

CS251: Introduction to Language Processing

Bottom-Up Parsing

Vishwesh Jatala

Department of CSE

Indian Institute of Technology Bhilai

vishwesh@iitbhilai.ac.in



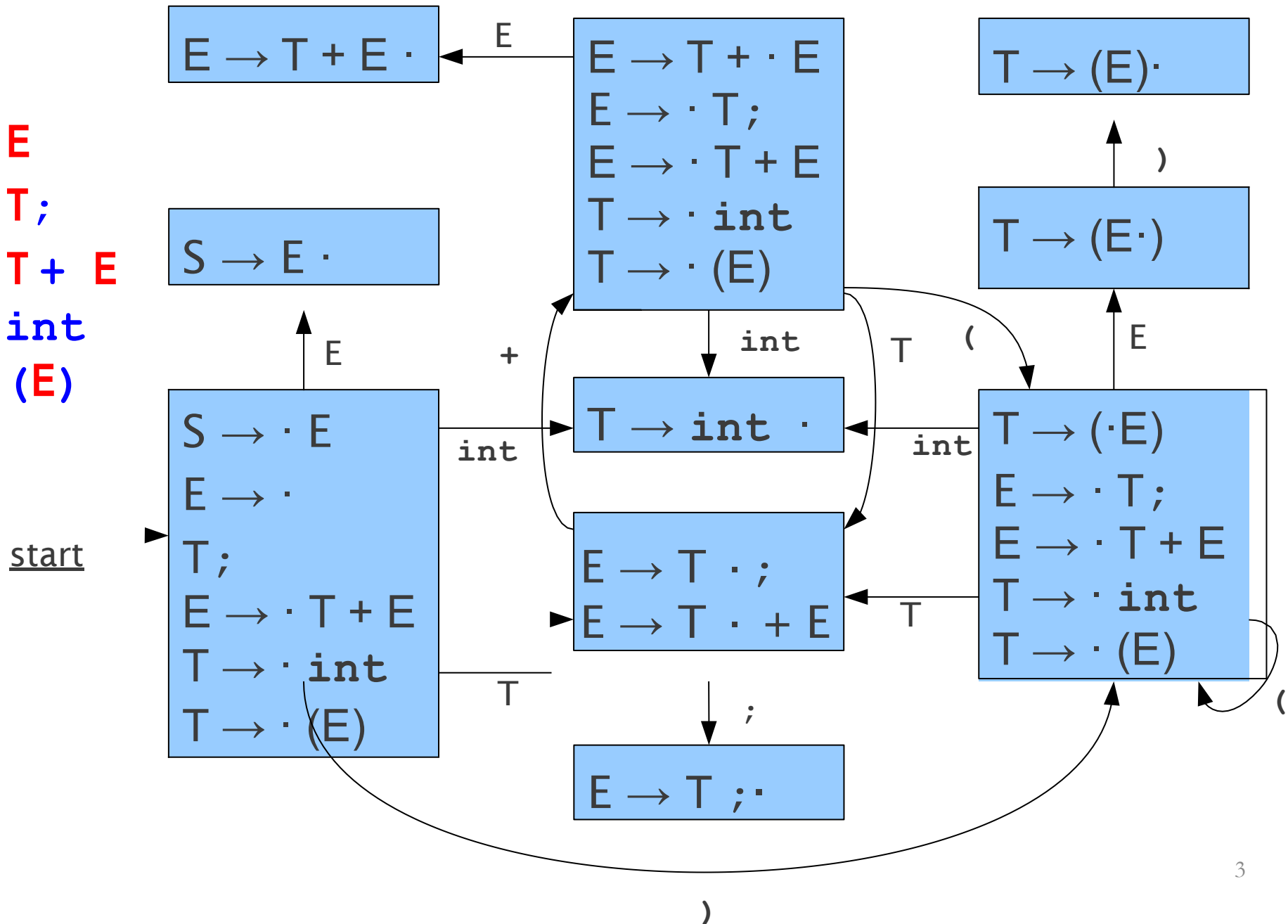
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Acknowledgement

- Today's slides are modified from that of *Stanford University*:
 - *<https://web.stanford.edu/class/archive/cs/cs143/cs143.1128/>*

LR(0) Grammar

$S \rightarrow E$
 $E \rightarrow T;$
 $E \rightarrow T + E$
 $T \rightarrow \text{int}$
 $T \rightarrow (E)$



LR(0) Tables

- (1) $S \rightarrow E$
 (2) $E \rightarrow T;$
 (3) $E \rightarrow T + E$
 (4) $T \rightarrow \text{int}$
 (5) $T \rightarrow (E)$

	Action					Goto	
	int	+	;	()	E	T
0	S9			S8		S1	S3
1	Acc	Acc	Acc	Acc	Acc		
2	r3	r3	r3	r3	r3		
3		S5	S4				
4	r2	r2	r2	r2	r2		
5	S9			S8		S2	S3
6	r5	r5	r5	r5	r5		
7					s6		
8	S9			S8		S7	S3
9	r4	r4	r4	r4	r4		

Example

$S \rightarrow E$

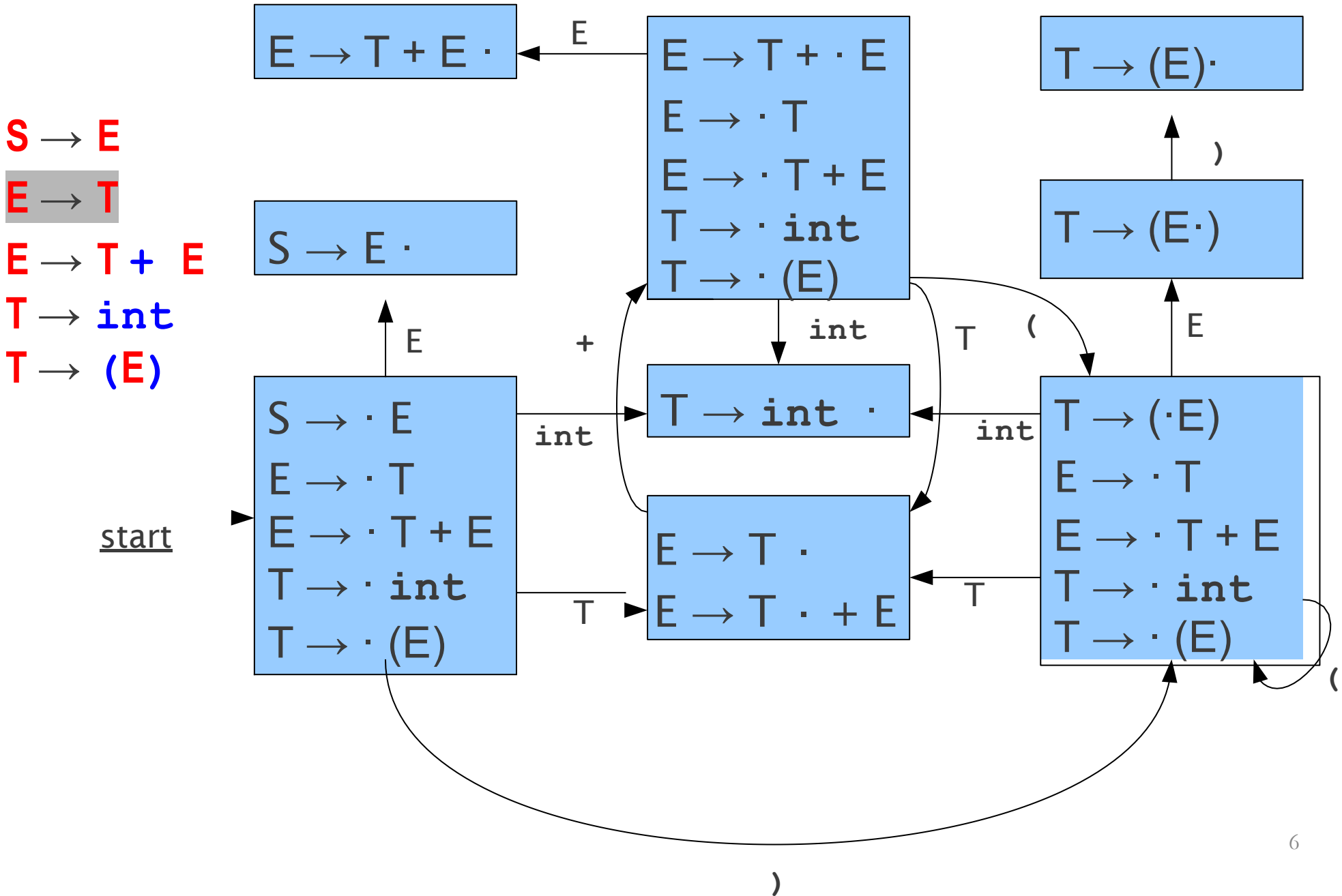
$E \rightarrow T$

$E \rightarrow T + E$

$T \rightarrow \text{int}$

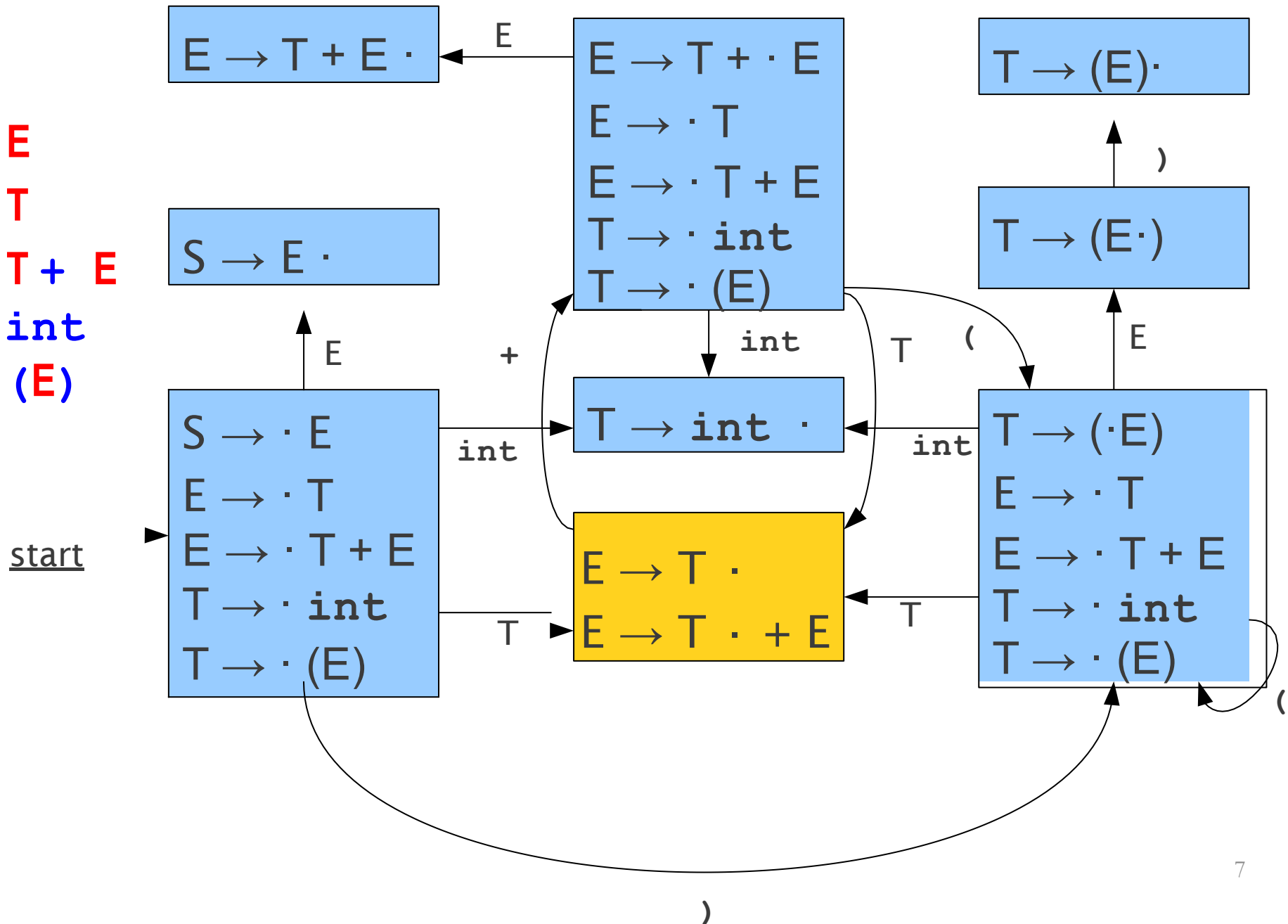
$T \rightarrow (E)$

A Non-LR(0) Grammar



A Non-LR(0) Grammar

$S \rightarrow E$
 $E \rightarrow T$
 $E \rightarrow T + E$
 $T \rightarrow \text{int}$
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Example

$S \rightarrow E$

$E \rightarrow T$

$E \rightarrow T + E$

$T \rightarrow \text{int}$

$T \rightarrow (E)$

)

Another Example

S → **E**

E → **L** = **R**

E → **R**

L → **id**

L → ***R**

R → **L**