IRREGULAR GRAPHS WITH RESPECT TO LOCAL DEGREE SETS

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Let \( v \) be a vertex of a graph \( G \). A set \( S_G(v) \) consisting of all degrees of vertices from open neighbourhood of \( v \) in \( G \) is called a \textit{local degree set for} \( v \). Note that repetitions in \( S_G(v) \) are allowed and the cardinality of \( S_G(v) \) is \( \deg_G(v) \). By \( S \) we denote the class of all graphs \( G \) satisfying \( S_G(v_1) \neq S_G(v_2) \) for any two vertices \( v_1, v_2 \) in \( G \). In other words \( S \) includes all graphs which are irregular with respect to their local degree sets.

In this talk we examine, for fixed \( n \), the existence of graphs of order \( n \) belonging to \( S \). Moreover, we consider the relationship between \( S \) and other classes of graphs. In particular, we show that the class of graphs with a cyclomatic number bounded from above by \( k \) contains finitely many graphs from \( S \). Many other properties of the class \( S \) are investigated. Among others the results that \( S \) is closed with respect to the lexicographic product and closed with respect to taking complement of a graph are obtained.

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