LL(1) Grammar

- If entry $M[A, a]$ contains multiple entries in any cell then that grammar is not LL(1).

- It can also show that a grammar $G$ is LL(1) if and only if whenever $A \rightarrow \alpha | \beta$ are two distinct production of $G$ of following condition hold
  - (i). For no terminal ‘$a$’ do $\alpha$ and $\beta$ derives the string’s beginning with ‘$a$’.
  - (ii). At most one of $\alpha$ and $\beta$ can derive the empty string.
  - (iii). If $\beta \rightarrow \varepsilon$, then $\alpha$ does not derive any string beginning with a terminal in FOLLOW($A$)
Consider the grammar

- \( S \rightarrow iCtSS' | a \)
- \( S' \rightarrow eS | \epsilon \)
- \( C \rightarrow b \)

First Compute FIRST and FOLLOW

- FIRST(S) = \{i,a\}, FIRST(S') = \{e\}, FIRST(C) = \{b\}
- FOLLOW(S) = FOLLOW(S') = \{e,\$\}, FOLLOW(C) = \{t\}

Predictive Parsing Table Entry Calculation

- \( M[S,i] = S \rightarrow iCtSS' \)
- \( M[S,a] = S \rightarrow a \)
- \( M[S',e] = S' \rightarrow eS \)
- \( M[S',\epsilon] = S' \rightarrow \epsilon \)
- \( M[S',\$] = S' \rightarrow \epsilon \)
- \( M[C,b] = C \rightarrow b \)
Here entry $M[S',e]$ contains multiple entry, so this grammar is not LL(1).
Example

- Example 1
- Example 2
- Example 3
Assignment 1

- Programming Assignment – 10 Marks

1. Write a program in C/C++/Java, to identify whether a given line is a comment or not?

2. Write a program in C/C++/Java, to Construct a program for how to Compute FIRST () & FOLLOW () for any given grammar.

Last Date of Assignment Submission – 11-Sep-2017 (till 6 PM)

Assignment Submission link is given in following webpage

https://sites.google.com/site/jkmkhare/course