Contents

Error Processing

1. `<s>` → a
2. `<s>` → (`<s><r>`
3. `<r>` → ,`<s><r>`
4. `<r>` →)

Grammar for S-Expressions `(a, (a, a), ((a), a))`

	a	,	(	)	⊣
`<s>`	1	R_a_	2	R_b_	R_c_
`<r>`	R_d_	3	R_e_	4	R_f_
▽	R_g_	R_h_	R_i_	R_j_	Accept

Starting Stack: ▽`<s>`

1. Pop, Advance
2. Replace(`<r><s>`), Advance
3. Push(`<s>`), Advance
4. Pop, Advance

- R_a_, R_b_: “,/)” occurs when s-expression expected
- R_c_: s-expression incomplete
- R_d_, R_e_: Missing comma
- R_g_, R_h_, R_i_, R_j_: * occurs after s-expression

((a(,a)⊣

Stack	Input
▽<s>	((a(,a)⊣
▽<r><s>	(a(,a)⊣
▽<r><r><s>	a(,a)⊣
▽<r><r>	(,a)⊣

Missing comma - Not very useful error message when pointing at comma

E-List

1. <E> → <T><E-List>
2. <E-List> → +<T><E-List>
3. <E-List> → ε
4. <T> → <P><T-List>
5. <T-List> → *<P><T-List>
6. <T-List> → ε
7. <P> → (<E>)
8. <P> → ident

	Ident	+	*	(	)	⊣
<E>						
<E-List>		2				
<T>						
<T-List>						
<P>						
)						
▽						
{ADD}		out	{ADD}	Pop	Retain	
{MULT}						

2. Replace(<E-List>{ADD}<T>), Advance

Removal of Left-Recursion

- <E> → <E>+<T>
- <E> → <T>

Replaced by

- <E> → <T><E-List>
- <E-List> → +<T><E-List>
- <E-List> → ε

Left Factoring

- <E> → ident(<params>)
- <E> → ident

Replaced by

- <E> → ident<param part>
- <param part> → (<params>)
- <param part> → ε

The If Statement is Not LL

- <s> → if <c> then <s> else <s>
- <s> → if <c> then <s>

If A=B then if C=D then P ← Q else X ← Y

Left Factor

1. <s> → if <c> then <s> <else part>
2. <else part> → else <s>
3. <else part> → ε
    - Follow(<else part>) = Follow(<s>) = {else, ⊣}

	if	then	else	⊣
<s>	1			
<else part>	3		2,3	3

1. Replace(<else part><s> then <c>), Advance
2. Repace(<s>), Advance
3. Pop, Retain