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LiTeC PARSER

PARSER

- The data from the lexical analysis phase is broken down into smaller parts using a parser.
- A parser receives input from a token sequence and outputs a parse tree.
- When given a grammar, a parser generator will automatically produce source code that can parse streams of characters.
- A parser for a programming language's grammar checks to see if the grammar can produce the string of tokens for a program in that language.

PARSER

- A parse tree generated by the parser demonstrates how grammatical productions are expanded into a phrase that matches the letter sequence.
- A parser reports program syntax errors for the grammar of a programming language.
- When a token is required, a parser calls the lexical analyzer.
- The grammar of a programming language can be parsed manually or automatically.
- Context-free grammar is a foundation for a programming language parser grammar.

YACC

- YACC(Yet Another Compiler Compiler) provides a tool to generate a parser for a given grammar.
- It generates LALR(1)(Look Ahead Left-to-right Rightmost derivation) parser.
- It is used in conjunction with Lex and is a bottom-up parser.
- YACC takes grammar in .y file as input and outputs C program called y.tab.c which contains parsing tables.
- Structure of yacc input file:

declarations

%%

translation rules

%%

auxiliary C routines

AMBIGUITY AND CONFLICTS

- Shift-reduce conflict: It occurs when the grammar permits the reduction of one rule for a specific token while simultaneously allowing the shifting of another rule for the same token.
- They are automatically resolved by YACC parser generator by preventing reductions when they would do so.
- If two or more rules apply to the same input sequence, there will be a reduce/reduce conflict.
- The grammar is said to be ambiguous if there are several leftmost derivations, multiple rightmost derivations, or multiple parse trees for a particular input string.

IMPLEMENTATION

- We started with improving the code in our lexer with minor corrections.
- We learned about syntax analysis and parsing. Then, we wrote YACC grammar in parser.y file.
- The team members had researched about how exactly yacc and bison work, to produce the parser.
- After done with lexical analysis, we generated parsing table using the command: bison parser.y

THANK YOU