

Parser :-

- The process of deriving the string from the given grammar is known as derivation (parsing).
- Depending upon how derivation is performed we have two types of parsers.

Top-Down (LL)
Parser

{ start from start
symbol S & proceed
to string }

Bottom-up (LR)
Parser

{ start from string,
proceed to S }

(i) Top-down parsing:-

- start from S , proceed to string

- It follows LMD

- It may have problem due to choices in production rule due to more than one production for same terminal

eg:-

$S \rightarrow aABe$

$A \rightarrow Abc|b$

$B \rightarrow d$

I/p: ~~a~~~~b~~~~c~~~~d~~~~e~~ \$

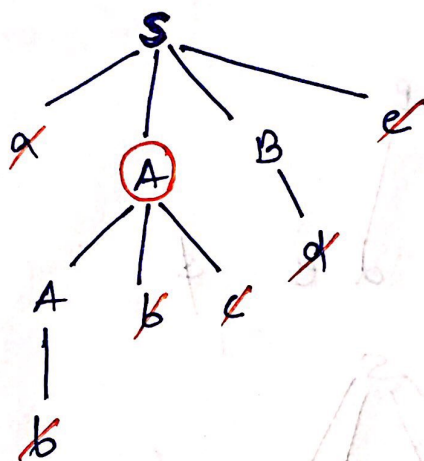
$S \rightarrow a \textcircled{A} B e$

$S \rightarrow a \textcircled{A} b c B e$

$S \rightarrow a b b c \textcircled{B} e$

$S \rightarrow \underline{a b b c d e}$

LMD



As we can see A has two production

$A \rightarrow Abc$

$A \rightarrow b$

Both generates b as first alphabet

(ii) Bottom-up parsing :-

$S \rightarrow aABe$

$A \rightarrow Abc|b$

$B \rightarrow d$

I/p: $abcde$ \$

- It starts from string, proceed to S

a b b e d e \$ $A \rightarrow b$

a b b c d e \$ $A \rightarrow A b c$

a b b c d e \$

a b b c d e \$

$B \rightarrow d$

$S \rightarrow a A B e$

It follows RMD in reverse order :

$S \rightarrow a A B e$

$B \rightarrow d$

$A \rightarrow A b c$

$A \rightarrow b$

$s \rightarrow a A \textcircled{B} e$

$s \rightarrow a \textcircled{A} d e$

$s \rightarrow a \textcircled{A} b c d e$

$s \rightarrow a b b c d e$

- Identify correct handle (substitute or substiting)
is always difficult.