CMPSC 401
Compiler Development
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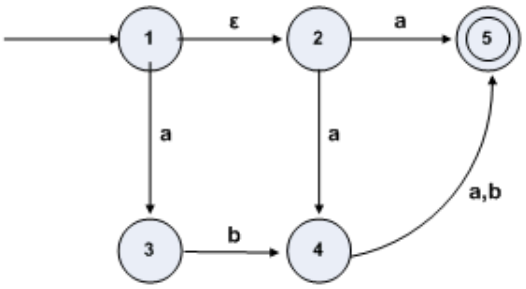
NFA to DFA Conversion Example, February 7, 2019

Assume we have the following NFA.



We start we the start state `1` and we need to figure out what other states are reachable for each input symbol.

From state {`1`} on input `a` we can reach state {`3, 4, 5`}.
From state {`1`} in input `b` we can not reach any state.

Now we generated a new DFA state, {`3, 4, 5`}. Again we check which other states are reachable on each input from this state.
From state {`3, 4, 5`} on input `a` we can reach state {` 5`}.
From state {`3, 4, 5`} in input `b` we can reach {`4, 5`}.

Now we do the same thing for new states {` 5`} and {`4, 5`}.

From state {`5`} on input `a` we can not reach any state, and so we do not add any new states.
From state {`3, 4, 5`} on input `b` we can not reach any state.

From state {`4, 5`} on input `a` we can reach state {`5`}.
From state {`4, 5`} in input `b` we can reach {`5`}.

We can now easily draw the DFA diagram based on this state transition information for states {`1`}, {`3, 4, 5`}, {`5`}, and {`4, 5`}. The final states of the DFA are the sets that contain 5 since that is the only final state of the NFA.