Problem 1. *Let*

$$A = \begin{bmatrix} 1 & 2 & 0 \\ 2 & 6 & 4 \\ 0 & 4 & 11 \end{bmatrix}$$

(a) Find the symmetric factorization of $A = LDL^T$.
(b) Use the Gauss-Jordan method to find A^{-1}.

Problem 2. *Computing high power of matrices is definitely a complicated thing. Suppose we have*

$$A = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{bmatrix}, B = \begin{bmatrix} 3 & 2 & 0 \\ 0 & 3 & 2 \\ 0 & 0 & 3 \end{bmatrix}, C = \begin{bmatrix} 1 & 0 & 2 & -1 \\ 2 & 0 & 4 & -2 \\ -1 & 0 & -2 & 1 \\ -3 & 0 & -6 & 3 \end{bmatrix}$$

Try to compute A^5, B^5, C^5.