

## Guide for Test 1

- The test is in class on Friday 22 April.
- Bring a calculator (for arithmetic).
- We did not fully cover Section 6.6 in the homework. I suggest that you do Section 6.6 problems 2b, 3b, and 4b.
- Guaranteed question:  
Let

$$A = [***given***]$$

1. Use Gaussian elimination without pivoting to factor  $A = LU$ .
2. Use your  $LU$  factorization to solve

$$Ax = [***Given***].$$

3. Use your  $LU$  factorization to find  $|A|$ .
  4. Is  $A$  diagonally dominant? positive definite? singular?
- Likely questions:
    1. Redo your factorization using pivoting.
    2. Explain/justify/demonstrate why pivoting is necessary.
    3. Derive the operation counts for  $LU$  decomposition.
    4. Show that [more abstract proof]

## 546 Project Information

- Your project topic is due on Tuesday 26 April. I will then make comments and modifications so that we can finalize the topic at the end of the week. Topic guidelines:
  - It should apply numerical linear algebra to something that you encounter in your work, in your other classes, or in your outside interests. It should be interesting and perhaps even useful.
  - It should go beyond what we have learned in the class, so it has more substance than a simple homework problem. “Beyond” can mean either going into greater depth on one technique, or combining several techniques.
- A draft of the report is due Monday 23 May. It should be essentially finished, but I will make comments and return them for revisions. There is no set length for the report, but to do a reasonable job it will probably be 10 pages, not including graphs, programs, etc. Use your good problem skills.
- You will give a presentation of about 15 minutes. I would like these to be in the Applied and Computational Mathematics seminar on Tuesday 31 May at 3:10pm (in 320 Morton).