

Study guide for Chap 06

The exam problems will be closely related to your homework problems. Make sure you understand all the homework problems.

1. Section 6.1:

Study how to count the number of operations to leading order efficiently both for Gaussian elimination and backward substitution. Do this both for full matrices and sparse matrices such as those in Homework 13.

2. Section 6.1:

Practice programming for Gaussian elimination (without pivoting) and backward substitution. Implement the code for tridiagonal matrices.

3. Section 6.2:

Study how to perform partial pivoting and scaled pivoting manually for small matrices.

4. Section 6.5:

Study how to perform LU decomposition with or without pivoting manually for small matrices.

5. Section 6.5: Study how Gaussian elimination or LU decomposition can be used to evaluate the determinant of a matrix.

6. Section 6.6: Study theoretical properties of diagonal dominant matrices and its connection with Gaussian elimination without pivoting. Do the same for symmetric positive definite matrices.

7. Section 6.6: Study theoretical properties of symmetric positive definite matrices. Study and practice how to perform Choleski and LDL^T decomposition for symmetric positive definite matrices. Be able to derive the pseudo-code by performing the LDL^T and $G^T G$ multiplication and compare them with A entry-wise.