

Semantic Web Assignment 2
Due: Thursday 2:20PM, Mar 17, 2015 in Blackboard
This assignment is to be done on your own.

What to turn in: a compressed file called: **HW2_lastname_firstname.tar.gz** or **HW2_lastname_firstname.zip**, which contains the following uploaded to Blackboard:

- (1) **Part 1:** Handwritten Problem Set Submitted in class
- (2) **Part 2:** DomainModel.owl and DomainModel.java
- (3) **CSC250 Part 3:** PWMModel.owl

Part 1. Written Problems

For the following ontology:

<http://www.cs.hofstra.edu/~knarig/SemanticWeb/travel.owl>

1. Create an RDF graph of all the Individuals and their relationships (10)
2. List the restricted classes and describe their restrictions in natural language (5)
2. Given the Activity class, restrict the BeachDestination class to reflect the types of activities that a Beach destination can have. (5)
3. Assign property values to the individuals CurrawongBeach and BondiBeach so that it will be inferred to be part of the BeachDestination class. (5)
4. List all the inferred relationships in this ontology. Are there any inconsistencies? If so, specify.(15)

Part 2. Ontology Design/Protege Editor and Programming

1) (30 pts)

In this assignment, you will model two OWL ontologies within a certain domain. Example sites are listed below which you will use to create your ontologies with. For each ontology, create classes, properties and restricted classes. For each class, choose 5 instances that may belong in that class. Do not assert individuals to be part of these classes but create but just assign the properties describing each individual. We will let the reasoner infer which classes these individuals belong in.

- a. Create these ontologies using the Protege Editor. Save it in the files called model1.owl and model2.owl
- b. Write a paragraph describing your ontologies, note the differences between them and give reasons as to why you chose to model them in this specific way.

Music:

B&N Music (bn.com)

Amazon Music (amazon.com)

Restaurants

Menu Pages (menupages.com)

Restaurant Row (restaurantrow.com)

Social Networks

Facebook Profile (facebook.com)

LinkedIn Profile (linkedin.com)

Travel

Orbitz (orbitz.com)

Expedia (expedia.com)

News Sites

NYTimes (nytimes.com)

Wall Street Journal (wsj.com)

2) Programming:

In this portion of the assignment, you will learn how to use the JENA API to process the owlModel1.owl and owlModel2.owl files. Create a Java class called ProcessOWL and write methods to accomplish the following:

- a) readModel: read an ontology into a model.
- b) printEntities: print the classes and individuals of an ontology Model
- c) printInferences: pass the ontology model to a reasoner engine and using the inferred ontology, for each individual, list the inferred classes it belongs in

Example output:

Model1

Classes: Books, TextBooks, Paperbacks, Classics

Individuals: Jane Eyre, Tom Sawyer, Foundations of Semantic Web Technologies

Model2

Classes: BestSellers, NYTimesPicks, TextBooks, Literature

Individuals: Jane Eyre, Blink, Foundations of SW Technologies

Inferred Model1:

Jane Eyre: Classics, PaperBacks

Tom Sawyer: Classics, PaperBacks

Foundations of SW Technolgoies: TextBooks

Inferred Model2:

Jane Eyre: Literature, NYTimesPicks
Blink: NYTimesPicks, BestSellers
Foundations of SW Technologies: TextBooks

Part 3: Semantic Web Services (CSC250 Required; CSC150 Optional)

a. In this assignment you will model two service classes from the Programmable Web (<http://www.programmableweb.com>) service categories. Given at least 5 APIs from each category, read through the API documentation and try to find high-level features that describe that service category. You will create these distinguishing features as subclasses of the Feature class for that service category and then assign them to the 'hasFeature' Object property for each API. If you are unfamiliar with the domain of this service class, read through a Wikipedia article relating to the service domain to see what common features exist across these APIs. The skeleton ontology with an example of the Utility, Real Estate, Travel, Social and Advertising classes is provided here:

<http://www.cs.hofstra.edu/~knarig/SemanticWeb/PW.owl>.

Note how some of these APIs are overlapping between both classes.

b. Write a paragraph describing the service categories and the types of high-level features it has and whether or not any APIs are overlapping between both categories