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Edge -Balance Index Sets of Helm

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Abstract

The edge-balance index set of a graph G (V, E) was defined by Chopra, Lee and Su[1] in 2010 as follows: For an edge labeling f:E(G)→{0,1}, a partial vertex labeling f * : V(G) → {0, 1} is defined as

$$f^*(v) = \begin{cases} 0 \text{ , if more edges with label 0 are incident to v} \\ 1 \text{ , if more edges with label 1 are incident to v} \\ \text{unlabeled , otherwise} \end{cases}$$

For i = 0 or 1, let $A = \{uv \in E : f(uv) = i\}$ and $B = \{v \in V : f^*(v) = i\}$
Let $eG(i) = |A|$ and $vG(i) = |B|$. The edge balance index set of G denoted as EBI(G) is computed as $EBI(G)=\{|vG(0) - vG(1)|$: the edge labeling f satisfies $|eG(0) - eG(1)| \leq 1\}$. The edge-balance index set for the fan graph Fn-1 where Fn-1 = Pn-1+K1 and wheel graph Wn, where Wn = Cn-1 + K1 was obtained by Lee, Tao, Lo[5]. In this paper, we compute the edge-balance index set for the Helm graph, where the Helm graph is defined as the graph obtained from a wheel graph by attaching a pendant edge at each vertex of the n- cycle.