									0										
S_2		S_3	S_9								0	1								
S_3				S_6	S_4								0	0						
S_4				S_6	S_3								0	0						
S_5				S_6	S_9								0	2						
S_6						S_7									0					
S_7							S_8									0				
S_8								S_6	S_9								0	1		
S_9																		))		

0 = x happen

1 = reject ATM

2 = lock ATM

