TDT 44 – Semantic Web

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About the course

Goal: The students get an orientation of the theoretical, methodological and technological background and of the ongoing standardization work that support semantic Web.

You will gain:

- Background theoretical knowledge
- Practice of construction and realization of semantic web
- Insight to relevant problems within Web information resources and services

Mostly self-driven.

Learning Material

BOOK: "Exploiting Linked Data and Knowledge Graphs in Large Organisations." Jeff Z. Pan, Guido Vetere, Jose Manuel Gomez-Perez, Honghan Wu. (Available online from NTNU network.)

PRESENTATIONS

EXTERNAL LINKS

Follow the course wiki page:
https://www.ntnu.no/wiki/display/idiemner/TDT44+-+Semantic+Web

Schedule

26.09.2018	Introductory meeting
TBA	Mid-term follow-up meeting (in October)
29.11.2018	Oral exam

One obligatory assignment that will make up the grade together with a short oral presentation.

The details of the assignment will be available on the wiki page soon.

Brief Introduction to Semantic Web

Semantic Web

Machines understanding the meaning
or
Meaning is machine readable.

Why do we need it?
Too much information, too little structure.
Meaning (semantics) of data is only human readable.

Application areas

“Smart systems of any type”

- Search engines
- E-learning
- E-commerce
- Recommender systems

How to do it?

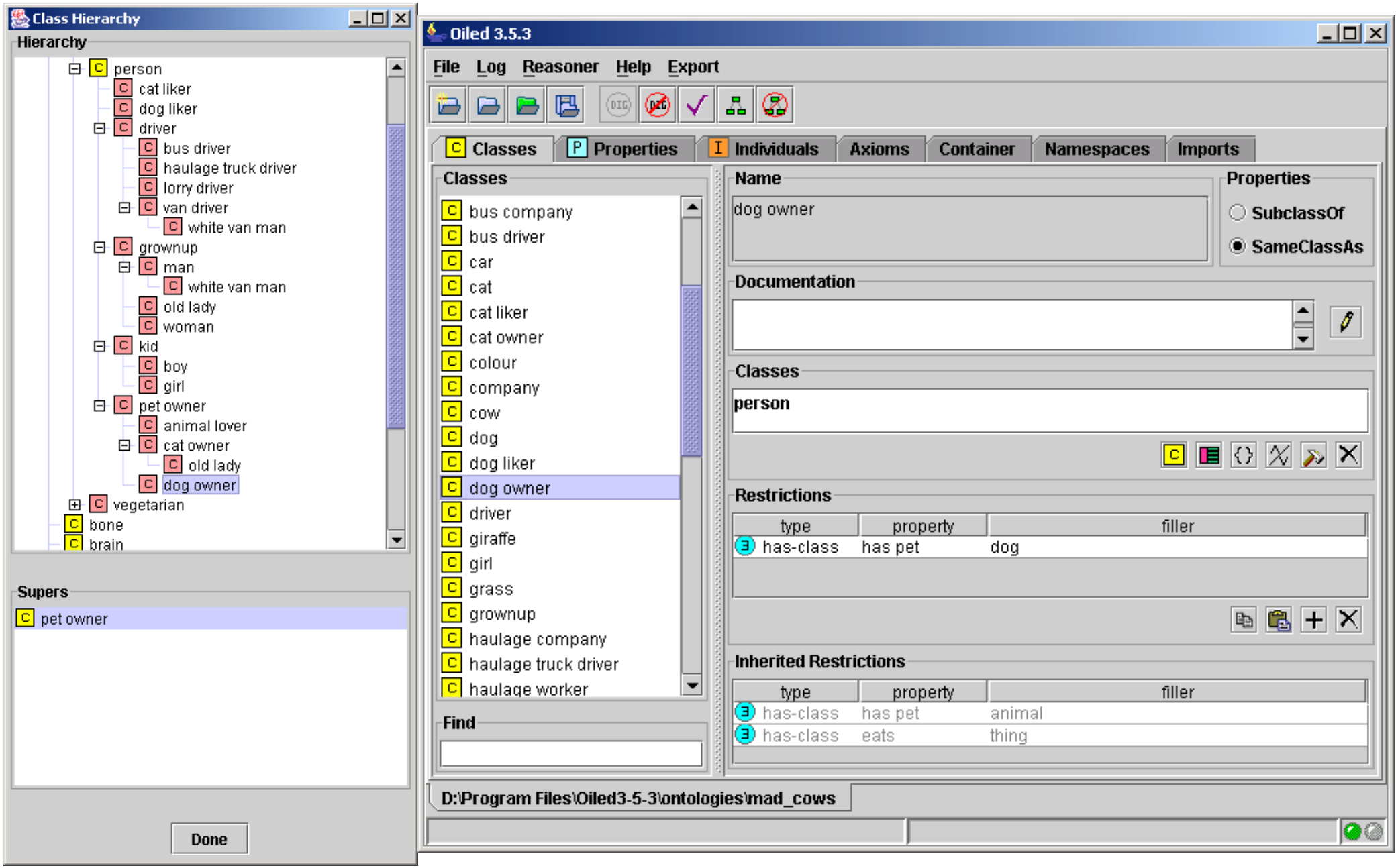
Frameworks, descriptions, structured representation of data, links, inference etc.

Ontology

An ontology describes a formal specification of a certain domain. The types of entities and relationships are defined in ontologies.

There are different ontology languages:
XML, RDF, OWL ...

An example:


Class Hierarchy
Hierarchy
person
cat liker
dog liker
driver
bus driver
haulage truck driver
lorry driver
van driver
white van man
grownup
man
white van man
old lady
woman
kid
boy
girl
pet owner
animal lover
cat owner
old lady
dog owner
vegetarian
bone
brain
Supers
pet owner
Done
Oiled 3.5.3
File
Log
Reasoner
Help
Export
Classes
Properties
Individuals
Axioms
Container
Namespaces
Imports
Classes
bus company
bus driver
car
cat
cat liker
cat owner
colour
company
cow
dog
dog liker
dog owner
driver
giraffe
girl
grass
grownup
haulage company
haulage truck driver
haulage worker
Find
Name
dog owner
Properties
SubclassOf
SameClassAs
Documentation
Classes
person
Restrictions
type
property
filler
has-class
has pet
dog
Inherited Restrictions
type
property
filler
has-class
has pet
animal
has-class
eats
thing
D:\Program Files\Oiled3-5-3\ontologies\mad_cows

XML

Document is a labeled tree.

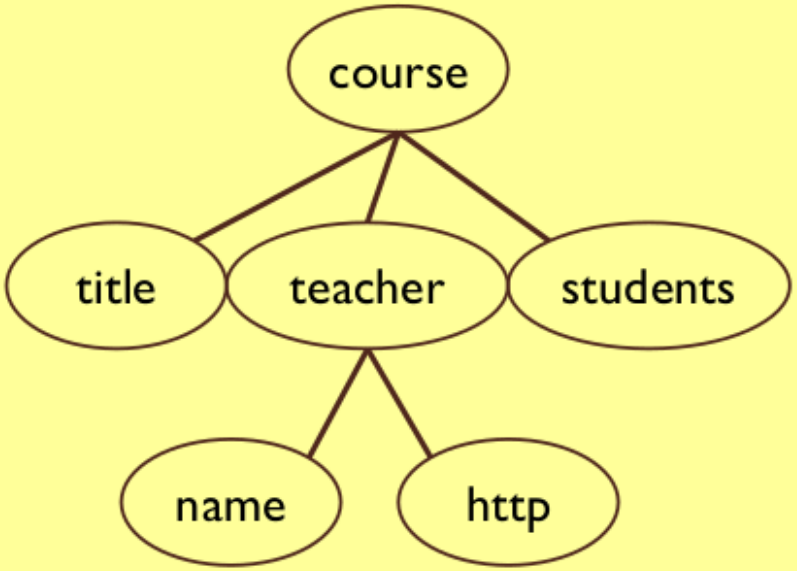
- node = label + attr/values + contents

```
<course date="...">
        <title>...</title>
        <teacher>...</teacher>

        <name>...</name>

        <http>...</http>
        <students>...</student
s>
</course>
```

=



- XML Schema: grammars for describing legal trees and datatypes

RDF (Resource Description Framework)

RDF is a standard to describe entities/resources. A resource can be anything we can identify, such as a person, a homepage or great dragons in the Game of Thrones.

Resources in RDF are described as triplets:
[subject, predicate, object]
[lemon, is, yellow]
[Ann, knows, Barbara]

RDF

RDF models the relations between things.

- It has more interoperability,
- Provides better understanding of the data.

In this course you will work with RDF.

- Read and study relevant learning materials.
- Check last year’s assignment.
- Follow the course wiki page.
- Contact me for further questions.