**CS385 - COMPUTER LANGUAGE ENGINEERING - LAB 5 S6 CSE,**

For this lab you will use a parser generator called “Constructor of Useful Parsers” (CUP for short). CUP is a system for generating LALR parsers from simple specifications. To get started:

***Download cup-11a.jar from your AUMS account and add it to your classpath:***

***CMD> export CLASSPATH=$CLASSPATH:/cup-11a.jar:***

EXAMPLE 1: A grammar for simple declaration statement. Carefully go through the rules and make sure you understand the significance of every line in the grammar. Follow the step-by-step instructions below to create the grammar, compile and execute:

Type the following grammar and save the file as **declaration. cup** for recognizing simple declaration statements in a text editor.

**CUP FILE**

import java\_cup.runtime.\*;

scan with {: return getScanner().next\_token(); :};

terminal INT,STRING,SEMI,COMMA,ID, SPACE, EOFILE;

non terminal prog, stmt, decln, varlist, type, s;

s ::= prog {: System.out.println("Valid declaration"); :}

EOFILE {:System.exit(0);:} ;

prog ::= progstmt |stmt ;

stmt ::= decln;

decln ::= type SPACE varlist SEMI;

type ::= INT | STRING ;

varlist ::= ID COMMA varlist | ID ;

Save the below file as declaration and generate the java file using jlex and compile the java file.

**JLEX FILE**

importjava\_cup.runtime.Symbol;

importjava\_cup.runtime.Scanner;

%%

%cup

%eofval{

System.exit(0);

%eofval}

%%

";" {System.out.println("LA "+yytext());return new Symbol(sym.SEMI);}

"," {System.out.println("LA "+yytext());return new Symbol(sym.COMMA);}

" " {System.out.println("LA "+yytext());return new Symbol(sym.SPACE);}

[0-9]+ {System.out.println("LA "+yytext());return new Symbol(sym.INT,new Integer(yytext()));}

"int" {System.out.println("LA "+yytext());return new Symbol(sym.INT);}

"string" {System.out.println("LA "+yytext());return new Symbol(sym.STRING);}

[a-z][a-z0-9]\* {System.out.println("LA "+yytext());

return new Symbol(sym.ID,new String(yytext()));}

[\n\r] {System.out.println("LA"+"EOF");return new Symbol(sym.EOFILE);}

At the command prompt, type the following command to generate the parser code in Java.

CMD> cup declaration.cup

**Note**: If you didn’t set the classpath as mentioned above, this step will give errors.

If the above step completed successfully, you will find three files in your working directory: Parser.java, Sym.java, declaration.java

Write the **main function**as :

*import java.io.\*;*

*public class Main*

*{*

*public static void main(String[] args)throws Exception*

*{*

*parser p = new parser(new Yylex(new FileReader("input"))); p.parse(); } }*

Save this as Main.java

Compile the \*.java files. The corresponding .class files will be created.

CMD> javac declaration.java parser.java sym.java Main.java

If the input is correct as per the grammar definition - you will get “Valid declaration” as output. It merely means the input is accepted. For incorrect input, you will get errors. Try typing incorrect syntax or some junk text to get error messages.