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Scott F Beaver* (beavers@wou.edu), Mathematics Department, Western Oregon University, 345 N. Monmouth Ave., Monmouth, OR. *Löwdin Orthogonalization - A Natural Supplement to Gram-Schmidt.*

We have traditionally shown students one method of orthogonalizing a set of n vectors in \mathbb{R}^m (or \mathbb{C}^m), where $m \geq n$. Gram-Schmidt orthogonalization (GSO) is intuitive, but compels a choice of distinguished (initial) vector, and yields no general relation between the original set and the orthogonalized set. It is proposed that in linear algebra courses in which the SVD is discussed, the method of Löwdin orthogonalization (LO) (or *symmetric* orthogonalization) be offered for contrast to and comparison with GSO. Though both methods yield orthogonal bases for their linear spans, LO is democratic (it treats all vectors in the original set with equal footing), and it minimizes the Frobenius norm of the difference vectors (i.e., disturbs the original set minimally in the ℓ^2 setting), so is quite useful for some problems in chemistry and signal processing. A simple and natural method of obtaining the LO of a given set of vectors, based on the SVD, is presented. (Received September 21, 2006)