Dragan Mašulović

The Number of Finite Homomorphism-Homogeneous Tournaments with Loops,

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Abstract

A structure is called homogeneous if every isomorphism between finitely induced substructures of the structure extends to an automorphism of the structure. Recently, P. J. Cameron and J. Nešetřil introduced a relaxed version of homogeneity: we say that a structure is homomorphism-homogeneous if every homomorphism between finitely induced substructures of the structure extends to an endomorphism of the structure.

In this short note we compute the number of homomorphism-homogeneous finite tournaments where vertices are allowed to have loops. Our main result is thatin case $n \geq 4$ there are, up to isomorphism, $F_n + n - 1$ homomorphism-homogeneous tournaments on n vertices, where F_n is the n-th Fibonacci number. This is the only class of homomorphism-homogeneous structures where we can provide an exact number of nonisomorphic objects, and the number turns out to be closely related to Fibonacci numbers.