The independence numbers and the chromatic numbers of random subgraphs of Kneser's graphs and their generalizations

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The classical Kneser graph is the graph whose set of vertices consists of all the r-subsets of the set $[n] = \{1, \dots, n\}$ and whose edges are formed by all the vertex pairs with empty intersection. The chromatic number of this graph was found by Lovász, and the independence number $\binom{n-1}{r-1}$ of this graph is given by the Erdős–Ko–Rado theorem.

Recently Bollobás, Narayanan and Raigorodskii studied random subgraphs of the Kneser graphs and showed that with high probability their independence numbers coincide with the value $\binom{n-1}{r-1}$ for a very large range of the parameters. Also, Kupavskiy studied the chromatic numbers of the same random graphs.

We study the independence numbers and the chromatic numbers of random subgraphs of the graphs $G(n, r, s)$, where the vertices are the same as in the Kneser graph and the edges are formed by the pairs of vertices whose intersection is of size s. Obviously, for $s = 0$, we come back to the Kneser graph.

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