that makes $\boldsymbol{a}$ diagonal (because $\boldsymbol{\Lambda}$ is diagonal). It follows that if the matrix $\boldsymbol{X}$ that causes $\boldsymbol{X}^{-1}\boldsymbol{a}\boldsymbol{X}$ to be diagonal is known, then the problem is solved: the diagonal matrix so produced has the eigenvalues as its only nonzero elements, and the matrix $\boldsymbol{X}$ used to bring about the transformation has the corresponding eigenvectors as its columns. The solutions of eigenvalue equations are best found by using mathematical software.

Further reading

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