

Project 2

Parser

The goal of our project this semester is to develop a prototype C compiler. This is done by compiling C programs into processors such as x86, MIPS, ARM, or pseudo assemblies. In this class we will use **LLVM IR** as the target codes. **The project is divided into several parts including language definition, lexical analyzer, C-grammar, symbol table handlings, parser, and code generation.** In the project 2, you will need to decide the set of language features you want to support in your compiler, and write the **syntax analyzer**.

Instead of generating codes, you will only need to **output grammar rules in the code generator part** to test whether the grammar is correctly passed. An example code may look like:

```
program: VOID ID '(' ')' '{' declarations stmts '}'
        { if (TRACEON)
            System.out.println("program: VOID ID ( ) { declarations stmts }"); }

declarations: type ID ';' declarations
              { if (TRACEON)
                  System.out.println("declarations: type ID ; declarations"); }
...

```

You can find a demo C grammar in this link:

<https://github.com/antlr/examples-v3/tree/master/java/C>.

In your hand-in report, you need to have the followings: (最基本的要求)

- **To define the subset of the language which you want to choose from C.** (你所設定的 **C subset** 至少要支援 **if-then**、**if-then-else**、**for-loop**、**while-loop** 結構、至少支援呼叫 固定參數(一個參數與兩個參數) 的 **printf function**.)
- Give a set of testing programs that can illustrate the features of your subset of the language. (at least 3 test programs)
- Use the “**ANTLR**” to help you develop the parser.
- You can use **Java** or **other languages** to write your parser. (**Java is recommended**)

Please turn in the following:

- A file describes your language which is a subset of C language. (MS-WORD file)
- The source codes:
 - ANTLR grammar file, `myparser.g`.
 - A program to call your parser, `testParser.java`.
 - Testing programs. (at least 3 programs)
- A readme file (pure text file) describes how to compile and execute your parser analyzer.
- A “Makefile”.
- 你所使用的 antlr jar file，例如: `antlr-3.4-complete.jar`。
- 任何其他執行程式所需的檔案。
- 任何其他你覺得應該付上的資料。

請將上述的檔案打包壓縮存成 `tar.bz2` 之格式，檔名為<學號>.`tar.bz2` 檔 (例如:
401234567.tar.bz2，上傳到 eCourse2。

Due Date: April 17 (Monday), 24:00pm, 2023