$L(h,k)$ labelings and rankings of some dense graphs

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An $L(2,1)$ labeling, introduced by Griggs and Yeh, is a vertex labeling motivated by the channel assignment problem. A generalization, $L(h,k)$ labeling, is a vertex labeling in which labels of adjacent vertices differ by at least h, and labels of vertices that are at distance two differ by at least k. The span of an $L(h,k)$ labeling is the difference between the largest label and the smallest label. The $L(h,k)$ span of a graph is the smallest span of all $L(h,k)$ labelings of the graph. For a graph G, a function $f : V(G) \to \{1,2,\ldots,k\}$ is a k-ranking, if $f(u) = f(v)$ implies that every $u-v$ path contains a vertex x such that $f(x) > f(u) = f(v)$. The rank number of a graph G is the minimum value of k such that G has a k-ranking.

This talk will discuss the $L(h,k)$ spans and rank numbers of some classes of graphs including graphs obtained by removing a maximum matching, or the edges in an arbitrary path, from complete graphs. We will also identify graphs with large rank numbers.

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