MATH 1080: Spring 2016

Midterm Exam II Review Topics

Chapters: III.12-16, IV.20-23

Theory:
Understanding the distinction between conditioning, stability and accuracy
Definition of absolute and relative condition numbers
Basic axioms of floating-point arithmetic
Definition of stable and backward stable algorithms
Definition of accuracy
Definition of row echelon form
Row reduction and elementary row operations
LU factorization and properties of triangular matrices
Definition of partial pivoting
Definition and properties of a positive definite symmetric matrix
Definition of Cholesky factorization

Methods
Computation of Jacobian of a function and the norm of the Jacobian
Computation of absolute and relative condition numbers
Computation of matrix condition number
Determination of stability of a simple algorithm
Determination of accuracy of a simple algorithm
Computation of LU factorization with and without partial pivoting
Verification of positive definiteness of a matrix
Computation of Cholesky factorization of a positive-definite symmetric matrix
Solution of a system of linear equations using LU or Cholesky factorization