On the 6-cordiality of trees

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In 1991, M. Hovey defined the k-cordial labeling of a graph as a function from the set of vertices to $\mathbb{Z}_k$ so that

(i) Each label appears on at most one more vertex than any other

(ii) The induced edge-weights are found by summing the labels on vertices incident to a given edge, modulo k

(iii) Each edge-weight appears on at most one more edge than any other.

He conjectured that for any positive integer k, all trees are k-cordial, and showed this holds for $3 \leq k \leq 5$. We discuss the problem of showing all trees are 6-cordial without the aid of a computer.

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