

midterm 2

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- Represent a problem in terms of matrices and vectors.
 - Construct a Markov Matrix
 - Construct a linear algebra problem
- Compute the solution to a linear system.
 - Compute the solution of a linear system using Naive Gaussian Elimination on a 3×3 matrix
 - Compute the solution of a linear system using Gaussian Elimination with partial pivoting on a 3×3 matrix
 - Compute the solution of a linear system using an LU factorization
- Construct elimination matrices, properties of elimination matrices

- What is the cost of solving banded or triangular or tridiagonal system?
- What is the cost of forming an LU decomposition?
- Given an LU decomposition what is the cost of solving the linear system?
- What is the cost of solving a full, triangular, tridiagonal, or diagonal system?
- What is the cost of matrix-matrix or matrix-vector multiplication?
- What is pivoting? What is partial or full pivoting?
- When is pivoting necessary?
- Determine the first pivot element of a small system.

- Compute the digits of accuracy in a solution.
- Compute the eigenvalues of a matrix.
- Determine the norm of a matrix or vector in the p , 2, 1, or infinity norm
- Compute the condition number of a small matrix.
- What does the condition number measure?
- Use the power method to find the smallest or largest eigenvalue/vector of a small 3×3 matrix.
- How many solutions does a linear system have and when does a system have a solution?

- Determine permutation matrices to swap rows of a matrix.
- Perform forward elimination, backward substitution (separately)
- What does power method converge to?
- Compute eigenvectors of small matrix

- Compute SVD of small matrix
- The singular values are the eigenvalues of what?
- The vectors in U of an SVD are the eigenvectors of what?
- The vectors in V of an SVD are the eigenvectors of what?
- What is an orthogonal matrix?
- Given two vectors, determine two vectors that are orthogonal that span the same space.