VisAVis: An Approach to an Intermediate Layer between Ontologies and Relational Database Contents

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Introduction

- VisAVis Protégé Plugin
- Features
  - Map between RDB and Ontologies
  - Execute queries expressed in RDQL

Motivation

- The Semantic Web Vision orders that web pages need to be annotated in terms of an ontology language
- What happens with Data stored in databases and is generated and retrieved automatically?

Definitions

- An Ontology can be defined as a model of a Knowledge Base
- Thus, we have the Terminological and the Assertional Box (ABox & TBox)
- Simplified point of view:
  - TBox <-> Schema of the RDB
  - ABox <-> Instance of the actual data

Mapping Process

- Capture Database Data
- Select an Ontology Class
- Validate the mapping
- Modify the resulting Ontology

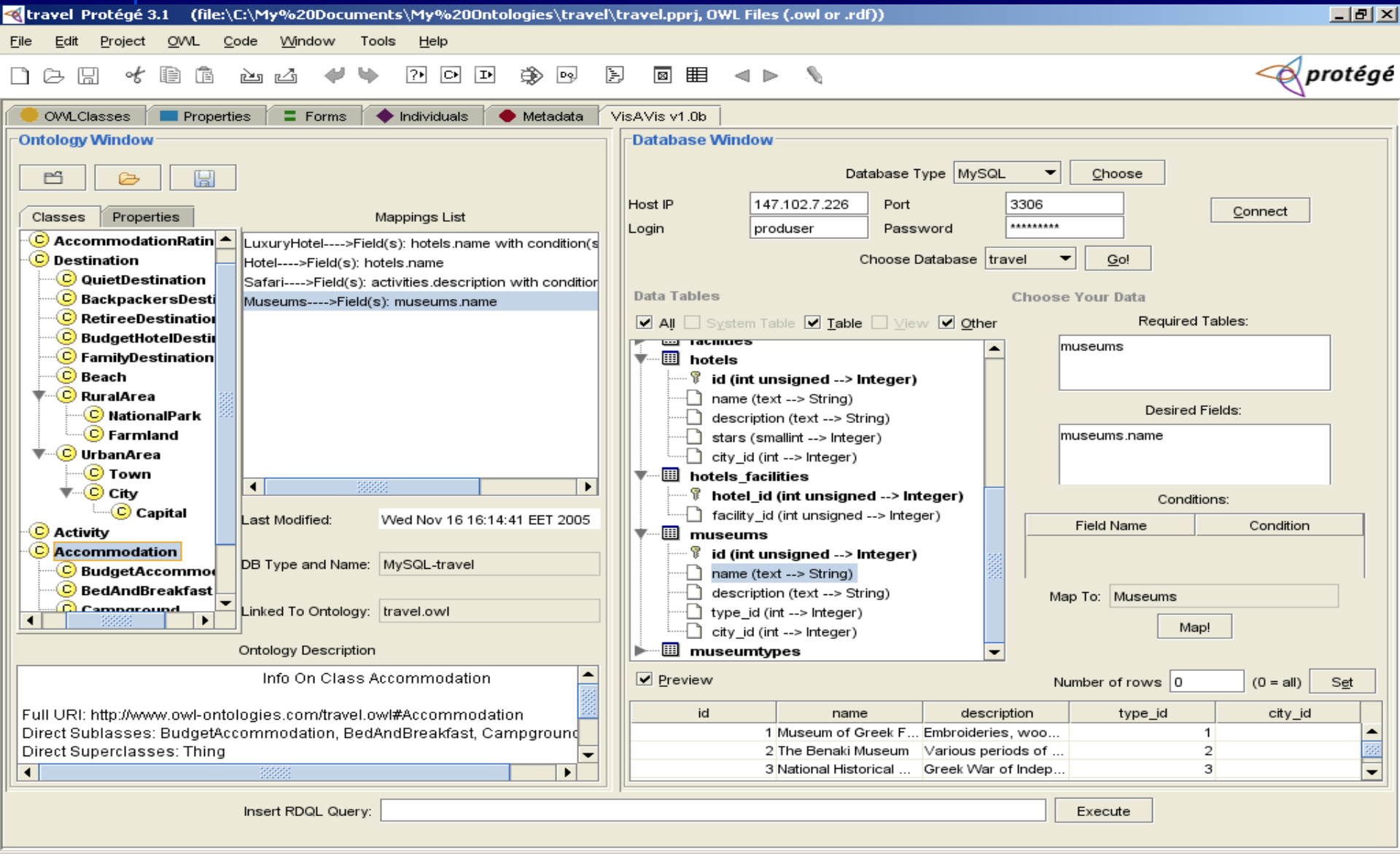
Mapping Process

- Validate the mapping
  - Disjoint classes cannot have mappings to common data. Common data includes data in tables with a foreign key relation
  - Maintain subclass hierarchy in the database

Query Execution

- Parse requests
- Instead of returning the class resources, we check if the mapping property exists
  - Yes: redirect the query to the database
  - No: No changes

Use-Case Scenario



Use-Case Scenario

```
<owl:Class rdf:about="#Hiking">
   <queryString>SELECT activities.description FROM
    activities, activities_types WHERE
    (activities.activity_type_id = activities_types.id)
    AND (activities_types.name = "Hiking")
   </queryString>
   <rdfs:subClassOf>
      <owl:Class rdf:about="#Sports"/>
   </rdfs:subClassOf>
</owl:Class>
```

Implementation

- Java, version 1.5.0 or higher
- Jena framework, tested in versions 2.2 and 2.3
- Protégé, tested in 3.0, 3.1, 3.1.1, 3.2beta
- MySQL and PostgreSQL, with JDBC connection

Future Work

- Richer SQL builder
- Support for more databases
- Return results from both the database and the ontology

Questions

Thank you for your attention

- VisAVis plugin available at http://www.cn.ntua.gr/~nkons/essays_en.html