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IRREGULAR LABELINGS OF CIRCULANT GRAPHS

We investigate the *irregularity strength* $(s(G))$ and *total vertex irregularity strength* $(tvs(G))$ of circulant graphs $Ci_n(1, 2, \ldots, k)$.

We prove that $tvs(Ci_n(1, 2, \ldots, k)) = \frac{n+2k}{2k+1}$, while $s(Ci_n(1, 2, \ldots, k)) = \frac{n+2k-1}{2k}$. In order to do that, we split the graph $Ci_n(1, 2, \ldots, k)$ into segments and label each segment using 0, 1 and 2 in such a way that the weighted degrees of the vertices included in that segment are distinct multiplicities of 2. In the next step we multiply all the edge labels by about $s/2$ (depending on the parity of s) in order to obtain the labeling where all the weighted degrees in any chosen segment differ by at least s. Then by changing the weighted degrees in every segment by distinct integer from the set $\{1, 2, \ldots, s\}$ we obtain the desired irregular weighting.