Young Researchers

CREAM: a Package to Compute [Auto, Endo, Iso, Mono, Epi]-morphisms, Congruences, Divisors and More for Algebras of Type $(2^n, 1^n)$

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CREAM[1] stands for "Algebra **C**ong**R**uences, **E**ndomorphisms and **A**utomorphis**M**s" and is a GAP package with fast methods for calculating congruences, automorphisms, endomorphisms, isomorphisms, monomorphisms, epimorphisms, divisors, sub-algebras and more for algebras of type $(2^m, 1^n)$, a finite universal algebra with m binary and n unary operations.

While there are efficient algorithms to decompose very particular classes of semigroups, groups and quasigroups, there are no similar facilities available for the more general algebraic structures. CREAM provides efficient algorithms implementations to decompose algebras of type $(2^m, 1^n)$. This was achieved by relying only on generic Universal Algebra theorems, by optimizing part of the code in C and by the integration with Mace4.

References

[1] João Araújo, Rui Pereira, Wolfram Bentz, Choiwah Chow, João Ramires, Luis Sequeira, Carlos Sousa, *CREAM: a Package to Compute [Auto, Endo, Iso, Mono, Epi]-morphisms, Congruences, Divisors and More for Algebras of Type* $(2^n, 1^n)$; 2022, `https://arxiv.org/abs/2202.00613`.