The algorithm runs as follow:

MOVENFA(S,a): the transaction function from the set S in NFA, over edge a

ε-closure(s): s is a simple state from NFA

ε-closure(S): S is a set of states from NFA

We’ll construct:

SDFA : the set of states in DFA

Add X to SDFA: where X is some set of NFA states

MOVEDFA (T,b): the transition function from DFA to add an edge to the growing DFA

Initially, add the starting state of DFA into SDFA:

A = ε-closure(0) = {0,1,2,4,7} SDFA = {A}

#1st execution of the loop:

Take out A, and calculate as follows:

The new state transmitted from state A via edge a:

MOVEDFA(A,a) = ε-closure(MOVENFA(A,a))

= ε-closure({3,8}) = {1,2,3,4,6,7,8}

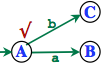
Since this doesn’t exist in SDFA, a new state B = {1,2,3,4,6,7,8} is added into SDFA; and label correspondingly in the DFA automata graph.

Following the same logic, we have the new state transmitted from state A via edge b:

MOVEDFA(A,b) = ε-closure(MOVENFA(A,b)) = ε-closure({5}) = {1,2,4,5,6,7}

Since this set doesn’t exist in SDFA, add this new state C = {1,2,4,5,6,7} into SDFA.

Finish this time of loop since we’ve checked all possible vocabulary [a,b]. Mark A. Here’s what we’ve built after A this time of loop. Note that A is marked while B,C are not.



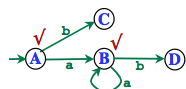
#2nd execution of the loop:

Take out an Unmarked State; here we take B. Note that B = {1,2,3,4,6,7,8}.

MOVEDFA(B,a) = ε-closure(MOVENFA(B,a)) = ε-closure({3,8}) = {1,2,3,4,6,7,8} = B. Stay the same

MOVEDFA(B,b) = ε-closure(MOVENFA(B,b)) = ε-closure({5,9}) = {1,2,4,5,6,7,9} = D. New state is created since this set doesn’t exist in SDFA yet.

Now the current building DFA looks like this:



Note that B is marked.

End of #2nd time of loop.

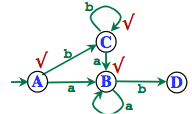
#3rd execution of the loop:

Take out unmarked state C, note that C = {1,2,4,5,6,7}.

MOVEDFA(C,a) = ε-closure(MOVENFA(C,a)) = {1,2,3,4,6,7,8} = B.

MOVEDFA(C,b) = ε-closure(MOVENFA(C,b)) = {1,2,4,5,6,7} = C.

After this time execution, C is marked and the built DFA it’s like this:



End of #3rd execution of the loop.

#4th execution of the loop:

Take out unmarked state D, note that D = {1,2,4,5,6,7}.

MOVEDFA(D,a) = ε-closure(MOVENFA(D,a)) = {1,2,3,4,6,7,8} = B.

MOVEDFA(D,b) = ε-closure(MOVENFA(D,b)) = {1,2,4,5,6,7,10} = E. (new state)

After this execution, the current built DFA:

End of #4th execution of the loop.

#5th execution of the loop:

Take out unmarked state E, note that E = {1,2,4,5,6,7,10}.

MOVEDFA(E,a) = ε-closure(MOVENFA(E,a)) = {1,2,3,4,6,7,8} = B.

MOVEDFA(E,b) = ε-closure(MOVENFA(E,b)) = {1,2,4,5,6,7} = C.

After this execution, the current built DFA:

End of #5th execution of the loop.

Since all unmarked states has been processed, the while loop finishes.

Now we need to do: for each S in SDFA, if any final state in NFA belongs to S, then mark S as final state.

In this example the only final state is 10, and only E contains 10. Therefore, we mark E as final state of DFA. The complete result is as below: