Havel–Hakimi, Murphy, Maxine, and Hereditary Classes

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A number of algorithms give bounds on the independence of a given graph. Some of these algorithms, including those of Havel—Hakimi and Murphy, use only the degree sequence of a graph to generate their bounds. Another algorithm, sometimes called Maxine, relies on iteratively deleting vertices of maximum degree.

We present hereditary classes of graphs for which the algorithms mentioned above are guaranteed to yield a maximum independent set and characterize them in terms of forbidden induced subgraphs.

Keywords: independence number, degree sequences, algorithms