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III-ACSAD

NFA – ASSIGNMENT2

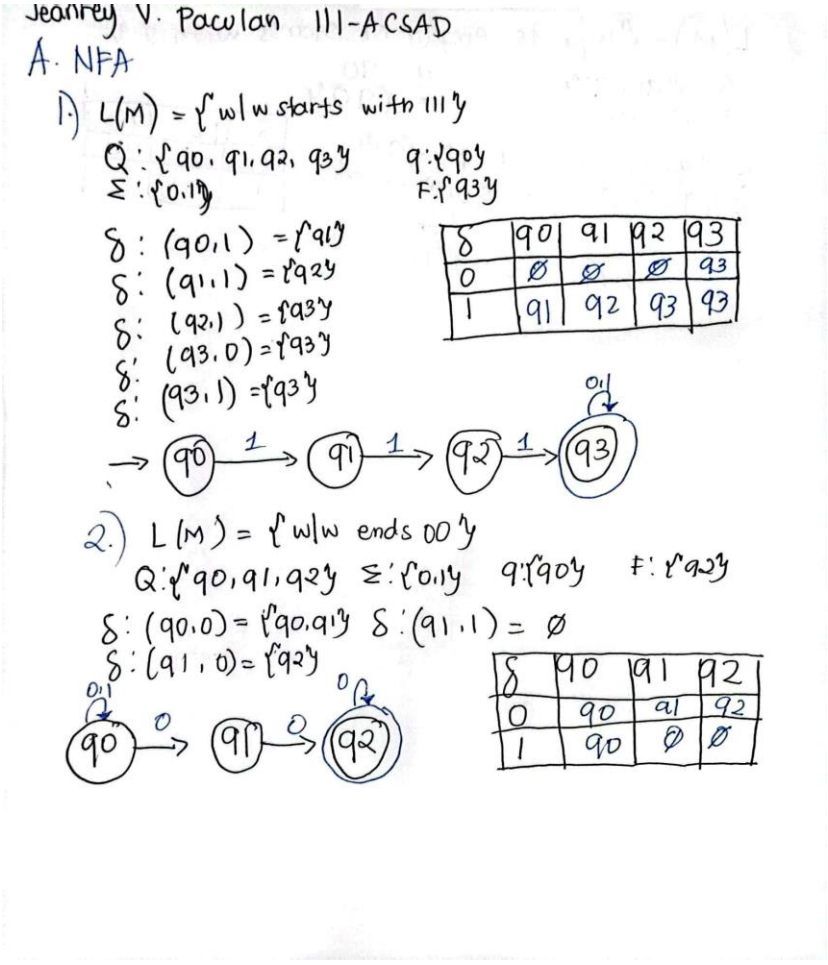
NFA, NFA to DFA

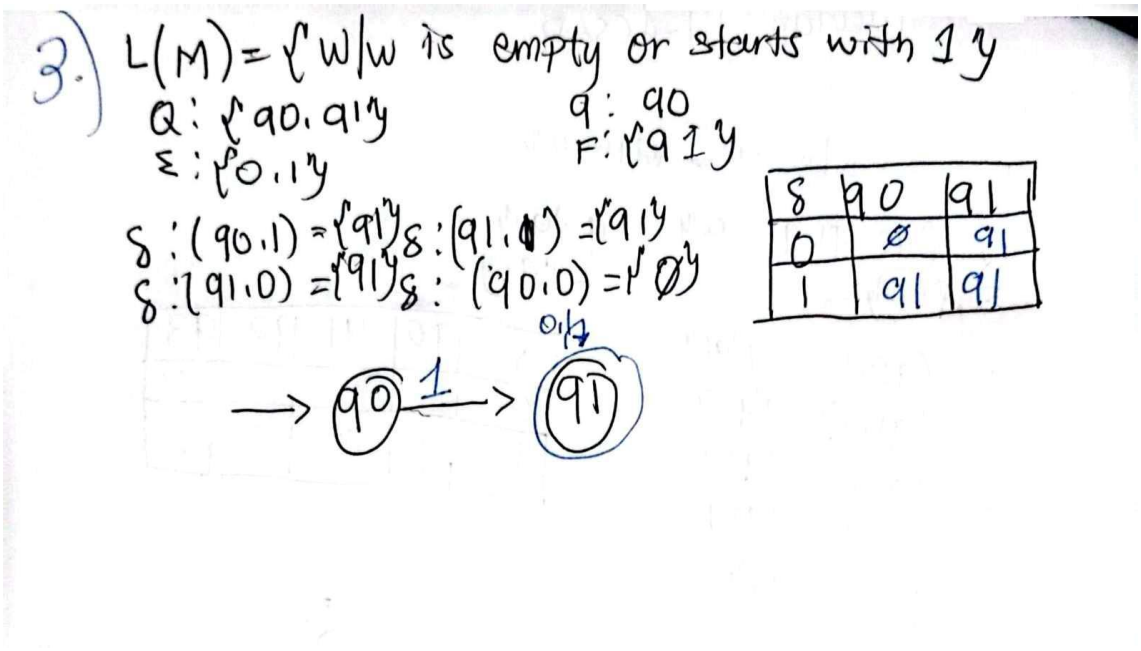
A. Create an NFA and provide the 5 Tuple for the following:

1. L(M) = {w|w starts with 111}

2. L(M) = {w|w ends with 00}

3. L(M) = {w|w is empty or starts with 1}





δ	q0	q1
0	∅	q1
1	q1	q1

B. Using the Transition Diagram for each sub-item in Test A, provide the equivalent DFA (Transition Diagram, 5 Tuple, and State Diagram)

8. NFA - DFA

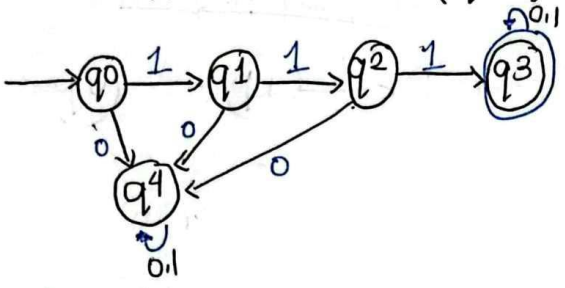
1) $Q' : \{q^0, q^1, q^2, q^3, q^4\}$ $\Sigma' : \{0, 1\}$ $q : q^0$ $F' : \{q^3\}$

$\delta : (q^0, 1) = q^1$ $\delta : (q^2, 1) = q^3$ $\delta : (q^4, 0) = q^4$

$\delta : (q^0, 0) = q^4$ $\delta : (q^2, 0) = q^4$ $\delta : (q^4, 1) = q^4$

$\delta : (q^1, 1) = q^2$ $\delta : (q^3, 1) = q^3$

$\delta : (q^1, 0) = q^4$ $\delta : (q^3, 0) = q^3$



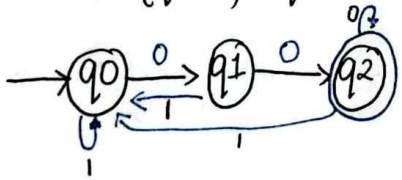
δ	q0	q1	q2	q3	q4
0	q4	q4	q4	q3	q4
1	q1	q2	q3	q3	q4

2.) $Q' : \{q0, q1, q2\}$ $\Sigma' : \{0, 1\}$ $q : q0$ $F : \{q2\}$

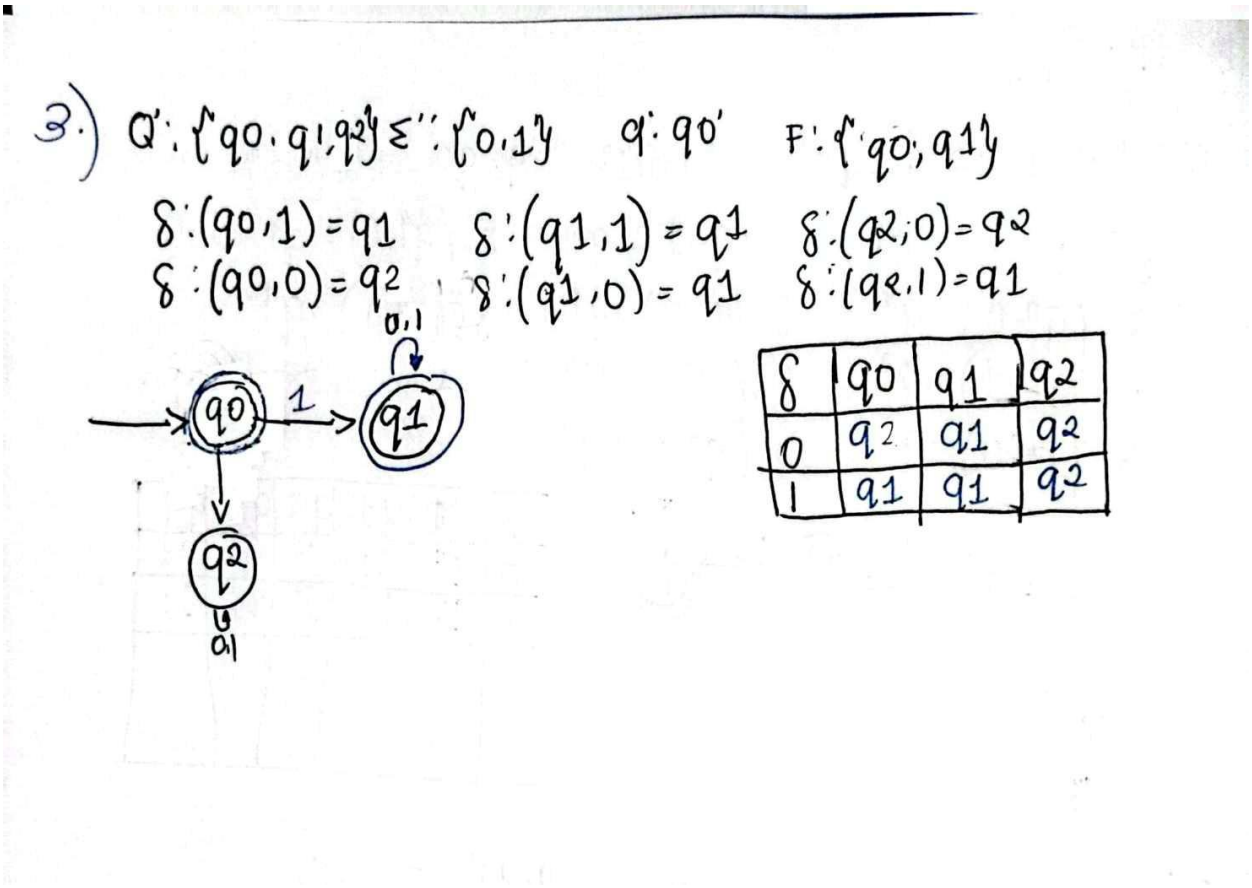
$\delta : (q0, 0) = q1$ $\delta : (q1, 1) = q0$

$\delta : (q0, 1) = q0$ $\delta : (q2, 0) = q2$

$\delta : (q1, 0) = q2$ $\delta : (q2, 1) = q0$



δ	q0	q1	q2
0	q1	q2	q2
1	q0	q0	q0



C. Perform the Union operation on B.1 and B.2.

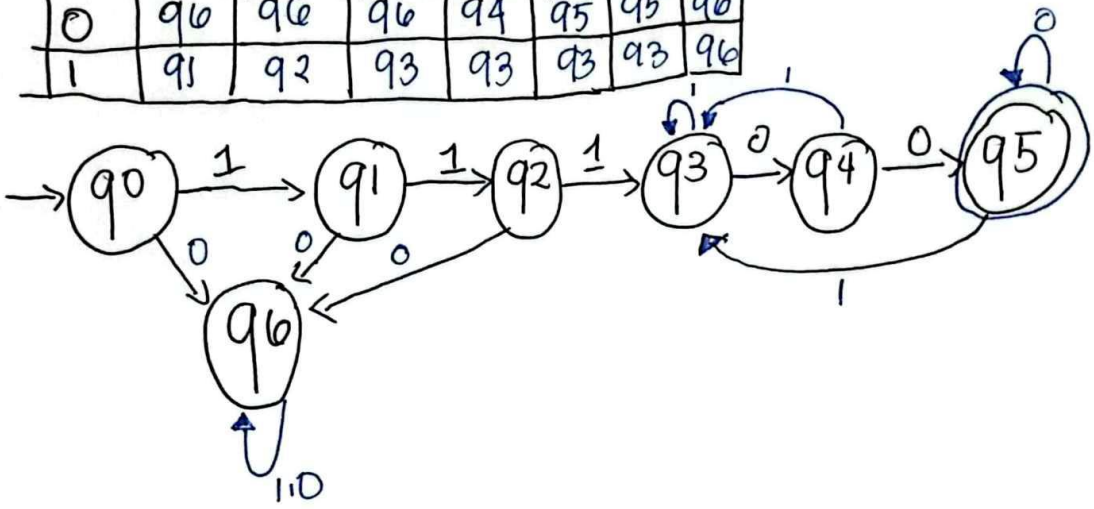
Provide the equivalent DFA and 5 Tuple

C. Perform Union on B1, B2

$Q = \{q0, q1, q2, q3, q4, q5, q6\}$

$\Sigma = \{0, 1\}$ $q = \{q0\}$ $F = \{q5\}$

δ	q0	q1	q2	q3	q4	q5	q6
0	q6	q6	q6	q4	q5	q5	q6
1	q1	q2	q3	q3	q3	q3	q6



$\delta'(q0, 0) = q6$

$\delta'(q0, 1) = q1$

$\delta'(q1, 0) = q6$

$\delta'(q1, 1) = q2$

$\delta'(q2, 0) = q6$

$\delta'(q2, 1) = q3$

$\delta'(q3, 0) = q4$

$\delta'(q3, 1) = q3$

$\delta'(q4, 0) = q5$

$\delta'(q4, 1) = q3$

$\delta'(q5, 0) = q5$

$\delta'(q5, 1) = q3$