CS 4308 – Concepts of Programming Languages

Course Project

Spring 2021

The CS4308 project consists of the development of a language processor (interpreter or compiler) for a subset of the Basic programming language. The language processor can be implemented in any of the following programming languages: C , C + + , Java, or Python.

CS4308 Project

The specification of the grammar of Basic can be found on several web pages. You will have to define a subset of the language for the project.

All tokens in this language are separated by white spaces. The scanner and/or the parser should detect any syntactical or semantic error. Any error discovered should cause an appropriate error message to be printed, and then the interpreter should terminate. Run-time errors should also be detected with appropriate error messages being printed.

For CS4308 Project

You are required to apply a complete software development process.

In your implementation, the source code (of the scanner, parser, and complete interpreter):

- Use good programming practice. The source code must be well structured and include relevant comments. Avoid programming shortcuts.
- The source code must be easy to understand, comments should help in clarifying your implementation.
- Do not 'hard-code' input data in your source programs, use appropriate input statements.

In your submission, do not include compiled files and/or IDE project files. Only the source files are to be submitted.

Your complete submission must include: a well written report (see ‘submission report.pdf’), the grammar of subset of the Basic language, files of source code, input source file used to test your project.

Your report must document the work done. Include explanation of how to run your program (scanner), the input and the output produced when running your program.

Submit all your files in a single archive.

Deliverables (see CS4308 course schedule for due dates):

1. Module_3 – 1st Deliverable

Develop a complete **scanner** for the chosen subset of the Basic language. Define the grammar of a subset of Basic. You must submit a short report describing the work performed. You must also include the source of the scanner program, the source program to test the scanner, input and output files. The report must show the execution of this scanner program by using appropriate input files, the program must show a list of the tokens scanned.

2. Module_5 – 2nd Deliverable

Develop a complete **parser** for the subset of the Basic language. This parser program must execute with the scanner. The report must show the execution of this parser program by using one or more relevant input files, the program must show the corresponding statements recognized. The report must describe the work performed. Submit the parser source program, the source input program (Basic), input and output files.

3. Module_7 – 3rd Deliverable

Develop a complete **interpreter** (that translates to the stack abstract machine) that includes the scanner, parser, and executer/translator. The report must show the execution of this program by using one or more input files, the program must show the results of executing every statement recognized by the parser. Write a short report describing the work performed. Include the interpreter/translator source program, input and output files.