

A RECURRENCE FOR $(1 - 23 - 4)$ -AVOIDING PERMUTATIONS

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We show that the number $u(n)$ of permutations of $[n]$ that avoid the dashed pattern $1 - 23 - 4$ is given by $u(n) = \sum_{k=1}^n u(n, k)$, where the $u(n, k)$ satisfy the recurrence

$$u(n, k) = u(n - 1, k - 1) + k \sum_{j=k}^{n-1} u(n - 1, j).$$

The proof relies on a bijection from the pattern-avoiding permutations to increasing ordered trees whose leaves, taken in preorder (aka walk-around order), are also increasing.