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# Introduction to Semantic Modelling Building Blocks

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# Introduction

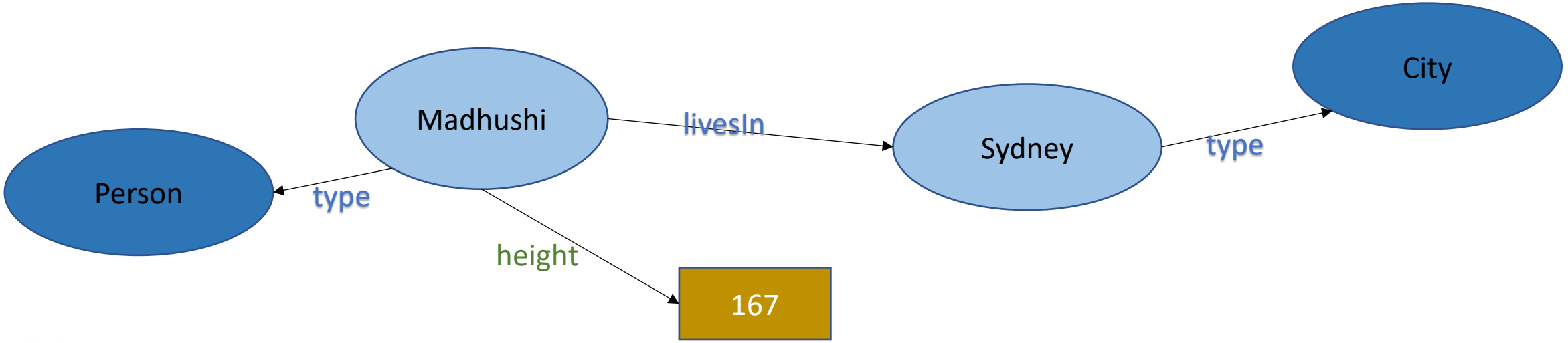
- Last 5 weeks of COMP9322 will introduce you to the semantic web and linked-data technologies.
- These are the fundamentals of modern web, founded by Tim Berners-Lee.
- Today exercises will introduce you to a application and the main building blocks of semantic models.
- Lectures and future labs will teach you fundamentals, theories and applications.

# Building Blocks of Semantic Web

- RDF- Resource Description Framework

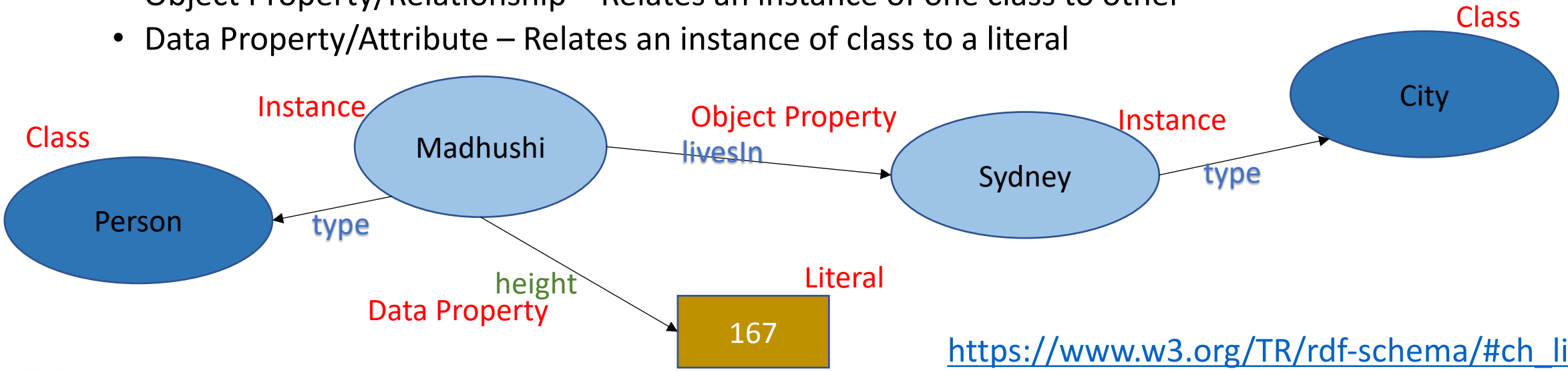
  "idea of making statements about resources (in particular web resources) in expressions of the form *subject–predicate–object*, known as *triples*"

- *A labelled directed multi-graph.*



# Building Blocks of Semantic Web

- All things described by RDF are called *resources*
- Classes - Resources may be divided into groups called classes.
- Instance - The members of a class are known as *instances* of the class.
- Literals- Literals are used for values such as strings, numbers, and dates.
- Properties - Relation between subject resources and object resources.
  - Object Property/Relationship – Relates an instance of one class to other
  - Data Property/Attribute – Relates an instance of class to a literal




https://www.w3.org/TR/rdf-schema/#ch_literal

# Let’s Explore DBpedia

Complete exercise 1.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# Quick Introduction to Protégé

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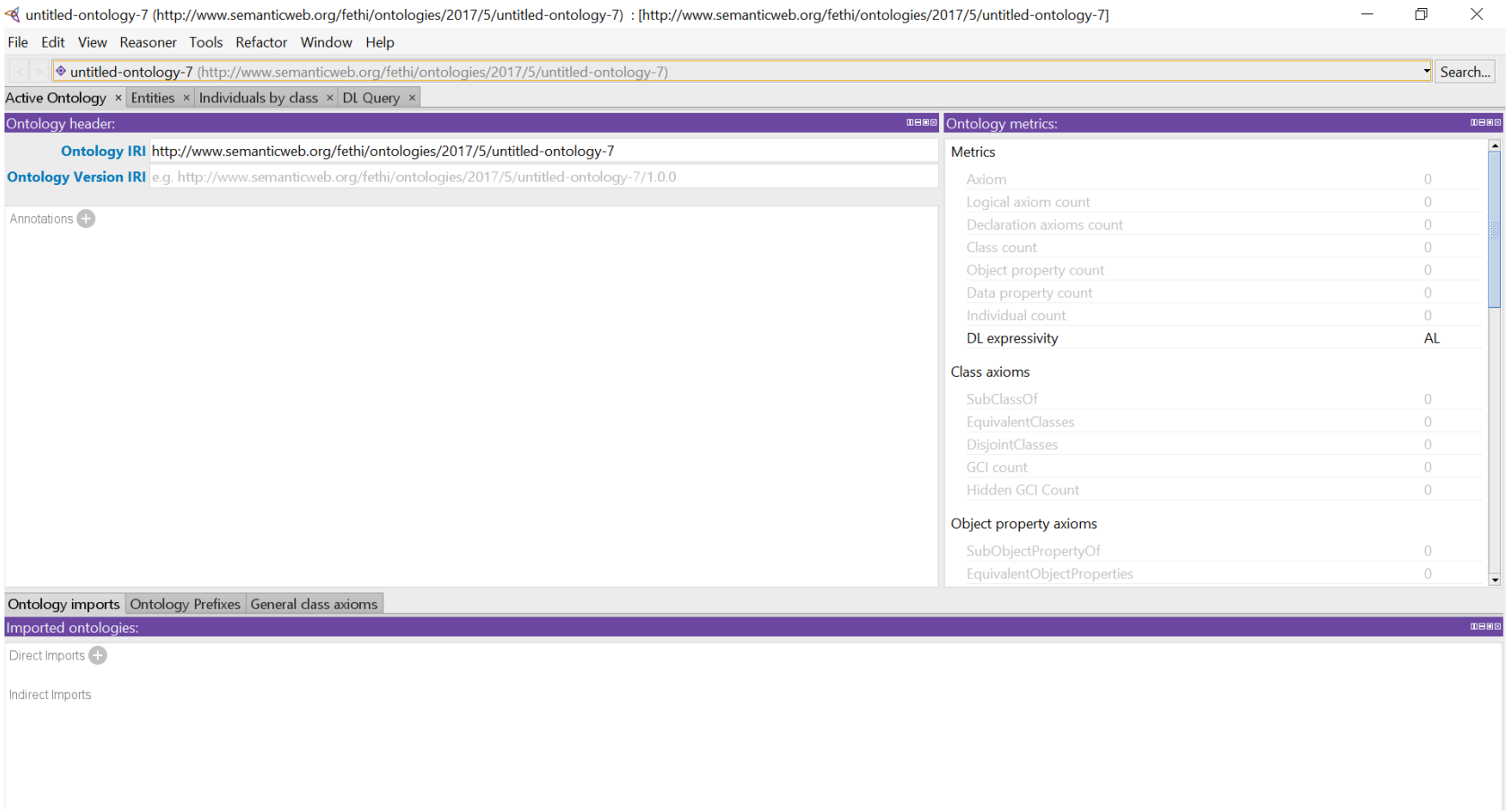
# About Protégé

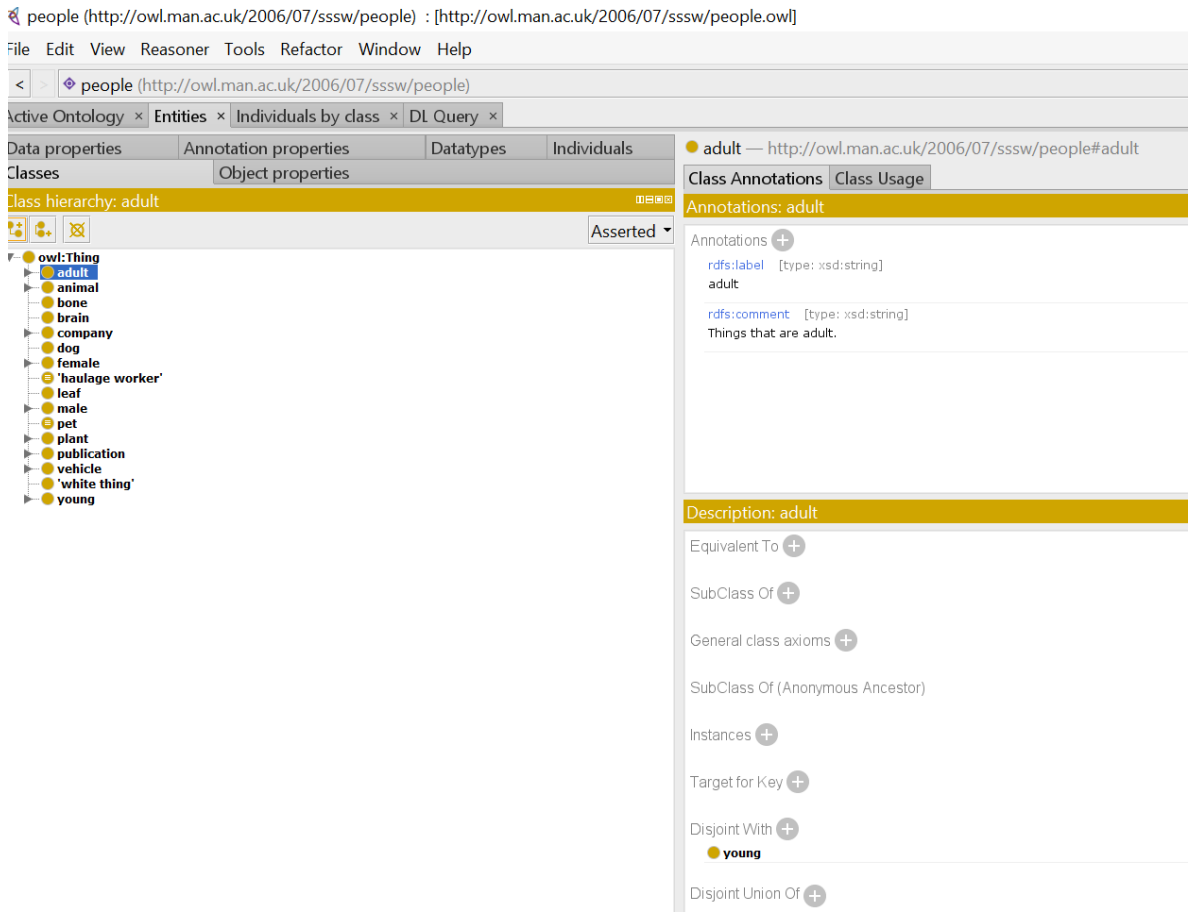

- http://protege.stanford.edu/
- Protégé is a free, open-source platform developed in Stanford University, that provides a growing user community with a suite of tools to construct semantics models and ontologies

# Main view


untitled-ontology-7 (http://www.semanticweb.org/fethi/ontologies/2017/5/untitled-ontology-7) : [http://www.semanticweb.org/fethi/ontologies/2017/5/untitled-ontology-7]
File Edit View Reasoner Tools Refactor Window Help
untitled-ontology-7 (http://www.semanticweb.org/fethi/ontologies/2017/5/untitled-ontology-7)
Search...
Active Ontology
Entities
Individuals by class
DL Query
Ontology header:
Ontology IRI
http://www.semanticweb.org/fethi/ontologies/2017/5/untitled-ontology-7
Ontology Version IRI
e.g. http://www.semanticweb.org/fethi/ontologies/2017/5/untitled-ontology-7/1.0.0
Annotations
Ontology metrics:
Metrics
Axiom 0
Logical axiom count 0
Declaration axioms count 0
Class count 0
Object property count 0
Data property count 0
Individual count 0
DL expressivity AL
Class axioms
SubClassOf 0
EquivalentClasses 0
DisjointClasses 0
GCI count 0
Hidden GCI Count 0
Object property axioms
SubObjectPropertyOf 0
EquivalentObjectProperties 0
Ontology imports
Ontology Prefixes
General class axioms
Imported ontologies:
Direct Imports
Indirect Imports

# Activities

- Open a semantic model (ontology)
- Explore entities (tab entities)



# Protégé Views (1)

- Hierarchy view
  - The primary means of navigating around an ontology is the various hierarchy views that are shown on the left of a tab by default.
  - Selecting an entity in its tree causes a global selection update (making it possible to go back and forward like a web browser). Other views that can show entities of the same type will refresh to display information pertinent to that entity.
- Annotation view
  - Classes, properties, individuals, ontologies and even axioms can be annotated. All of the views look and act the same way.
  - Clicking **Add**, double clicking on an existing annotation or clicking its **edit** button opens the editor (below)

# Protégé Views (2)

- Description view
  - **Equivalent classes** each entry specifies a named class or expression that is equivalent to the current selected class
  - **Superclasses** each entry specifies a named class or expression that is a superclass of the current selected class
  - **Inferred anonymous superclasses** protege searches all ancestors of the selected class and accumulates all of their anonymous superclasses which are then displayed in this section
  - **Members** each entry specifies an individual that has this class as its type in a class assertion axiom
  - **Disjoint classes** each entry specifies a single disjoint statement. A disjoint statement can contain 2 or more classes (the current selected class is removed from the list for clarity)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# Complete the exercise 2..

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# Reading Material

- "Information Management: A Proposal", Tim Berners-Lee, CERN March 1989, May 1990 - https://www.w3.org/History/1989/proposal.html
- How it all started- https://www.w3.org/2004/Talks/w3c10-HowItAllStarted/
- A Little History of the World Wide Web, Dan Connolly, 2000 - https://www.w3.org/History.html
- W3 Standards - https://www.w3.org/standards/
- “Web Data” activity at W3C - https://www.w3.org/2013/data/
- Creating a simple ontology in Protégé - http://protegewiki.stanford.edu/wiki/Protege4Pizzas10Minutes