CSE341

Programming Languages

HW3

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What Does This Program Do?

This program implements a syntax analyzer that accepts or rejects a given program in G++. Syntax analysis rules of G++ is explained in the document in G++Syntax.pdf.

To do this, it uses rules in a meta-grammar such as CFGs. Yacc lets us to generate a C code to do syntax analysis
Using Yacc, we can implement our interpreter. It creates a C file by the lexer. And there is a lex.h file.

The program implements the CFG for expressions and if statements.
This also means that we need to have the proper things for some basic data types.

Yacc is a program for the linux systems parser generator, generating LALR parser based on a formal grammer, written in a notation similar to BNF.

Outputs

```
[1]> ;; helloworld.g++
[2]> (+ 10 10)
20
[3]> (list 1 2 123)
(1 2 123)
[4]> (set x (** (- 6 4) (/ 32 (* 4 2))))
16
[5]> (set y (concat (list 6 7 3 6) (list 1 2 5 7)))
(6 7 3 6 1 2 5 7)
[6]> (set z (append 4 (list 1 2 5 7)))
(4 1 2 5 7)
[7]> (if (and true false) (list 5 6) (list 6 78 9))
(6 78 9)
[8]> (if (or true false) (list 5 6) (list 6 78 9))
(5 6 0)
[9]> (not (and true true))
FALSE
[10]> (not (or false false))
TRUE
[11]> (disp '(6 7 2 9))
(6 7 2 9)
[12]> (disp (** 5 3))
125
[13]> (equal 5 4)
TRUE
[14]> (equal 5 5)
TRUE
[15]> (less 6 9)
TRUE
[16]> (less 9 13)
TRUE
[17]> (less 13 9)
FALSE
[18]> (deffun sumup (x) (if (equal x 0) 1  (set x (- x 1))))
SUMUP
[19]> (sumup 5)
SUMUP
[20]> (exit)
Bye.
```

How to Run This Program?

```
lex gpp_lexer.l
yacc -d gpp_parser.y
gcc lex.yy.c y.tab.c -w
./a.out
```

In the directory;

>lex gpp_lexer.l
>yacc -d gpp_parser.y
>gcc lex.yy.c y.tab.c -w
> ./a.out

OR

```
> ./a.out
```