

Symmetric Positive Definite (SPD) Matrix

- An SPD matrix acts sort of like a positive number.
- A is *symmetric* if $a_{ij} = a_{ji}$, for all i and j .
- Several equivalent conditions for A to be *positive definite*:
 - All eigenvalues are > 0
 - LU factorization without pivoting succeeds, and all pivots are > 0
 - For every nonzero vector x , the number $x^T A x > 0$
- SPD matrices come up a lot in scientific computing & data analysis!
- The temperature matrix is SPD.