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CORRECTNESS OF INHERITANCE HIERARCHIES IN RECURSIVE OBJECT-ORIENTED DATABASE SCHEMAS

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Abstract

Database design is traditionally recognized as one of the difficult activities in developing database applications. With the advent of Object-Oriented databases (OODBs), and their rich underlying data model, the problem becomes even harder. In particular, in designing an OODB schema, the presence of inheritance hierarchies, with multiple supertypes and the possibility of inheritance conflicts, can lead to incorrect schema definitions. In this paper, we address the problem of the characterization of a correct inheritance hierarchy, within the widely accepted frame of Carelli’s type theory. The analysis is extended to recursive OODB schemas, showing that such a theory fails to deal correctly with all possible cases. It results that, in presence of recursive record types, the problem of certifying correctness is, in general, undecidable. Therefore, we introduce the notion of fully certifiable schemas, supplying a formal characterization of the schemas for which correctness is decidable.