HW2

April 21, 2025

STAT 207 HW2

Your Name

All homeworks should be completed independently; make your answers and codes as concise as possible; avoid excessive outputs; submit BOTH your source code and output file to Canvas.

1. NAS Problem 6.7.3

2. NAS Problem 6.7.5

3. CS Exercise 5.3

Implementation of Gram-Schmidt orthonormalization.

4. Sweeping

Consider the matrix

$$A = \begin{pmatrix} 4 & 6 & 3 \\ 6 & 10 & 6 \\ 3 & 6 & 7 \end{pmatrix}.$$

Compute by hand its inverse by sweeping. Determine whether A is positive definite based on the intermediate results of sweeping.

5. Find more than one Cholesky decompositions of the following matrix.

$$A = \begin{pmatrix} 1 & 2 & 2 \\ 2 & 4 & 4 \\ 2 & 4 & 17 \end{pmatrix}$$

Therefore it is not unique for positive semidefinite matrices.

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