SE V

Assignment 12

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Problem Statement: Write a program for intermediate code generation using LEX & YACC for control flow statement. (while loop or switch case).

Objectives:

To understand forth phase of compiler ie. Intermediate Code Generation (ICG).
To learn & use compiler writing tools.
To learn how to write three address code for given statement.

Theory:

In the analysis-synthesis model of a compiler, the front end analyses a source program & creates an intermediate representation, from which the back end generates target code. Ideally, details of the source language are confined to the front end and back end. The front end translates a source code into an intermediate representation from which the back end generates target code.

Intermediate languages:

Three ways of intermediate representation
- syntax tree
- postfix notation
- Three address code

steps to execute the program:

$flex or $flex filename.l
$yacc -d filename.y
$gcc lex.yy.c y.tab.c -ll -ly -lm
$./a.out

Algorithm:

1. Declare header file "y.tab.h"
2. End declaration section by %%
3. Match regular expression
4. If match found then convert it into char & store it in yylval.p where p is a pointer declared in YACC
5. Return token
6. If input contains new line character(\n) then return 0
7. If input contains " " then return yytext[0]
8. End rule section by %%
9. Declare main function
10. call function yywrap()

YACC.

1. Declaration of header files
2. Declare structure for three address code representation having fields of argument 1, arg 2, operator, result.
3. Declare pointer of char type in union.

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4. Declare token expression of type pointer.
5. give priedence to "*", "/"
6. give precedence to "+", "-"
7. End of declaration section
8. If final expression evaluates then add it to the table of three address code.
9. If the input is,
   i) E + E or E - E or E/E or E * E
   then add to table argument 1, argument 2, operator
10. if (E) then $2 to $$
11. if digit of letter then assign $1 to $$
12. End the section.
13. declare main function and call yyparse()
14. declare yyerror for any error handle.
15. End.

Conclusion:- Thus I have implemented program for intermediate code using lex & yacc for control flow.