

Algebras from Finite Group Actions and a Question of Eilenberg and Schützenberger

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In 1976, S. Eilenberg and M.P. Schützenberger posed the following Diabolical question: if A is a finite algebraic structure, Σ is the set of all identities true in A , and there exists a finite subset F of Σ such that F and Σ have exactly the same finite models, must there also exist a finite subset F' of Σ such that F' and Σ have exactly the same finite and infinite models? (That is, must the identities of A be “finitely based”?). It is known that any counter example to their question must be inherently nonfinitely based (INFB) but not inherently nonfinitely based in the finite sense (INFBfin). In this talk, I will show that the algebras constructed by Lawrence and Willard from group action do not provide a counter example to this question. If time permits, I will give the first known examples of inherently nonfinitely based “automatic algebras” constructed from group actions.

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