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Left to Right-Right Most Parsing Algorithm with Lookahead

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Abstract : Left to Right-Right Most (LR) parsing algorithm is a widely used algorithm of syntax analysis. It is contingent on a parsing table, whereas the parsing tables are extracted from the grammar. The parsing table specifies the actions to be taken during parsing. It requires that the parsing table should have no action conflicts for the same input symbol. This requirement imposes a condition on the class of grammars over which the LR algorithms work. However, there are grammars for which the parsing tables hold action conflicts. In such cases, the algorithm needs a capability of scanning (looking-ahead) next input symbols ahead of the current input symbol. In this paper, a 'Left to Right'-'Right Most' parsing algorithm with lookahead capability is introduced. The 'look-ahead' capability in the LR parsing algorithm is the major contribution of this paper. The practicality of the proposed algorithm is substantiated by the parser implementation of the Context Free Grammar (CFG) of an already proposed programming language 'State Controlled Object Oriented Programming' (SCOOP). SCOOP's Context Free Grammar has 125 productions and 192 item sets. This algorithm parses SCOOP while the grammar requires to 'look ahead' the input symbols due to action conflicts in its parsing table. Proposed LR parsing algorithm with lookahead capability can be viewed as an optimization of 'Simple Left to Right'-'Right Most' (SLR) parsing algorithm.

Keywords : left to right-right most parsing, syntax analysis, bottom-up parsing algorithm
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