

Step 3: Compute First & Follow's for all non-terminal symbols.

↑ ↑

two functions

* First is the set of terminals that can arrive first in any string generated by the non-terminal.

* Follow's is the set of terminals that can appear immediately after a string generated by the non-terminal.

$$E' \rightarrow E$$

$$E \rightarrow E + T$$

$$E \rightarrow T$$

$$T \rightarrow T * F$$

$$T \rightarrow F$$

$$F \rightarrow id$$

$$F \rightarrow (E)$$

For $F \rightarrow id$, $\{ \}$ must be in
First set of F

For $T \rightarrow *$ will follow something

include T

First

F

$\{ id, \{ \} \}$

T

$\{ id, \{ \} \}$

E

$\{ id, \{ \} \}$

E'

$\{ id, \{ \} \}$

→ we don't have any terminal starting T 's production rule.
But T can be F and F have $id \& \{ \}$. ∴ Copy F 's First for T .

bottom up approach

* If we had : $T \rightarrow \epsilon$

then $T \rightarrow T * F$

$T \rightarrow E * F$

$\therefore T \rightarrow * F$

$\therefore *$ will also be in T 's First

Follows

↓ go top down

IF we have:
rule 1

$$A \rightarrow \alpha B$$

↳ what follows A follows B

S
!

$$\left. \begin{array}{l} A, B \text{ both} \\ \text{followed by} \\ \alpha \end{array} \right\} \begin{array}{l} A \alpha B \\ \downarrow \\ \alpha B \alpha B \end{array}$$

IF we have:
rule 2

$$A \rightarrow \alpha B \beta$$

follows of B include first of β

Hence α, β means anything

$$\begin{array}{c} F \rightarrow (E) \\ \overbrace{\quad}^T \quad \overbrace{\quad}^\alpha \end{array} \quad E \rightarrow E + T$$

Follows
do not include ϵ

E'

$\{ \$ \}$ indicating end of file

E

$\{ +, ,), \# \}$
rule 2 rule 1

T

$\{ *, ., +,), \# \}$
rule 1

F

$\{ *, +,), \# \}$
rule 1

For rule 2: $A \rightarrow \alpha B \beta$ if β leads to ϵ

it will lead to rule 1
which means copying
A's following