RGPV 2010, 02

Q. Write short note on equivalent of DFA and NDFA ?

Ans.

1. Every DFA is an NDFA.
2. If from a regular set an NDFA is created than there may be chances of existence of DFA.

DFA is 5 tuple machine:

M = (Q, Σ, δ, q0, F)

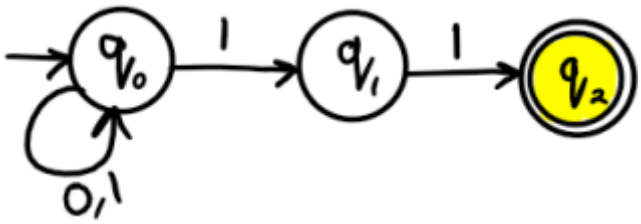
1. Q is a finite non empty set of states.
2. Σ is a finite non empty set of input symbols.
3. δ is a transition function, QXΣ int to Q
4. q0 is an initial state belong to Q.
5. F is the set of final states belong to Q.

NDFA is 5 tuple machine:

M = (Q, Σ, δ, q0, F)

1. Q is a finite non empty set of states.
2. Σ is a finite non empty set of input symbols.
3. δ is a transition function, QXΣ int to 2^Q
4. q0 is an initial state belong to Q.
5. F is the set of final states belong to Q.

Problem 01: Convert the following Non-Deterministic Finite Automata (NDFA) to Deterministic Finite Automata (DFA).



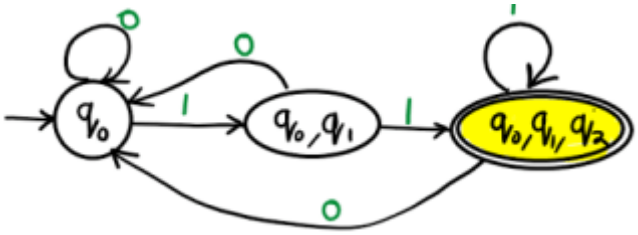
Transition table for NDFA from above NDFA transition diagram

State	Input 0	Input 1
->q0	q0	q0, q1
q1	–	*q2
q2	–	–

Transition table for DFA from above NDFA transition table

State	Input a	Input b
->q0	q0	{q0, q1}
{q0, q1}	q0	*{q0, q1, q2}
*{q0, q1, q2}	q0	*{q0, q1, q2}

Transition diagram from above DFA transition table



Reference:

1. Introduction to Automata Theory Language & Computation, Hopcroft& Ullman,
2. Theory of Computation, Chandrasekhar & Mishra, PHI.

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22. Grammar is ambiguous. S → aSbS|bSaS|∈
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