Assignment 4. Cholesky & Jacobi Marks 10

Posted on 27.08.2025 @ 2:30 pm and due on 27.08.2025 @ 6:00 pm

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1. Use Cholesky factorization for the matrix $\mathbb{A}$ and solve for $\mathbb{A}\mathbf{x} = \mathbf{b}$ for the following **[5]**

$$\mathbb{A} = \begin{pmatrix} 4 & 1 & 1 & 1 \\ 1 & 3 & -1 & 1 \\ 1 & -1 & 2 & 0 \\ 1 & 1 & 0 & 2 \end{pmatrix} \quad \text{and} \quad \mathbf{b} = \begin{pmatrix} 3 \\ 3 \\ 1 \\ 3 \end{pmatrix}$$

2. Use Jacobi iterative method to solve the above matrix to a precision of 10^{-6}. **[5]**