

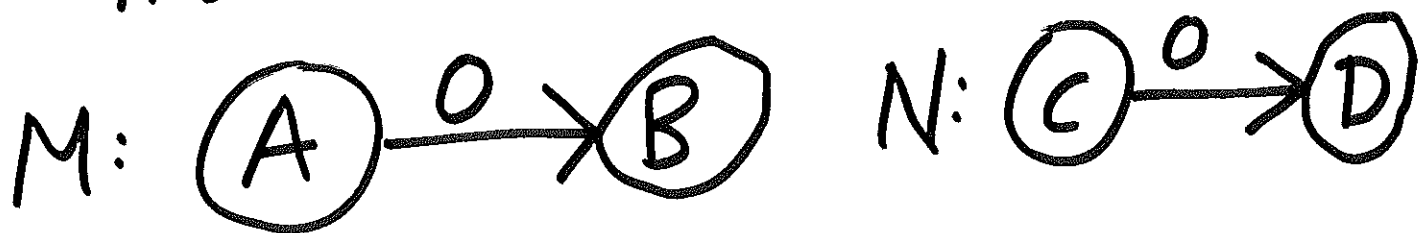
# The Product Construction

idea: build FA that emulates two FAs simultaneously

algorithm:

given DFAs  $M$  and  $N$ ,  
build new DFA where  
each state is (ordered) pair  
of states one from  $M$  and  
one from  $N$ .

Transitions:



can do union, intersection, etc

For union: make accept  
states that accept in  $M$  or  $N$

For intersection: make accept  
states that accept in  $M$  and  $N$

For symmetric difference:  
make accept states that  
accept in one & reject in other.