

On Pattern Avoiding Alternating Permutations

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Abstract: An alternating permutation of length n is a permutation $\pi = \pi_1 \pi_2 \dots \pi_n$ such that $\pi_1 < \pi_2 > \pi_3 < \pi_4 > \dots$. Let A_n denote the set of alternating permutations of $\{1, 2, \dots, n\}$, and let $A_n(\sigma)$ be the set of alternating permutations in A_n that avoid a pattern σ . Recently, Lewis used generating trees to enumerate $A_{2n}(1234)$, $A_{2n}(2143)$ and $A_{2n+1}(2143)$, and he posed some conjectures on the Wilf-equivalence of alternating permutations avoiding certain patterns of length four. Some of these conjectures have been proved by Bóna, Xu and Yan. In this paper, we prove two conjectured relations $|A_{2n+1}(1243)| = |A_{2n+1}(2143)|$ and $|A_{2n}(4312)| = |A_{2n}(1234)|$.

AMS Classification: 05A05, 05A15

Keywords: alternating permutation, pattern avoidance, generating tree

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