

First Midterm Test – Semantic Web course a.a. 2024/2025

Solve the following two exercises and upload the solutions on Moodle in a .txt file.

1) RDF/S for Representing Knowledge (6 Points)

- Use the Turtle syntax to represent the facts described in the following text.
- For individuals, use Wikidata IRIs using the wd prefix.
- Only for the underlined words in the text, define your own classes or properties using the default prefix, and state that they are subclasses or subproperties of a term of FOAF or DC.
- For all other classes and properties, choose and use the terms from RDF, RDFS, FOAF, or DC listed below.
- For literals, use the appropriate XSD datatypes.
- Any individual must have rdf:type, rdfs:label, and rdfs:comment.
- Validate your code using <http://ttl.summerofcode.be>

TEXT

Vincent Willem van Gogh (30 March 1853 – 29 July 1890) was a Dutch Post-Impressionist painter who is among the most famous and influential figures in the history of Western art. He had a younger brother named Theo van Gogh. Vincent created several famous paintings, including The Starry Night (1889) and The Potato Eaters (1885).

Notes

- Carefully select terms from RDF, RDFS, FOAF, or DC when representing general properties and classes not specified for custom definition.
- Ensure that each individual entity (e.g., Vincent van Gogh, The Starry Night) is fully annotated as specified.
- Validate and refine your Turtle syntax to achieve precise, error-free output.

Prefixes

rdf: <<http://www.w3.org/1999/02/22-rdf-syntax-ns#>>

rdfs: <<http://www.w3.org/2000/01/rdf-schema#>>

xsd: <<http://www.w3.org/2001/XMLSchema#>>

foaf: <<http://xmlns.com/foaf/0.1/>>

dcterms: <<http://purl.org/dc/terms/>>

dctypes: <<http://purl.org/dc/dcmitype/>>

wd: <<http://wikidata.org/entity/>>

Classes

foaf:Person, the class of people

dctypes:Text, the class of texts (books, poems, letters...)

dctypes:Image, the class of images (paintings, prints, drawings, ...)

Properties

rdf:type, an individual (IRI) is instance of a class (IRI)

rdfs:label, a resource (IRI) has a name (xsd:string)

rdfs:comment, a resource (IRI) has a description (xsd:string)

foaf:name, a resource (IRI) has a name (xsd:string)

foaf:givenName, a person (IRI) has a given name (xsd:string)

foaf:familyName, a person (IRI) has a family name (xsd:string)

foaf:knows, a person (IRI) knows another person (IRI)

dcterms:creator, a resource (IRI) has a creator (IRI)

dcterms:created, a resource (IRI) has a date of creation (xsd:date)

dcterms:issued, a resource (IRI) was published on a date (xsd:date)

Individuals

- Vincent van Gogh (Q5582)
- Theo van Gogh (Q317188)
- The Starry Night (Q45585)
- The Potato Eaters (Q154469)

SPARQL Queries (24 Points)

Instructions

- Download the knowledge base from Moodle, open it in a text editor, and review its contents.
- Download the Blazegraph JAR file and launch it.
- Access the Blazegraph web interface and create a new namespace named "midterm1" (without spaces).
- Upload the knowledge base into Blazegraph.
- Write and execute the following queries on the knowledge base.

Queries

1. Retrieve the labels of authors and the labels of their novels published after the year 1930.
2. Retrieve the labels of fictional characters and the number of movies in which they are the main characters.
3. Retrieve the sum of the prices of novels and movies for each language label.
4. Retrieve the average price for every type of work (such as novels, movies, etc.), applying a 10% discount to the original price.
5. Retrieve eight distinct, alphabetically ordered family names of people who are not directors, starting from the sixteenth result.
6. Retrieve the labels of fictional characters who are the main characters in fewer than seven works (such as novels, movies, etc.).