

CIIC 4030/ICOM 4036 Programming Languages

Assignment #2

Given the lexical analyzer implemented in assignment #1, add the parsing code using PLY to recognize the following context-free grammar:

program : statements

statements : statement
 | statements statement

statement : assignment_statement
 | if_statement
 | if_else_statement
 | while_statement
 | action_statement

assignment_statement : IDENTIFIER EQUALS expression SEMICOLON

if_statement : IF LPAREN expression RPAREN LCURLY statements RCURLY

if_else_statement: IF LPAREN expression RPAREN LCURLY statements RCURLY
 ELSE LCURLY statements RCURLY

while_statement : WHILE LPAREN expression RPAREN LCURLY statements RCURLY

action_statement: RETURN expression
 | WRITE expression
 | WHERE expression
 | LOOP expression

expression : operation_expression
 | boolean_expression

operation_expression : expression PLUS expression
 | expression MINUS expression
 | expression STAR expression
 | expression SLASH expression
 | expression MOD expression
 | expression NEQ expression
 | expression LEQ expression
 | expression GEQ expression
 | expression LT expression
 | expression GT expression
 | LPAREN expression RPAREN
 | NUMBER

boolean_expression : TRUE
 | FALSE

function : FN IDENTIFIER LPAREN list_parameters RPARENT type LCURLY statements RCURLY

list_parameters: empty
 | IDENTIFIER type
 | IDENTIFIER type COMMA list_parameters

struct : STRUCT IDENTIFIER LCURLY statements RCURLY

let expression : let IDENTIFIER
 | let MUT IDENTIFIER
 | let REF IDENTIFIER

type : int | float | char | boolean