Web Ontology Language

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So what’s happening?

- RDF - A recap
- What is OWL?
- How does it relate to RDF?
- Some technicalities
- Demo
RDF - Say what now?

- Makes **structural** statements about resources
- Organized into triples of `<subject, predicate, object>`
- subject → **lion**, predicate → **eats**, object → **zebra**

For example:

→ `<lion, eats, zebra>`

Another example, for the author of a book.

→ `<J.K.Rowling, wrote, Harry Potter>`
What is OWL?

- OWL is an enhancement to RDF
- Vocabulary for describing properties, classes, and relations between these
  - e.g. cardinality, equality, symmetrism ++
- W3C created it in order to get machines better as reasoning tasks
- For instance:
  
  When comparing knowledge bases on the web, a program must know when two different terms are being used to mean the same (e.g. “car” and “automobile”)

- A solution to this is to collect information into ontologies.
  
  Which is kind of hard ...
Ontologies, you say?

From the book:

"An ontology formally describes a list of terms and the relationships between them in order to represent an area of knowledge".

These relationships are things such as:

- Subclass relationship
- Properties - e.g. color, name
- Value restrictions - e.g. cardinality
- and others...
OWL vs. RDF - A summary

- RDF defines the **structure** of the data. OWL is used to describe **semantic relationships** between data.
- Used for automated reasoning.

Example - derive implicit facts:

*If we have that “Bob is married to Jane”, then with OWL we can **derive** that “Jane is married to Bob”.*
A simple example (turtle syntax)

```
person:id1  person:name       "Bob" ;
    person:marriedTo  person:id2 .

person:id2  person:name       "Jane" .

person:marriedTo  rdf:type   owl:SymmetricProperty .
```

From this we can derive that Linda is married to Lars because “marriedTo” is symmetric
but ... there is always a tradeoff

- In OWL, there is a tradeoff between expressiveness and reasoning efficiency.
- More expressiveness $\rightarrow$ lower efficiency
- Therefore OWL comes in three types: OWL Full, OWL DL, and OWL Lite.
  - The details are rather technical, but it boils down to
  - Choose the one best suited for your needs.
OWL 2 - The future? Maybe?

- Quick mention, because the book is outdated.
- OWL 2 is an update to OWL. No vast changes, but it is a bit more expressive and has more user-friendly syntax.
- It is backwards compatible.
- The principles and the purpose of the language are the same as for OWL.
So ... why OWL?

- Enables incorporation of arbitrary semantic metadata on the web
- Example usage
  - Music - artist, track length, album info ++
  - Video - Summaries, reviews ++
  - News articles - Genre, keywords ++
The moment you’ve all been waiting for

Live Demo