

# Knowledge Representation Laboratory 7: Building Knowledge Graphs and Constraints

CITS3005

This laboratory will involve setting up RDFLib in Python on your system, working through the basic tutorial, and completing some exercises.

1. The Medium article at <https://medium.com/wallscope/constructing-sparql-queries-ca63b8b9ac02> describes the process of building a large knowledge graph corresponding to all the modern Olympics, and the running some queries. A turtle file of a fragment of that knowledge graph is available from the unit web page ([www.csse.uwa.edu.au/teaching/CITS3005/olympics.ttl](http://www.csse.uwa.edu.au/teaching/CITS3005/olympics.ttl)).

Import this graph with rdfib, and run the listed SPARQL queries in rdfib.

Can you write a query that will order all countries by how likely an athlete from that country is to win a medal in their event?

2. Follow a similar process to build a knowledge graph of the UWA handbook data, using the files provide on the unit project page. Describe a schema for the data, and represent the schema in RDFS. Particularly what super-classes are make sense to include in the descriptions.

Can you design a SPARQL query to rank the majors by the minimum number of textbooks required to complete that major?

3. Examine the handbook data and design a set of constraints to ensure that the data is consistent and usable. What kind of errors and omissions have you found? What kind of shapes would be required to detect those errors.

Design a constraint to ensure that all units have at least three outcomes.