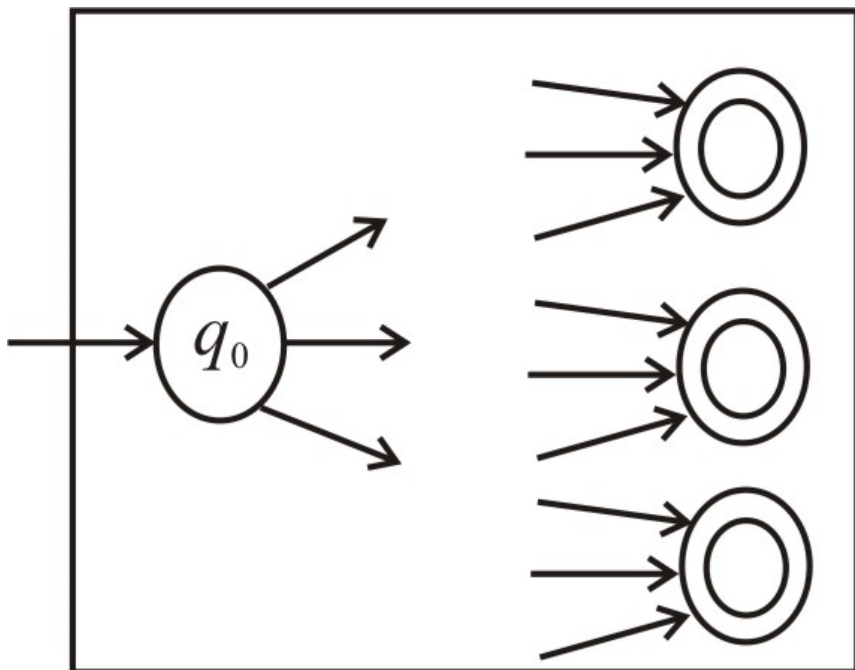


Let  $M = (Q, \Sigma, \delta, q_0, F)$  be the DFA that recognizes  $A$ ,

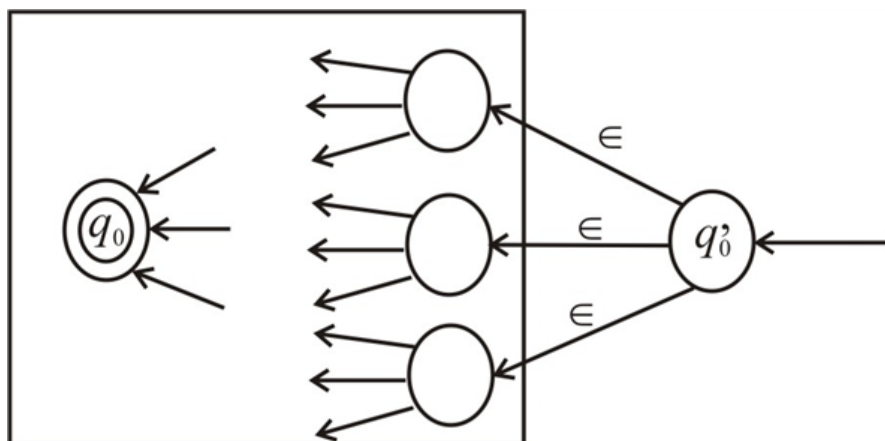
Now we build a NFA  $M'$  for  $A^R$  as follows:

- Reverse all the arrows of  $M$
- Convert the start state for  $M$  as the only accept state  $q'_{\text{accept}}$  for  $M'$ .
- Add a new start state  $q'_0$  for  $M'$ , and from  $q'_0$ , add  $\epsilon$ -transitions to each state of  $M'$  corresponding to accept states of  $M$ .

$M$



$M'$ :



Here  $q'_0 = q'_{\text{accept}}$

- For any  $w \in \Sigma^*$ , there is a path following  $w$  from the start state to an accept state in  $M$  iff there is a path following  $w^R$  from  $q'_0$  to  $q'_{\text{accept}}$  in  $M'$
- That means that  $w \in A$  iff  $w^R \in A^R$ .