ℹ Introduction

Answer 4 out of 5 tasks

The exam comprises 5 tasks, *but you shall only answer 4 of them.* Each task you choose counts 25% of the final grade. You will not get extra credits from answering more than 4 tasks.

ℹ Task 1

Task 1: Multiple choice

Task 1 consists of 10 multiple choice questions. For each question, mark the best answer alternative.

1 1a

Task 1a: Jena can most accurately be described as...
Select an alternative:

- ○ An RDF-based programming language

- ○ A semantic programming environment

- ○ A set of libraries and tools for RDF programming in Java

- ○ A tool for storing and analysing large RDF graphs

Maximum marks: 1

2 1b

Task 1b: What is not a central class/interface in Jena's RDF API?
Select an alternative:

- ○ Statement

- ○ Turtle

- ○ Model

- ○ Literal

Maximum marks: 1

3   # 1c

Task 1c: Which data structure is output from a SPARQL CONSTRUCT query?
Select an alternative:

○ A boolean value

○ The user can chose

○ An RDF graph

○ A table

Maximum marks: 1

4   # 1d

Task 1d: What is a triple store?
Select an alternative:

○ An online semanic dataset

○ A database system specifically for RDF data

○ A tool for wrapping non-semantic datasets

○ A combination of RDF data, ontology, and SPARQL endpoint

Maximum marks: 1

5   # 1e

Task 1e: An axiom in RDFS is most accurately described as...
Select an alternative:

○ A triple that is entailed by an RDFS rule

○ A triple that is asserted by a trusted source

○ A triple that is implicitly there in all RDFS models

○ Something that is formally proven

Maximum marks: 1

6 **1f**

Task 1f: Which property not reflexive?
Select an alternative:

○ rdt:type

○ owl:sameAs

○ rdfs:subPropertyOf

○ rdfs:subClassOf

Maximum marks: 1

7 **1g**

Task 1g: The property "semanticRelation" is defined in which vocabulary?
Select an alternative:

○ RDFS

○ VoID

○ VANN

○ SKOS

Maximum marks: 1

8 **1h**

Task 1h: Wikidata now gets most of its data from...
Select an alternative:

○ DBpedia

○ User-generated content

○ Wikipedia

○ Natural Language Processing (NLP)

Maximum marks: 1

9   1i

Task 1i: In OWL, the statement "Herbivores only eat Plants" is most similar to...
Select an alternative:

- ○ A universal property restriction

- ○ A cardinality restriction

- ○ A complement class

- ○ An existential property restriction

Maximum marks: 1

10   1j

Task 1j: How can you state that something is not the case in plain DL (not OWL DL)?
Select an alternative:

- ○ Contradiction

- ○ Disjunctiveness

- ○ Negative property assertion

- ○ Subsumption of bottom

Maximum marks: 1

11 # Task 2

Task 2: Vocabularies

a. Why do we need RDFS in addition to RDF? What are the most important additional features of RDFS compared to RDF?

b. Why do we need OWL addition to RDFS? What are the most important additional features of OWL compared to RDFS?

c. What is the purpose of the geo vocabulary? Very briefly explain its most important properties and other terms.

d. What is the purpose of the PROV vocabulary. Very briefly explain its most important properties and other terms, or show them in a simple diagram.

e. What is the purpose of the SIOC vocabulary. What is its full name? Very briefly explain its most important properties and other terms, or show them in a simple diagram.

Fill in your answer here

Format ▾	**B** *I* U x₂ x²			Ω	Σ	ABC▾	

Words: 0

Maximum marks: 10

12

Task 3

Task 3: Open datasets

a. What is GeoNames? List different ways in which we can access data in GeoNames.

b. Explain briefly how the GeoNames ontology is organised.

c. When taliking about GeoNames, what is the Concept-Document distinction? How does GeoNames handle it?

d. What is the Linked Open Data cloud? What are the most prominent types of data (or domains) in the LOD cloud? Give an example of central datasets for each type/domain.

e. What is Linked Open Vocabularies?

Fill in your answer here

| Format ▾ | B | I | U | x₂ | x² | Iₓ | | | | ↶ | → | ⟳ | | | Ω | ⊞ | | Σ | | ABC▾ | | ⤬ |

Words: 0

Maximum marks: 10

13   # Task 4

Task 4: DL (25%)

Write the following statements in Description Logic (DL) using the underlined terms as concepts, roles, and individuals.

Note: If writing the special DL characters in Inspera is difficult, you are free to use substitutions, such as:

- *ALL/ONLY instead of ∀ ,*
- *EXISTS/SOME instead of ∃ ,*
- *SUBSETEQ instead of ⊑ ,*
- *== instead of ≡ ,*
- *>= instead of ≥ ,*
- *AND instead of ⊓ ,*
- *OR instead of ⊔ ,*
- *BOTTOM instead of ⊥ ,*
- *TOP instead of ⊤ , and so on.*

a. A Resource is either a Video, Audio or Text.
b. No Resource is more than one of these: Video, Audio and Text.
c. A Video has at least one soundtrack.
d. A Video can only have Audio resources as soundtracks.
e. Anything that is a soundtrack is an Audio resource.
f. A Resource is tagged at least three times.
g. Anything that is used as a tag is a Keyword.
h. Gullruten2018 is a Video.
i. Gullruten2018 is tagged with Entertainment, Bergen, and SigridBondeTusvik.

Fill in your answer here

Format	B	I	U	x₂	x²								Ω			Σ		

Words: 0

Maximum marks: 10

14   **Task 5**

Task 5: Semantic representation of media archives (25%)

You are brought in as an advisor for TV2. They want to start using semantic technologies to make their archival materials easier to retrieve. Their archive consists of videos in particular, but also of many other types of background information. They want both to make internal production more effective and to offer their archives to external customers as a commerical service.

a. Present the main arguments for and against using semantic technologies for this purpose.
b. Outline a plan for how the IT department should get started with using semantic technologies.
c. Which vocabularies or ontologies do you know that define terms that can be reused in a vocabulary for TV2's archive?
d. TV2 would have to develop/refine parts of such a vocabulary themselves. Outline a plan for doing this.

Fill in your answer here

| Format ▾ | **B** | *I* | <u>U</u> | x₂ | x² | I× | ⧉ | ⧉ | ↰ | ↱ | ↻ | ☰ | ☰ | Ω | ⊞ | ✎ | Σ | ABC ▾ | ✖ |

Words: 0

Maximum marks: 10