AI3001- Knowledge Representation and Reasoning

Programming Assignment No. 2

Fall 2024

Instruction

The assignment is for individual and there should not be any case of cheating. You can have discussion about any problem and approach among yourself but do not share code and instruction for any problem.

The objective of this assignment is to make you understand how a declarative language can be used to process semantically rich queries. You will be using RDF, OWL or XML representational files to process semantic rich queries. You are free to use Python to process knowledge representation and query processing.

Due Date: November 14th, 2024 21:00PM

Problem No. 1 Beverages

You are given a web ontology file for beverages in ttl format (Beverages.ttl). Read the file and using SPARQL answer the following queries.

1. Retrieve All Beverages in the Hierarchy
2. List All Types of Tea (Including Subcategories)
3. Identify Cold Beverages Only
4. Find Beverages That Are Either Soda or Juice
5. Retrieve All Hot Beverages and Their Types Using Reasoning
6. Logical Question: Find All Beverages that are Neither Hot Not Cold
7. Find All Beverages Containing 'Tea' in Their Label
8. Identify Subcategories with More Than One Type
9. Find the Direct Subcategories of Beverages (Immediate Children Only)
10. Find beverages contains soda.

Problem No.2 Furniture

A RDF file is provided in ttl format for knowledge representation for the concepts of furniture. Using this file write the SPARQL queries for the given queries.

1. Retrieve All Types of Seating Furniture (Including Subcategories)
2. List All Types of Tables in the Furniture Hierarchy
3. Retrieve All Storage Furniture Types with "Cabinet" in Their Label
4. Find Direct Subcategories of Furniture
5. List All Items that Belong to the Storage Category
6. Find Furniture Types Not Classified as Seating or Table
7. Identify All Categories with More Than One Specific Type of Furniture
8. Retrieve All Furniture Items Containing "Bed" in Their Label
9. List All Bed and Storage Items Together