INTERPRETATIONS OF DIFFERENCE SEQUENCES OF SOME COMBINATORIAL NUMBER SEQUENCES

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The classical Bell numbers count partitions of finite sets. Higher order difference sequences of the sequence of Bell numbers were investigated by several authors. In our talk, we collect some meanings of these numbers including an interpretation published in Hungarian, therefore less known by the mathematical community, which we extend to study independent partitions of certain graphs.

We generalize these results to the difference sequences of the sequence of the so-called r-Bell numbers concentrating on two main interpretations: one enumerating set partitions having fixed largest singleton, as well as the graph theoretic one mentioned above.

If the blocks in the partition or the partition itself is ordered, then we obtain Bell–Lah and Fubini numbers, respectively. In the final part of our talk, we work with difference sequences of the r-generalizations of these sequences. We find that one of the two main interpretations works for r-Bell–Lah numbers, while the other for r-Fubini numbers.

This is a joint work with Gábor Nyul.