Using Subsumption in Semantic Query Optimization*

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Abstract

Semantic Query Optimization optimize query processing by transforming a query into a semantically equivalent one, i.e. a query whose result is the same for every instance of the database. Semantic query optimization can be obtained by a query rewriting that takes into account the integrity constraints the database must satisfy. In this paper we analyze the possibility of implementing semantic optimization in OODBMs by means of the subsumption relation computation over a database schema. *Subsumption* relations over a schema includes all the specialization relations between classes (types) both explicitly declared in the schema and entailed by the schema. Subsumption computation has been previously used in the database area to perform schemata acquisition and checking for coherence and query processing optimization. In this paper we extend complex object data models with integrity constraints expressed as rules and propose to apply subsumption computation to perform semantic query optimization in object-oriented databases. In this way it is possible to obtain queries having as arguments more specific classes and minimize data access. The paper includes a formalization of complex object data models including path description and integrity constraint rules, enriched with the notion of *subsumption*. A method for semantic query optimization is proposed and its feasibility is analyze by examining some example.

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