Introduction

The purpose of this project is to demonstrate practical knowledge of the java programming language, regular expressions, finite automata, software engineering and design, as well as general problem solving skills in a group dynamic. Throughout this project we have applied knowledge acquired during our undergraduate studies to design, build, test and deploy a working compiler for a LITTLE language.

A working compiler, for even a LITTLE language, is a positive for future endeavors and job searches. It serves to show that we not only understand how to program but that we also understand the foundations of the computer science field. Be completing this project, we have gained insight into each of the elements that make up computer science and how they fit together to create a finished product.

In the course of this report we will touch on the background and purpose of a compiler, each of the components that make up a compiler and a summary of what we learned, what we could have done better, where we will go from here.

Background

Methods and Discussion

Scanner

Starting off with our program we had decided on a lot of key things to try and make development easiest. The group settled with using Java for the programming language as we are the most comfortable with. Next, seeing the complexity behind trying to setup IDE's to use Antlr, no IDE was used in running or building our program. Everything would be done in the terminal using either vim or nano as the text editors. This made running the code simpler and no extra configuration needed to be done. Seeing how Windows is not entirely reliable when it comes to the set of commands to use or to test our bash scripts in, Linux became the standard OS the group would be using when testing the program and bash scripts. So far, no issue has come up when using these same set of files in OSX but if there becomes an issue later on, Linux would be used entirely.

The group ran into very few difficulties after understanding how to use antlr and run everything in general; only minor grammatical errors or regular expression difficulties. At first, there was some trouble getting everything to communicate with Antlr properly. Eventually we decided to run the demo files when they were available. That is when we learned about problems with using Windows in general.

Parser

Symbol Table

Semantic Routines

Full-fledged Compiler