First Computing Project
MA/CS 375, Fall 1997

This project is due September 16. Plan your work so that if your computer is down a short period, your project will not be late.

This project will count as part of your grade so you must work independently. It is permissible to discuss the project with your instructor, fellow students, and friends. However, the computer programs and report must be done only by the student doing the project.

Your project is to write and test an accurate floating point quadratic equation solver, based on the quadratic formula. (See example 1.15.) Your tests should involve a sufficiently wide range of coefficients, certainly some with a size ratio (smallest/largest) small compared with unit roundoff. (Hint: You may use randomly generated coefficients, but then be sure to have a randomly generated exponent.) Relative errors should be tabulated and discussed, and all computations should be carried out in floating point arithmetic. Discuss in detail what you have done to minimize the effect of rounding errors, explaining why you expect your code to be accurate.

A rough grading outline is as follows:

50% Correctness and robustness of the program.

30% Comprehensiveness and correctness of the tests.

15% Discussion of the program and results.

5% Presentation.