ON GENERAL MATRICES HAVING
THE PERRON-FROBENIUS PROPERTY*

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Abstract. A matrix is said to have the Perron-Frobenius property if its spectral radius is an
eigenvalue with a corresponding nonnegative eigenvector. Matrices having this and similar properties
are studied in this paper as generalizations of nonnegative matrices. Sets consisting of such gener-
alized nonnegative matrices are studied and certain topological aspects such as connectedness and
closure are proved. Similarity transformations leaving such sets invariant are completely described,
and it is shown that a nonnilpotent matrix eventually capturing the Perron-Frobenius property is in
fact a matrix that already has it.

Key words. Perron-Frobenius property, Generalization of nonnegative matrices, Eventually
nonnegative matrices, Eventually positive matrices.

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