CSCE 330 Fall 2005
Homework 1

1. This list of questions is from Robert Sebesta's textbook. Please indicate the source of your answer (e.g., a web site, a book, an article, class notes) with each question.

   (a) In what year was the Plankalkuel designed? In what year was that design published? **Answer:** 1945, 1972

   (b) What two common data structures were included in Plankalkuel? **Answer:** arrays, records

   (c) How were the pseudecodes of the early 1950s implemented? **Answer:** by interpretation

   (d) Speedcoding was invented to overcome two significant shortcomings of the computer hardweare of the early 1950s. What were these two? **Answer:** Non-connotative names, absolute addressing. (Also: floating-point arithmetic, automatic incrementing of address register)

   (e) Which IBM computer introduced floating point arithmetic and indexing? **Answer:** The 704

   (f) In what year was the Fortran design project begun? **Answer:** 1954

   (g) What was the primary application area of computers at the time Fortran was designed? **Answer:** Scientific computations

   (h) Where was LISP developed? By whom? **Answer:** IBM (summer 1958), by John McCarthy of MIT and, later, Stanford

   (i) Which dialect of LISP is used for introductory programming courses at MIT and some other universities? **Answer:** Scheme

   (j) What two professional organizations together designed ALGOL 60? ACM and GAMM (Gesellshaft fuer Gewandte Matematik und Mekanik)

   (k) In what version of ALGOL did block structure appear? **Answer:** 60

   (l) What organization was most responsible for the early success of COBOL (in terms of extent of use)? **Answer:** DoD

   (m) What design criterion was used extensively in ALGOL 68? **Answer:** orthogonality

   (n) What are the concurrent program units of Ada called? **Answer:** tasks

2. 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.)