CSC236 Week 08: Machines, Expressions: Equivalence

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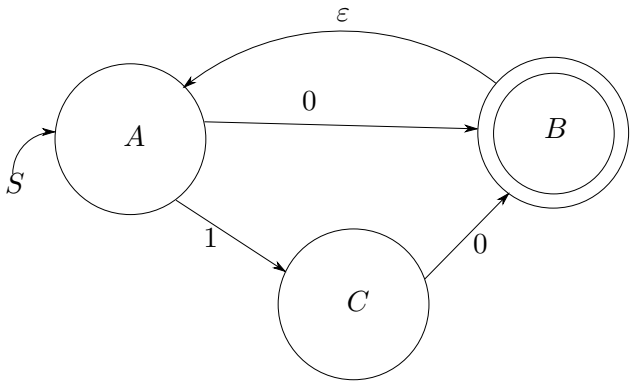
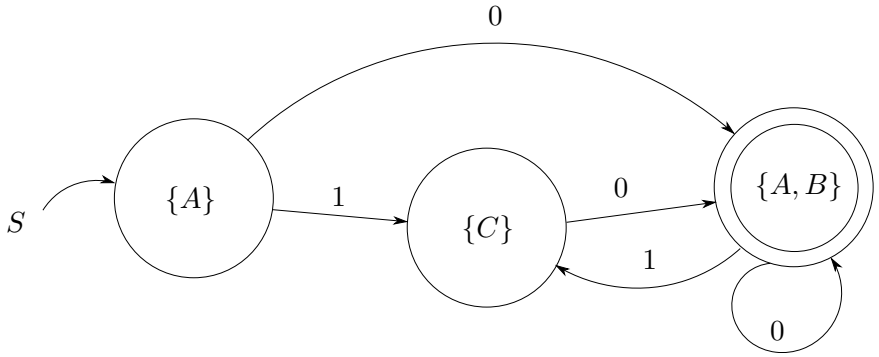
Contents

1 NFSA that accepts $L((0+10)(0+10)^*)$

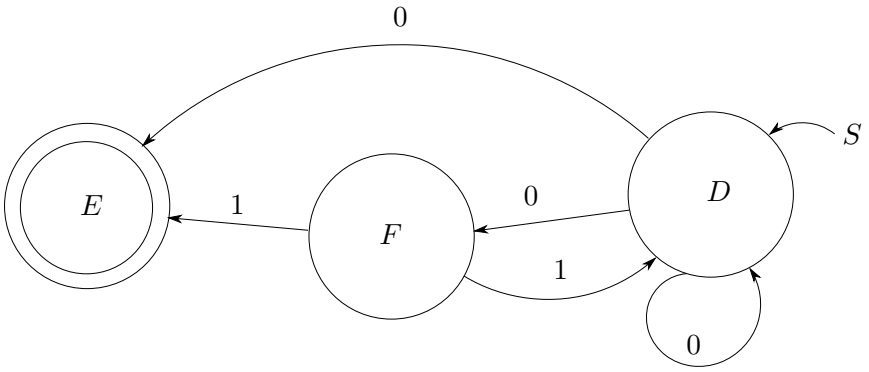


The ε transition makes it non deterministic. $A \xrightarrow{0} A \cup B$ and $C \xrightarrow{0} A \cup B$.

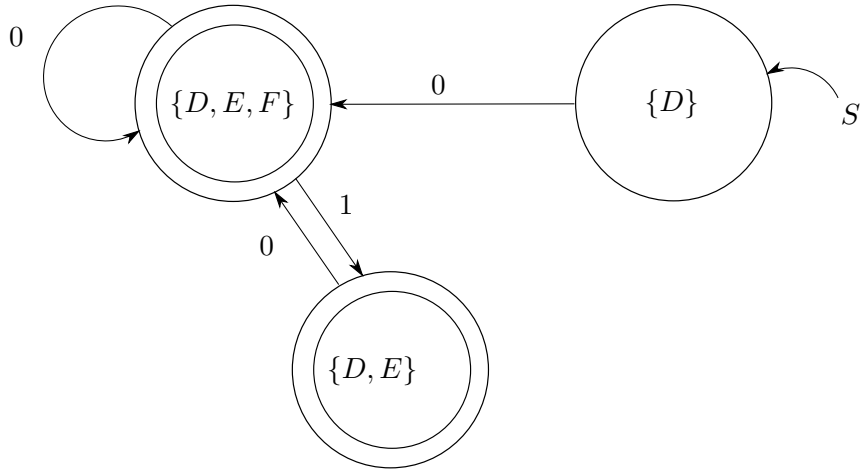
The corresponding DFSA is as follows:



2 NFSA that accepts $\mathrm{Rev}(L((0+10)(0+10)^*))$



The corresponding DFSA is as follows:



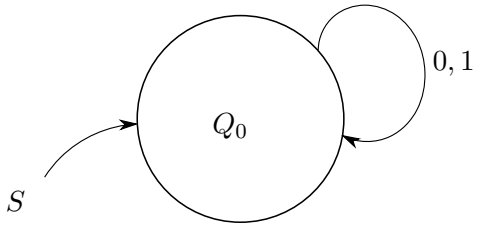
3 FSAs and regexes are equivalent.

$L = L(M)$ for some DFSA $M \iff L = L(M')$ for some NFSA $M' \iff L = L(R)$ for some regular expression R.

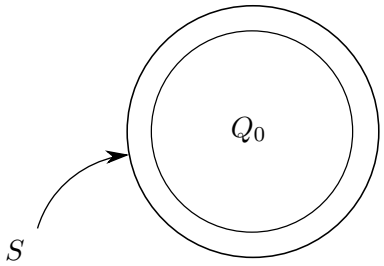
Step 1.0: convert $L(R)$ to $L(M')$.

Start with $\emptyset, \varepsilon, a \in \Sigma$.

- Base case: Let $s \; in \; \{\emptyset, \varepsilon, a\}$ for some $a \in \Sigma$.
  $L(\emptyset) = L(M)$, where M is:



$L(\varepsilon) = L(M)$, where M is:



For correctness, assume $a = 0$

$L(0) = L(M)$, where M is: