pentadiagonal matrix

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An $n \times n$ **pentadiagonal** matrix (with $n \geq 3$) is a matrix of the form

$$\begin{pmatrix} c_1 & d_1 & e_1 & 0 & \cdots & \cdots & 0 \\ b_1 & c_2 & d_2 & e_2 & \ddots & & \vdots \\ a_1 & b_2 & \ddots & \ddots & \ddots & \ddots & \vdots \\ 0 & a_2 & \ddots & \ddots & \ddots & e_{n-3} & 0 \\ \vdots & \ddots & \ddots & \ddots & \ddots & d_{n-2} & e_{n-2} \\ \vdots & & \ddots & a_{n-3} & b_{n-2} & c_{n-1} & d_{n-1} \\ 0 & \cdots & \cdots & 0 & a_{n-2} & b_{n-1} & c_n \end{pmatrix}.$$

It follows that a pentadiagonal matrix is determined by five vectors: one n-vector $c = (c_1, \ldots, c_n)$, two $(n-1)$-vectors $b = (b_1, \ldots, b_{n-1})$ and $d = (d_1, \ldots, d_{n-1})$, and two $(n-2)$-vectors $a = (a_1, \ldots, a_{n-2})$ and $e = (e_1, \ldots, e_{n-2})$. It follows that a pentadiagonal matrix is completely determined by $n + 2(n-1) + 2(n-2) = 5n - 6$ scalars.