CS301P Compiler Design Laboratory Exercises Lab #7

Date: October 23, 2024

Objectives

- To implement the translation of different program constructs (arithmetic expressions and selection statements) to equivalent three address codes.

Exercises

1. Implement a CFG grammar with associated semantic rules to translate the arithmetic expressions (including post/pre increment/decrement operators as completed in Lab #6) and two-way selection statements of C language to equivalent three address code. (as discussed in class). You may assume simple relational expressions. Consider the following example. However you may make assumptions to simplify the problem. The statements can be nested. You should implement also appropriate error handling.

```
if ( x < 100 ) {
  a++;
} else {
   a--;
}
y = a;
```

should be translated to

```
     if x < 100 goto L1
     goto L2
L1:  t0 = a + 1
     a = t0
     goto L3
L2:  t1  = a - 1
     a = t1
L3:  t2 = a;
     y = t2;
```

```
if x > 10 {
 printf("hello");
}
```

should be reported as

```
error: expected '(' before 'x'
```

```
if (x > 10) {
 printf("hello")
}
```

should be reported as

```
error: expected ';' after expression
```

Submission Guidelines

- The name of the parser executable should be *parser*
- The respective lex and yacc programs can have the same name but with the extension *.l* and *.y*, respectively.
- The names for the given program should be *prob1* of course with appropriate extensions.
- Other submission requirements remain same as the previouis Lab.

Evaluation Guidelines and Academic Honesty

Same as week#1