

ICECA

International Conference Enumerative Combinatorics and Applications University of Haifa – Virtual – September 4-6, 2023

The image of the pop operator on various lattices

Yunseo Choi

Department of Mathematics and Physics, Harvard University

ychoi@college.harvard.edu

Extending the classical pop-stack sorting map on the lattice given by the right weak order on S_n , Defant defined, for any lattice M , a map $\text{Pop}_M : M \rightarrow M$ that sends an element $x \in M$ to the meet of x and the elements covered by x . In parallel with the line of studies on the image of the classical pop-stack sorting map, we study $\text{Pop}_M(M)$ when M is the weak order of type B_n , the Tamari lattice of type B_n , the lattice of order ideals of the root poset of type A_n , and the lattice of order ideals of the root poset of type B_n . In particular, we settle four conjectures proposed by Defant and Williams on the generating function

$$\text{Pop}(M; q) = \sum_{b \in \text{Pop}_M(M)} q^{|\mathcal{U}_M(b)|},$$

where $\mathcal{U}_M(b)$ is the set of elements of M that cover b .

This is joint work with Nathan Sun.