

## i Introduction to part 1: General questions

In this task, you get 22 multiple choice questions. Selecting the correct answer gives +1 point, whereas wrong answers give -1 point. An empty answer gives 0 points.

You should try to finish this task in less than 25 minutes. It counts around 14% of the exam.

### 1 INFO216 - LOD acronym

**LOD is an acronym for**

**Select one alternative:**

- Lean Open Data
- Linked Open Data
- Live Online Data
- Linguistic Online Documents

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Maximum marks: 1

### 2 INFO216 - not a core LOD principle

**Which is NOT one of the four core LOD principles?**

**Select one alternative:**

- Use URIs that answer to HTTP requests
- URIs return information that contain URIs of related resources
- URIs return information about resources on standard semantic formats
- Use URIs that are language-independent.
- Use URIs to identify resources

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Maximum marks: 1

### 3 INFO216 - not a LOD best practice

Which is NOT a best practice for data provisioning in the LOD cloud?

Select one alternative:

- Use terms from widely deployed vocabularies
- Refer to additional access methods (e.g., SPARQL)
- Provide dataset-level metadata (e.g., VANN, VS)
- Make proprietary vocabulary terms dereferencable
- Provide licensing metadata (e.g., CC)
- Provide provenance metadata (e.g., PROV)
- Map proprietary vocabulary terms to other vocabularies
- Use URIs that are standardised by the W3C

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Maximum marks: 1

### 4 INFO216 - RDF resources can be

An RDF resource can be

Select one alternative:

- a concept
- any of these
- a material phenomenon (including people and artefacts)
- an information resource
- a property

---

Maximum marks: 1

## 5 INFO216 - RDF resource types

**An RDF resource**

**Select one alternative:**

- always has rdfs:Class as its rdf:type
- may or may not have an rdf:type
- always has at least one rdf:type
- must have exactly one rdf:type

---

Maximum marks: 1

## 6 INFO216 - RDF lists

**It is true about an rdf:List (collection) that**

**Select one alternative:**

- New members cannot be added without deleting triples
- It is easy to add new members
- It is typically used to represent alternatives
- Cannot contain the same resource several times

---

Maximum marks: 1

## 7 INFO216 - RDFS containers

An RDFS container **CANNOT**

Select one alternative:

- Be an rdfs:Alt, rdfs:Bag or rdfs:Seq
- Be an rdf:List
- Have duplicate members
- Be extended without deleting triples

---

Maximum marks: 1

## 8 INFO216 - reification

Reification is that

Select one alternative:

- A URI answers HTTP requests and returns more information about a resource
- 303 redirection is used to return information about a resource
- A triple is unpacked into four new triples
- A resource represents a material thing or place

---

Maximum marks: 1

## 9 INFO216 - RDF expressiveness

Which of these are supported by the RDF semantics?

Select one alternative:

- The object in a hasWorkHomepage triple is a URL
- The subject in a hasLicensePlate triple is a Vehicle
- Legally owning a gun means owning a licensed weapon
- A Motorbike is a Vehicle
- Everything that is used as a predicate in a triple is an rdf:Property

---

Maximum marks: 1

## 10 INFO216 - RDFS Schema

RDF Schema (RDFS) is NOT

Select one alternative:

- Used for defining other vocabularies
- Used to query RDF graphs
- The foundation for SKOS, OWL and OWL2
- A small RDF vocabulary for more expressive graphs

---

Maximum marks: 1

## 11 INFO216 - why RDFS classes

What is NOT a reason that RDFS has resource classes?

Select one alternative:

- Knowing the type (class) of a resource often means we can infer additional information about it (entailment)
- Classes are important for defining and using other RDFS concepts
- We can describe the class formally using RDFS and OWL DL
- The type (class) of a resource is an important part of its semantics
- RDFS classes restrict which properties RDF resources can have

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Maximum marks: 1

## 12 INFO216 - RDFS resource classes

What is true about RDFS resource classes?

Select one alternative:

- Resources have the same RDFS class throughout their lifetime
- Classes are templates for instantiating objects
- The properties of a resource are only visible to its neighbours
- The properties of a resource determines its RDFS class
- Provides Information hiding

---

Maximum marks: 1

**13 INFO216 - RDFS expressiveness**

**Which one can be expressed in plain RDFS?**

**Select one alternative:**

- A Republic has exactly one President
- Properties with different URIs are actually the same
- A StringQuartet has two violins but only one viola and one cello
- A class is a union (or intersection) of other classes
- A FootballTeam has 11 players, a VolleyballTeam only 6
- The BirthNumber of a Person is unique
- Everyone who receives medial treatment is a patient
- Every ancestor of an ancestor is an ancestor too
- A class is a negation of another class
- Two individuals with different URIs are actually different

---

Maximum marks: 1

## 14 INFO216 - RDFS axioms

It is NOT true about RDFS axioms that

Select one alternative:

- Triples that are “built into” the RDFS semantics
- Predefined in any RDFS graph even when they are not visible
- An essential part of the semantics of RDFS
- There are 40 axioms and 3 axiom schemas
- Based on description logic (DL)

---

Maximum marks: 1

## 15 INFO216 - JSON-LD keywords

Which is NOT a reserved keyword in JSON-LD?

Select one alternative:

- @id: signifies that the JSON object with the @id key is identified by a particular URI
- @rule: signifies an entailment rule that applies to the object
- @context: signifies a JSON object that contains the context (or semantic mapping) for the other objects in the same JSON array
- @type: signifies that the JSON object with the @type key has a particular RDF type (or several types)
- @value: signifies that a value is a literal

---

Maximum marks: 1

## 16 INFO216 - JSON-LD forms

### JSON-LD forms

Select one alternative:

- Regularised and normalised forms are harder to program because there are many rules to follow
- Expansion does not also do regularisation
- A graph can only be expressed in a single way
- Compaction removes context by pushing semantics out into the objects
- Expansion creates a normalised form for easier parsing by computer
- Compaction represents the objects compactly by pulling semantics back into the context

---

Maximum marks: 1

## 17 INFO216 - RDF serialisation 1

Which RDF serialisation is this?

```
[
  {
    "@id": "http://ex.org/DaVinci",
    "@type": [
      "http://ex.org/Person"
    ],
    "http://ex.org/painted": [
      {
        "@id": "http://ex.org/MonaLise"
      }
    ]
  },
  {
    "@id": "http://ex.org/Paris",
    "@type": [
      "http://ex.org/City"
    ]
  },
  {
    "@id": "http://ex.org/Louvre",
    "@type": [
      "http://ex.org/Museum"
    ],
    "http://ex.org/isLocatedIn": [
      {
        "@id": "http://ex.org/Paris"
      }
    ]
  },
  {
    "@id": "http://ex.org/MonaLisa",
    "http://ex.org/isIn": [
      {
        "@id": "http://ex.org/Louvre"
      }
    ]
  }
]
```

Select one alternative:

- JSON-LD
- TriG
- N-TRIPLE
- NQUAD
- RDF/XML
- Turtle (TTL)

---

Maximum marks: 1

## 18 INFO216 - RDF serialisation 2

Which RDF serialisation is this most typically?

```
<http://ex.org/Paris> <http://www.w3.org/1999/02/22-rdf-syntax-ns#type> <http://ex.org/City> .  
<http://ex.org/DaVinci> <http://www.w3.org/1999/02/22-rdf-syntax-ns#type>  
<http://ex.org/Person> .  
<http://ex.org/MonaLisa> <http://ex.org/isIn> <http://ex.org/Louvre> .  
<http://ex.org/Louvre> <http://www.w3.org/1999/02/22-rdf-syntax-ns#type>  
<http://ex.org/Museum> .  
<http://ex.org/DaVinci> <http://ex.org/painted> <http://ex.org/MonaLise> .  
<http://ex.org/Louvre> <http://ex.org/isLocatedIn> <http://ex.org/Paris> .
```

Select one alternative:

- TriG
- NQUAD
- RDF/XML
- N-TRIPLE
- JSON-LD

---

Maximum marks: 1

## 19 INFO216 - RDF serialisation 3

### Which RDF serialisation is this?

```
<?xml version="1.0" encoding="UTF-8"?>
<rdf:RDF
  xmlns:ns 1="http://ex.org/"
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
>
  <rdf:Description rdf:about="http://ex.org/DaVinci">
    <ns 1:painting rdf:resource="http://ex.org/MonaLise"/>
    <rdf:type rdf:resource="http://ex.org/Person"/>
  </rdf:Description>
  <rdf:Description rdf:about="http://ex.org/Louvre">
    <rdf:type rdf:resource="http://ex.org/Museum"/>
    <ns 1:isLocatedIn rdf:resource="http://ex.org/Paris"/>
  </rdf:Description>
  <rdf:Description rdf:about="http://ex.org/Paris">
    <rdf:type rdf:resource="http://ex.org/City"/>
  </rdf:Description>
  <rdf:Description rdf:about="http://ex.org/MonaLisa">
    <ns 1:isIn rdf:resource="http://ex.org/Louvre"/>
  </rdf:Description>
</rdf:RDF>
```

### Select one alternative:

- TriG
- NQUAD
- N-TRIPLE
- Turtle (TTL)
- RDF/XML
- JSON-LD

---

Maximum marks: 1

## 20 INFO216 - RDF serialisation 4

**Which RDF serialisation is this?**

```
_:N27d77573d5e64e6da9412cb97554e0be {  
  ns1:DaVinci a ns1:Person ;  
  ns1:painting ns1:MonaLise .  
  ns1:MonaLisa ns1:isIn ns1:Louvre .  
  ns1:Louvre a ns1:Museum ;  
  ns1:isLocatedIn ns1:Paris .  
  ns1:Paris a ns1:City .  
}
```

**Select one alternative:**

- NQUAD
- JSON-LD
- TriG
- N-TRIPLE
- Turtle (TTL)
- RDF/XML

---

Maximum marks: 1

## 21 INFO216 - RDF serialisation 5

**Which RDF serialisation is this most typically?**

```
ns1:DaVinci a ns1:Person ;  
  ns1:paints ns1:MonaLise .  
ns1:MonaLisa ns1:isIn ns1:Louvre .  
ns1:Louvre a ns1:Museum ;  
  ns1:isLocatedIn ns1:Paris .  
ns1:Paris a ns1:City .
```

**Select one alternative:**

- TriG
- NQUAD
- N-TRIPLE
- Turtle (TTL)
- JSON-LD
- RDF/XML

---

Maximum marks: 1

## 22 New Question

**Description logic (DL) is**

**Select one alternative:**

- A query language
- More expressive than 1. order predicate calculus
- A semantic vocabulary
- A logic about concepts, individuals and the roles they play
- Less expressive than propositional logic

---

Maximum marks: 1

## **i Introduction to part 2: Vocabularies**

In this task, you get 33 multiple choice questions. Selecting the correct answer gives +1 point, whereas wrong answers give -1 point. An empty answer gives 0 points.

You should try to finish this task in less than 40 minutes. It counts ca 22% of the exam.

**23 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Describe time information and temporal relations."

**Select one alternative:**

- BIO
- MO
- DC
- VANN
- CC
- SKOS
- SIOC
- DBpedia and Wikidata ontologies
- schema.org
- Microdata
- BIBO
- OWL-Time
- FOAF
- VS
- PROV-O

---

Maximum marks: 1

## 24 INFO216 - which vocabulary

Which vocabulary matches best?

"Describes people, their friends and workplaces."

Select one alternative:

- DBpedia and Wikidata ontologies
- schema.org
- VANN
- Microdata
- DC
- PROV-O
- FOAF
- SIOC
- CC
- VS
- BIBO
- MO
- SKOS
- BIO

---

Maximum marks: 1

**25 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Used for categorisation and classification in libraries and other information archives etc."

**Select one alternative:**

- CC
- Microdata
- MO
- SIOC
- DC
- VANN
- SKOS
- schema.org
- DBpedia and Wikidata ontologies
- BIO
- VS
- PROV-O
- FOAF

---

Maximum marks: 1

**26 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Describes general encyclopedic information."

**Select one alternative:**

- MO
- BIBO
- PROV-O
- VANN
- SIOC
- VS
- SKOS
- Microdata
- BIO
- DC
- DBpedia and Wikidata ontologies
- schema.org
- FOAF
- CC

---

Maximum marks: 1

**27 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Describe geolocations."

**Select one alternative:**

- VANN
- VS
- SIOC
- FOAF
- PROV-O
- BIBO
- CC
- MO
- Microdata
- BIO
- DC
- SKOS
- DBpedia and Wikidata ontologies
- GEO

---

Maximum marks: 1

**28 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Some cross-over into genealogical information."

**Select one alternative:**

- BIO
- Microdata
- BIBO
- SKOS
- MO
- CC
- DC
- PROV-O
- schema.org
- VANN
- SIOC
- FOAF
- VS

---

Maximum marks: 1

**29 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Describe a person's life as a series of interconnected key events."

**Select one alternative:**

- Microdata
- SIOC
- DBpedia and Wikidata ontologies
- FOAF
- VANN
- DC
- CC
- BIO
- MO
- BIBO
- VS
- PROV-O
- SKOS
- schema.org

---

Maximum marks: 1

**30 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"For annotating descriptions of vocabularies with examples and usage notes."

**Select one alternative:**

- BIO
- BIBO
- PROV-O
- schema.org
- DC
- VANN
- CC
- DBpedia and Wikidata ontologies
- SIOC
- VS
- SKOS
- Microdata
- FOAF
- MO

---

Maximum marks: 1

**31 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Marking up information about commercial products and services."

**Select one alternative:**

- schema.org
- PROV-O
- BIBO
- DBpedia and Wikidata ontologies
- FOAF
- VANN
- DC
- SKOS
- CC
- MO
- VS
- BIO
- SIOC

---

Maximum marks: 1

**32 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Describe the status of vocabulary terms on the Web of Data."

**Select one alternative:**

- SKOS
- DBpedia and Wikidata ontologies
- SIOC
- FOAF
- BIO
- schema.org
- PROV-O
- VS
- Microdata
- CC
- VANN
- DC
- BIBO
- MO

---

Maximum marks: 1

**33 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Provides terms for finding out more about people and their backgrounds."

**Select one alternative:**

- VS
- VANN
- MO
- schema.org
- CC
- BIBO
- SKOS
- SIOC
- BIO
- DC
- PROV-O
- Microdata

---

Maximum marks: 1

**34 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Describe the sources of information and how it has been derived."

**Select one alternative:**

- FOAF
- DBpedia and Wikidata ontologies
- MO
- SIOC
- Microdata
- SKOS
- VANN
- VS
- CC
- PROV-O
- schema.org
- BIBO
- BIO

---

Maximum marks: 1

**35 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Describes metadata about electronic and other documents."

**Select one alternative:**

- DBpedia and Wikidata ontologies
- PROV-O
- BIBO
- FOAF
- CC
- Microdata
- schema.org
- SKOS
- MO
- VANN
- SIOC
- VS
- DC
- BIO

---

Maximum marks: 1

**36 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Describes metadata about web resources (video, images, web pages...) and physical resources (books, CDs, artworks...)."

**Select one alternative:**

- OWL-Time
- BIO
- CC
- VS
- Microdata
- DC
- MO
- SIOC
- FOAF
- schema.org
- VANN

---

Maximum marks: 1

**37 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Describe the temporal content of Web pages and the temporal properties of Web services."

**Select one alternative:**

- OWL-Time
- Microdata
- DBpedia and Wikidata ontologies
- VS
- schema.org
- SIOC
- PROV-O
- SKOS
- VANN
- BIBO
- DC
- MO
- CC
- FOAF
- BIO

---

Maximum marks: 1

**38 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Backed by major payers such as Google, Yahoo and Yandex."

**Select one alternative:**

- SIOC
- MO
- BIBO
- VS
- Microdata
- DBpedia and Wikidata ontologies
- schema.org
- PROV-O
- VANN
- OWL-Time
- BIO
- DC
- FOAF
- SKOS
- CC

---

Maximum marks: 1

**39 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Can represent licensing permissions, obligations and restrictions."

**Select one alternative:**

- CC
- DBpedia and Wikidata ontologies
- BIBO
- Microdata
- VANN
- FOAF
- SKOS
- VS
- BIO
- OWL-Time
- MO
- SIOC
- schema.org
- PROV-O
- DC

---

Maximum marks: 1

**40 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Annotation format for inserting semantic data into HTML documents."

**Select one alternative:**

- schema.org
- FOAF
- VS
- SIOC
- Microdata
- MO
- CC
- VANN
- PROV-O
- SKOS
- DBpedia and Wikidata ontologies
- BIBO
- BIO
- OWL-Time
- DC

---

Maximum marks: 1

## 41 INFO216 - which vocabulary

Which vocabulary matches best?

"Describe the information that online community sites (weblogs, message boards, wikis...) have about their structure and contents."

Select one alternative:

- VANN
- OWL-Time
- PROV-O
- BIBO
- DC
- schema.org
- FOAF
- Microdata
- DBpedia and Wikidata ontologies
- VS
- BIO
- SKOS
- MO
- CC
- SIOC

---

Maximum marks: 1

## 42 INFO216 - which vocabulary

Which vocabulary matches best?

"Can represent how and by whom information has been created."

Select one alternative:

- SIOC
- MO
- schema.org
- FOAF
- VANN
- Microdata
- DBpedia and Wikidata ontologies
- CC
- VS
- SKOS
- OWL-Time
- PROV-O
- BIBO
- BIO

---

Maximum marks: 1

**43 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Provides terms for describing products, services and offers."

**Select one alternative:**

- DBpedia and Wikidata ontologies
- CC
- OWL-Time
- SIOC
- VS
- PROV-O
- MO
- Microdata
- VANN
- SKOS
- FOAF
- BIBO
- DC
- BIO
- schema.org

---

Maximum marks: 1

#### 44 INFO216 - which vocabulary

Which vocabulary matches best?

"Provides terms for describing product ratings."

Select one alternative:

- PROV-O
- SIOC
- BIO
- FOAF
- CC
- MO
- DC
- VANN
- schema.org
- Microdata
- DBpedia and Wikidata ontologies
- VS
- BIBO
- OWL-Time
- SKOS

---

Maximum marks: 1

**45 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Providing mappings between concept schemes."

**Select one alternative:**

- MO
- BIBO
- FOAF
- SKOS
- DBpedia and Wikidata ontologies
- Microdata
- schema.org
- SIOC
- DC
- VANN
- OWL-Time
- BIO
- VS
- PROV-O
- CC

---

Maximum marks: 1

**46 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Letting webmasters markup their pages in ways recognized by search providers such as Google, Microsoft, Yahoo and Yandex."

**Select one alternative:**

- FOAF
- CC
- SKOS
- BIBO
- VS
- DBpedia and Wikidata ontologies
- schema.org
- BIO
- SIOC
- PROV-O
- VANN
- OWL-Time
- DC
- MO

---

Maximum marks: 1

## 47 INFO216 - which vocabulary

Which vocabulary matches best?

"Assess their quality, reliability and trustworthiness of RDF datasets."

Select one alternative:

- VANN
- SIOC
- DC
- PROV-O
- BIBO
- BIO
- schema.org
- Microdata
- VS
- MO
- FOAF
- DBpedia and Wikidata ontologies
- CC
- SKOS
- OWL-Time

---

Maximum marks: 1

**48 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Describe copyright licenses in RDF."

**Select one alternative:**

- SIOC
- DC
- CC
- SKOS
- VS
- FOAF
- MO
- schema.org
- BIBO
- OWL-Time
- Microdata
- DBpedia and Wikidata ontologies
- BIO
- PROV-O
- VANN

---

Maximum marks: 1

**49 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Describe bibliographic entities on the semantic Web in RDF."

**Select one alternative:**

- Microdata
- SKOS
- VANN
- OWL-Time
- VS
- BIBO
- FOAF
- SIOC
- CC
- PROV-O
- DBpedia and Wikidata ontologies
- MO
- schema.org
- DC
- BIO

---

Maximum marks: 1

**50 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Can be used as a citation ontology, as a document classification ontology, or as a way to describe documents in RDF."

**Select one alternative:**

- VANN
- SKOS
- VS
- CC
- Microdata
- schema.org
- OWL-Time
- BIO
- DC
- SIOC
- DBpedia and Wikidata ontologies
- BIBO
- MO
- PROV-O

---

Maximum marks: 1

**51 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Provides main concepts and properties for describing metadata about music (artists, albums, tracks...)."

**Select one alternative:**

- SIOC
- DC
- SKOS
- Microdata
- CC
- FOAF
- BIO
- VANN
- BIBO
- OWL-Time
- MO
- PROV-O
- VS
- schema.org

---

Maximum marks: 1

**52 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"For marking up (primarily commercial) web sites."

**Select one alternative:**

- BIO
- CC
- OWL-Time
- schema.org
- MO
- BIBO
- FOAF
- VANN
- VS
- SIOC
- SKOS
- PROV-O
- DC
- DBpedia and Wikidata ontologies

---

Maximum marks: 1

**53 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Making classification schemes, subject heading lists, taxonomies and other fixed vocabularies."

**Select one alternative:**

- PROV-O
- CC
- DC
- SKOS
- MO
- FOAF
- VS
- Microdata
- BIO
- VANN
- DBpedia and Wikidata ontologies
- BIBO
- OWL-Time
- SIOC

---

Maximum marks: 1

**54 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Used to represent, exchange and interrelate library catalogues."

**Select one alternative:**

- SKOS
- VANN
- SIOC
- Microdata
- DBpedia and Wikidata ontologies
- PROV-O
- FOAF
- CC
- BIO
- OWL-Time
- VS
- schema.org
- MO

---

Maximum marks: 1

**55 INFO216 - which vocabulary**

**Which vocabulary matches best?**

"Letting search providers improve the display of search results, enabling new tools and applications."

**Select one alternative:**

- BIO
- BIBO
- FOAF
- CC
- SKOS
- DBpedia and Wikidata ontologies
- schema.org
- OWL-Time
- Microdata
- DC
- PROV-O
- VANN
- VS
- SIOC
- MO

---

Maximum marks: 1

**i Introduction to part 3: Knowledge graphs**

In this task, you get 15 multiple choice questions. Selecting the correct answer gives +1 point, whereas wrong answers give -1 point. An empty answer gives 0 points. You should try to finish this task in less than 18 minutes. It counts approximately 10% of the exam.

**56 INFO216 - which KG / KB?**

**Which open knowledge graph (or knowledge base) matches best?**

"Contains information about more than 90 billion things."

**Select one alternative:**

- GDELT
- GeoNames
- Wikidata
- Google's KG
- Freebase
- EventKG 3.0
- WordNet
- DBpedia
- Amazon's KG
- BabelNet

---

Maximum marks: 0

**57 INFO216 - which KG / KB?**

**Which open knowledge graph (or knowledge base) matches best?**

"Was used to seed Wikidata and Google's knowledge graph."

**Select one alternative:**

- BabelNet
- Amazon's KG
- GeoNames
- WordNet
- Wikidata
- Google's KG
- EventKG 3.0
- DBpedia
- Freebase
- GDELT

---

Maximum marks: 1

**58 INFO216 - which KG / KB?**

**Which open knowledge graph (or knowledge base) matches best?**

"Describes 800 M word senses in more than 280 languages."

**Select one alternative:**

- Wikidata
- Amazon's KG
- DBpedia
- BabelNet
- Google's KG
- Freebase
- GDELT
- WordNet
- GeoNames
- EventKG 3.0

---

Maximum marks: 1

**59 INFO216 - which KG / KB?**

Which open knowledge graph (or knowledge base) matches best?

"Provides structured information to Wikipedia."

Select one alternative:

- GeoNames
- EventKG 3.0
- DBpedia
- BabelNet
- WordNet
- GDELT
- Wikidata
- Freebase
- Amazon's KG
- Google's KG

---

Maximum marks: 1

**60 INFO216 - which KG / KB?**

**Which open knowledge graph (or knowledge base) matches best?**

"Updates are available through spreadsheets every 15 minutes."

**Select one alternative:**

- DBpedia
- WordNet
- GeoNames
- Google's KG
- Wikidata
- Freebase
- BabelNet
- Amazon's KG
- EventKG 3.0
- GDELT

---

Maximum marks: 1

**61 INFO216 - which KG / KB?**

**Which open knowledge graph (or knowledge base) matches best?**

"Gets its data from Wikipedia, Wikidata and other Wikimedia projects."

**Select one alternative:**

- Amazon's KG
- Freebase
- Wikidata
- Google's KG
- WordNet
- GDELT
- GeoNames
- DBpedia
- BabelNet

---

Maximum marks: 1

**62 INFO216 - which KG / KB?**

**Which open knowledge graph (or knowledge base) matches best?**

"A central aim is to enrich online shopping experiences."

**Select one alternative:**

- GeoNames
- Wikidata
- GDELT
- WordNet
- BabelNet
- EventKG 3.0
- Amazon's KG
- Google's KG
- DBpedia
- Freebase

---

Maximum marks: 1

**63 INFO216 - which KG / KB?**

**Which open knowledge graph (or knowledge base) matches best?**

"Uses skos:Concepts to link synonyms from different languages."

**Select one alternative:**

- WordNet
- EventKG 3.0
- DBpedia
- Amazon's KG
- GeoNames
- BabelNet
- Google's KG
- Wikidata
- GDELT
- Freebase

---

Maximum marks: 1

**64 INFO216 - which KG / KB?**

Which open knowledge graph (or knowledge base) matches best?

"Acquired by Google in 2010."

Select one alternative:

- Google's KG
- WordNet
- Wikidata
- Freebase
- EventKG 3.0
- DBpedia
- GDELT
- Amazon's KG
- GeoNames
- BabelNet

---

Maximum marks: 1

**65 INFO216 - which KG / KB?**

Which open knowledge graph (or knowledge base) matches best?

"Contains around 58 000 Norwegian place names."

Select one alternative:

- EventKG 3.0
- GDELT
- WordNet
- GeoNames
- Amazon's KG
- Wikidata
- Google's KG
- Freebase
- BabelNet
- DBpedia

---

Maximum marks: 1

**66 INFO216 - which KG / KB?**

**Which open knowledge graph (or knowledge base) matches best?**

"Organises English words by relations such as hypernym, hyponymh, etc."

**Select one alternative:**

- WordNet
- DBpedia
- EventKG 3.0
- Google's KG
- GDELT
- BabelNet
- Amazon's KG
- GeoNames
- Freebase
- Wikidata

---

Maximum marks: 1

**67 INFO216 - which KG / KB?**

**Which open knowledge graph (or knowledge base) matches best?**

"Intended as an authoritative KG of all products in the world."

**Select one alternative:**

- WordNet
- GDELT
- Freebase
- Google's KG
- EventKG 3.0
- BabelNet
- GeoNames
- Amazon's KG
- Wikidata
- DBpedia

---

Maximum marks: 1

**68 INFO216 - which KG / KB?**

**Which open knowledge graph (or knowledge base) matches best?**

"Enrich general internet search results."

**Select one alternative:**

- DBpedia
- Freebase
- Amazon's KG
- GeoNames
- BabelNet
- Wikidata
- Google's KG
- GDELT
- EventKG 3.0
- WordNet

---

Maximum marks: 1

**69 INFO216 - which KG / KB?**

Which open knowledge graph (or knowledge base) matches best?

"Describes around 1.3 million events."

Select one alternative:

- EventKG 3.0
- GDELT
- Google's KG
- DBpedia
- Wikidata
- WordNet
- Freebase
- GeoNames
- BabelNet
- Amazon's KG

---

Maximum marks: 1

**70 INFO216 - which KG / KB?**

Which open knowledge graph (or knowledge base) matches best?

"Is claimed to contain more than 500 000 000 000 triples."

Select one alternative:

- Google's KG
- GDELT
- EventKG 3.0
- Freebase
- Amazon's KG
- WordNet
- Wikidata
- GeoNames
- BabelNet
- DBpedia

---

Maximum marks: 1

**i Introduction to part 4: OWL**

In this task,

- First, you get 6 multiple choice questions about OWL properties. Each question may have one or more correct answer alternatives. Each correct answer gives +0.5 point, whereas each wrong answer gives -0.5 point. An empty answer gives 0 points.
- Then, you are presented with a small domain. You are asked to write 12 OWL expressions about the domain in Turtle. Each OWL expression gives up to +3 points. There are no negative points given for the OWL expressions.

You should try to answer this part in around 45 minutes. It counts around 27% of the exam.

**71 INFO216 - hasNeighbour property**

The hasNeighbour object property between two people is  
Select one or more alternatives:

- Functional
- Symmetric
- Asymmetric
- Irreflexive
- Inverse functional
- Transitive
- Reflexive

---

Maximum marks: 1

**72 INFO216 - hasLocation property**

The hasLocation object property is  
Select one or more alternatives:

- Irreflexive
- Asymmetric
- Reflexive
- Symmetric
- Transitive
- Inverse functional

---

Maximum marks: 1

**73 INFO216 - connectedByRoad property (one-way streets)**

The `isConnectedByRoad` object property between two locations (there can be one-way streets) is

Select one or more alternatives:

- Transitive
- Asymmetric
- Irreflexive
- Reflexive
- Inverse functional
- Symmetric
- Functional

---

Maximum marks: 1

**74 INFO216 - hasMother property**

The hasMother object property between two persons is  
Select one or more alternatives:

- Symmetric
- Irreflexive
- Functional
- Reflexive
- Inverse functional
- Asymmetric
- Transitive

---

Maximum marks: 1.5

**75 INFO216 - hasSibling property**

The hasSibling object property between two people is  
Select one or more alternatives:

- Inverse functional
- Functional
- Transitive
- Symmetric
- Irreflexive
- Asymmetric
- Reflexive

---

Maximum marks: 1.5

**76 INFO216 - hasFlightTo property**

The hasFlightTo object property between two airports is  
Select one or more alternatives:

- Transitive
- Asymmetric
- Functional
- Irreflexive
- Inverse functional
- Reflexive

---

Maximum marks: 0.5

## i INFO216 - problem domain for writing OWL in Turtle notation

Assume the following owl:NamedClasses are defined as shown in the figure:

:Country, :City, :CapitalCity, :Region, :CapitalRegion, :Division

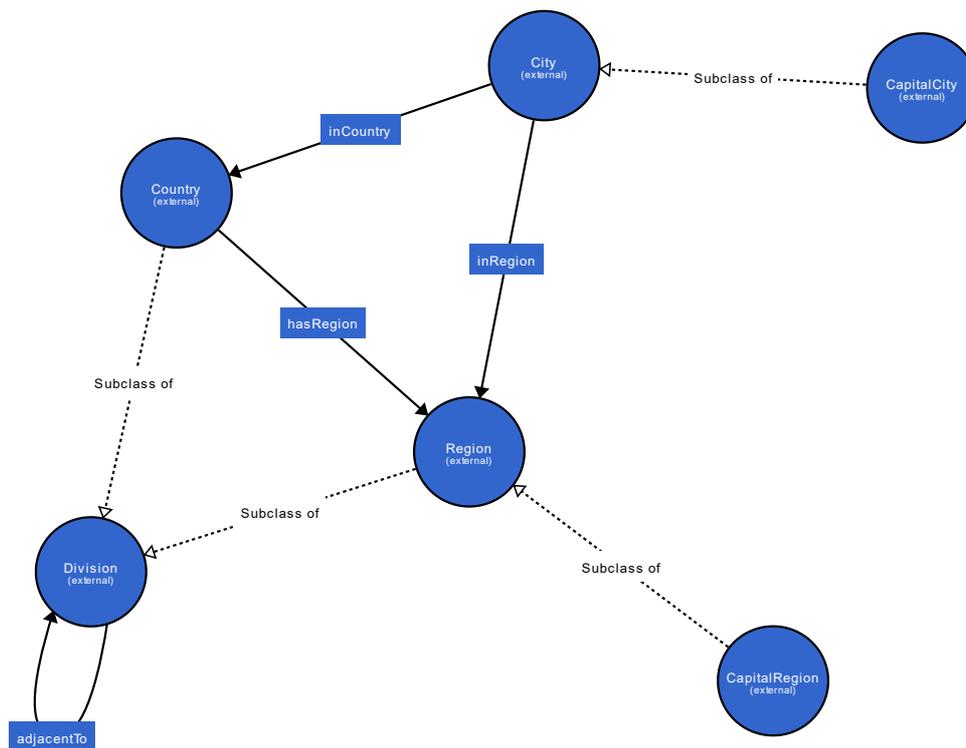
Assume the following OWL:ObjectProperties are defined as shown in the figure:

:inCountry (from :City to :Country)

:hasRegion (from :Country to :Region)

:inRegion (from :Region to :City)

:adjacentTo (from :Division to :Division)



**77 INFO216 - OWL in TTL: country has regions**

**Write this in Turtle using OWL terms**

(assuming prefixes such as rdfs: and owl: are defined):

"A country has one or more regions."

**Write your Turtle expression here**

---

Maximum marks: 3

**78 INFO216 - OWL in TTL: city in country**

**Write this in Turtle using OWL terms**

(assuming prefixes like rdfs: and owl: are defined):

"A city is located in exactly one country."

**Write your Turtle expression here**

---

Maximum marks: 3

**79 INFO216 - OWL in TTL: capital is city**

**Write this in Turtle using OWL terms**

(assuming prefixes like rdfs: and owl: are defined):

"A capital city is a city."

**Write your Turtle expression here**

---

Maximum marks: 3

**80 INFO216 - OWL in TTL: country has capital**

**Write this in Turtle using OWL terms**

(assuming prefixes like rdfs: and owl: are defined):

"A country has only one capital."

**Write your Turtle expression here**

---

Maximum marks: 3

**81 INFO216 - OWL in TTL: division is country or region**

**Write this in Turtle using OWL terms**

(assuming prefixes such as rdfs: and owl: are defined):

"A division is either a country or a region."

**Write your Turtle expression here**

---

---

Maximum marks: 3

**82 INFO216 - OWL in TTL: division adjacency 1**

**Write this in Turtle using OWL terms**

(assuming prefixes such as rdfs: and owl: are defined):

"Anything that is adjacent to something is a division."

**Write your Turtle expression here**

---

Maximum marks: 3

**83 INFO216 - OWL in TTL: division adjacency 2**

**Write this in Turtle using OWL terms**

(assuming prefixes such as rdfs: and owl: are defined):

"A division cannot be adjacent to itself."

**Write your Turtle expression here**

---

Maximum marks: 3

**84 INFO216 - OWL in TTL: city in region 1**

**Write this in Turtle using OWL terms**

(assuming prefixes such as rdfs: and owl: are defined):

"A city is located in at most one region."

**Write your Turtle expression here**

---

Maximum marks: 3

**85 INFO216 - OWL in TTL: capital region**

**Write this in Turtle using OWL terms**

(assuming prefixes like rdfs: and owl: are defined):

"A capital region is a region that has a capital city."

**Write your Turtle expression here**

---

Maximum marks: 3

**86 INFO216 - OWL in TTL: city in region 2**

**Write this in Turtle using OWL terms**

(assuming prefixes such as rdfs: and owl: are defined):

"If a city is in a region, it must be in the country of that region."

**Write your Turtle expression here**

---

Maximum marks: 3

**87 INFO216 - OWL in TTL: island state**

**Write this in Turtle using OWL terms**

(assuming prefixes like rdfs: and owl: are defined):

"An island state is a country that is next to no (other) country."

**Fill in your answer here**

---

Maximum marks: 3

**88 INFO216 - OWL in TTL: city state**

**Write this in Turtle using OWL terms**

(assuming prefixes such as rdfs: and owl: are defined):

"A country with only one city and at most one region is a city state."

**Fill in your answer here**

---

Maximum marks: 3

**i Introduction to part 5: SPARQL**

In this task:

- First, you get 5 multiple choice questions about SPARQL. Each question has one correct answer. Each correct answer gives +1 point, whereas wrong answers give -1 point. An empty answer gives 0 points.
- Then, you are presented with a small dataset (*note that the terms used here are different from the ones in the OWL tasks.*) You are asked to write 7 updates or queries related to the dataset in SPARQL. Some of the SPARQL statements give up to +6 points. There are no negative points given for the SPARQL statements.

You should try to answer this part in around 45 minutes. It counts approximately 27% of the exam.

**89 INFO216 - SPARQL ASK returns**

**A SPARQL ASK query returns**

**Select one alternative:**

- A graph
- A tree
- A boolean (True or False)
- A table
- It is not a SPARQL query

---

Maximum marks: 1

**90 INFO216 - SPARQL CONSTRUCT returns**

**A SPARQL CONSTRUCT query returns**

**Select one alternative:**

- A table
- A tree
- A boolean (True or False)
- A graph
- It is not a SPARQL query

---

Maximum marks: 1

**91 INFO216 - SPARQL DESCRIBE returns**

**A SPARQL DESCRIBE query returns**

**Select one alternative:**

- A tree
- A table
- A graph
- It is not a SPARQL query
- A boolean (True or False)

---

Maximum marks: 1

**92 INFO216 - SPARQL INSPECT returns**

**A SPARQL INSPECT query returns**

**Select one alternative:**

- A graph
- It is not a SPARQL query
- A table
- A boolean (True or False)
- A tree

---

Maximum marks: 1

**93 INFO216 - SPARQL SELECT returns**

A SPARQL SELECT query returns

Select one alternative:

- A tree
- It is not a SPARQL query
- A boolean (True or False)
- A table
- A graph

---

Maximum marks: 1

**94 INFO216 - SPARQL: add region triples**

Write a SPARQL Update that adds the triples written below in Turtle to a triple store:

@prefix : <http://ex.org/> .

:Norway :hasRegion :OsloRegion, :Rogaland, :Trondelag, :Vestland, :Viken .

:OsloRegion :hasCity :Oslo .

Fill in your answer here

---

Maximum marks: 5

## 95 INFO216 - SPARQL: count city triples

How many triples (without axioms and entailments) is written in Turtle here:

```
:Norway :citiesByPopulation ( :Oslo :Bergen :Trondheim :Stavanger :Drammen ) .
```

Number of triples: .

---

Maximum marks: 4

## 96 INFO216 - SPARQL: list cities

Assume these triples have been added to your triple store:

```
:Norway :citiesByPopulation ( :Oslo :Bergen :Trondheim :Stavanger :Drammen ) .
```

Complete this single-line SPARQL query so that it returns these 5 Norwegian cities:

```
PREFIX : <http://ex.org/>
```

```
SELECT ?city WHERE {
```

```
  :Norway ( :citiesByPopulation  ) ?city .
```

```
}
```

Expected result (the order may be different):

?city
:Oslo
:Bergen
:Trondheim
:Stavanger
:Drammen

---

Maximum marks: 6

**97 INFO216 - SPARQL: add city triples**

**Write a SPARQL Update statement that uses the :citiesByPopulation list to add five corresponding unordered :hasCity triples.**

(The statement must be general so that it also works on other lists of cities and other countries.)

**Fill in your answer here**

**Expected result written in Turtle:**

:Norway :hasCity :Oslo, :Bergen, :Trondheim, :Stavanger, :Drammen .

---

Maximum marks: 6

98 **INFO216 - SPARQL: cities per region**

Assume the triple store has been extended with more triples (still written in Turtle):

```

:Norway :hasCity :Os, :Voss, :Sandnes, :Fredrikstad, :Sarpsborg .
:OsloRegion :regionalCity :Oslo .
:Vestland :regionalCity :Bergen, :Os, :Voss .
:Trondelag :regionalCity :Trondheim .
:Rogaland :regionalCity :Stavanger, :Sandnes .
:Viken :regionalCity :Drammen, :Fredrikstad, :Sarpsborg .
:Oslo :hasPopulation 580000 .
:Bergen :hasPopulation 213585 .
:Os :hasPopulation 14046 .
:Voss :hasPopulation 6043 .
:Trondheim :hasPopulation 147139 .
:Stavanger :hasPopulation 121610 .
:Drammen :hasPopulation 90722 .
:Fredrikstad :hasPopulation 72760 .
:Sandnes :hasPopulation 63032 .
:Sarpsborg :hasPopulation 52159 .

```

Write a SPARQL query that counts the number of cities in each region in Norway.

Fill in your answer here

**Expected result:**

?region	?cityCount
:OsloRegion	1
:Viken	3
:Vestland	3
:Trondelag	1
:Rogaland	2

---

Maximum marks: 5

**99 INFO216 - SPARQL: ordered cities per region**

Continue with the same triple store. Extend the previous SPARQL query so that it lists the city population in each region in Norway *in descending order*.

Fill in your answer here

**Expected result:**

?region	?cityCount
:Viken	3
:Vestland	3
:Rogaland	2
:OsloRegion	1
:Trondelag	1

---

Maximum marks: 5

**100 INFO216 - SPARQL syntax**

**SPARQL syntax most resembles**

**Select one alternative:**

- RDF/XML
- Manchester OWL
- Turtle (TTL)
- JSON-LD

---

Maximum marks: 4