A Survey of Strongly Multiplicative Graphs and Related Labelings

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A labeling of a graph is said to be *multiplicative* if its vertices are labeled with positive integers and its edges are labeled with the product of the labels on its endpoints in such a way that all of the edge labels are different. Since every graph has a multiplicative labeling, we consider those graphs G, called *strongly multiplicative*, for which the set of labels is $\{1, 2, \ldots, n\}$, where n is the order of G. Some properties of such graphs will be presented, along with some families of strongly multiplicative graphs.

We also discuss two other families that have this same set of vertex labels but different operations for the edge labels, still requiring that all of the labels on the edges be different. One is the family of *strongly ∗ graphs*, where the label on edge vw is the sum of the labels on v and w and the product of their labels. The other is the family of *strongly quotient graphs*, where the label on edge vw is the smaller of the labels on v and w divided by the larger.

Note: This is part of the special session "Structured Families of Graphs and Orders: Mathematical and Algorithmic Aspects" (organized by Ann Trenk, Karen Collins, and Michal Stern).