i

Instructions

The exam consists of five tasks, of which you only need to answer four. Each task counts 25% of the final grade. Note that when submitting your exam, the system might warn you that you have not answered all of the five questions.

1

Task A: Linked Open Data

1. Explain the Linked Open Data principles.
2. What is the LOD Cloud? List five of its most important parts.
3. How is the LOD Cloud similar and how does it differ from the original semantic web vision?
4. What does LOV stand for, and what is it?

Fill in your answer here

Format

Words: 0

Maximum marks: 25

2

Task B: Jena

1. What is Jena?
2. Draw an architecture overview of Jena (use a separate paper sheet if you want). Explain each of the components carefully.
3. Below you will find a description of a scenario. Write Java code or pseudocode that uses Jena's core API to create the corresponding OWL ontology. Reuse terms from common vocabularies when you can.
4. For the same problem description, write Java code or pseudocode to create the OWL ontology with one or more SPARQL INSERT statements.

Scenario: A parking house is a kind of building and has unique (one and only one) capacity for a specific number of cars. CityGarage is a Parking House. It can take 225 cars. All buildings and cars have unique locations. SV27564 is a car that is currently parked in the CityGarage.

Fill in your answer here

Format

Words: 0

Maximum marks: 25

3 Task C: RDFS semantics

1. What is an axiom in RDFS? Provide an example (for example written in Turtle).
2. What is an entailment rule (or implication rule) in RDFS?
3. What does it mean that the rdfs:subClassOf property is transitive and reflexive?
4. Write the entailment rule that states that rdfs:subClassOf is transitive (for example using SPARQL CONSTRUCT or INSERT).

Fill in your answer here

Format

Words: 0

Maximum marks: 25

4 Task D: Wikidata

1. What is Wikidata?
2. Where do the data in Wikidata come from?
3. Explain how data is structured in Wikidata.
4. Compare WIkidata and DBpedia. What are the main similarities and differences?

Fill in your answer here

Format

Words: 0

Maximum marks: 25

5 Task E: Ontology

1. Model the scenario described below as an OWL ontology. You can draw some of it as a graph (use a separate paper sheet if you want) and write other parts in Turtle or using Description Logics. Reuse terms from common vocabularies when you can.
2. Assume that your ontology is stored in a database that supports RDFS and OWL entailment. Write a SPARQL query that lists all buses that currently have too many passengers.
3. Write a SPARQL query that identifies the following inconsistency: a person is in a vehicle, but the location of the person is different from the location of the vehicle.

Scenario: A location has a longitude, a latitude and an altitude. A vehicle can be a bicycle, bus or a car. A car can be a private car or a taxi. A building has a unique (one and only one) location. A parking house is a kind of building and has capacity for a specific number of cars. Bicycle stands, bus stops and taxi stops are locations. A person can use a vehicle. A car can be inside a parking house. A bicycle can be in a stand. A bus can be at a bus stop. A taxi can be at a taxi stop. Bicycles, buses and cars are disjoint. A person and a vehicle has a unique (one and only one) location at any particular time. A taxi can have up to 4 passengers, whereas a bus can have up to a specific number of passengers.

Fill in your answer here

Format

Words: 0

Maximum marks: 25