

**procedure** NFAtoDFA(  $N$  an NFA )  
 Let  $T[\text{row}][\text{col}]$  be an empty transition table defining  $D$ .  $T[\text{row}][\cdot]$  is uniquely identified by a set of states from  $N$ , each  $T[\cdot][\text{col}]$  uniquely identifies a character  $c \in \Sigma$ .

```

let  $L$  be an empty stack
let  $A$  be the set of accepting states for  $N$ 
let  $i$  be the starting state of  $N$ 
 $B \leftarrow \text{FollowLamda}(\{i\})$ 
initialize row  $T[B][\cdot]$ 
mark  $T[B][\cdot]$  as the starting state of  $D$ 
if (  $A \cap B \neq \emptyset$  ) then (
  mark  $T[B][\cdot]$  as an accepting state of  $D$ 
)
push  $B$  onto  $L$ 
repeat (
   $S \leftarrow \text{pop } L$ 
  foreach (  $c \in \Sigma$  ) do (
     $R \leftarrow \text{FollowLambda}(\text{FollowChar}(S, c))$ 
     $T[S][c] \leftarrow R$ 
    if (  $|R| > 0$  AND  $T[R][\cdot]$  does not exist ) then (
      initialize row  $T[R][\cdot]$ 
      if (  $A \cap R \neq \emptyset$  ) then (
        mark  $T[R][\cdot]$  as an accepting state of  $D$ 
      )
      push  $R$  onto  $L$ 
    )
  )
) while (  $|L| > 0$  )

```

$T$  now defines a DFA  $D$  equivalent to  $N$

**procedure** FollowLambda(  $S$  a  $\subseteq$  of NFA  $N$  states )  
 returns the set of NFA states encountered by  
 recursively following only  $\lambda$  transitions  
 from states in  $S$

```

Let  $M$  be an empty stack
foreach ( state  $t \in S$  ) push  $t$  onto  $M$ 
while (  $|M| > 0$  ) do (
   $t \leftarrow$  pop  $M$ 
  foreach (  $\lambda$  transition from  $t$  to state  $q$  ) do (
    if (  $q \notin S$  ) then (
      add  $q$  to  $S$ 
      push  $q$  onto  $M$ 
    )
  )
)
return  $S$ 

```

**procedure** FollowChar(  $S$  a  $\subseteq$  of NFA  $N$  states,  $c \in \Sigma$  )  
returns the set of NFA states obtained from following  
all  $c$  transitions from states in  $S$

Let  $F$  be an empty set

```
foreach ( state  $t \in S$  ) do (  
    foreach (  $c$  transition from  $t$  to state  $q$  ) do (  
        add  $q$  to  $F$   
    )  
)  
return  $F$ 
```