

Quiz 05

Dec 29, 2009.

1. Write down the matrix representation of orthonormal projection onto $\text{span}\{(3, 0, -4)^T\}$ relative to standard inner product in $\mathbb{R}^3$.
2. Let B be an $N^3 \times N^3$ nonsingular matrix with $B_{ij} = 0$ if $|i - j| > N$ and $N \gg 1$. Give the operation count (multiplication and division only) of solving $Bx = f$ by Gaussian elimination. Express your answer as $O(N^k)$ and find out k . Explain.

3. Find LU factorization of $A = \begin{pmatrix} 1 & 1 & -1 \\ 1 & 2 & -2 \\ -2 & 1 & 1 \end{pmatrix}$. Verify your answer.

4. True or False?

If L is a non-singular lower-triangular matrix, then so is L^{-1} . Explain.

5. True or False?

If T is a non-singular tridiagonal matrix, then so is T^{-1} . Explain.

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