Compiler Project: Mini C Language

Abstract:

Mini C Language is the implementation of a few specifications of the C Language. This language has the basic features of the C Language.

Project Idea:

1. Values: Integers, Strings
2. Bindings
   i) Block Structure
   ii) Declarations: Variables, Procedures
3. Abstraction: Procedures
4. Types: Integers, String, One-dimensional static arrays
5. Expressions: Integer airthmetic and comparisons
6. Comments: Multi-line
7. Imperative features:
   a) Commands: assignment, sequence, selection, iteration, I/O

Language Specifications:

1. Keywords:

if, else,while, for, do, int, main, break, case, char, continue, default, return, switch, void

2. Operators:
   Arithmetic:
   +, -, /, *, %, ^
   Relational:
   >, <, <=, >=, ==, !=
   Assignment:
   +=, -=, *=, /=, %=, ^=
3. Delimiters:
   , ;
4. Identifiers:
   The identifiers start either with an alphabet or '_'.
5. Literals:
   Integers , char and string literals

Tools Used:

1. Flex- Flex is used to generate the 'lex.yy.c' file from the lexer file
2. YACC- Yacc parser is used to generate 'y.tab.c & y.tab.h' files from yacc file

Things done in the project:

1. Variable Declaration:
   Variables with their *Types*,*Name*, *Size* and *Scope* are stored in the symbol table. The symbol table uses the Linked List data structure.
   i) In semantic.y file, the function *mySymTab* is used to call the symbol table to add the entries the table
   ii) In semantic.y file, function *context-check* is used to check whether the identifier is previously declared or not.
   Iii) Variables and arrays can be added to the symbol table with their size.
2. Error handling:
   i) The language has the ability to check whether the variables are previously declared in the program.
3. Comments:
   Single and Nested Multi-line comments can be identified.
4. Scope:
   It also checks the scope of the variables inthe program.
5. Semantic rules:
   The attributed semantic rules are also mentioned in the parser file.

Things to be done:

1. The function prototye and binding of the parameters to the functions need to be done.
2. Generation of the Three-Address-Code yet to be done.

Submitted By:
Ankit Agarwal
J08015