ON THE B-CHROMATIC NUMBER OF PROPER INTERVAL GRAPHS

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The b-chromatic number of a graph $G$, denoted $\chi_b(G)$, is the largest integer $k$ such that $G$ admits a proper $k$-coloring in which every color class contains at least one vertex that has a neighbor in each of the other color classes. In this work we concentrate on b-chromatic number of proper interval graphs. A natural upper bound for $\chi_b(G)$ is $m$-degree of a graph $G$ which is the largest integer $m(G)$ such that $G$ has $m(G)$ vertices of degree at least $m(G) - 1$. For several graph classes $m(G) - 1 \leq \chi_b(G) \leq m(G)$ holds. But that is not the case with proper interval graphs. Therefore we have developed some new tools that are applicable when $\chi_b(G) < m(G) - 1$. In particular we determined a lower bound for $\chi_b(G)$ and several exact results.

Keywords: b-colorings, b-chromatic number, proper interval graphs.

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