

SLR parsing

Example:

1) $E \rightarrow E + T$

2) $E \rightarrow T$

3) $T \rightarrow T * F$

4) $T \rightarrow F$

5) $F \rightarrow (E)$

6) $F \rightarrow id$

Non-Terminal - caps.
+/*, - ~~terminal~~ terminal.

Augmented Grammar.

$E' \rightarrow E$

$E \rightarrow E + T$

$E \rightarrow T$

$T \rightarrow T * F$

$T \rightarrow F$

$F \rightarrow (E) \mid id$

(Constructing
table.)

SLR parsing

canonical collection of Items.

I_0 : (Closure of $E' \rightarrow \cdot E$).

$E' \rightarrow \cdot E$

$E \rightarrow \cdot E + T$

$E \rightarrow \cdot T$

$E \rightarrow \cdot T * F$

$E \rightarrow \cdot F$

$F \rightarrow \cdot (E)$

$F \rightarrow \cdot id$

$goto(I_0, E) = I_1$

$goto(I_0, T) = I_2$

$goto(I_0, F) = I_3$

$goto(I_0, () = I_4$

$goto(I_0, id) = I_5$

I_1 :

$E' \rightarrow E \cdot$

$E \rightarrow E \cdot + T$

$goto(I_1, +) = I_6$

I_2 :

$E \rightarrow T \cdot$

$T \rightarrow T \cdot * F$

$goto(I_2, *) = I_7$

I_3 :

$T \rightarrow F \cdot$

I_4 :

$F \rightarrow (\cdot E)$

$E \rightarrow \cdot E + T$

$E \rightarrow \cdot T$

$T \rightarrow \cdot T * F$

$T \rightarrow \cdot F$

$goto(I_4, E) = I_8$

$goto(I_4, T) = I_2$

$F \rightarrow \cdot (E)$ $goto(I_4, F) = I_{13}$

$goto(I_4, () = I_4$

$F \rightarrow \cdot id$ $goto(I_4, id) = I_{15}$

$I_5:$
 $F \rightarrow id.$

$goto(I_1, +) = I_6.$

$I_6:$

$E \rightarrow E + \cdot T$

$T \rightarrow \cdot T * F$

$T \rightarrow \cdot F$

$F \rightarrow \cdot (E)$

$F \rightarrow \cdot id.$

$goto(I_6, T) = I_9$

$goto(I_6, F) = I_3$

$goto(I_6, () = I_4$

$goto(I_6, id) = I_5$

$goto(I_2, *) = I_7.$

$I_7:$

$T \rightarrow T * \cdot F$

$F \rightarrow \cdot (E)$

$F \rightarrow \cdot id$

$goto(I_7, F) = I_6$

$goto(I_7, () = I_4$

$goto(I_7, id) = I_5$

$goto(I_4, E) = I_8$

$goto(I_4, T) = I_2$

$goto(I_4, F) = I_3$

$goto(I_4, () = I_4$

$goto(I_4, id) = I_5$

$I_8:$

$F \rightarrow (E \cdot)$

$E \rightarrow E \cdot + T$

$goto(I_8,)) = I_{11}$

$goto(I_8, +) = I_6$

I₉:

$E \rightarrow E + T.$

$T \rightarrow T * F.$

$\text{goto}(I_9, *) = I_7$

I₁₀

$T \rightarrow T * F.$

I₁₁

$E \rightarrow (E).$

	action						goto		
	id	+	*	()	\$	E	T	F
0	S ₅			S ₄			1	2	3
1		S ₆				acc			
2		r ₂	S ₇		r ₂	r ₂			
3		r ₄	r ₄		r ₄	r ₄			
4	S ₅			S ₄			8	2	3
5		r ₆	r ₆		r ₆	r ₆			
6	S ₅			S ₄				9	3
7	S ₅			S ₄					10
8		S ₆			S ₁₁				
9		r ₁	S ₇		r ₁	r ₁			
10		r ₃	r ₃		r ₃	r ₃			
11		r ₅	r ₅		r ₅	r ₅			

$$\text{FOLLOW}(E) = \{ \$, +,) \}$$

$$\text{FOLLOW}(T) = \{ \$, +,), * \}$$

$$\text{FOLLOW}(F) = \{ \$, +,), * \}$$

$$E' \rightarrow E. \rightarrow \text{It is in } I_1 \text{ so}$$

$$(1, \$) \Rightarrow \text{accept.}$$

$$E \rightarrow \cdot E \Rightarrow \text{is in } I_0 \text{ so } I_0 \text{ is}$$

Initial state.

Take the first production.

$$E \rightarrow E + T$$

Search for $E \rightarrow E + T$.

It is in I_0

$$\text{so } \text{FOLLOW}(E) = \{ \$, +,) \}$$

$$\text{All } \{q, \$ \}, \{q, + \}, \{q,) \} \text{ as } r_1.$$

$$E \rightarrow T. \rightarrow I_2$$

$$(2, \$), (2, +), (2,)$$