March 2024

Master 1 - UY1 Semantic Web

Hands on sessions

Part 1: Knowledge Engineering /30

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Hands on 0: Installation and configuration of tools /10

- ➔ Presence to the overall lectures /5
- ➔ Installation and configuration of tools **/5**
  - Dia: for knowledge modeling using UML **1pts**
  - Protégé: for knowledge representation **1pts**
  - Tool for deploying Knowledge Graphs: Install Jena Fuseki Server **3pts**
    - Download jena-fuseki-server.zip: https://jena.apache.org/download/
    - Unzip the file
    - Enter in the jena-fuseki-server unzipped and type the command:
      ./fuseki-server --update --mem /ds: to allow update on the dataset *(--update) and to create a dataset named ds (--mem /ds)*
      *Or: **./fuseki start**: start the server; and **./fuseki stop**: stop the server*
    - Go to the web browser: localhost:3030
    - Deploy a simple ontology and make some SPARQL queries

Hands on 2: Knowledge Acquisition and modeling 10pts

1. Data collection on what you eat daily **2pts**
   - **Objectif:** describe your eating habit
   - Write 10 facts on your eating and drinking habit **1pt**
   - Create a RDF graph using these facts using Dia **1pt**
2. Collecting knowledge on the food eaten in Africa **6pts**
   - **Objectif:** describe all the food eaten in Africa
   - Choose a country
   - Collect all the food images and names eaten in this country **2pts**
   - Describe the ingredient of each food **2pts**
   - Provide the food components of some foods of your choice **2pts**
3. Create UML describing your knowledge **2pt**

Hands on 3: Knowledge Serialization and use 10pts

Download the ontology provided on the following link:

- Enrich this ontology ontology using the knowledge acquired during the Hands on 2 **1pts**
- Populate this ontology using imaginary data **1pts**
- Deploy the ontology using Jena Fuseki Server **1pt**
- Design an interface for enriching and populating this ontology to obtain a food knowledge graph: **7pts**
    - Design an interface to save data
    - Write the SPARQL queries to obtain the following information:
    - Show all the classes and subclasses
    - Show all the food eaten by a person “provide the name as argument”
    - Give the list of all the persons in ascending or descending order
    - Give the name of all the foods in ascending and descending order
    - Design an interface to query the KG using SPARQL endpoint

Part 2: Large Language Models /20

Mr. Jean Bikim

Hands on 0: Installation and configuration of tools /10

➔ Installation and configuration of tooL

- ◆ Create an HuggingFace token **1pts**
- ◆ Copy the code on google collab without errors **4pts**
  - ○ Install dependencies
  - ○ Load dataset
  - ○ Load model
  - ○ Configure training and LoRA parameters