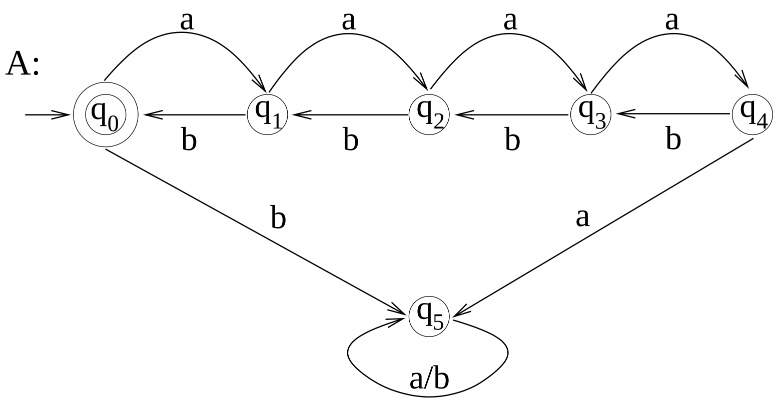
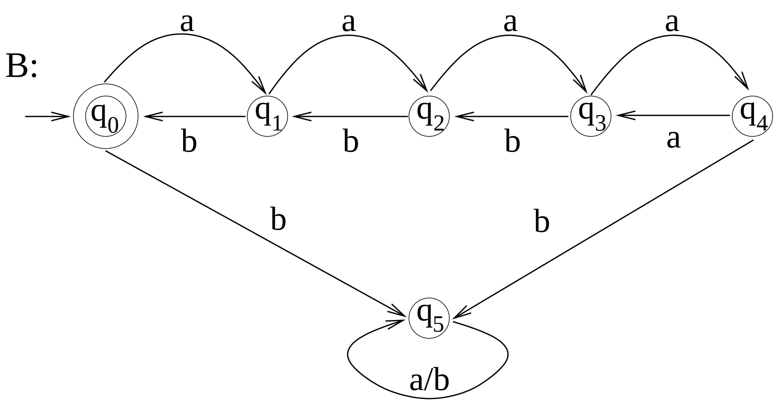
Note on Question 4.16 Page 184 (Assignment7)

In the following example, the DFAs for A and B have 6 states. However, the shortest strings differ in A and B have length 8 ($aaaabbbb \in A$ but $aaaabbbb \notin B$, $aaaaabbb \in B$ but $aaaaabbb \notin A$). Any string with length at most 7 is either accepted by both A and B or rejected by both A and B. Therefore, checking strings with length up to the number of states of the DFAs is not sufficient.





Consider another example. $A = \{(abab)^*abaa\}$ and $B = \{abaa(aaaa)^*\}$. For A, pumping length is 4, $x = \varepsilon$, $y = abab$, $z = abaa$. For B, pumping length is 4, $x = abaa$, $y = aaaa$, $z = \varepsilon$. The shortest strings differ in A and B have length 8 ($abababaa \in A$ but $abababaa \notin B$, $abaaaaaa \in B$ but $abaaaaaa \notin A$). Any string with length at most 7 is rejected by both A and B except for $abaa$, which is accepted by both A and B. Thus, checking strings with length up to the pumping length is not sufficient, either.