

Labeled Partitions with Colored Permutations

William Y.C. Chen, Henry Y. Gao, and Jia He

Abstract: In this paper, we extend the notion of labeled partitions with ordinary permutations to colored permutations in the sense that the colors are endowed with a cyclic structure. We use labeled partitions with colored permutations to derive the generating function of the fmaj_k indices of colored permutations. The second result is a combinatorial treatment of a relation on the q -derangement numbers with respect to colored permutations which leads to the formula of Chow for signed permutations and the formula of Faliharimalala and Zeng [10] on colored permutations. The third result is an involution on permutations that implies the generating function formula for the signed q -counting of the major indices due to Gessel and Simon. This involution can be extended to signed permutations. In this way, we obtain a combinatorial interpretation of a formula of Adin, Gessel and Roichman.

AMS Classification: 05A30, 05A19, 05A15

Keywords: labeled partition, flag major index, colored permutation, q -derangement number

Download: [PDF](#)

[Return](#)