MCA 18 302
PRINCIPLES OF COMPILERS

MODULE 2
SYNTAX ANALYSIS

1. Role Of Parser
2. Error Handling And Recovery
3. Context Free Grammars
   a) Derivations
   b) Parse Tree
   c) Ambiguity
   d) Associativity And Precedence Of Operators
4. Definitions Of Parsing
   a) Top -Down Parsing And
      - Recursive Descent Parsing
      - non-recursive Predictive Parsing-
      - LL (1) Grammars
   b) Bottom-up Parsing-
      - Reductions, handle Pruning
      - shift Reduce Parsing
      - operator Precedence Parsing,
      - Simple LR Parsing.

Reductions

- Bottom up parsing as the process of reducing a string w to the start symbol of the grammar.
- At each reduction step a particular substring matching the right-side of a production is replaced by the symbol on the left of that production, and if the substring is chosen correctly at each step, a rightmost derivation is traced out in reverse.

eg: Consider the grammar.

$S \rightarrow aABe$

$A \rightarrow Abc \mid b$

$B \rightarrow d$.

The sentence abbcde can be reduced to S by the following steps:

abbcde	
aAbcde	$(A \rightarrow b)$
aAde	$(A \rightarrow Abc)$
aABe	$(B \rightarrow d)$
S	$(S \rightarrow aABe)$

By a sequence of 4 reduction we are able to reduce abbcde to S. These reductions, in fact, trace out the following right most derivation in reverse:

$$S \underset{rm}{\Rightarrow} aA\underline{B}e \underset{rm}{\Rightarrow} a\underline{A}de \underset{rm}{\Rightarrow} aAbcde \underset{rm}{\Rightarrow} abbcde$$