Multithreshold Graphs

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Chvatal and Hammer defined a graph to be a *threshold graph* if every vertex v has a real *rank* $r(v)$ such that two vertices v and w are adjacent precisely when $r(v) + r(w) \geq 0$. We extend this notion: we define a graph to be a *k-threshold graph* if every vertex v has a real *rank* $r(v)$ and there exist k real numbers called *thresholds* such that two vertices v and w are adjacent precisely when $r(v) + r(w)$ is greater than or equal to an odd number of thresholds. The 1-threshold graphs are precisely the threshold graphs of Chvatal and Hammer.
The class of 2-threshold graphs is intermediate between the class of bipartite permutation graphs and the class of permutation graphs.
We will report on graph classes such that few thresholds suffice, classes requiring many thresholds, and show an upper bound on the number of thresholds for all graphs on n vertices.

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