

Arrow Relations in Integer Partition Lattices

Asma Almazaydeh (*Department of Mathematics, Tafila Technical University*)

Mike Behrisch (*Institute of Discrete Mathematics and Geometry, Technische Universität Wien*)

Edith Vargas-García (*Department of Mathematics, ITAM*)

Andreas Wachtel (*Department of Mathematics, ITAM*)

Integer partitions started to gain interest in 1674 when Leibniz investigated the number of ways one can write (partition) a positive integer n as a sum of positive integers. Brylawski showed that the set of all partitions of a positive integer n endowed with the dominance ordering is a complete lattice. These lattices are called lattices of integer partitions, or just partition lattices, for short. The lattices of integer partitions can be viewed as concept lattices; in this contribution we continue the investigations of Behrisch and et al. and Ganter of those lattices, and concentrate on the problem of determining their factor lattices as suggested by Ganter. This question is equivalent to characterising the compatible subcontexts, which in turn have a description in terms of so-called arrow relations. Moreover, we focus on results on these arrow relations and thus shed some light on the structure of lattices of integer partitions.

Keywords: Lattice, Integer partition, Dominance order, Arrow relation