

## Homework 03

You are suggested to finish question 1-4 prior to Quiz 03, and the rest prior to Quiz 04.

1. Section 2.6 Exercises: Q1 (a), (b), (c);
2. Section 2.6 Exercises: Q5 (a), (b), (c), (d);
3. Section 2.6 Exercises: Q6 (a), (b), (c), (d);
4. Find the Cholesky decomposition  $A = LL^T$  of the following matrices:

$$(a) \begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 2 & 3 & 2 \\ 1 & 3 & 9 & 5 \\ 1 & 2 & 5 & 4 \end{bmatrix}, \quad (b) \begin{bmatrix} 1 & -1 & 2 & 0 & 2 \\ -1 & 2 & -4 & 1 & -2 \\ 2 & -4 & 9 & 1 & 3 \\ 0 & 1 & 1 & 14 & 3 \\ 2 & -2 & 3 & 3 & 30 \end{bmatrix},$$

5. Perform a conditioning analysis for the matrix addition for two matrices  $A, B \in \mathbb{R}^{n \times n}$ .
6. Perform a conditioning analysis for the matrix multiplication for two matrices  $A, B \in \mathbb{R}^{n \times n}$ .