

Title: Arity Hierarchies

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Abstract: Many logics considered in finite model theory have a natural notion of an arity. The purpose of this article is to study the hierarchies which are formed by the fragments of such logics whose formulae are of bounded arity. Based on a construction of finite graphs with a certain property of homogeneity, we develop a method that allows us to prove that the arity hierarchies are strict for several logics, including fixed--point logics, transitive closure logic and its deterministic version, variants of the database language Datalog, and extensions of first--order logic by implicit definitions. Furthermore, we show that all our results already hold on the class of finite graphs.