ICS 313-02 (002) Dr. Mamdouh Najjar

Fundamentals of Programming Languages

Programming Assignment # 1
Interpreter for a First Language (*FirLan*)
(30 Points)
Due March 14, 2001

A. **Given *FirLan* Syntax described in BNF rules:**

<program> → <prog_name> PROG_START; <stmts> PROG_END;
<prog_name> → <ident>
<stmts> → <stmt> | <stmt> <stmts>
<stmt> → <assign> | <write>
<write> → Write (<var>);
<assign> → <var> := <expr>;
<var> → <ident>
<ident> → <char> | <char> <ident>
<char> → A | B | C | … | Z | a | b | … | z
<expr> → <expr> + <term> | <expr> - <term> | <term>
<term> → <term> * <factor> | <term> / <factor> | <factor>
<factor> → (<expr>) | <var> | <integer>
<integer> → <digit> | <digit> <integer>
<digit> → 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9

B. **Your Program**

Your program should read a program written in ***FirLan*** and executes its statements assuming all statements are syntacticaly correct.

This grammer will allow the generation of programs like:

```
ExampleProg
PROG_START ;
One := 1 ;
Two := 2 ;
Five := 5 ;
OneFive := One + Five / Two;
Write ( OneFive ) ;
ExprOne := Five * 12 / ( Two + Five * 2 ) ;
ExprTwo :=  21 -  7  * ( Five  /  Two  * 2 ) ;
Write ( ExprOne ) ;
Write ( ExprTwo ) ;
ExprThree :=  12 + 4 * ( 17 – 5 ) / 2;
Write ( ExprThree ) ;
PROG_END ;
```

Important notes:

1- Your interpreter must read a ***FirLan*** program from an input file named ***firlan.in***.

2- Your interpreter must write the ***FirLan*** results into an output file named ***firlan.out***.

3- The source file ***firlan.ext*** must include the following:

- your name, ID number
- Course title, number, and section number
- the statement of the problem
- a brief summary of your interpreter implementation method
- a dictionary of all global variables (name, type, and usage)
- for each procedure or function include the following:
    - Usage of the procedure or function
    - Meanings of the input variables
    - Meanings of the output variables

4- No assignment will be accepted after the due date.

5- Hand out a print out and a diskette contain all files.