

Introduction to Theory of Computation

Chapter 2

February 7, 2018

Find a DFA: 101 but not 111

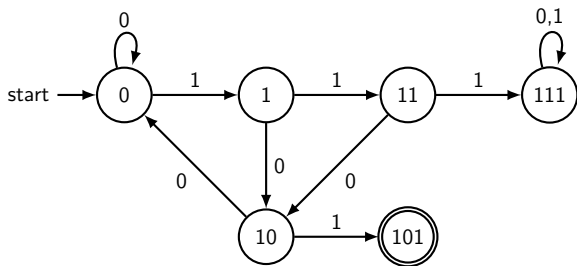
$\{w : w \text{ contains the string } 101 \text{ but not the string } 111\}$

Start with the basics:

Find a DFA: 101 but not 111

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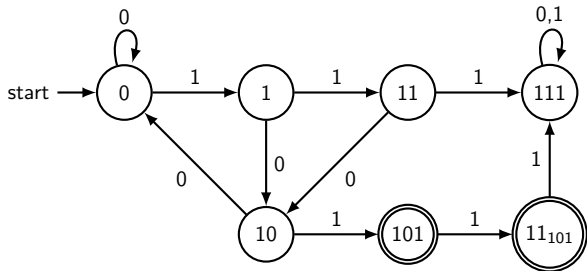
Start with the basics:



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.

Find a DFA: 101 but not 111

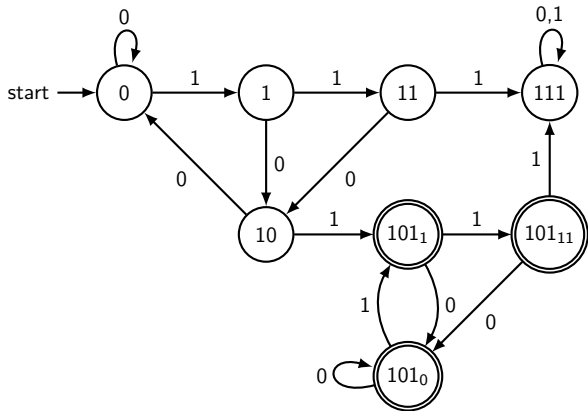
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Now we just have to fill in the missing arcs.

Find a DFA: 101 but not 111

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



Find a DFA: 101 but not 111, part 2

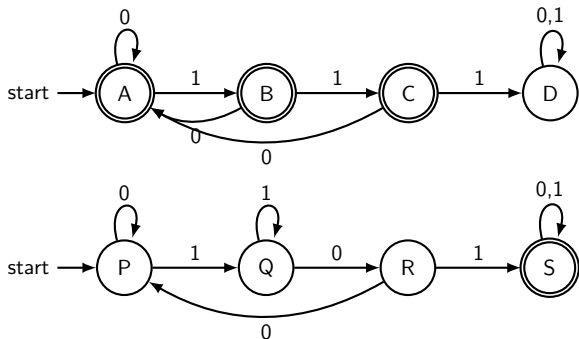
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Let's do the same thing by starting with the two base languages, and forming the intersection.

Find a DFA: 101 but not 111, part 2

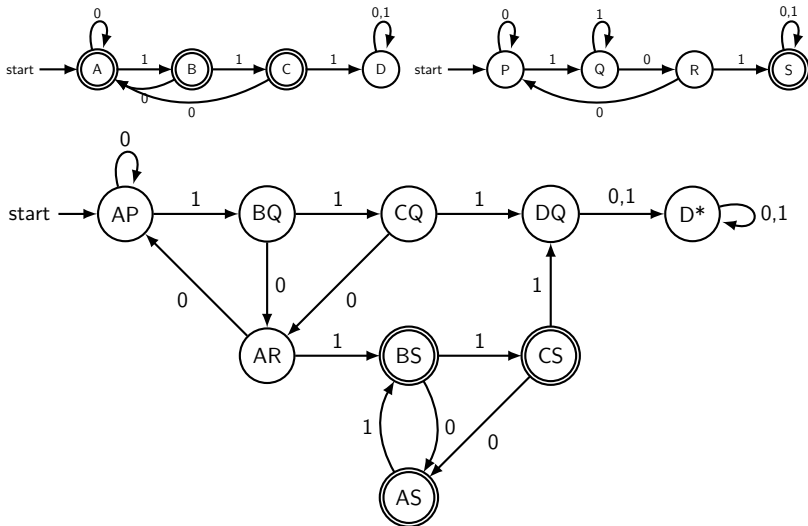
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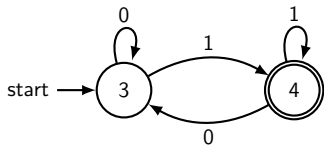
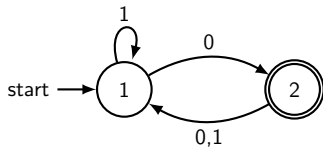


Find a DFA: 101 but not 111, part 2

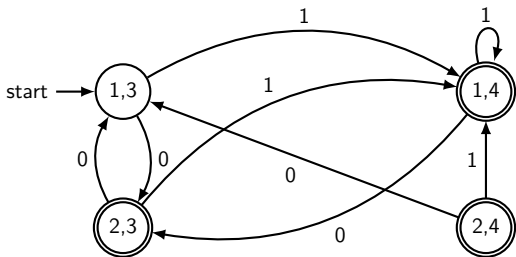
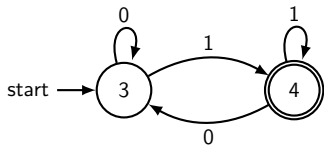
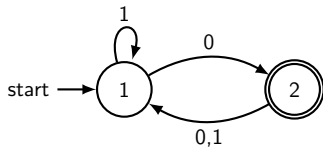
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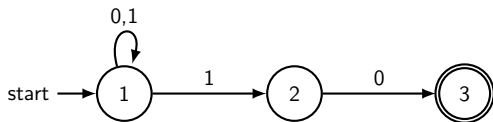
Union of Two DFAs



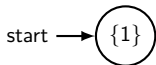
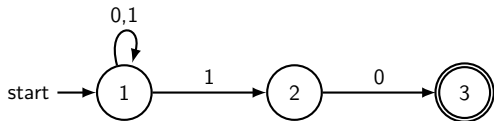
Union of Two DFAs



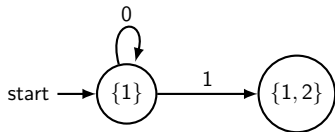
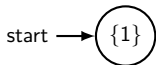
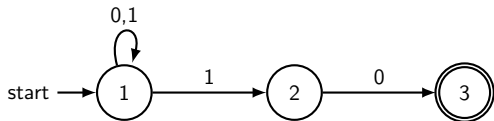
Converting NFA to DFA, no ϵ



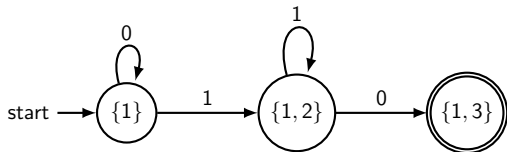
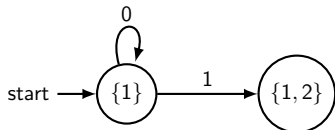
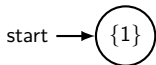
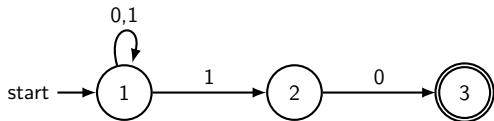
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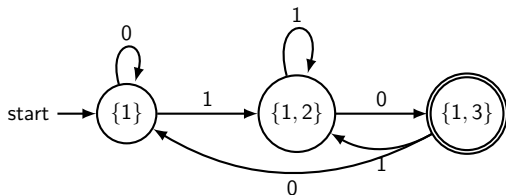
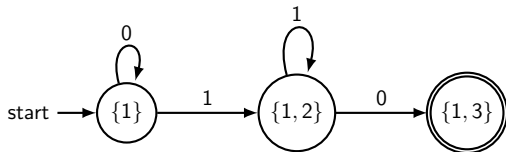
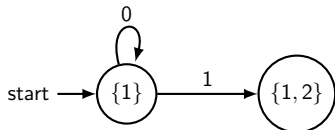
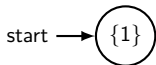
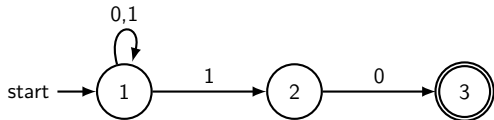
Converting NFA to DFA, no ϵ



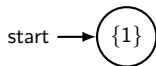
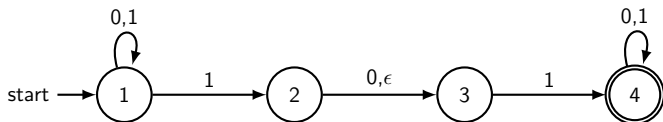
Converting NFA to DFA, no ϵ



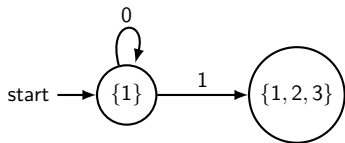
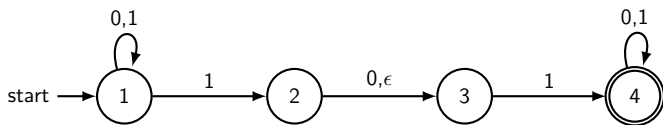
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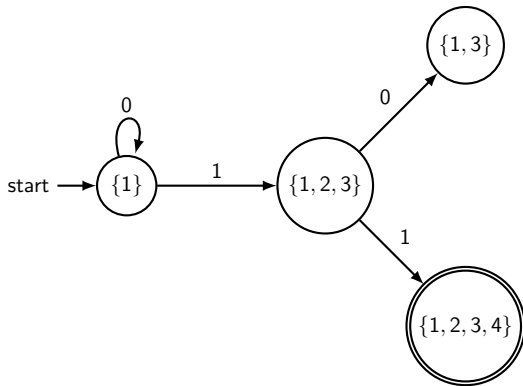
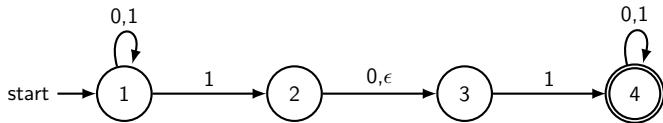
Converting NFA to DFA, with ϵ -closure



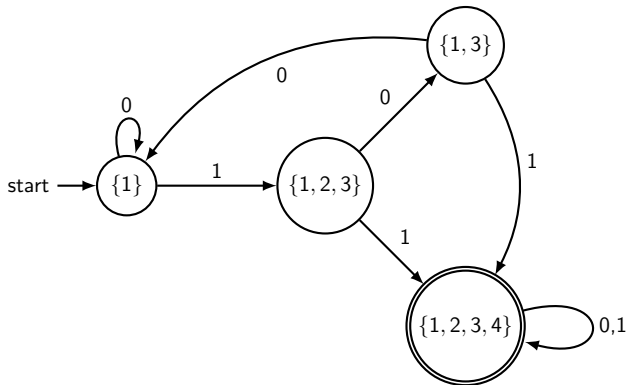
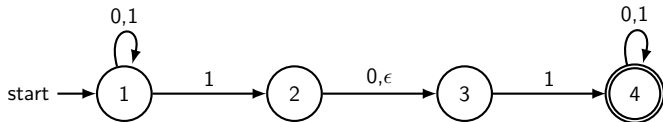
Converting NFA to DFA, with ϵ -closure



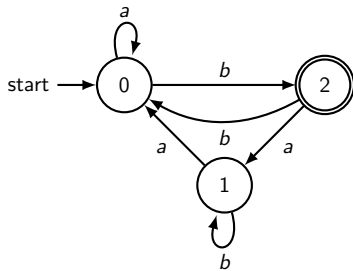
Converting NFA to DFA, with ϵ -closure



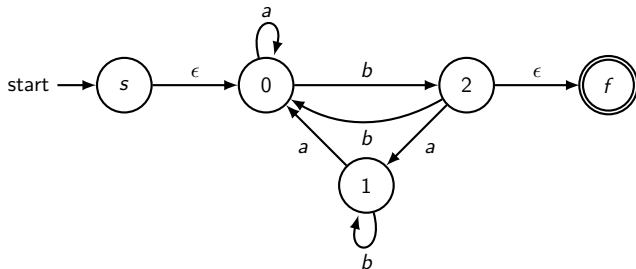
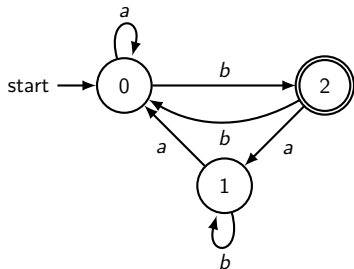
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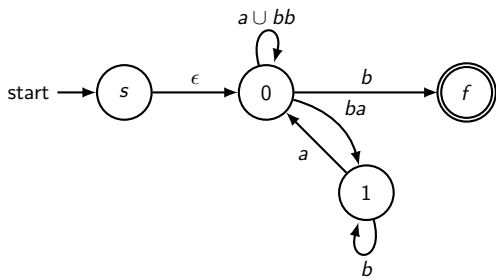
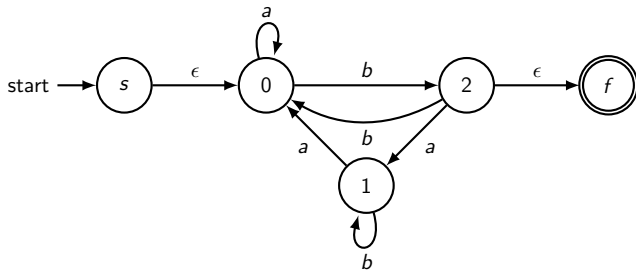
Converting NFA to RE



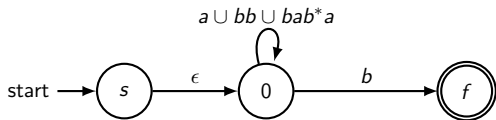
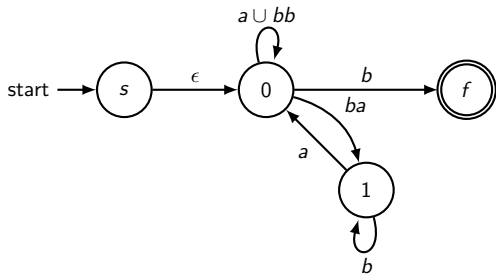
Add new start and accept states



Eliminate 2



Eliminate 1



Eliminate 0

