Datalog access to real-world web services

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Web services now play an important role in our lives. Both our personal and enterprise related data can now be found in some remote data centers accessible only through third party application programming interfaces (API). This shift from self-controlled database systems to third-party managed database systems has brought forward many research challenges, one of which is the ability to integrate such multiple heterogeneous and autonomous web service API in a transparent manner. Mediation-based data integration approach when extended to web service API on one hand helped to achieve a declarative approach to the problem of extracting desired information from the web services, but on the other hand led to several new open challenges.

Data providing operations of web service API can be considered as relation with access patterns [1], i.e., a relation that takes as input one or more values and returns associated tuple of values. Several currently available web service documentations are only human readable. Hence, one major goal is to reduce the human programming effort of the process of extracting information from web services. Datalog program, including conjunctive queries help to describe API operations as well as query them using query rewriting algorithms like inverse-rules algorithm. However, there are several practical challenges [2] especially considering the strict certain answer semantics of such algorithms that fail to address the problem of incomplete information as well as a large number of spurious calls that need to be made for API operations involving more than one input arguments. These two cases were studied by us while building DaWeS [1], a data warehouse fed with web services.

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