Rounding Issues
Math 314—002
Application Mini-Project #1
Due: Thursday, September 11

Goal: This application mini-project is based on two Explorations from your text: "Lies My Computer Told Me" on pages 66–67, and "Partial Pivoting" on pages 86–87. The idea is that the rounding that is necessarily done automatically by your calculator and by computer programs can introduce significant errors.

Instructions: Although you may choose to work alone, it is highly recommended that this project be done in groups of two or three students. Groups of size four or more are not permitted. Each group will turn in one solution to the tasks described below, and each member of the group will receive the same grade on the project. You should be careful to understand each part of the project – related questions may appear on exams.

Submission Guidelines: Please use the following guidelines when preparing your project for submission:

1. Include a cover page on which each member of the group *signs* their full name. Also, in the top right hand corner of each page submitted, write the names (first and last, written legibly) of each group member. You should not include student ID or social security numbers.

2. Only use one side of each sheet of paper and staple the pages together.

3. Presentation will be considered when grading this project. You should take care to write legibly and hand in full sheets of paper with no fringe, tears, etc. You should also clearly label each problem and submit these in order.

4. Give justification (in complete sentences!) for your answers.

5. Be academically honest. This means, for example, providing a list of sources other than the textbook (if any) that you used to do the assignment; stating clearly that you're copying or mimicking an example from the book in order to do the assignment (if appropriate).

6. The project is due at the beginning of class. Under certain circumstances, late submissions may be accepted, but they will be penalized.

Project Tasks:

1. Read the four paragraphs on page 66, and do the four problems on pages 66–67. Note that #1 and #2 are computational. This means you need to show your work clearly, and you may decide that a sentence or two of explanation is needed. On the other hand, #3 and #4 require you to give careful and thoughtful explanations.

2. Read the paragraph on page 67, and, as suggested, do some experiments with the linear system given there. Be sure to write a nice description of what you see happening as well as an explanation of why you think this is happening.

3. Read the paragraph at the top of page 86 and do the two problems on that page. Again, #1 is a computational problem and so you need to show your work clearly, and you may decide that a sentence or two of explanation is needed. The questions at the end of each part of #2 require more thoughtful and careful explanations.

4. Read the paragraph at the bottom of page 86 and then do #3, on page 87. Although this problem is stated as a purely computational one, you should also write a sentence or two of explanation at the end, describing what you found.

5. Write a short paragraph summarizing what you learned from this Application Mini-Project.