ON THE BRUALDI-LI MATRIX AND ITS PERRON EIGENSPACE

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Abstract. The $n \times n$ Brualdi-Li matrix $B_n$ has recently been shown to have maximal Perron value (spectral radius) $\rho$ among all tournament matrices of even order $n$, thus settling the conjecture by the same name. This renews our interest in estimating $\rho$ and motivates us to study the Perron eigenvector $x$ of $B_n$, which is normalized to have 1-norm equal to one. It follows that $x$ minimizes the 2-norm among all Perron vectors of $n \times n$ tournament matrices. There are also interesting relations among the entries of $x$ and $\rho$, allowing us to rank the teams corresponding to a Brualdi-Li tournament according to the Kendall-Wei and Ramanajucharyula ranking schemes.

Key words. Tournament matrix, Perron value, Perron vector, Brualdi-Li matrix, Team ranking.

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