

# Simulating a fragment of SPARQL with structural recursions\*

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## Abstract

The SPARQL [1] query language is one of the key technologies of the Semantic Web. It is able to retrieve and manipulate data stored in RDF documents, which are essentially node- and edge-labelled graphs. Structural recursions [2], on the other hand, are graph transformers, which work on edge-labelled graphs, and are mainly used in the field of semi-structured and XML databases. In this paper, we propose a way to simulate a fragment of the SPARQL language using structural recursions. This fragment consists of a subset of those queries that can be built using the core SPARQL operators AND, OPTIONAL, UNION, and a restricted form of FILTER. The aforementioned subset can be characterized by an easily verifiable property of the auxiliary graph used in the transformation. The significance of this rewriting is that the complexity results for the emptiness and containment problems of structural recursions can be directly applied to the simulated fragment of SPARQL.

*Keywords:* SPARQL, Semantic Web, structural recursion, static analysis

*MSC:* 68P20, 68Q17

## References

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