# Large and Judicious Bisections of Graphs

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**Abstract**

It is very well known that every graph on $n$ vertices and $m$ edges admits a bipartition of size at least $m/2$. This bound can be improved to $m/2 + (n-1)/4$ for connected graphs, and $m/2 + n/6$ for graphs without isolated vertices, as proved by Edwards, and Erdős, Gyárfás, and Kohayakawa, respectively. A bisection of a graph is a bipartition in which the size of the two parts differ by at most 1. We prove that graphs with maximum degree $o(n)$ in fact contain a bisection which asymptotically achieves the above bounds. All these results follow from a more general theorem, which can also be used to prove several conjectures of Bollobás and Scott on bisections of graphs.

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