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John Sinkovic* (john.sinkovic@uwaterloo.ca). *Graphs for which inertia bounds are not tight.*

Given a simple graph G , a weight matrix W of G is a real symmetric matrix such that $w_{ij} = 0$ whenever ij is not an edge of G . The inertia of W is an ordered triple (n_+, n_-, n_0) consisting of the number of positive, negative, and zero eigenvalues (multiplicity of zero). The inertia of a weight matrix can be used to give an upper bound on the independence number, $\alpha(G)$. The following is attributed to D.M. Cvetković.

$$\alpha(G) \leq n_0 + \min\{n_+, n_-\}$$

for any weight matrix W .

Recently, C. Elphick and P. Wocjan proposed a lower bound for the chromatic number $\chi(G)$.

$$1 + \max\left\{\frac{n_+}{n_-}, \frac{n_-}{n_+}\right\} \leq \chi(G)$$

It is interesting and oft times difficult to find graphs for which a bound is not tight. We give some examples of when the inequalities above are strict. (Received September 19, 2016)