

Introduction to Week Three

Gaussian Elimination

- ✓

Video: Gaussian Elimination without Pivoting | Lecture 24
11 min
- ✓

Reading: Round-off Errors in Gaussian Elimination
10 min
- ✓

Video: Gaussian Elimination with Partial Pivoting | Lecture 25
5 min
- ✓

Reading: Reduced Round-off Errors in Gaussian Elimination with Partial Pivoting
5 min
- ▶

Video: LU Decomposition with Partial Pivoting | Lecture 26
10 min
- 📖

Reading: The (PL)U Decomposition of A
10 min

Operation Counts

Eigenvalues and Eigenvectors

Matrix Algebra in MATLAB

Systems of Nonlinear Equations

Quiz

Programming Assignment:
Fractals from the Lorenz
Equations

Reduced Round-off Errors in Gaussian Elimination with Partial Pivoting

Consider again the system of equations given by

$$\epsilon x_1 + 2x_2 = 4, \qquad x_1 - x_2 = 1.$$

The solution of these equations using Gaussian elimination with partial pivoting is found to be

$$x_2 = \frac{4 - \epsilon}{2 + \epsilon}, \qquad x_1 = 1 + x_2.$$

Compute the value of x_2 and x_1 using MATLAB as a calculator. Now, repeat this calculation for the system of equations given by

$$2\epsilon x_1 + 2x_2 = 4, \qquad x_1 - x_2 = 1.$$

✓ **Completed** [Go to next item](#)

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