Ontologies and Rules

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SWRL – Semantic Web Rule Language

- SWRL is a rule language for the Semantic Web
- Rules are of the form of an implication between
  - an antecedent (body, condition) and
  - a consequent (head, conclusion)
- There are different representations for SWRL rules:
  - Human Readable Syntax
  - XML Concrete Syntax
  - RDF Concrete Syntax

https://www.w3.org/Submission/SWRL/

Human Readable Syntax

- Variables are same as SPARQL, indidated by ?

  ?x, ?something, ?object

- In the human readable syntAntecedent and consequent are separated by ⇒
  (in Protégé type -> instead of ⇒)

  hasParent(?x1,?x2) ∧ hasBrother(?x2,?x3) -> hasUncle(?x1,?x3)

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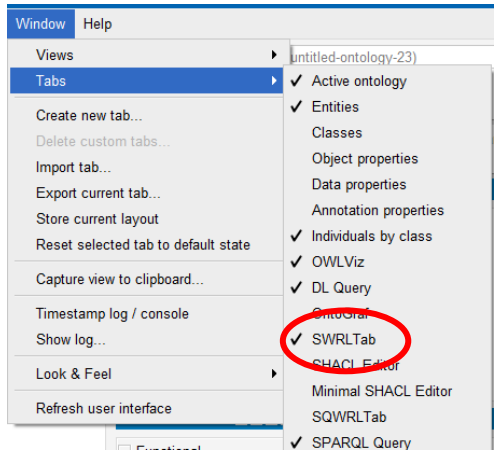
XML Concrete Syntax

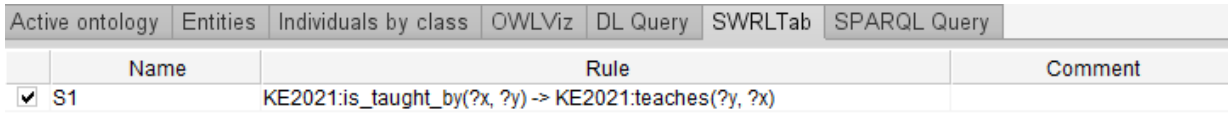
- This is the XML Syntax of the uncle rule:

```
<ruleml:imp>
 <ruleml:_rlab ruleml:href="#example1"/>
 <ruleml:_body>
   <swrlx:individualPropertyAtom  swrlx:property="hasParent">
     <ruleml:var>x1</ruleml:var>
     <ruleml:var>x2</ruleml:var>
   </swrlx:individualPropertyAtom>
   <swrlx:individualPropertyAtom  swrlx:property="hasBrother">
     <ruleml:var>x2</ruleml:var>
     <ruleml:var>x3</ruleml:var>
   </swrlx:individualPropertyAtom>
 </ruleml:_body>
 <ruleml:_head>
   <swrlx:individualPropertyAtom  swrlx:property="hasUncle">
     <ruleml:var>x1</ruleml:var>
     <ruleml:var>x3</ruleml:var>
   </swrlx:individualPropertyAtom>
 </ruleml:_head>
</ruleml:imp>
```

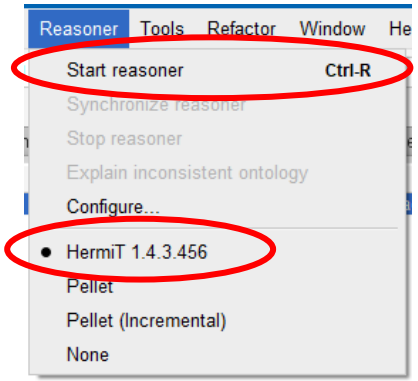
Rules in Protege



- In Protege there is a SWRLTab
- In this tab you specify rules



- To execute the rules, a reasoner must be started
  - In the menu Reasoner select reasoner HermiT and start the reasoner



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Rules in Protege

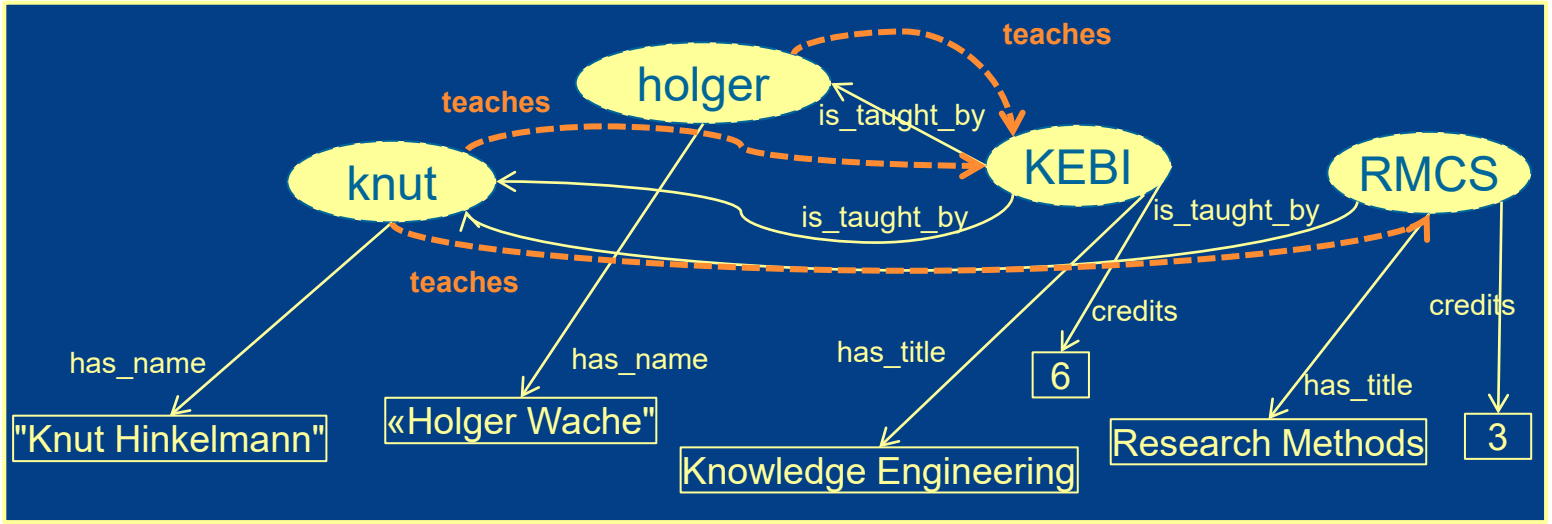
- The following rules derives the inverse of the proprerty is_taught_by

  ke:is_taught_by(?c, ?l) -> ke:teaches(?l, ?c)

  - The rules means:

    If a course ?c is taught by lecturer ?l, then lecturer ?l teaches course ?c

  - To run the rules there must be defined object property teaches has domain lecturer and range course



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