Question 3

Web Ontology Language (OWL) was created as a standard by the Web Ontology Working group, which was formed by the World Wide Web Consortium (W3C). Grau et al. (2008) There are 3 language variants of OWL. Owl Lite, OWL DL and OWL Full. Where OWL DL has more expressive power than OWL Lite and OWL in turn has more expressive power than OWL DL. (Patel-Schneider, Hayes, & Horrocks, 2004)

RDF uses triples of the form

$$\langle A, R, B \rangle$$

to represent information. Where A is the Subject that has a relationship, R is the relationship and B is the Object the relationship applies to. (Grau et al., 2008)

OWL ontologies can be written using RDF triples. This syntax is called OWL 1 RDF. Indeed most have been written using OWL 1 RDF syntax. (Bechhofer & Carroll, 2004)

This can make expressing certain OWL 1 concepts difficult because RDF triples cannot be created for many OWL 1 constructs. (Grau et al., 2008) Using the example from Grau et al. (2008), to indicate A is the union of B and C we have to create the following construct:

$$\langle A, owl : unionOf, \_ : x1 \rangle$$

$$\langle \_ : x1, rdf : first, B \rangle$$

$$\langle \_ : x1, rdf : rest, \_ : x2 \rangle$$

$$\langle \_ : x2, rdf : first, C \rangle$$

$$\langle \_ : x2, rdf : rest, rdf : nil \rangle$$

(Grau et al., 2008)

This example shows a couple of interesting things. In OWL 1 RDF, RDF and OWL types are used together i.e. *owl:unionOf* and *rdf:first*. Also expressing relatively simple concepts can be difficult to read.

References

Bechhofer, S. K., & Carroll, J. (2004). Parsing owl dl: trees or triples? In *Proc. 13th int. conf. world wide web* (pp. 266–275).

Grau, B. C., Horrocks, I., Motik, B., Parsia, B., Patel-Schneider, P. F., & Sattler, U. (2008). OWL2: The next step for OWL. *J. Web Semant.*, *6*(4), 309–322.

Patel-Schneider, P. F., Hayes, P., & Horrocks, I. (2004, February). *Owl web ontology language semantics and abstract syntax, w3c recommendation.*