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Max-optimal and sum-optimal labelings of graphs.

A k -ranking of a graph is a labeling of its vertices with k positive integers such that any path between two vertices with the same label contains a vertex with a larger label. A k -ranking is minimal if the reduction of any label greater than 1 violates the described ranking property. We consider two norms for minimal rankings. The max-optimal norm is the smallest k for which G has a minimal k -ranking. This value is also referred to as the rank number. In this talk we consider the sum-optimal norm in which the sum of all labels over all minimal rankings is minimized. We investigate similarities and differences between the two norms. In particular we show that sum-optimal rankings of paths and cycles are also max-optimal. (Received September 20, 2010)