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A Simple Bijective Proof of a Familiar Derangement Recurrence,
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Abstract

It is well known that the derangement numbers d_n , which count permutations of length n with no fixed points, satisfy the recurrence $d_n = nd_{n-1} + (-1)^n$ for $n \geq 1$. Combinatorial proofs of this formula have been given by Remmel, Wilf, Désarménien, and Benjamin-Ornstein. Here, we present yet another, arguably simpler bijective proof.