UTM

UNIVERSITI TEKNOLOGI MALAYSIA

DISCRETE STRUCTURE (SECI 1013-03)

SEMESTER 1-2020/2021

ASSIGNMENT# 1

GROUP 13

GROUP MEMBERS:

NAME	MATRIC NO.
1. LEE JIA XIAN	A20EC0200
2. RISHMA FATHIMA BINTI BASHER	A20EC0137
3. SAKINAH AL'IZZAH BINTI MOHD ASRI	A20EC0142

LECTURER'S NAME:

DR. NOR AZIZAH BINTI ALI

Question 1

i.

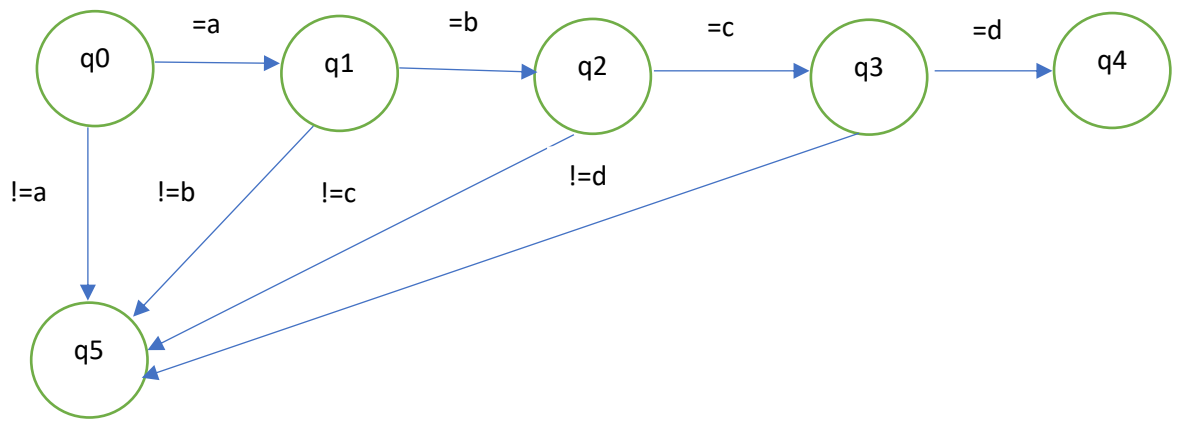
fs	a	b
q0	q1	q2
q1	q3	q2
q2	q1	q2
q3	q3	q2

ii.

Because DFA can trace the input by the user to accept only same character with the password.

After the user enter the password, we can use DFA to verify whether the password input by the user is same with the created password. First, in q0 the DFA will only proceed to q1 if only the first character key in by the user is match with the first character of the created password. Otherwise q0 will proceed to qn+1 (where the state to terminate the password verification). Then the process will repeat in the same way to verify the next character until qn, final state (n = number of character of the created password). In the state on the password is verified successfully.

For example : if password = abcd



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) aaaaaa

$$S_0 \xrightarrow{a} S_2 \xrightarrow{a} S_4 \xrightarrow{a} S_2 \xrightarrow{a} S_4 \xrightarrow{a} S_2 \xrightarrow{a} S_4$$

Not accepted by DFA because the end state is S_4 and S_4 is not the final state.

b) ababab

$$S_0 \xrightarrow{a} S_2 \xrightarrow{b} S_3 \xrightarrow{a} S_3 \xrightarrow{b} S_3 \xrightarrow{a} S_3 \xrightarrow{b} S_3$$

Accepted by DFA because the final state is S_3 and S_3 is the final state.

Question 3

i. a) S={S_0,S_1,S_2,S_3,S_4,S_5}

I={0,1}

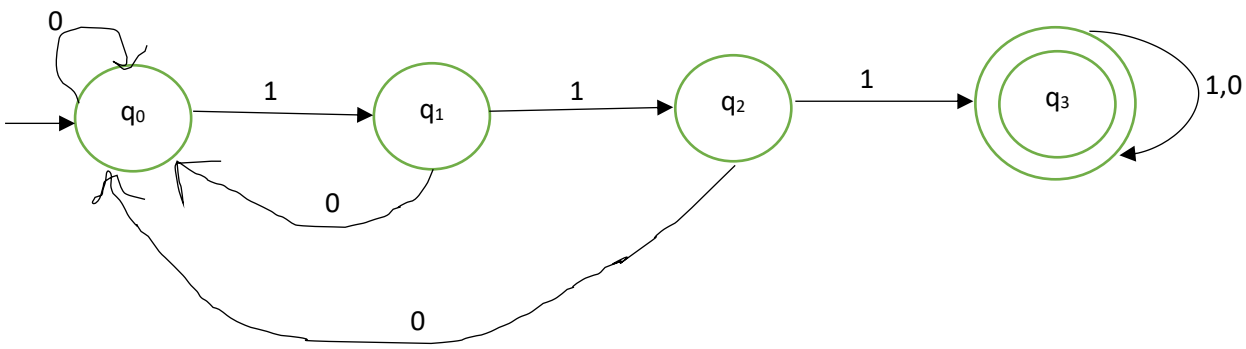
$q_0 = \{s_0\}$

F={S_0,S_1,S_5}

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

Not accepted by DFA because the end state is S_4 , S_4 is not the final state.

ii.



Question 4

State:

W – Wander

E – Evade

A – Attack

Input:

a – No enemy

b – Enemy and not vulnerable

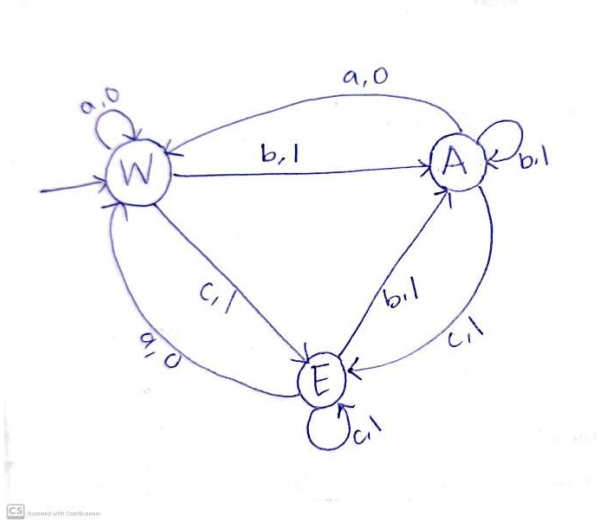
c – Enemy and vulnerable

Output:

0 – not shoot

1 – shoot

State	Input			Output		
	a	b	c	a	b	c
W	W	A	E	0	1	1
E	W	A	E	0	1	1
A	W	A	E	0	1	1



Question 5