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Computing Odd Graceful Labelings in Noncomputable Graphs.

A graceful labeling of a graph $G = (V, E)$ is an injection $\lambda : V \rightarrow \{0, 1, 2, \ldots, |E|\}$ such that the induced edge label, $|\lambda(v_i) - \lambda(v_j)|$ for $\{v_i, v_j\} \in E$, is distinct for all edges. This definition can be extended to countably infinite graphs. We explore the effective content of a result of Chawathe and Krishna about odd graceful labelings (the induced labels must be distinct odd numbers) of bipartite graphs, working in the context of computability theory. We will show that there is a connected, locally finite, bipartite, computably enumerable graph that has an odd graceful labeling, but no such computable labeling. (Received September 20, 2016)