Counting Graphs

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Let $H_j, j = 1, 2, \ldots, k$ be a finite collection of finite graphs. Let $v_i$ be the number of vertices in $H_i$. We want to count the number of graphs $G$ with $N$ vertices in which $H_j$ appears roughly $cN^{v_j}$ times. The tools are a combination of large deviations in probability theory and Szemeredi's regularity theorem for dense graphs.

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