

Department of Computer Engineering, SVNIT, Surat.
Theoretical Computer Science
Tutorial – 4

(NFA: Non-deterministic Finite Automata)

1. Construct a NFA to accept strings over alphabet $\Sigma = \{0,1\}$
 - a) The third symbol from the right end is 0.
 - b) The first and last digits are same.
 - c) Start with 01 and end with 10.
 - d) Ending with 110.
 - e) 0 as one of the last three character in the string.
2. Design a NFA to accept strings over alphabet $\Sigma = \{a,b\}$ ending with *aba*.
Now use this NFA to construct DFA to accepting the same set of string.
3. Let $M = \{\{q_1, q_2, q_3\}, \{0,1\}, \{q_1\}, \{q_3\}\}$ is NFA, where δ is given as
$$\begin{array}{ll} \delta(q_1, 0) = \{q_2, q_3\} & \delta(q_1, 1) = \{q_1\} \\ \delta(q_2, 0) = \{q_1, q_2\} & \delta(q_2, 1) = \{q_1, q_2\} \\ \delta(q_3, 0) = \{q_2\} & \delta(q_3, 1) = \{q_1, q_2\} \end{array}$$
Construct the transition diagram corresponding to NFA.
Also convert NFA in to equivalent DFA.
4. Construct the transition diagram from given transition table for NFA.
Convert a NFA in to equivalent DFA.

	0	1
$\rightarrow q_0$	$\{q_2\}$	\emptyset
q_1	\emptyset	$\{q_0, q_1\}$
$* q_2$	$\{q_0, q_1\}$	$\{q_0\}$