Pascal to MIPS Compiler

Software Design Document

Version <1.6>

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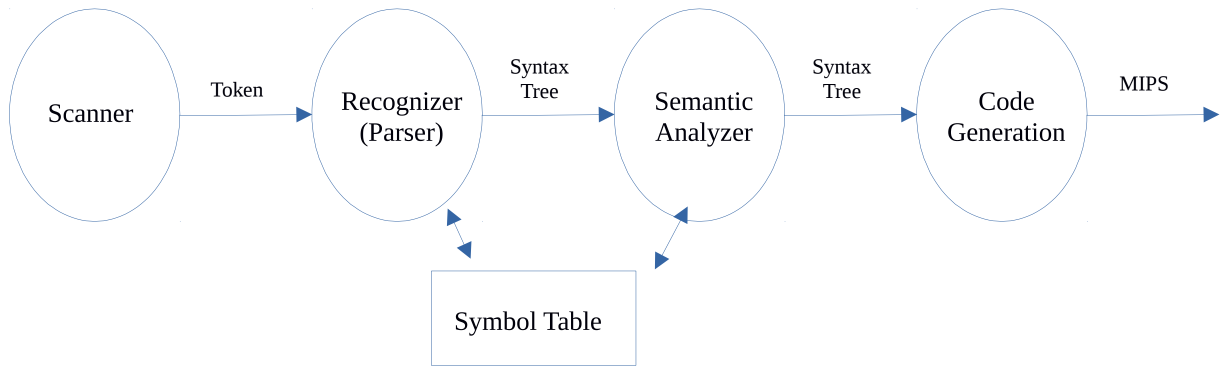
Revisions

Date	Description	Version
January 23rd, 2018	Created the document.	1.0
January 30th, 2018	Added cover page and separated sections.	1.1
January 30th, 2018	Added documentation about Parser.java	1.2
February 1st, 2018	Added graph containing the overview of the compiler.	1.3
Februrary 3rd, 2018	Added documentation about ParserTest.java	1.4
February 10th, 2018	Added documentation about SymbolTable.java, Kind.java, and SymbolTableTest.java. Edited Overview section.	1.5
February 18th, 2018	Added documentation about CompilerMain.java	1.6

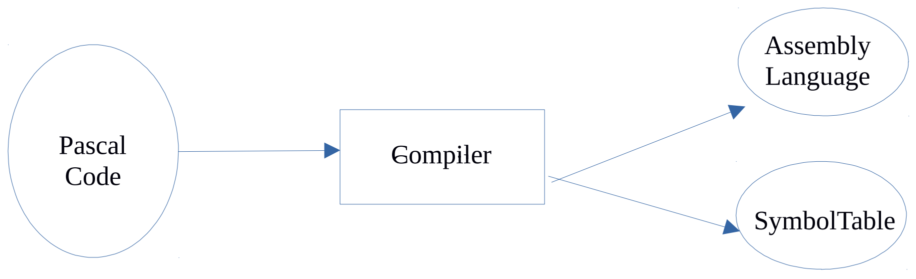
1. Introduction

This project is for Programming Languages and Compilers course, keystone for Computer Science majors, at Augsburg University. It contains a compiler in Java for Pascal, to finally, convert the code to MIPS. Its components are described below.

2. Overview



We want to be able to take in a Pascal file, and output an assembly language file and a .symboltable file that contains the symbols used in the code.



3. Implemented Components

/src/scanner/

a) Scanner.jflex – we used a JFlex tool to create Scanner.java which currently contains the skeleton of being able to read-in a file and creating their respective Token.

b) Scanner.java – created from the JFlex tool.

c) Token.java – This class contains the simple Token object, which contains String lexeme and TokenType.

d) TokenType.java – This class is an ENUM that contains all the relevant token types in Pascal.

e) LookUpTable.java – This class is a HashMap containing lexeme as a key and TokenType as value. The lexeme is matched to their respective TokenType using this LookUpTable.

f) ScannerTest.java – This class currently contains JUnit testing for yytext() and nextToken().

/src/parser/

a) Parser.java – contains a parser for Pascal based on the grammar provided by professor. On top of abiding the rules of the grammar, there are six other methods, isMulop(), mulop(), isAddop(), addop(), isRelop(), and relop() for simplicity.

b) ParsertTest.java – contains JUnit testing cases for program(), declarations(), subprogram_declaration(), statement(), simple_expression(), and factor().

/src/symboltable/

a) SymbolTable.java – contains constructor for our symbol table implemented using a HashMap that holds lexeme as a key and an object called DataStructure that holds a lexeme and the kind of the ID that we would like to store.

b) Kind.java – This class is an ENUM that contains all the types of ID that we will be storing.

c) SymbolTableTest.java – contains JUnit testing cases for SymbolTable.add(lexeme, DataStorage) and SymbolTable.getKind().

/src/compiler/

a) CompilerMain.java - Contains the main for the compiler; primarily, as of now, to test the integration of the SymbolTable to the parser.