



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

SCHOOL OF COMPUTING
Faculty of Engineering

ASSIGNMENT 5

DISCRETE STRUCTURE-07

GROUP-01:

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Question 1 and 2 (Part 1):

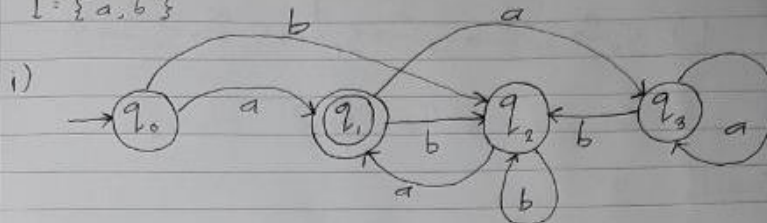
Question 1

$$M = \{S, I, q_0, f, F\}$$

$$S = \{q_0, q_1, q_2, q_3\}$$

$$F = \{q_1\}$$

$$I = \{a, b\}$$



- ii) DFA can be used to match the first match the email then the password can be matched using the DFA started with the password stored for an email address. DFA can also determine whether a password is invalid or not. Like one integer or one alphabet.

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_1	S_3
S_4	S_2	S_3

Question 2 (Part 2) and 3:

Question 2

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

no, S_4 is not the final state

b) $S_0 \xrightarrow{a} S_2 \xrightarrow{b} S_3 \xrightarrow{a} S_1 \xrightarrow{b} S_3 \xrightarrow{a} S_1 \xrightarrow{b} S_3$

Yes, S_3 is the final state

Question 3

i) a) $S = S_0, S_1, S_2, S_3, S_4, S_5$

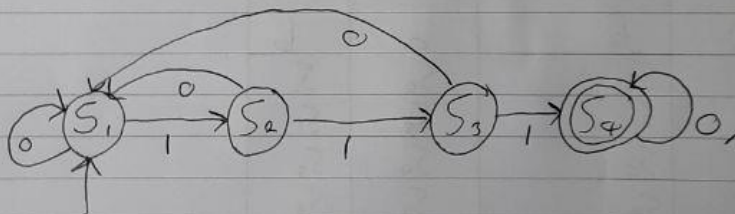
$I = 1, 0$

$q_0 = S_0$

$F = S_0, S_1, S_5$

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

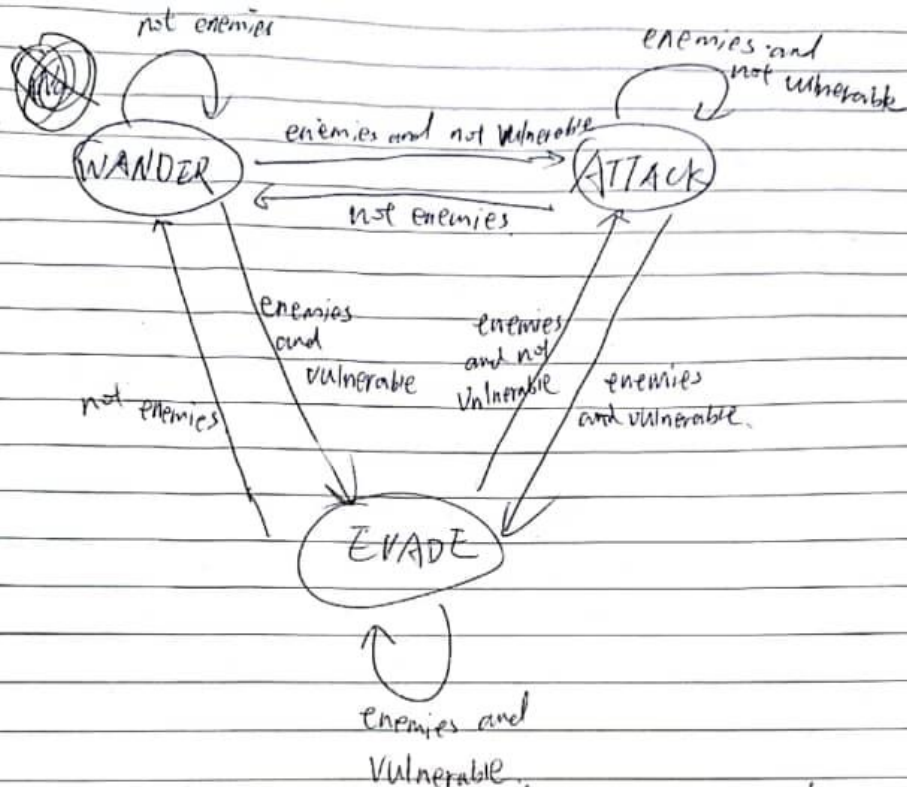
ii)



Question 4:

Q4

ZHOU CHENXIN A19204034



The finite state diagram has nodes and arcs. The nodes represent the state of hero. The arcs represent the change of state of the hero, that hero can remain in only one of the states at a times. The three states are: wander, attack; and evade. In the diagram, the inputs are shown as arcs. The hero may go from one state to another on some input, which is shown by an arc from one state to another. He may also stay in the same state for some inputs, which is shown by a self-loop arc.

Type

Question 5:

Question 5

- States:
- S_1 = Welcome screen
 - S_2 = Validating Card
 - S_3 = 1st PIN entering Screen
 - S_4 = 2nd PIN entering Screen
 - S_5 = 3rd PIN entering Screen
 - S_6 = Choosing transaction Screen.
 - S_7 = Performing transaction.
 - S_8 = Asking for other transaction Screen.
 - S_9 = Terminate ATM Session

Input =

- A = Insert ATM Card
- B = Valid ATM Card
- C = Invalid ATM Card
- D = Correct PIN
- E = Incorrect PIN
- f = Transaction Selected
- G = Complete transaction
- H = Yes for Other transaction
- I = No for Other transaction

Output =

- 0 = Nothing Happened
- 1 = Eject ATM Card
- 2 = Lock ATM Card

