

On generating bijections for permutations and inversion sequences

Melanie Ferreri

Abstract

We will explore how bijections demonstrating some combinatorial identities can be constructed recursively. Our first application concerns subsets of the group of permutations of n elements. We derive a bijective proof of the one-term recurrence for derangements, along with a bijective proof of the one-term identity for nonderangements. We then consider bijections showing equivalence relations on consecutive patterns in inversion sequences, deriving some new bijective proofs, and also showing a stronger form of equivalence for some consecutive patterns.