1127-05-351 **Jordan Almeter**, **Samet Demircan**, **Andrew Kallmeyer**, **Kevin G Milans*** (milans@math.wvu.edu) and **Robert Winslow**. *Graph 2-rankings.*

A 2-*ranking* of a graph G is a proper coloring $f : V(G) \to [t]$ such that for each path uvw in G, either u and w have distinct colors or $f(v) > f(u) = f(w)$. A 2-ranking is intermediate in strength between a star coloring and a distance-2 coloring. The 2-*ranking number of* G, denoted $\chi_2(G)$, is the minimum number of colors needed for a 2-ranking. A classical error-correcting code argument gives an optimal distance-2 coloring of the d-dimensional cube Q_d when d is one less than a power of two. We extend the argument to obtain $\chi'_2(Q_d) = d + 1$ for all d.

The *edge* 2-*ranking number* of a graph G, denoted $\chi'_2(G)$, is the 2-ranking number of the line graph of G. It is also the least integer t such that the edges of G can be partitioned into matchings $M_1, \ldots, M_t$ such that M_k is an induced matching in the subgraph of G with edge set $\bigcup_{j\in[k]} M_j$. What is the edge 2-ranking number of $K_{m,n}$? We obtain an asymptotic result when m is fixed and $n \to \infty$. For the diagonal case, we show only that $\Omega(n \log n) \le \chi'_2(K_{n,n}) \le O(n^{\log_2 3})$. (Received February 07, 2017)