

## Numerical Linear Algebra – Homework 6

This assignment is due at 3:15 p.m. on Tuesday 9 December.

1) Write Matlab code to implement the QR-factorization method for solving the overdetermined least-squares problem. You may assume that the matrix  $A$  has full rank. Remember, you should not explicitly for the matrix  $Q$ .

2) Let  $A$  be a  $m \times n$  matrix. Let  $A^T A = 0$ . Prove  $A = 0$ .

3) **Required for only those students enrolled in MATH 597.** Prove Property 4 on page 13 of the text.

4) Write Matlab code to solve the overdetermined least-squares problem, assuming you have the SVD of matrix  $A$  in hand. To obtain the SVD of matrix  $A$ , use the Matlab command `svd(A)`. Your solution vector  $\mathbf{x}$  should be of minimum 2-norm.