

By Shweta Tiwari from IT Department

Covered Topics Under UNIT-3 of "CD- COMPILER DESIGN (KIT-052)"

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CD: UNIT-3

Syntax-Directed Translation

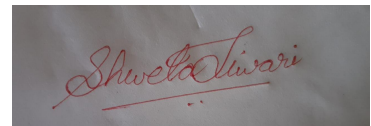
FALL SEMESTER, YEAR (V/VI, 3rd)

FALL SESSION (2022-23)

(CD)

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TOPIC On : UNIT-3

Syntax-Directed Translation: Advantages

By SHWETA TIWARI

Under On: Syntax-Directed Translation

PREPARED FOR
Engineering Students
All Engineering College

PREPARED BY
SHWETA TIWARI
Guest Faculty

① SDT for evaluation of expression

$$E \rightarrow E_1 + T \quad \{ E.val = E_1.val + T.val \} \quad \text{--- ①}$$

$$E \rightarrow T \quad \{ E.val = T.val \} \quad \text{--- ②}$$

$$T \rightarrow T_1 * F \quad \{ T.val = T_1.val * F.val \} \quad \text{--- ③}$$

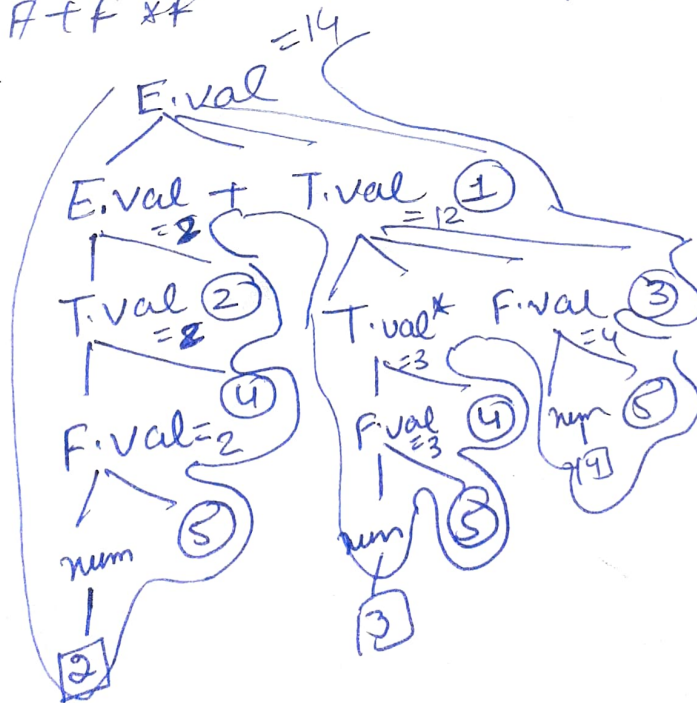
$$T \rightarrow F \quad \{ T.val = F.val \} \quad \text{--- ④}$$

$$F \rightarrow num \quad \{ F.val = num.val \} \quad \text{--- ⑤}$$

input $2+3*4$

$$\begin{aligned} E &\rightarrow E_1 + T \\ &\rightarrow T + T \\ &\rightarrow F + T \\ &\rightarrow F + T_1 * F \\ &\rightarrow F + F * F \end{aligned}$$

$$\begin{aligned} E &\rightarrow E_1 + T \\ &\rightarrow E_1 + T * F \\ &\rightarrow E_1 + F * F \\ &\rightarrow T + F * F \\ &\rightarrow F + F * F \end{aligned}$$



② SDT to convert infix expression to postfix expression

$E \rightarrow E + T \quad \{ \text{print} (" + "); \}$ — ①

$E \rightarrow T \quad \{ \}$ — ②

$T \rightarrow T * F \quad \{ \text{print} (" * "); \}$ — ③

$T \rightarrow F \quad \{ \}$ — ④

$F \rightarrow \text{num} \quad \{ \text{print} (\text{num.val}); \}$

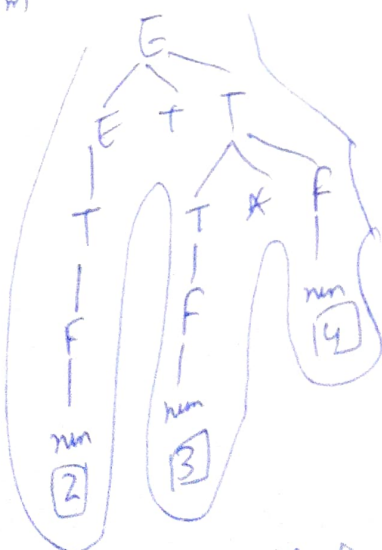
input $2 + 3 * 4$ ✓

convert postfix (~~2+3~~ $2 + 3 4 *$)
($2 3 4 * +$)

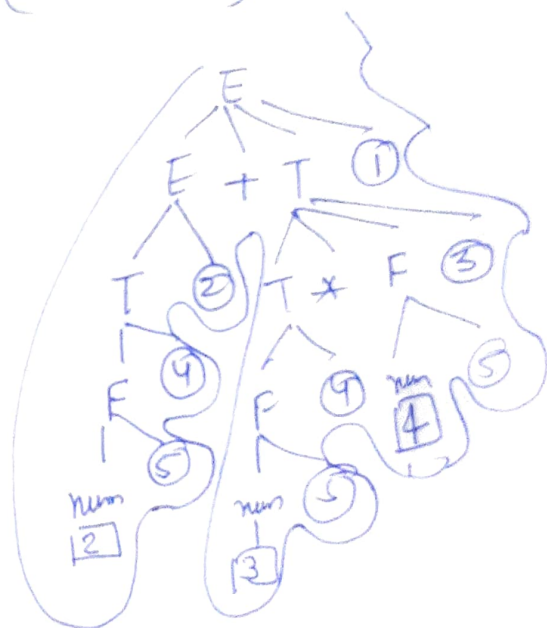
Top-down app.

$E \rightarrow E + T$
 $\rightarrow T + T$
 $\rightarrow F + T$
 $\rightarrow F + T * F$
 $\rightarrow F + F * F$

$E \rightarrow E + T$
 $E \rightarrow E + T * F$
 $F \rightarrow F * F$
 $F \rightarrow F * F * F$
 Bottom



$2 3 4 * +$



$2 3 4 * +$

Question What is the o/p if we carry out the following SDT to the given input string

$S \rightarrow xxw$ {print(1);} - ①

$S \rightarrow y$ {print(2);} - ②

$w \rightarrow sz$ {print(3);} - ③

Input/string xxxxyzz

$S \rightarrow xxw$
 $\rightarrow xxsz$
 $\rightarrow xxxwxz$
 $\rightarrow xxxxszz$
 $\rightarrow xxxxyzz$

o/p
 23131



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