Introduction to Theory of Computation

Chapter 2

February 5, 2018

Find a DFA: 101 but not 111

$\{w : w$ contains the string 101 but not the string 111$\}$
Start with the basics:

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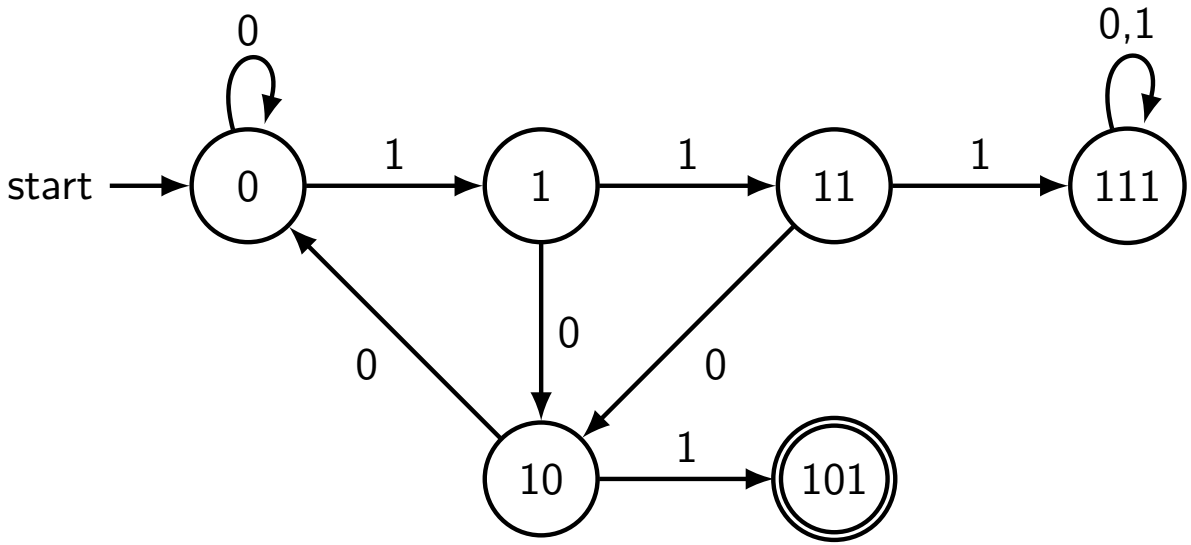

We know we can reject forever in state 111, but we cannot accept forever in state 101 because we still have to make sure we don't get a 111 later on.

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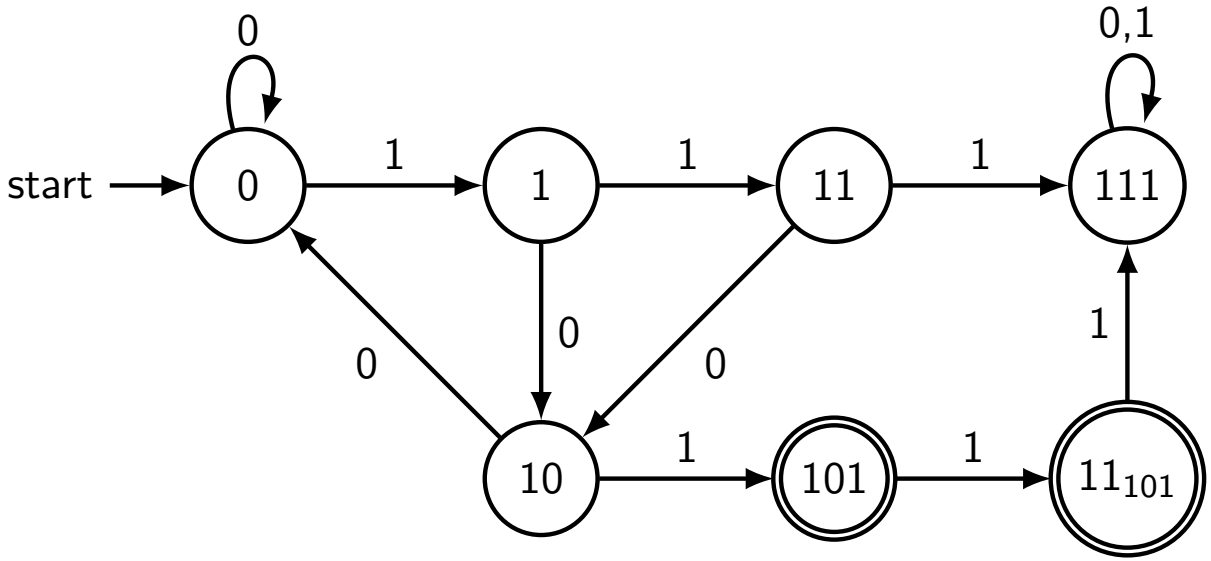
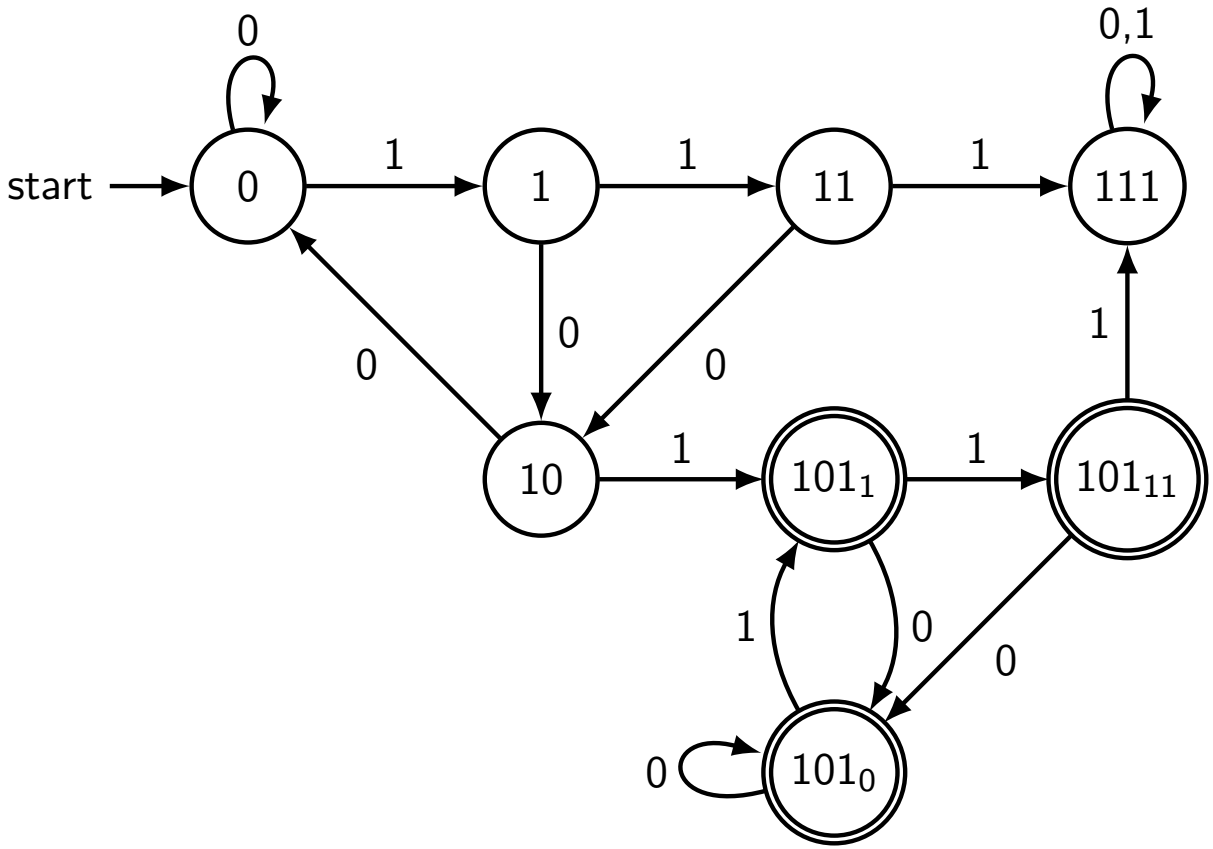


Now we just have to fill in the missing arcs.

Find a DFA: 101 but not 111

$\{w : w \text{ contains the string 101 but not the string 111}\}$



Find a DFA: 101 but not 111, part 2

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Let's do the same thing by starting with the two base languages, and forming the intersection.

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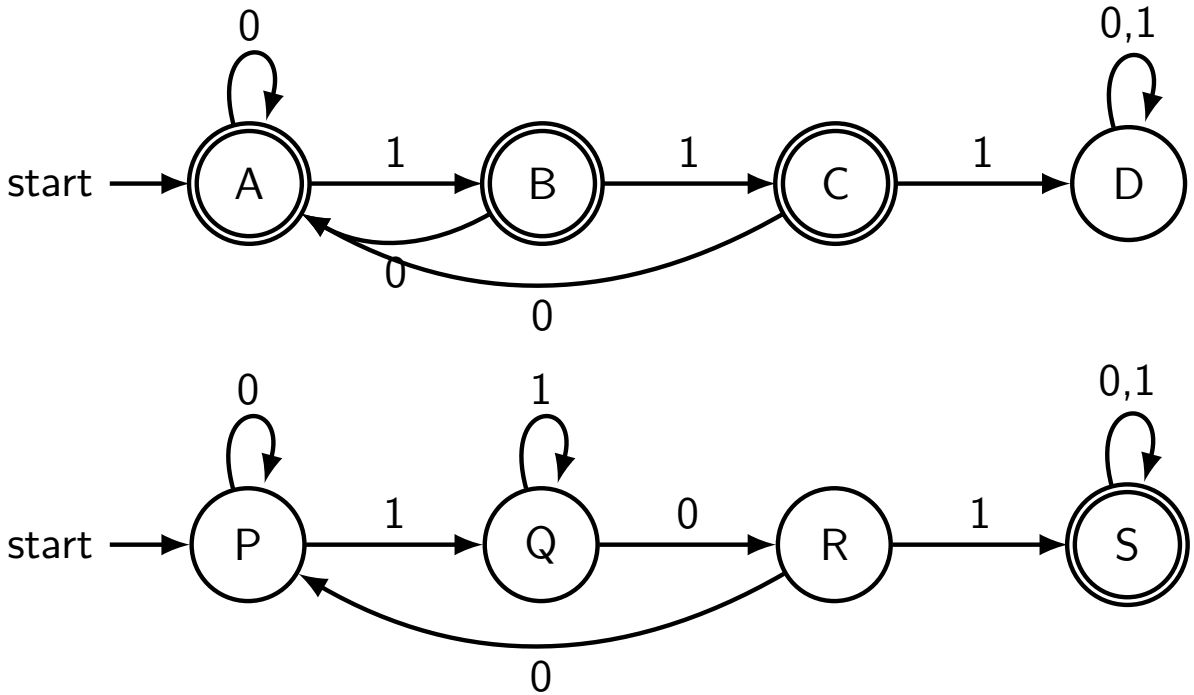

Find a DFA: 101 but not 111, part 2

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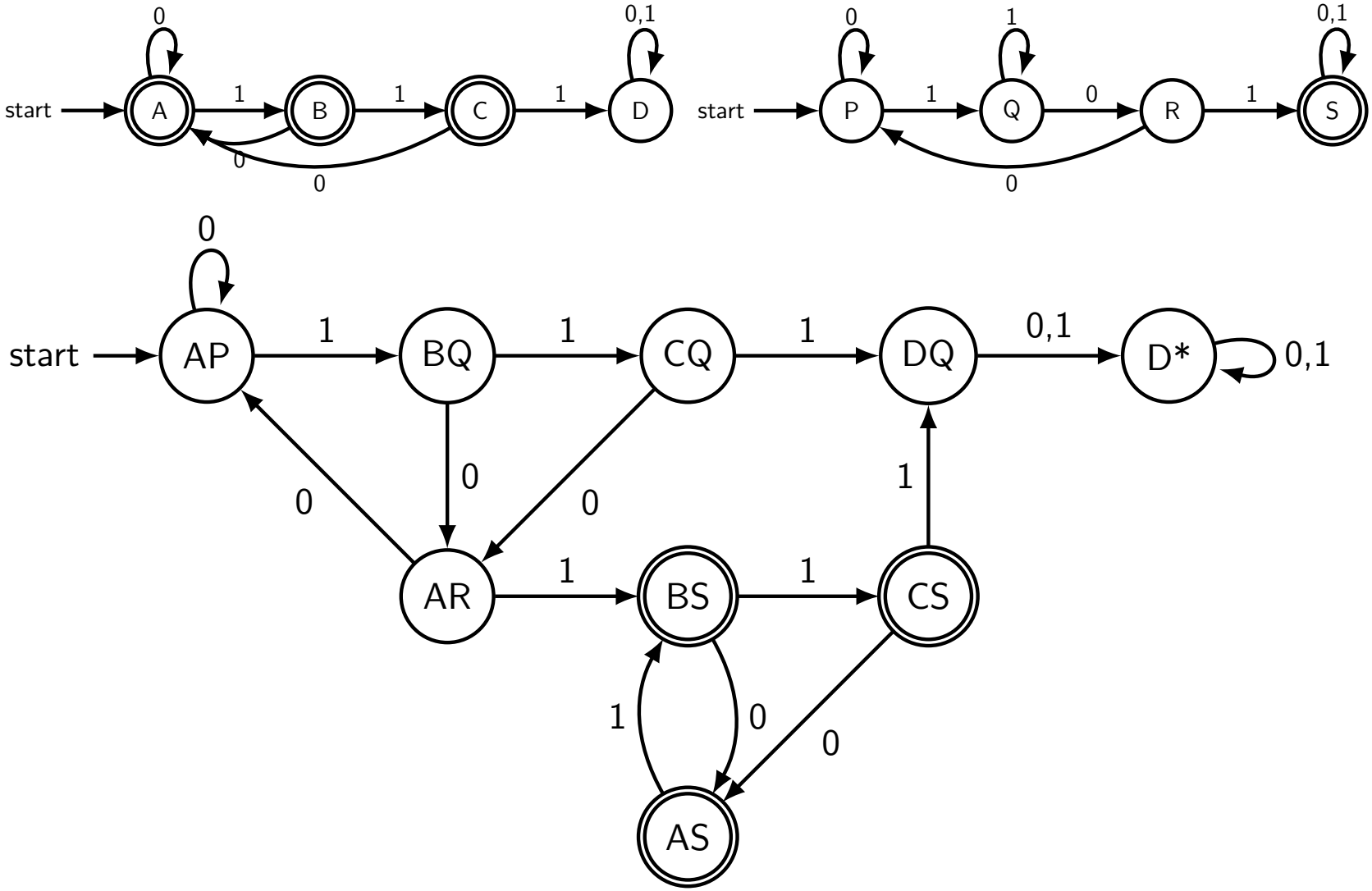
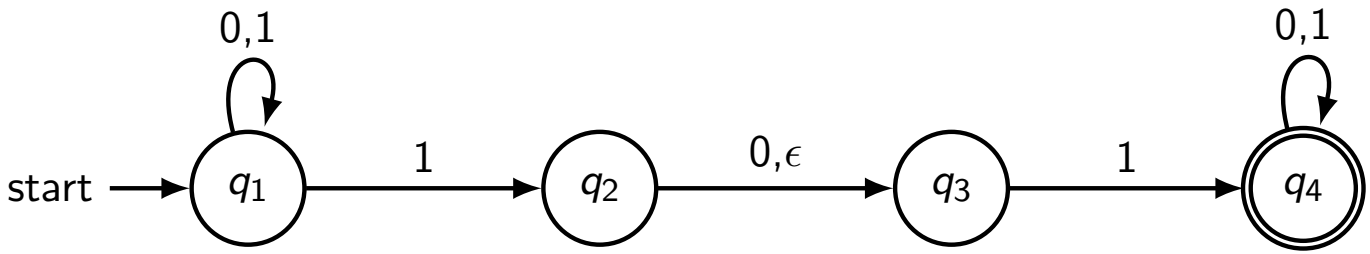
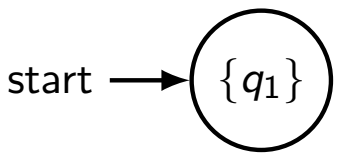
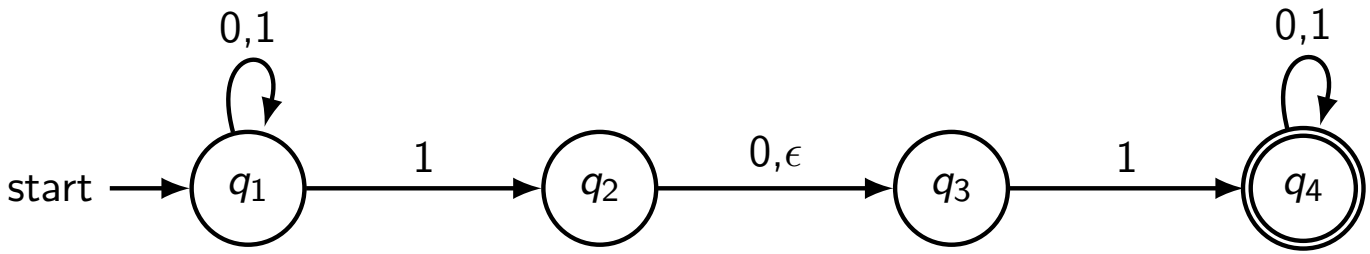


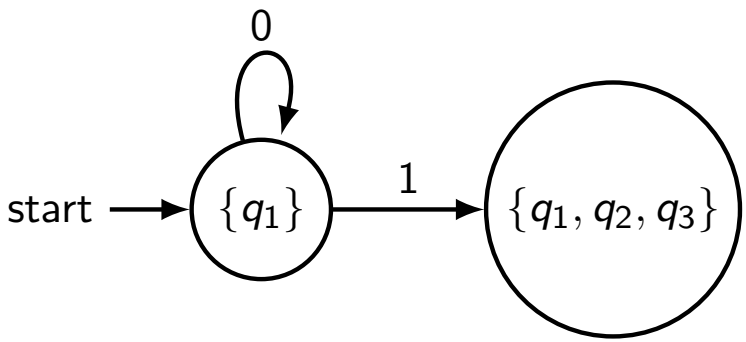
Converting NFA to DFA





Converting NFA to DFA





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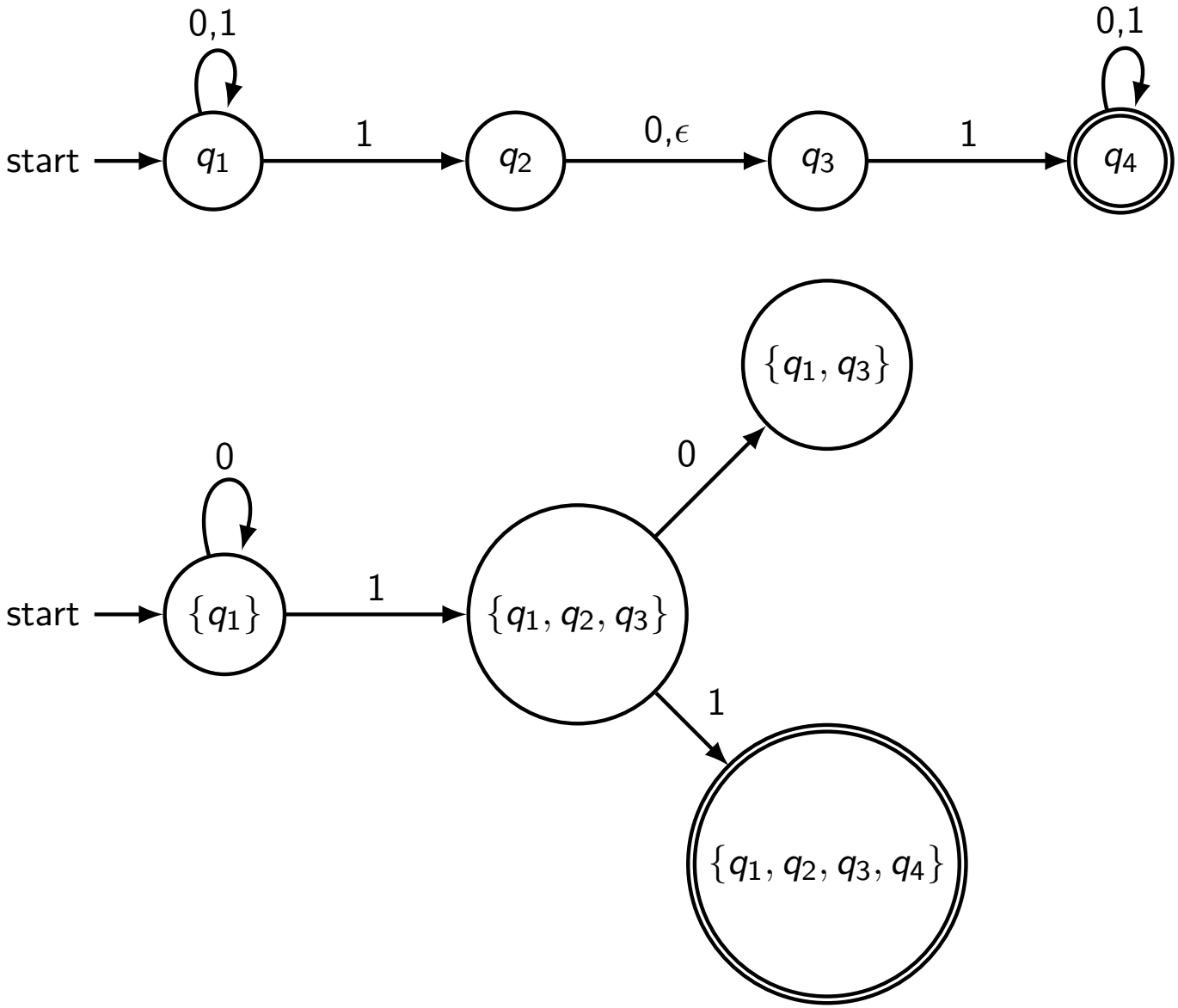

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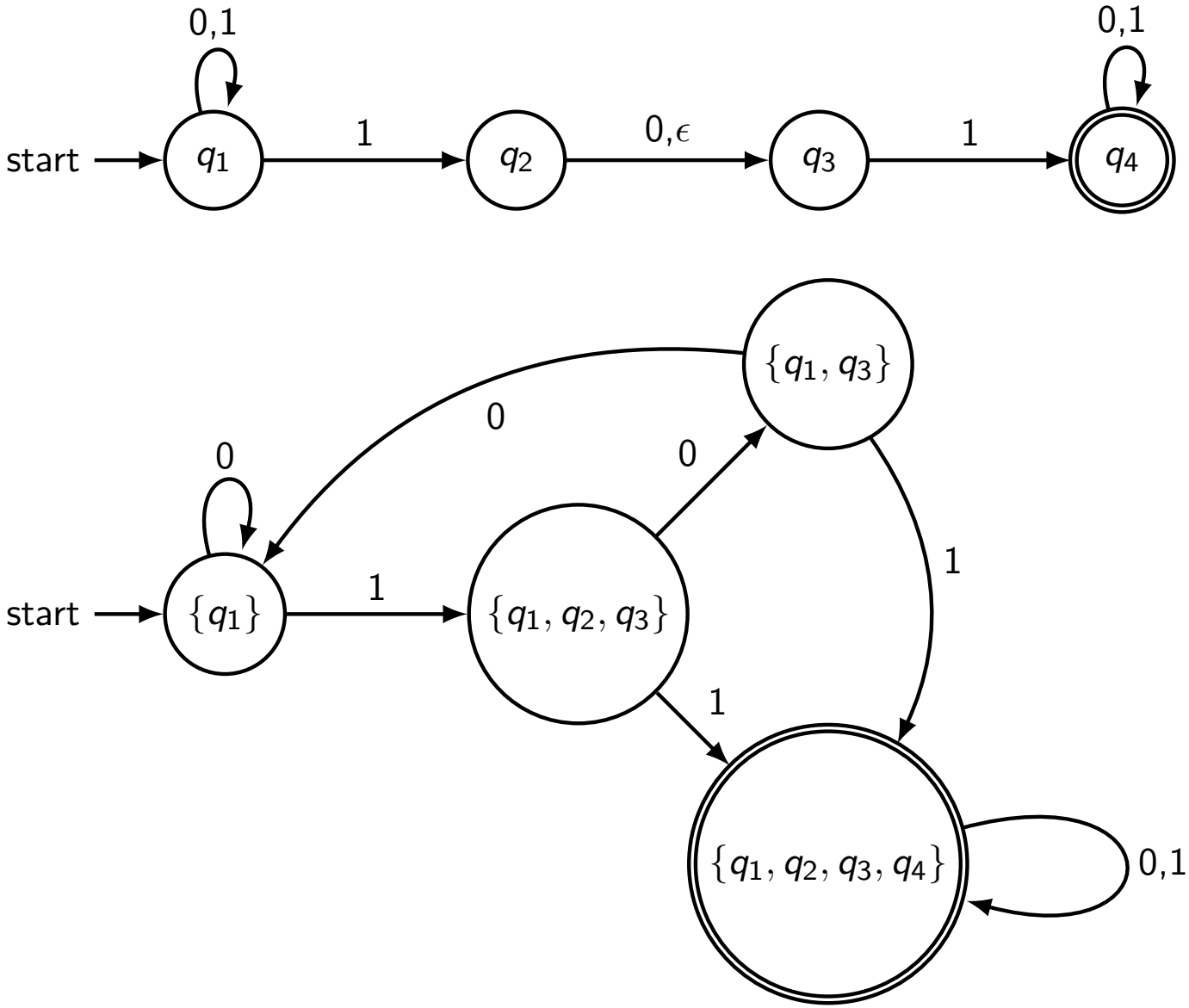
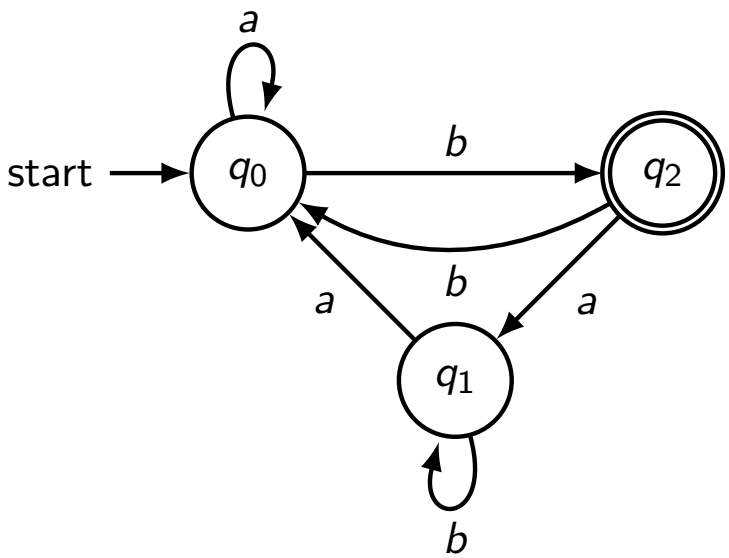
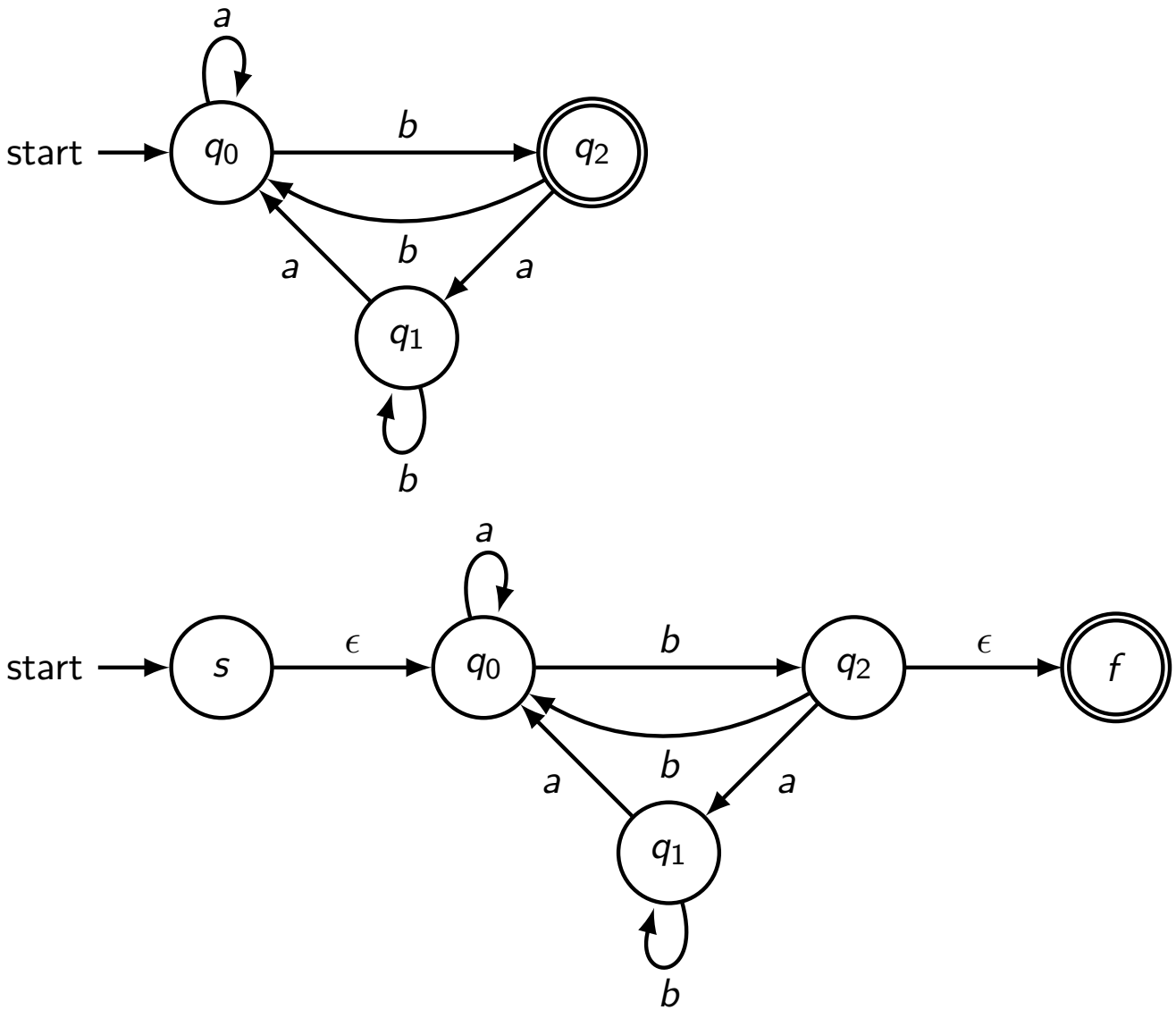


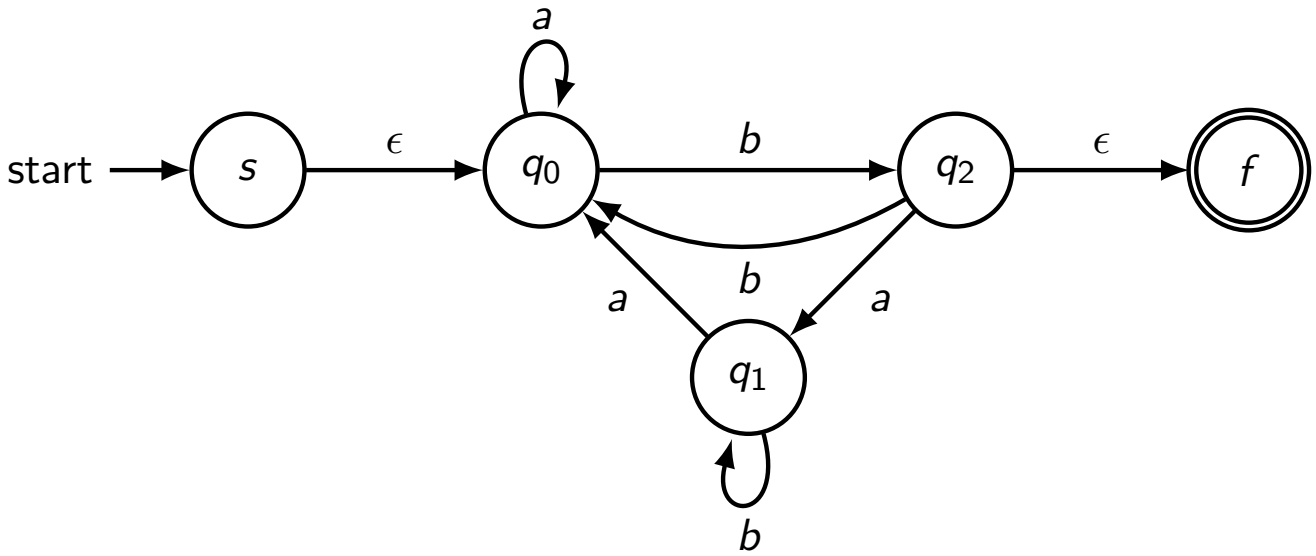
Converting NFA to RE

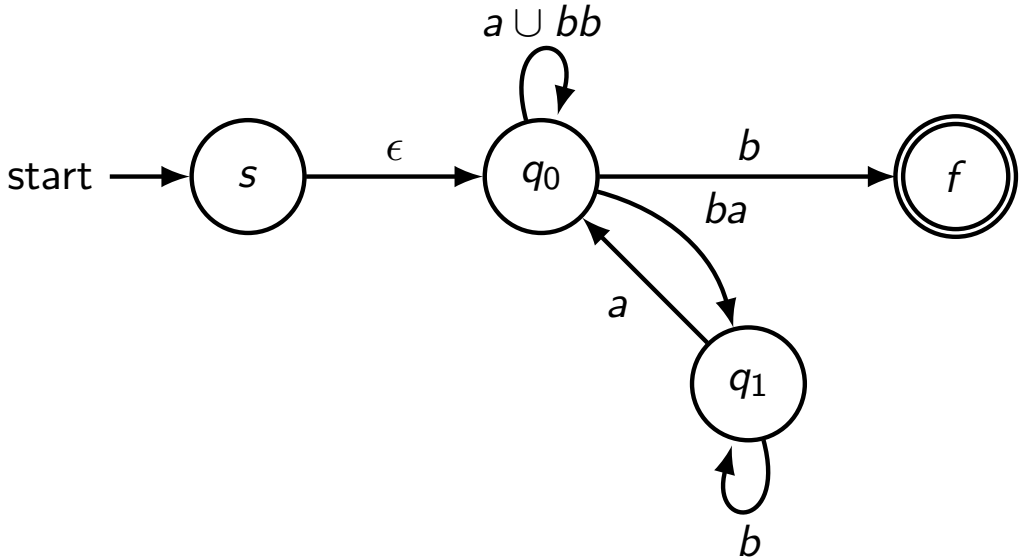


Add new start and accept states

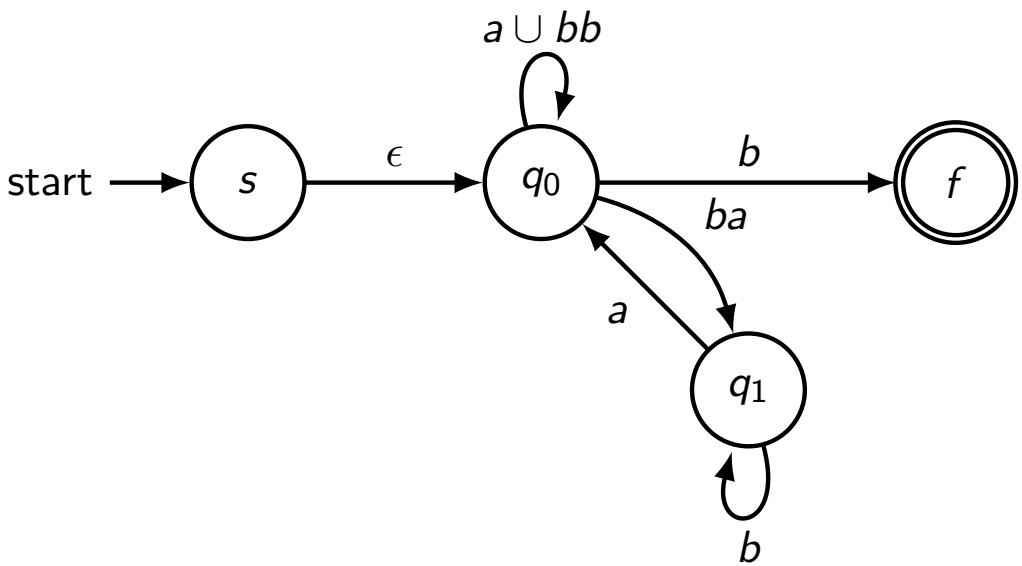


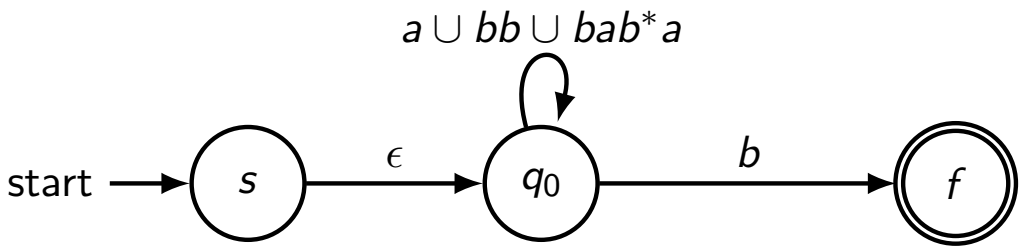
Eliminate q_2





Eliminate q_1





Eliminate q_0