

CS301P Compiler Design Laboratory Exercises Lab#9

Date: October 12, 2023

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 selection statements and *while* iterative statement of C language to equivalent three address code. You may assume any complex conditional expressions. Consider the following example. However you may make assumptions to simplify the problem.

```
k = 0;
while (k < n || n != 100) {
    if (x < 100) {
        a++;
    }
    else {
        a--;
    }
    y = a;
    k++;
}
k = m + n
```

should be translated to

```
    t0 = 0
    k = t0
    if k < n goto L0
    goto L4
L4: if n != 100 goto L0
    goto L5

L0: if x < 100 goto L1
    goto L2
L1: t1 = a + 1
    a = t1
    goto L3
L2: t2 = a - 1
    a = t2
L3: t3 = a;
```

```
        y = t3;  
L5:    t4 = m + n  
        k = t4
```

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.
- Submit also the 4 test cases that you have tried. The files should be named *test1.c*, ... *test4.c*
- Other submission requirements remain same as week#1.

Evaluation Guidelines

Same as week#1

Academic Honesty

Same as week#1