Constraints in RDF: Theory and Implementation.

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Abstract

RDF (Resource Description Framework) is a World Wide Web Consortium recommendation for specifying meta-data models on the web. RDF databases consist of triples in the form of subject-predicate-object, which are often conceptualized as a directed labeled graph. In the first part of the talk we show how to extend the basic model of RDF with integrity constraints by recalling our recently defined functional and equality constraints, and by introducing triple generating constraints. Our formal framework is inspired and motivated by the importance of the corresponding constraints in the relational model. We continue with presenting the formal notion of satisfaction for the three types of constraints—with special emphasis on the new triple generating constraints—and by recalling our mechanism to express functional constraints in terms of equality generating constraints. Next, we present a new chase-like algorithm for triple-generating constraints and show how, without additional restrictions on the constraint language, our method does not necessarily terminate.

In the second part of the talk, we present a demo of the RDF reasoner developed in our group. We demonstrate how to define functional and equality generating constraints and how to perform some classical reasoning tasks such as satisfiability and entailment checking on them. We finalize our talk by sketching some open problems currently under study in our research group.