MATH 1080: Spring 2019

Midterm Exam I Review Topics

Chapters: I.1-3, II.6-8, 10-11

Theory:
  - Definition and properties of scalar & outer products
  - Definition and properties of an orthogonal matrix
  - Definition and properties of norms (Cauchy Schwartz inequality, matrix norm inequality)
  - Definition and properties of a projector
  - Definition and properties of an orthogonal projector
  - Definition of the full and reduced QR factorization.
  - Definition and properties of the Householder reflector.

Methods
  - Computation of inner and outer products
  - Characterization of an orthogonal matrix as a transformation (rotation, reflection, etc.).
  - Computation of an orthogonal projector onto a specified range.
  - Computation of reduced or full QR factorization by Gram-Schmidt orthogonalization
  - Computation of full QR factorization by Householder algorithm.
  - Finding orthogonal basis for a specified linear vector space.
  - Solving a linear system using QR decomposition.
  - Least-squares minimization.
  - Determination of the operation count (flops) in a given algorithm.