

Meeting: 999, Nashville, Tennessee, SS 4A, Special Session on Universal Algebra and Lattice Theory

999-08-52 **Brian L Walter*** (bwalter@evergreen.edu), S2 A-2117, 2700 Evergreen Parkway NW,
Olympia, WA 98505. *Finitely Based Varieties of Directed Graph Algebras*. Preliminary report.

Shallon invented a means of deriving algebras from graphs, yielding numerous examples of so-called graph algebras with interesting equational properties. Our subject is directed graph algebras, derived from directed graphs in the same way that Shallon's graph algebras are derived from graphs. We present results characterizing some types of finitely based directed graph algebra varieties. We classify the finitely based looped directed graph algebras and find the five finitely based varieties generated by them, showing that every looped directed graph algebra is either finitely based or inherently nonfinitely based. We present further results about loop-free directed graph algebras and graph algebras in general. We exhibit an equational base for the variety generated by all directed graph algebras. We also show a general two-part method for showing that varieties are finitely based; this method is then developed further, into syntactic and semantic components, and applied in the specific case of varieties generated by directed graph algebras. (Received July 26, 2004)