# CS 4308 – Concepts of Programming Languages

## Course Project

The CS4308 project consists of the development (not only implementation) of an interpreter for a subset of the Basic language. The interpreter can be implemented in any of the following programming languages: C , C + + , Java, Python, or Ada.

This project consists of developing a complete language processor (interpreter ) for a **subset** of the **Basic language**.

The language processor will process an Basic (source) program. All tokens in this language are separated by white spaces. The parsing algorithm should detect any syntactical error. Each error discovered should cause an appropriate error message to be printed. Run-time errors should also be detected with appropriate error messages being printed.

You are required to apply a complete software development process. In your implementation, the source code (of the scanner, parser, and complete interpreter):

- The source code must be well-structured and 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. Otherwise it beats the purpose of software development.

In your submission, do not include compiled files and/or IDE project files.

Your complete submission must include: a well written report (see 'submission report.pdf'), the subset of the language grammar used (in BNF or EBNF notation), source code files of the implementation, input grammar program file used to test your project. Submit all your files in a single archive.

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

### Deliverables (see course schedule for due dates):

## 1. Module_3 – 1st Deliverable

Develop a complete scanner for the subset of the Basic language. The scanner implementation must include an array of the keywords used in the subset of Basic, an array (or list) of the identifiers.

Search the web for the grammar of the Basic programming language. Define the grammar of a subset of Basic. You must submit a short report describing the work performed. You must also include the grammar of the subset of Basic, source code files of the scanner program, the 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. Include the parser source program, input and output files.

## 3. Module_7 – 3rd Deliverable

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