

# 1 Examples

For this we use the vscode extension `LaTeX Workshop` and the the Copilot extension `GitHub Copilot` with the chat extension `GitHub Copilot Chat`. It uses `TeXlive` and the `latexmk` command.

**Lemma 1.** *All principle submatrices of a symmetric positive-semidefinite matrix are symmetric positive-semidefinite.*

*Proof.* Let  $A \in \mathbb{R}^{n,n}$  be a symmetric positive-semidefinite matrix and let  $B \in \mathbb{R}^{k,k}$  be a principle submatrix of  $A$ . Furthermore, as  $B$  is a principle submatrix of  $A$ , there exists a matrix  $E \in \mathbb{R}^{n,k}$  such that  $B = E^T A E$ , has only elements in  $\{0, 1\}$  and  $E^T E = I$ . It follows that  $B$  is symmetric positive-semidefinite.  $\square$

GitHub Copilot: Sure, here's a clearer version of the same text:

*Proof.* Let  $A \in \mathbb{R}^{n,n}$  be a symmetric positive-semidefinite matrix, and let  $B \in \mathbb{R}^{k,k}$  be a principal submatrix of  $A$ . This means that  $B$  is obtained by selecting  $k$  rows and  $k$  columns of  $A$ , and arranging them into a square matrix. Since  $B$  is a principal submatrix of  $A$ , there exists a matrix  $E \in \mathbb{R}^{n,k}$  such that  $B = E^T A E$ , where  $E$  has only elements in  $\{0, 1\}$  and  $E^T E = I$ . This means that  $B$  is also symmetric positive-semidefinite.  $\square$