

On decidability of some classes of Stone algebras

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Using the method of interpretation (semantic embedding) and the so called triple construction we prove some (un)decidability results for several classes of Stone algebras constructed mainly from Boolean algebras.

In particular the following classes of Stone algebras have undecidable first order theories:

- a) the class of all Stone algebras;
- b) the class of all Stone algebras with bounded dense set;
- c) the class of all Stone algebras with finite dense set;
- d) the class of all Stone algebras with dense set forming a free distributive lattice with n generators (for fixed n);
- e) the class of all Stone algebras with Boolean dense set.

On the other hand, the following classes of Stone algebras have decidable first order theories:

- a) the class of all Stone algebras with bounded dense isomorphic to its skeleton under the structure map;
- b) a whole sequence of classes of Stone algebras constructed by iteration of the triple construction applied to a single Boolean algebra [a] is just the first item in this sequence];
- c) the class of all Stone algebras with at most n elements (for fixed n) and the dense set isomorphic to its skeleton (under an arbitrary lattice isomorphism).