

2071 Lab 5: Norms, errors and whatnot

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1:40-3:00PM MW, Thack 622

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Introduction

- ▶ Two sessions
- ▶ Vector and matrix norms, compatibility
- ▶ False “proof”: spectral radius is not always compatible
- ▶ Residual and solution error
- ▶ Relative errors
- ▶ Special tridiag matrix (**dif2**)
- ▶ Determinants

Exercises

1. L^1 , L^2 , L^∞ vector norms
2. Compatibility between vector and matrix norms
3. Example: L^2 is not compatible with spectral radius
4. See what happens to iterates when using this matrix
5. L^2 -norm is much slower than Frobenius norm
6. 4 cases of comparisons between residual and solution norms
 - ▶ You can “see” the exact solutions.
7. Use relative norms for errors!
8. Facts about tridiagonal.m (**dif2**) matrix
9. Determinant for tridiagonal matrix
10. (extra) Determinant function for arbitrary matrices.
 - ▶ Recursion is inefficient *in this case*