CSCE 330 Fall 2004

HOMEWORK 2

Assigned Thursday, 04-09-09. Due Thursday, 04-09-16

1. Write a program that shows why the optimization mentioned in section 1.5.3 cannot be done in general for C or Java (your choice!). Be short!

2. Show that the grammar of Figure 2.1 in the textbook is ambiguous by giving two parse tree (a.k.a. syntax trees) for the expression `a + 2 - b`.

3. Do exercise 1 on p.107 of the textbook.

4. Do exercise 2 on p.107 in the textbook.

5. Recall that computer architecture is a major influence on programming languages, and "[most] programming languages can be viewed as abstractions of an underlying von Neumann architecture" [textbook, p.8]. Why the von Neumann architecture? Also, comment on the following statement, which Patterson and Hennessy label "a fallacy": "Computers have been built in the same, old-fashioned way for too long, and this antiquated model of computation is running out of steam." (Reference: Patterson, David A. and John L. Hennessy. *Computer Organization and Design*, p.29. Morgan Kaufmann, 1998.)

6. Short answer questions on history.

   (a) Which major language is based on the principle of orthogonality?

   (b) Which major language was designed by John McCarthy?

   (c) Name two languages designed by John Backus. (You may need to do a little research for this!)

   (d) What has been the dominant programming language for business applications from 1960 to 1990 (at least)?

   (e) Name a declarative (logic-based) language.

   (f) Which two of the five languages you listed above were designed by committee?