

Query Optimization by Quantifier Elimination

Christoph Koch

École Polytechnique Fédérale de Lausanne

Abstract. Many of us who teach database query languages have seen creative students who lack a training in formal logic come up with surprising ways of using aggregation for expressing challenging queries in SQL – ways that do not feel natural to those trained in logic but which nevertheless exact admiration. In this talk, I show how quantifier elimination can be used to optimize SQL queries in surprising ways – ways whose results coincide with and generalize these apparently creative tricks. The new query optimization technique, apart from being potentially useful for practical query engines, suggests a particular way in which the logically untrained mind synthesizes queries (not quantifier elimination, though) – an observation at best based on an amateur’s understanding of brain science, but potentially still useful for teaching databases.