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Let M be a NFA (non deterministic finite automatic)

Let N be the another NFA with single accept states q_{final} .

We go through every accept state M and do the following

(i) make it non – accepting state

(ii) add an ϵ -transition from that state to q_{final}

Then we will get NFA N .

If M has no accept states, then there will be no transitions coming into q_{final} .

Now we will discuss this formally.

$M = (Q, \Sigma, \delta, q_0, F)$ then

$N = (Q \cup \{q_{\text{final}}\}, \Sigma, \delta', q_0, \{q_{\text{final}}\})$ for any $q \in Q$ and $a \in \Sigma$

$$\delta'(q, a) = \begin{cases} \delta(q, a) & \text{if } a \neq \epsilon \text{ or } q \notin F \\ \delta(q, a) \cup \{q_{\text{final}}\} & \text{if } a = \epsilon \text{ and } q \in F \end{cases}$$

And $\delta'(q_{\text{final}}, a) = \emptyset$

Thus we get N by simply making every accept state of M as non – accepting state and adding an ϵ – transition from that state to q_{final}

Thus M is equivalent to N .

Thus every NFA is converted to an equivalent one that has single accept state.