



Parsing VI
The LR(1) Table Construction



Building the Canonical Collection

Start from $s_0 = \text{closure}([S' \rightarrow S, \underline{\text{EOF}}])$

Repeatedly construct new states, until all are found

The algorithm

```
 $s_0 \leftarrow \text{closure}([S' \rightarrow S, \underline{\text{EOF}}])$   
 $S \leftarrow \{s_0\}$   
 $k \leftarrow 1$   
while ( $S$  is still changing)  
   $\forall s_j \in S$  and  $\forall x \in (T \cup NT)$   
     $s_k \leftarrow \text{goto}(s_j, x)$   
    record  $s_j \rightarrow s_k$  on  $x$   
  if  $s_k \notin S$  then  
     $S \leftarrow S \cup s_k$   
     $k \leftarrow k + 1$ 
```

- Fixed-point computation
- Loop adds to S
- $S \subseteq 2^{(\text{LR ITEMS})}$, so S is finite



Example from SheepNoise

Starts with S_0

$s_0 \leftarrow \text{closure}(\{ [\text{Goal} \rightarrow \cdot \text{Expr}, \text{EOF}] \})$

```
 $s_0 \leftarrow \text{closure}([S' \rightarrow \cdot S, \text{EOF}])$   
 $S \leftarrow \{s_0\}$   
 $k \leftarrow 1$   
while ( $S$  is still changing)  
   $\forall s_j \in S$  and  $\forall x \in (T \cup \text{NT})$   
     $s_k \leftarrow \text{goto}(s_j, x)$   
    record  $s_j \rightarrow s_k$  on  $x$   
  if  $s_k \notin S$  then  
     $S \leftarrow S \cup s_k$   
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