On Burnside Varieties

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The following algebraic problem is classical: what are all (idempotent) varieties of algebras that do not contain finitely generated infinite algebras? This is an unsolved hard problem even for varieties of classical algebraic structures. Such varieties are called Burnside varieties of algebras (W. Burnside). For instance:

1) A finitely generated distributive lattice is finite;

2) A finitely generated Boolean algebra is finite;

3) A finitely generated De Morgan algebra is finite;

4) A finitely generated Boole-De Morgan algebra is finite;

5) A finitely generated algebra with two binary, one unary and two nullary operations, satisfying the hyperidentities of the variety of Boolean algebras is finite;

6) A finitely generated algebra with two binary and one unary operations, satisfying the hyperidentities of the variety of De Morgan algebras is finite;

7) A finitely generated idempotent semigroup is finite.

In the main result of the current talk we give a general version of the last result concerning idempotent algebras with an associative hyperidentity. As a consequence we obtain new infinitely many idempotent varieties of binary algebras in which every finitely generated algebra is finite.