CAB402 Programming Paradigms
Practical Exercises (Week 12)

Download and Install Bison and Flex

- Install into a directory that contains no spaces (i.e. not C:\Program Files\GnuWin32)
- Windows versions:
    - http://downloads.sourceforge.net/gnuwin32/bison-2.4.1-setup.exe
    - http://gnuwin32.sourceforge.net/downlinks/flex.php
- Add bin directory to your PATH environment variable

Create file tut12.lex:

```
%{
#include "tut12.tab.h"
int line = 0;
%}
%option noyywrap
%%
[ \t]                   {   }
[\n]                    { line++; }
"("                     { return '('; }
")"                     { return ')'; }
";"                     { return ';'; }
"if"                    { return ifkeyword; }
"<="                    { return leq; }
[a-zA-Z][a-zA-Z0-9]*    { return identifier; }
[0-9]+                  { return integer; }
\"([^\\"]|\\[nt\"])*\"  { return string; }
%%
void yyerror(char *err)
{
   printf("line %d, text %s, error msg %s\n", line, yytext, err);

}
```

Create file tut12.y:

```
%token ifkeyword leq identifier integer string
%nonassoc leq
%%
stmt: ifkeyword '(' expr ')' stmt
    | expr ';'
    ;
expr: integer
    | string
    | identifier
    | identifier '(' args ')'
    | expr leq expr
    ;
args: expr
    | args ',' expr
    ;
%%
```

At windows command prompt:

- ➢ flex tut12.lex
- ➢ bison –d tut12.y

Create Empty Visual Studio C++ Console Application project:

- ➢ Add existing (generated) files: `lex.yy.c` and `tut12.tab.c`
- ➢ Create and file main.c:

```
#include <stdio.h>

extern FILE *yyin;

int main(int argc, char* argv[])
{
      yyin = fopen("test.c", "r");
      yyparse();
      return 0;
}
```

- ➢ Check that project builds without error.

Create input file test.c:

```
if (x <= 42)
      printf("Hello\n");
```

Start and Debug Visual Studio Project …