

## 5. RDFS

The purpose of this lab is to familiarize you to build an RDFS ontology and to make a simple RDFS inference engine.

### Tourism Ontology

Write an RDFS ontology in Turtle syntax that represents the following:

- Each museum is a tourism attraction.
- Each art museum is a museum.
- Each modern art museum is an art museum.
- Each history museum is a museum.
- Each landmark is a tourism attraction.
- Each outdoor spot is a tourism attraction.
- Each amusement park is a tourism attraction.
- Each restaurant is a tourism object.
- Each hotel is a tourism object.
- Each tourism attraction is a tourism object.
- Only tourism objects can have a TripAdvisor rating.
- Each 'has TripAdvisor rating' is a 'has rating'.
- Only hotels can have a star.
- Each 'has star' is a 'has rating'.
- Only museums can have curators.
- Only people can be a curator of a museum.
- Only tourism attractions can have ticket price.
- Only restaurants can have a head chef.
- Each 'has head chef' is a 'has chef'.

- ‘has chef’ has range chef.
- Each chef is a skilled worker.
- Only restaurants can have signature dishes.
- Only restaurants can have the information whether they are a Michelin-starred restaurant.
- Only hotels can have a number of rooms.
- Each hotel chain is a `rdfs:Container`.
- ‘has hotel’ is a `rdfs:ContainerMembershipProperty`.
- Only hotel chains can have hotels.
- ‘has hotel’ has range hotel.

## Simple RDFS Inference Engine using Jena

Create a simple RDFS forward-chaining inference engine with the following requirements:

- Use Jena to store and load triples.
- Use SPARQL queries to infer all new triples.  
Hint: Use CONSTRUCT and ASK queries to ease the development.
- You should cover all entailment rules, except the rule `rdfs1`, at:  
[http://www.w3.org/TR/rdf11-mt/#rdfs\\_patterns](http://www.w3.org/TR/rdf11-mt/#rdfs_patterns)

Using your inference engine and your tourism ontology, list new RDFS-inferred facts for each of the following:

- Museion is a modern art museum. The curator of Museion is Francesco Pavarotti.
- The number of rooms in the Greif is 20. The hotel chain BZ-Hotel has two hotels: the Greif and Laurin.
- The TripAdvisor rating of Chicken Hut is 3.5. It doesn’t have any Michelin’s star. Del Piero is the head chef of Chicken Hut.