

Micro-C Compiler SDD

General Overview

This project is to be used to compile and run programs written in the Micro-C programming language. It is written in Java, and consists of four main packages: scanner, parser, semantic analyzer, and code generator. These packages all lie within the src folder of the root directory, titled Compiler. Each package is described in detail in the following subsections.

Scanner

The scanner used for this compiler is generated by a Jflex file, and all the necessary files for this component are found in the scanner package. The design of my Jflex scanner is as follows: the jflex file Scanner.jflex contains several regex patterns that the generated scanner will parse for. It also contains the instructions for what the scanner will do upon finding each pattern. There is a Token class, which has the attributes lexeme and tokentype. The lexeme is the literal string that is parsed, while the tokentype is another object, created by the TokenType class. TokenType is simply an enum of all necessary types of tokens for this assignment. Finally, there is a LookupTable class. The LookupTable is a hashmap that is used for all the symbol, operator, and keyword tokens. When the scanner picks up any of those tokens, it sends the lexeme as a key to the LookupTable to get back the value associated with it, and assigns that value as its TokenType. There is also a class for a custom exception object, called BadCharacterException. This exception is thrown when the scanner picks up a lexeme that is not associated with any of

the regular expression patterns defined in Scanner.jflex. It holds an error message that lets the user know what the bad character was.

Parser

// Will describe when created

Semantic Analyzer

// Will describe when created

Code Generator

// Will describe when created