Regular symmetry groups of Boolean functions

Mariusz Grech
e-mail: mgrec@math.uni.wroc.pl
University of Wroclaw, Poland

Any function of the form

$$f : \{0,1\}^n \to \{0,1\}$$

is called a Boolean function. By $Aut(f)$ we denote the set of all symmetries of f, i.e., these permutation $\sigma \in S_n$ for which

$$f(x_{\sigma(1)}, \ldots, x_{\sigma(n)}) = f(x_1, \ldots, x_n).$$

We show the solution of a problem posed by A. Kisielewicz ([1]). We show that, with the exception of four known groups of small order, every regular permutation group is isomorphic with $Aut(f)$ for some Boolean function f. We present also a few methods that we have used, and which may be useful for solving similar problems.

References

[1] A. Kisielewicz, *Symmetry groups of boolean functions and constructions of permutation groups,* J. Algebra **199**, (1998) 379-403.