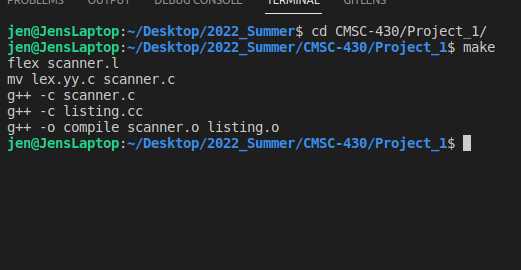
**Project Approach**

Before I started building out the lexical analyzer portion of my compiler, I first read the required course material, and watched the slides. In order to gain a better understanding, I decided to search YouTube in search of any instructional or tutorial videos that might put the course reading into a more visual perspective. However, I did find the course provided textbooks a bit easier to read oppose to other programming textbooks offered by other courses.

After I had a better understanding of how to the lexical analyzer works, how it is implemented, and its basic job functions in the compiler, I started going over the skeleton code of project 1, and building onto what was already there. The instructions provided for project 1 give a pretty clear road map of how to build out the lexical analyzer. Therefore, I mainly just followed project 1’s instructions step-by-step. Once everything seemed to be running correctly, and I was getting expected outputs, I decided to re-read some parts of the course readings and see if there was anything that I missed. This actually pushed me to review my code and make it bit more organized, and simplified in some areas.

**Test Plan/Cases**

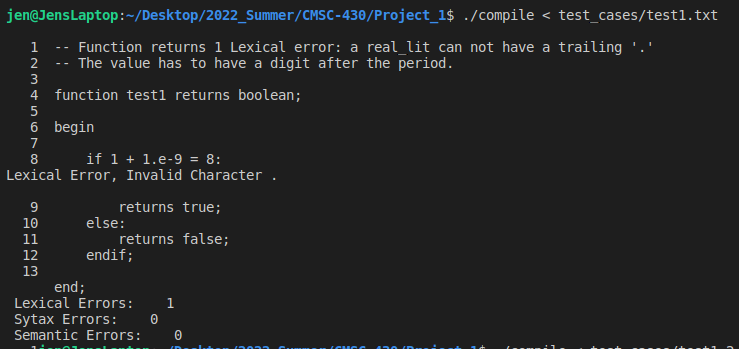
To build/compile the project I ran ‘make’ in the console. Which then built out the required files to be able to run the compile output file. I created four test cases that should make sure the lexical analyzer is working properly.



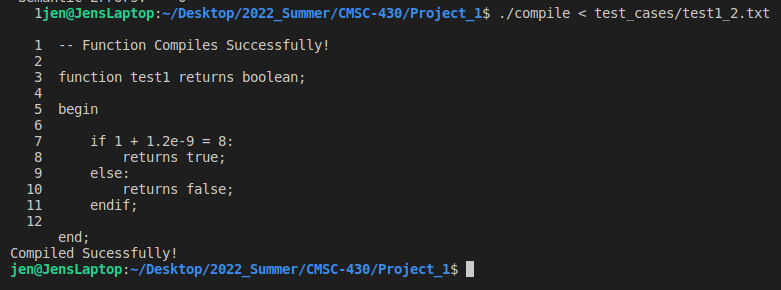
* **Test 1: Testing Real literals and Euler’s constant (eE)**

Test1 has two parts, test1.txt and test1\_2.txt.

* **Test1.txt** tests the use of real literals, and throws an error when there is no digit after the period. The lexical analyzer will see this as an Invalid Character.



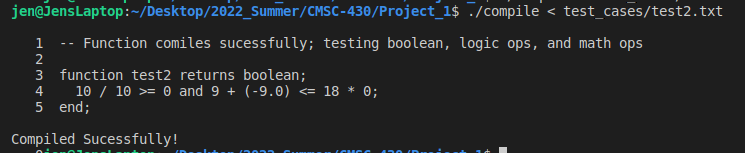
* **Test1\_2.txt** is the same function but a 2 is inserted after the period. Which will now Compile Successfully!



* **Test 2: Testing Boolean, Logic Operators, and More Math Operators**

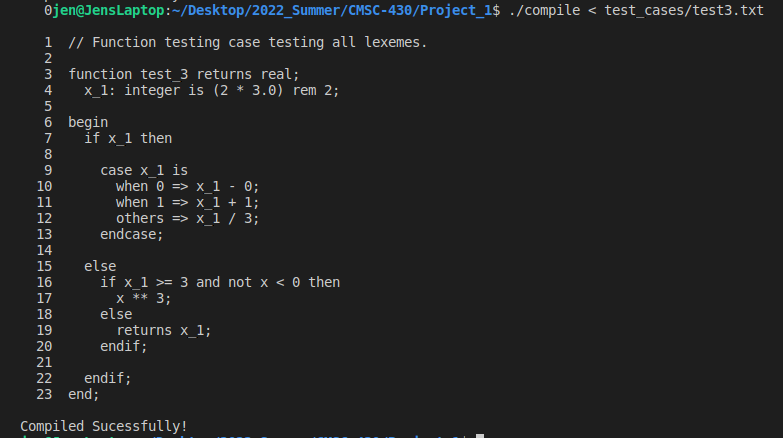
For test2.txt, I tested some logic operators (RELOP) and some math operators

(ADDOP/MULOP). The function that was written for this test returns a Boolean.



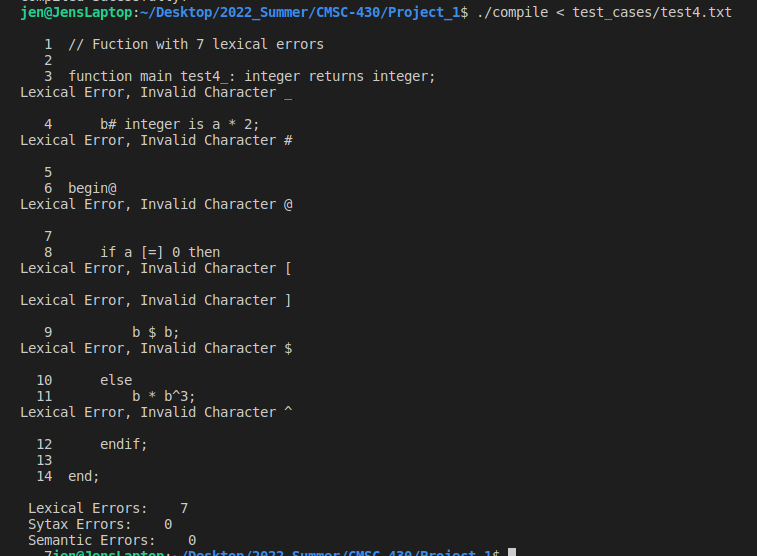
* **Test 3: Testing Mostly All Lexemes**

For this test3.txt, I wanted to try and test all lexemes in the scanner.l file, and make sure they are being read correctly. Also, I tested the second comment type and the ability to correctly use the underscore when naming/identifying a variable. Everything seemed to be working correctly, as I received “Compiled Successfully!” as the output.



* **Test 4: Testing for Lexical Errors**

Test4.txt is testing for lexical error, and making sure unidentified characters are being caught. In test4.txt, there are a total of 7 lexical errors (trailing ‘\_’, ‘#’, ‘@’, ‘[’, ‘]’, ‘$’, ‘^’). These characters have not either been defined in the scanner.l file or symbol is in an incorrect location (the trailing underscore), and they should be identified and returned as ‘Invalid Character ’ in the listing.cc file.



**Lessons Learned**