Project 3 Summary Report

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CMSC 430: Compiler Theory and Design

Professor Gregory Williams

Due Date: April 23rd, 2024

Project Approach

I went through the course learning resources for the weeks 5 and 6 to learn about symbol tables and syntax-directed translation. I downloaded all required materials for project 3 and prepped everything in VSCode like I did with the previous project, again copying all given test case files into the skeleton code folder. The Project 3 Approach was a helpful outline, as usual, but I still ran into vagueness in what I needed to do once again. This project proved a lot more difficult than the two previous projects because I felt there was more minimal direction and help for each thing I had to implement. I carefully read through the approach and the project requirements to see where I needed to change things in the files. The hardest part of it was implementing fold as well as when I had to add functions to the parser and to figure out how to implement the {$$ …} in different productions. It took a lot of troubleshooting and asking classmates for advice in order to get the intended results. This project by far has been extremely difficult and I needed extra time to complete it because I had such difficulty figuring things out. I took a total of over 20 hours on this project alone which did not feel like that was supposed to be the case for this class.

Test Cases

For this project, I used all provided test cases to test all functionalities added to the compiler and their results gave me an idea of what went wrong whenever something did not work. Due to the intense labor of this project and being turned in late, I did not have enough time to create extra test cases for this project.

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| --- | --- | --- | --- |
| Input | Expected Results | Actual Results | Pass/Fail |
| Test1.txt | Result = 25 | Result = 25 | Pass |
| Test2.txt | Result = 9 | Result = 9 | Pass |
| Test3.txt | Result with a random number since variable b and c are not defined | Result = 99 | Pass |
| Test4.txt | Result = 8 | Result = 8 | Pass |
| Test5.txt | Result = 115.57 | Result = 115.57 | Pass |
| Test6.txt | Result = 12 | Result = 12 | Pass |
| Test7.txt | Result = 5 | Result = 5 | Pass |
| Test8.txt | Result = 0 | Result = 0 | Pass |
| Test9.txt | Result = 3 | Result = 3 | Pass |
| Test10.txt | Result = 10 | Result = 10 | Pass |
| Test11.txt 6.8 | Result = 8.3 | Result = 8.3 | Pass |
| Test12.txt 16 15.9 | Result = 14.9 | Result = 14.9 | Pass |
| Test13.txt | Result = 2 | Result = 2 | Pass |
| Test14.txt | Result = 0 | Result = 0 | Pass |
| Test15.txt 1 2.5 65 | Result = 1 | Result = 1 | Pass |

Here are the screenshots for each test case:

A screen shot of a computer

Description automatically generatedA screen shot of a computer

Description automatically generatedA screen shot of a computer

Description automatically generated

A computer screen with a black background

Description automatically generated  
A screen shot of a computer

Description automatically generated  
A screenshot of a computer

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A screenshot of a computer program

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Lessons Learned

This project has improved my skills in the implementation of interpreters and understanding how they work/what they are meant to do. This was a completely separate concept that I couldn’t just come up with by looking at the grammar. I had to understand what a lot of different things meant, so I found it helpful that part of project 3 was predefined in the skeleton code. After a lot of trouble shooting and feedback from classmates on my code, I was able to figure out how the implementation of different functionalities worked. I hope that learning the ins and outs of an interpreter helps prepare me better for project 4, since I feel that projects 1 and 2 as well as the course material did not really help prepare me for this project as much as before. I think I might find the semantic analyzer interesting to build once we get to it in project 4.