LR(1) Parse Tables

LR(1) Parse Tables

- Closure Function (Figure 3.20)
- Goto Function (Figure 3.21)
- Build Canonical Collection (Figure 3.22)
- Build LR(1) Action and Goto Tables (Figure 3.24)

Closure Function

```
closure(s)
    while (s is still changing)
        for each item [A→β•Cδ,a] ∈ s
            for each production C→γ ∈ P
                for each b ∈ FIRST(δa)
                    s ← s ∪ {[C→•γ,b]}
    return s
```

■ **FIGURE 3.20** The *closure* Procedure.

Goto Function

```
goto(s,x)
  moved ← ∅
  for each item i ∈ s
      if the form of i is [α→β•xδ, a] then
          moved ← moved ∪ {[α→βx•δ, a]}
  return closure(moved)
```

■ FIGURE 3.21 The *goto* Function.

Build Canonical Collection

```
CC0 ← closure({[S'→•S,eof]})
CC ← {CC0}
while (new sets are still being added to CC)
  for each unmarked set CCi ∈ CC
      mark CCi as processed
      for each x following a • in an item in CCi
          temp ← goto(CCi,x)
          if temp ∉ CC
              then CC ← CC∪{temp}
          record transition from CCi to temp on x
```

■ **FIGURE 3.22** The Algorithm to Build CC.

Build LR(1) Action and Goto Tables

```
for each CC_i ∈ CC
    for each item I ∈ CC_i
      if I is [A→β•cγ,a] and goto(CC_i,c) = CC_j then
         Action[i,c] ← "shift j"
      else if I is [A→β•,a] then
         Action[i,a] ← "reduce A→β"
      else if I is [S'→S•,eof] then
         Action[i,eof] ← "accept"
    for each n ∈ NT
      if goto(CC_i,n) = CC_j then
         Goto[i,n] ← j
```

■ **FIGURE 3.24** LR(1) Table-Filling Algorithm.

LR(1) Parse Tables

1. S -> E
2. E -> T + E
3. E -> T
4. T -> id

LR(1) Parse Tables

- Configuration Item

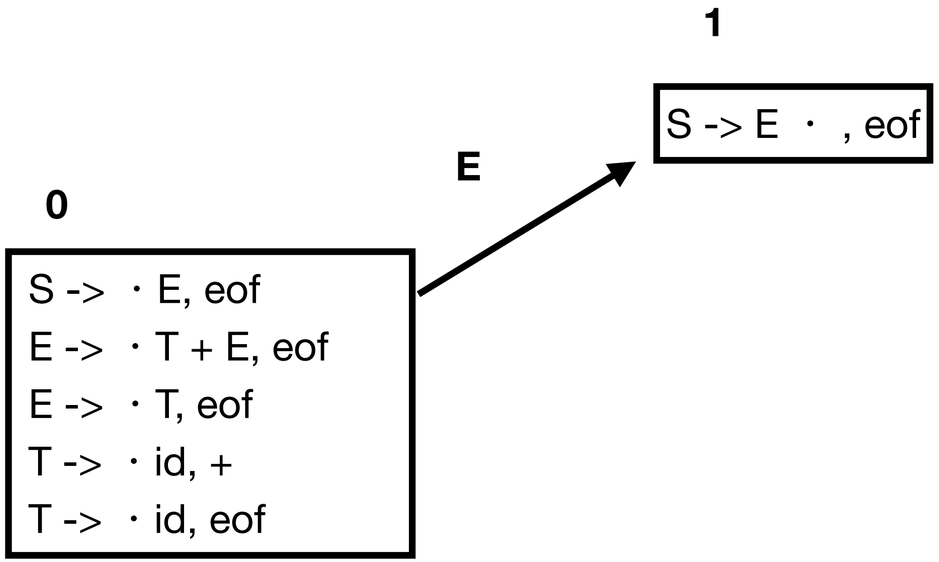
  S -> ・E, eof

LR(1) Parse Tables

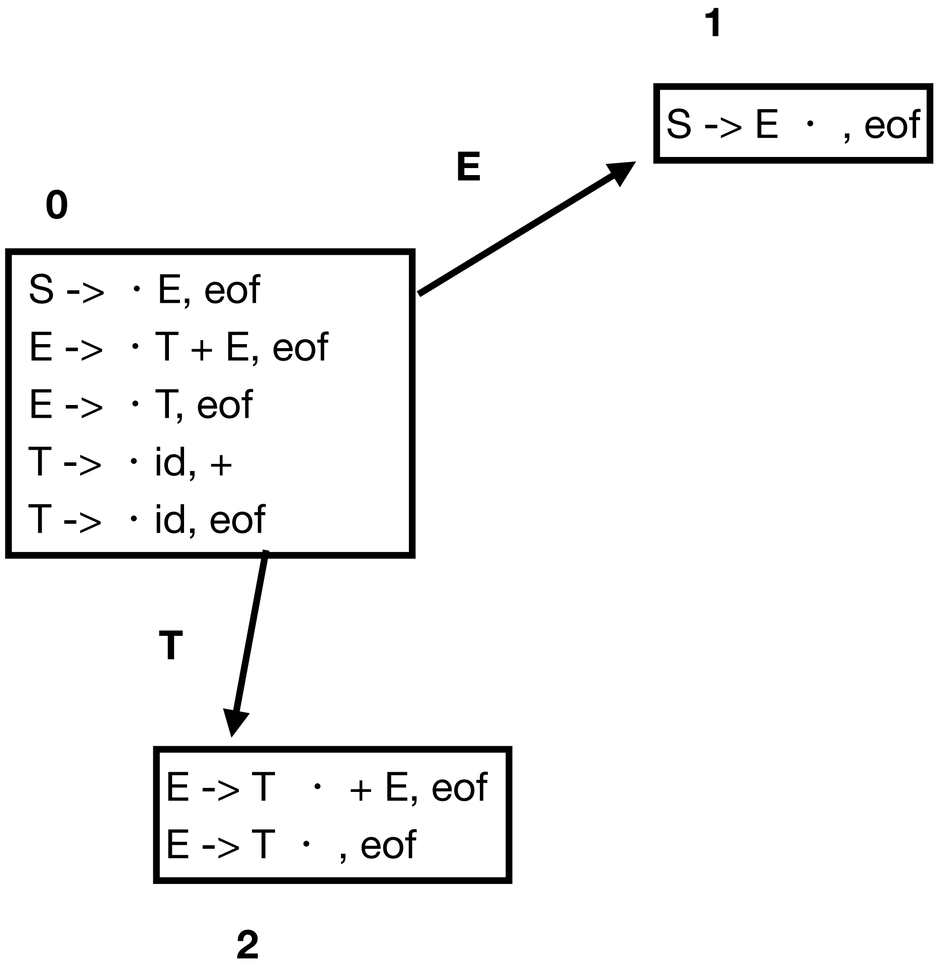
0

S -> · E, eof
E -> · T + E, eof
E -> · T, eof
T -> · id, +
T -> · id, eof

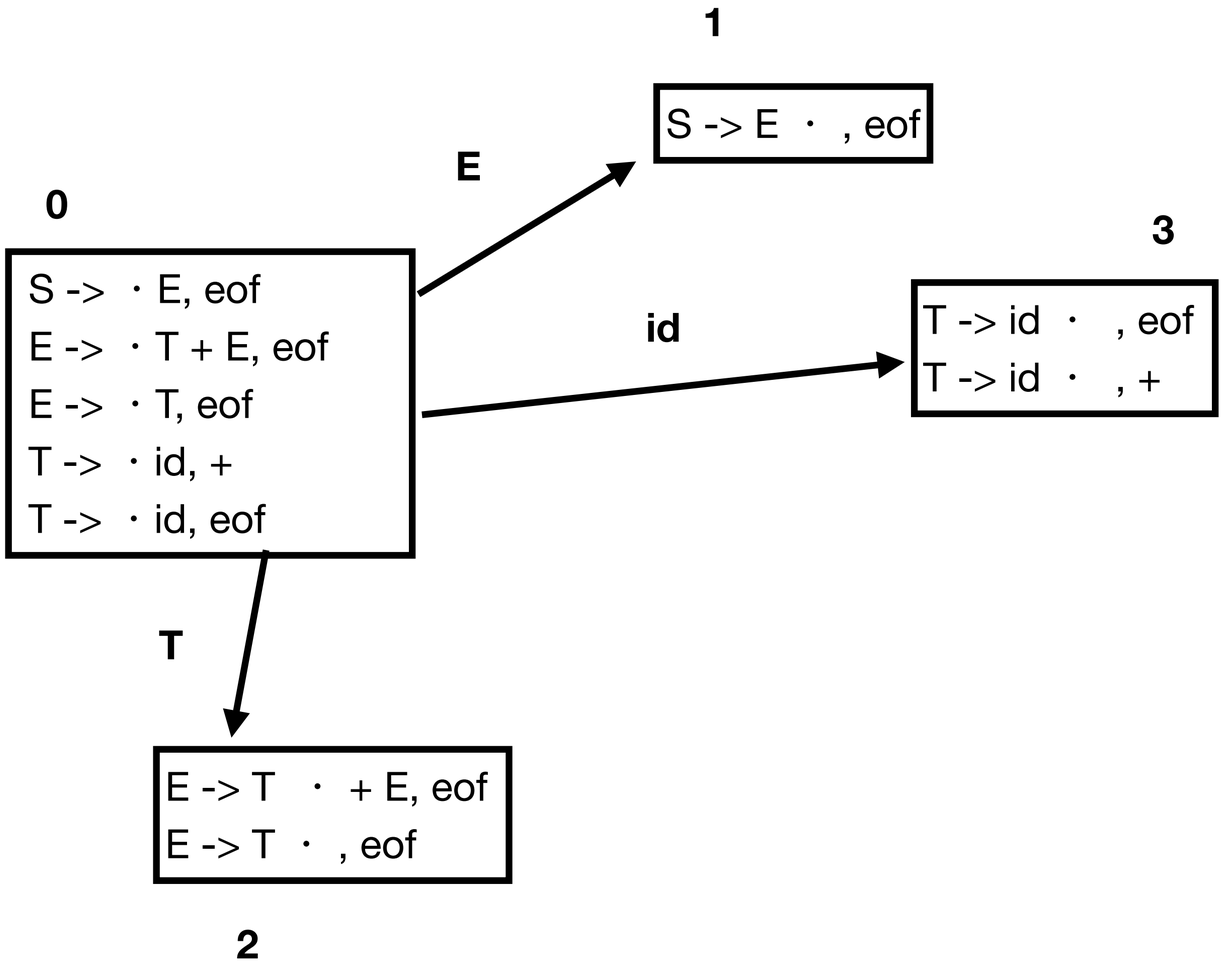
LR(1) Parse Tables



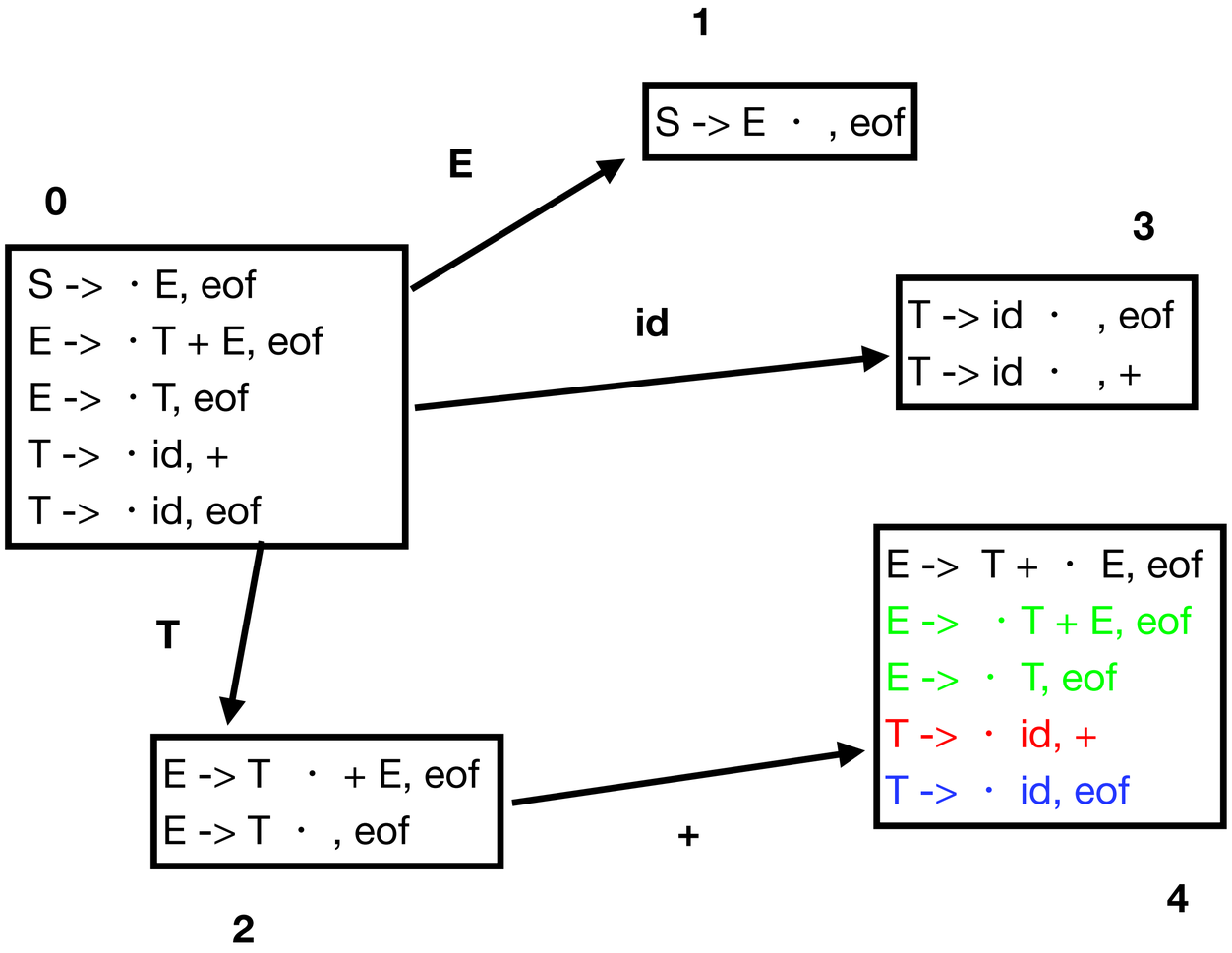
LR(1) Parse Tables



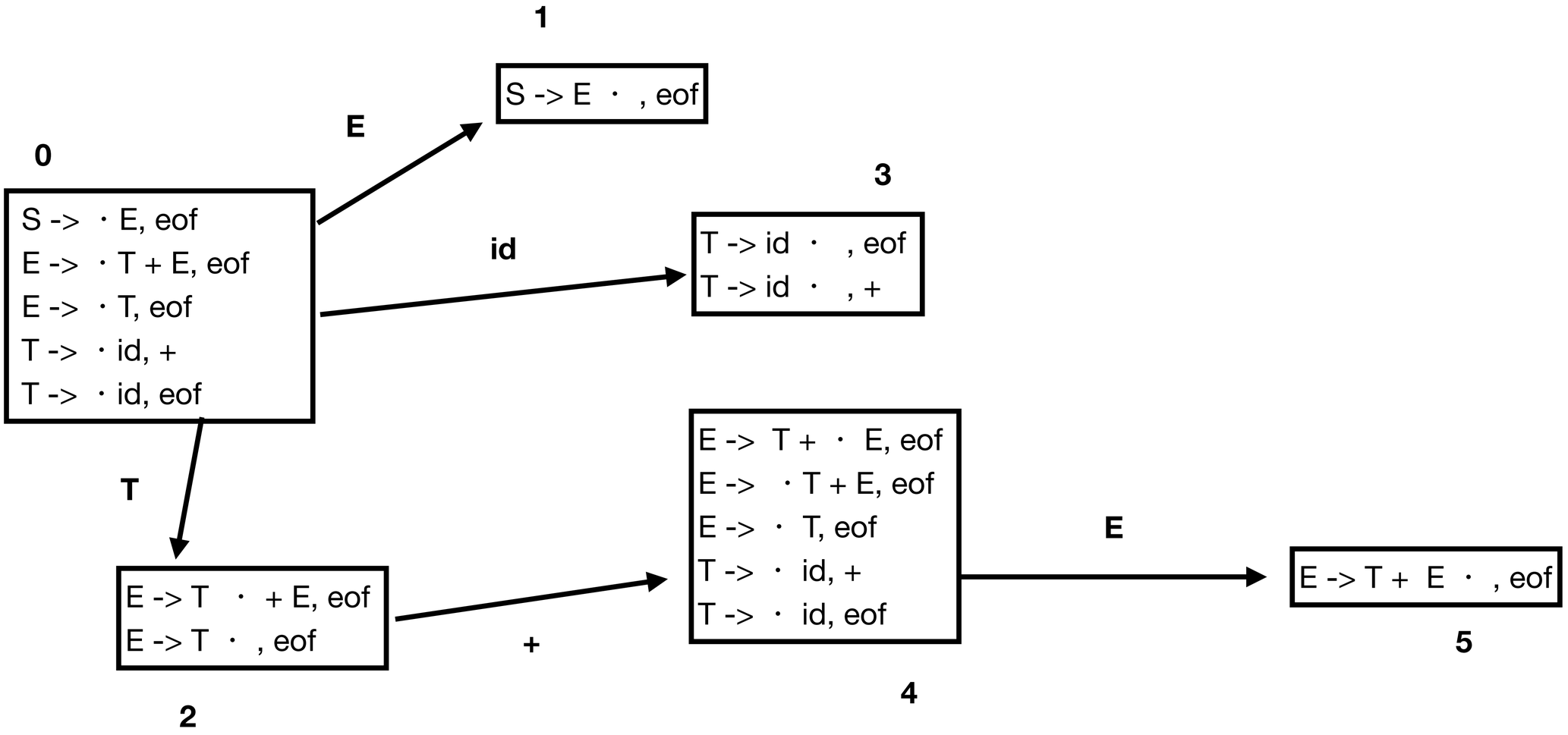
LR(1) Parse Tables



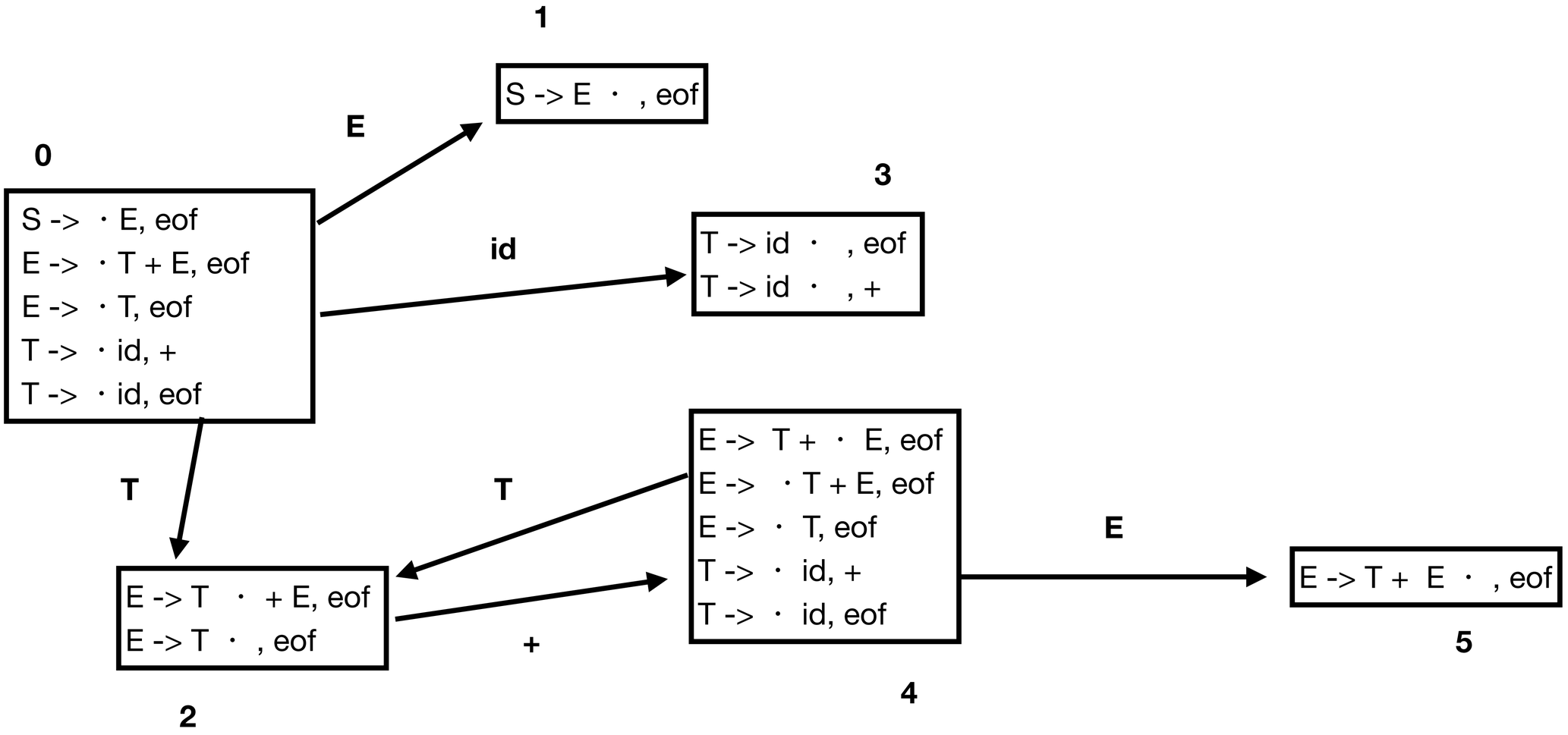
LR(1) Parse Tables



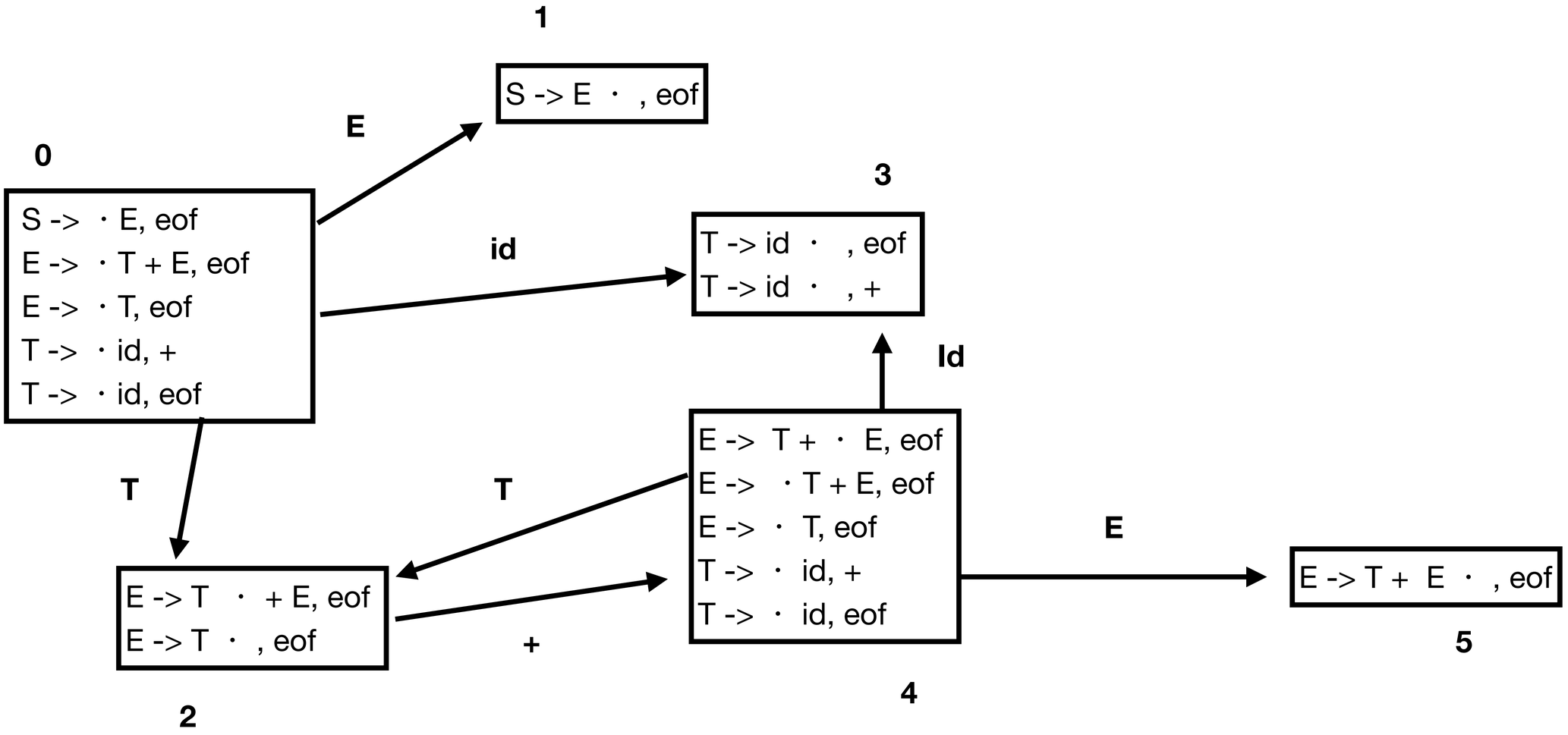
LR(1) Parse Tables



LR(1) Parse Tables



LR(1) Parse Tables



LR(1) Parse Tables

	Action Table			Goto Table	
State	*eof*	*id*	+	*E*	*T*
0		s 3		1	2
1	acc				
2	r 3		s 4		
3	r 4		r 4		
4		s 3		5	2
5	r 2				