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A SIMPLE CLOSED FORM FOR TRIANGULAR MATRIX POWERS*

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Abstract. Given a $k \times k$ triangular matrix $M = [m_{i,j}]$ with unique diagonal elements, a simple recursive formula is used to define a set of $\binom{k+2}{3}$ power factors, $p_{i,j,s}$, which are independent of the power to which the matrix is raised. Then for any power of M, negative, zero or positive (positive only, if the matrix is singular), the (i,j)-th element of M^n is given by a linear combination of power factors and powers of diagonal elements, namely $_n m_{i,j} = \sum_{s=i}^{j} p_{i,j,s} m_{s,s}^{n-1}$.

Key words. Matrix, Triangular, Powers, Closed form.

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