# CO7516 Semantic Web

# Coursework 2

## SPARQL queries and OWL ontologies
## (Individual work)

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## Important Dates:

Deadline: 14-March-2018 at 23:59 GMT

The deadline is strict and will not be changed. Please ensure that you submit your work in time.

- This coursework counts as 10% of your final mark (20% of coursework mark).
- This coursework is **an individual assignment,** not based on group work.
- Please read guidelines on plagiarism in the study guide and course documentation.
- This coursework requires knowledge about SPARQL, RDF(S) and OWL.
- Please put your plagiarism coversheet for this coursework in Box A or submit a signed coversheet electronically to the blackboard.

## Instructions:

- You have to use the **same domain** and the **same competency questions** that used in coursework 1

- This assignment will be marked out of 100 with 10% of the marks reserved for good documentation.

- Please make sure that you understand “what is expected” in this assignment, well before the deadline.

## Tasks:

### Part 1 [25 Marks]

1. Give ***two*** examples of constraint that you were not able to achieve in coursework 1 due to the limited expressivity of RDFS. (5%)

2. Choose ***three*** competency questions from coursework 1. For each question, write a SPARQL query to answer it. (15%)

3. Write ***one*** SPARQL query to search your ontology, and briefly explain what will be returned. Both queries should demonstrate ALL these features (10%):

    - OPTIONAL
    - FILTER
    - UNION
    - GROUP BY

### Part 2 [75 Marks]

Create and populate an OWL2 ontology in the same domain as in coursework 1.

1. Include at least 4 OWL subclass restrictions (use owl:Restriction). (5%)
2. Include at least 2 DataType Properties and at least 2 ObjectProperties. (5%)
3. Include at least 2 property restrictions each on the domain and range. (5%)
4. Include at least 1 Class defined using owl:intersectionOf. (5%)
5. Include at least 1 Class defined using owl:unionOf. (5%)
6. Include at least 3 Cardinality restrictions (exact, min and max). (6%)
7. Include at least 2 Existential restrictions. (5%)
8. Include at least 2 Universal restrictions. (5%)
9. Include at least
    a. 2 Symmetric Properties (4%)
    b. 2 Transitive Properties (4%)
    c. 2 Inverse Properties (4%)
    d. 2 Functional Properties (4%)
    e. 2 Inverse Functional Properties (4%)
    f. 1 Reflexive Property (2%)
    g. 1 Irreflexive Property (2%)
10. For each of the sub questions (2.1-2.9), indicate where the answers can be found.
11. Populate the ontology with necessary instances to showcase the ontology. (10%)

## Submission

- For Part 1 and Part 2.10, submit them as a PDF document **Answers.pdf**. Please include your name and email id in this document.

- Zip **Anwers.pdf** and all Protégé files in Part 2 in a single zip file for submission.

- The zip archive should be named **CO7516_CW2_your_email_id.zip**
- (e.g. CO7216_CW2_abc123.zip).

Your submission should also include a completed coursework plagiarism coversheet (signed PDF or image). You need to submit the zip file via Blackboard, and you are allowed to re-submit as many times as you like **before** the deadline. Marks for any coursework which does not have the accompanying cover sheet will be withheld till you provide one.