On Graceful Labelings of Cycles

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Abstract

Suppose that $G$ is a connected graph with $n$ vertices and $m$ edges. A vertex labeling $f : V(G) \to \{0, 1, 2, \ldots, m\}$ such that distinct vertices have distinct labels induces an edge labeling where an edge $xy$ gets the label $|f(x) - f(y)|$. If the edges are labeled $1, 2, \ldots, m$ then the labeling is called graceful.

A long standing and well-known conjecture states that every tree has a graceful labeling. In this presentation we describe an algorithm for computing graceful labelings of cycles. We also discuss some relationships between graceful labelings of paths and cycles.