

a)

- 01 Who borrowed video projector P?
- 02 Who is giving the lecture in room R at time T?
- 03 Which students fulfill the prerequisites for Course C?
- 04 In which pool room is the PC B?
- 05 Secretary S is a member of which faculty?
- 06 Which lecturer is not giving any lectures this semester?
- 07 Who has borrowed the most resources?
- 08 Which lectures have not yet hit their limits of attending students?
- 09 Which lecturer has given the most lectures?
- 10 Which lecturer has also been a student of the faculty?
- 11 Which lecture has the least number of students fulfilling its prerequisites?
- 12 Which room houses the most lectures?
- 13 Which students are at the faculty 5 days a week or more?
- 14 Which room houses no lectures at all?
- 15 Which lectures take place in the same room, at the same time?
- 16 Which lectures have the courses X, Y, Z as prerequisites?
- 17 Which lecture is a prerequisite of the most lectures?
- 18 Which tutor takes part in the most lectures?
- 19 Is student S ever in room R?
- 20 Do students S and T have any lectures in common?

b)

Glossary

Staff, Lecturer, Tutor, Secretary, Student Assistant, Research Staff,
Lecture, Seminar, Room, Time, number of students, prerequisites,
Resources, PC, Video projector

c)

See last page

d)

```
<?xml version="1.0"?>
```

```
<!DOCTYPE rdf:RDF [  
  <!ENTITY owl "http://www.w3.org/2002/07/owl#" >  
  <!ENTITY xsd "http://www.w3.org/2001/XMLSchema#" >  
  <!ENTITY rdfs "http://www.w3.org/2000/01/rdf-schema#" >  
  <!ENTITY rdf "http://www.w3.org/1999/02/22-rdf-syntax-ns#" >  
  <!ENTITY Ontology1292174488355 "http://www.semanticweb.org/  
ontologies/2010/11/Ontology1292174488355.owl#" >  
>
```

```
<rdf:RDF xmlns="http://www.semanticweb.org/ontologies/2010/11/
```

```

Ontology1292174488355.owl#"
    xml:base="http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl"
    xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
    xmlns:Ontology1292174488355="http://www.semanticweb.org/
ontologies/2010/11/Ontology1292174488355.owl#"
    xmlns:owl="http://www.w3.org/2002/07/owl#"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
    xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#">
<owl:Ontology rdf:about="http://www.semanticweb.org/
ontologies/2010/11/Ontology1292174488355.owl"/>

    <owl:AnnotationProperty rdf:about="&rdfs;comment"/>

    <!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#fulfills_prerequisites -->

    <owl:ObjectProperty
rdf:about="&Ontology1292174488355;fulfills_prerequisites">
        <rdfs:range
rdf:resource="&Ontology1292174488355;Lecture"/>
        <rdfs:domain
rdf:resource="&Ontology1292174488355;Student"/>
        <owl:propertyChainAxiom rdf:parseType="Collection">
            <rdfs:Description
rdf:about="&Ontology1292174488355;has_finished"/>
            <rdfs:Description
rdf:about="&Ontology1292174488355;is_prerequisite_of"/>
        </owl:propertyChainAxiom>
    </owl:ObjectProperty>

    <!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#gives -->

    <owl:ObjectProperty
rdf:about="&Ontology1292174488355;gives">
        <rdfs:type rdf:resource="&owl;InverseFunctionalProperty"/
>
        <rdfs:range
rdf:resource="&Ontology1292174488355;Lecture"/>
        <rdfs:domain
rdf:resource="&Ontology1292174488355;Lecturer"/>
    </owl:ObjectProperty>

    <!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#has_finished -->

```

```
<owl:ObjectProperty
rdf:about="&Ontology1292174488355;has_finished">
  <rdfs:range
rdf:resource="&Ontology1292174488355;Lecture"/>
  <rdfs:domain
rdf:resource="&Ontology1292174488355;Student"/>
</owl:ObjectProperty>
```

```
<!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#has_prerequisite -->
```

```
<owl:ObjectProperty
rdf:about="&Ontology1292174488355;has_prerequisite">
  <rdfs:range
rdf:resource="&Ontology1292174488355;Lecture"/>
  <rdfs:domain
rdf:resource="&Ontology1292174488355;Lecture"/>
</owl:ObjectProperty>
```

```
<!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#is_given_by -->
```

```
<owl:ObjectProperty
rdf:about="&Ontology1292174488355;is_given_by">
  <rdf:type rdf:resource="&owl;InverseFunctionalProperty"/>
>
  <owl:inverseOf
rdf:resource="&Ontology1292174488355;gives"/>
  <rdfs:subPropertyOf
rdf:resource="&owl;topObjectProperty"/>
</owl:ObjectProperty>
```

```
<!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#is_prerequisite_of -->
```

```
<owl:ObjectProperty
rdf:about="&Ontology1292174488355;is_prerequisite_of">
  <rdfs:range
rdf:resource="&Ontology1292174488355;Lecture"/>
  <rdfs:domain
rdf:resource="&Ontology1292174488355;Lecture"/>
  <owl:inverseOf
rdf:resource="&Ontology1292174488355;has_prerequisite"/>
  <rdfs:subPropertyOf
rdf:resource="&owl;topObjectProperty"/>
</owl:ObjectProperty>
```

```
<!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#takes_part_in -->
```

```
<owl:ObjectProperty
rdf:about="&Ontology1292174488355;takes_part_in">
  <rdfs:range
rdf:resource="&Ontology1292174488355;Lecture"/>
  <rdfs:domain
rdf:resource="&Ontology1292174488355;Student"/>
</owl:ObjectProperty>
```

```
<!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#takes_place_in -->
```

```
<owl:ObjectProperty
rdf:about="&Ontology1292174488355;takes_place_in">
  <rdfs:subPropertyOf
rdf:resource="&owl;topObjectProperty"/>
  <rdfs:domain>
    <owl:Restriction>
      <owl:onProperty
rdf:resource="&Ontology1292174488355;takes_place_in"/>
      <owl:someValuesFrom
rdf:resource="&Ontology1292174488355;Lecture"/>
    </owl:Restriction>
  </rdfs:domain>
  <rdfs:range>
    <owl:Restriction>
      <owl:onProperty
rdf:resource="&Ontology1292174488355;takes_place_in"/>
      <owl:onClass
rdf:resource="&Ontology1292174488355;Room"/>
      <owl:minQualifiedCardinality
rdf:datatype="&xsd;nonNegativeInteger">1</
owl:minQualifiedCardinality>
    </owl:Restriction>
  </rdfs:range>
</owl:ObjectProperty>
```

```
<!-- http://www.w3.org/2002/07/owl#topObjectProperty -->
```

```
<owl:ObjectProperty rdf:about="&owl;topObjectProperty"/>
```

```
<!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#Lecture -->
```

```
<owl:Class rdf:about="&Ontology1292174488355;Lecture">
```

```
    <rdfs:comment xml:lang="de">Eine Vorlesung die von einem
Dozenten gehalten wird</rdfs:comment>
    <rdfs:comment xml:lang="en">Represent a lecture given by
a Lecturer</rdfs:comment>
  </owl:Class>
```

```
  <!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#Lecturer -->
```

```
    <owl:Class rdf:about="&Ontology1292174488355;Lecturer">
      <rdfs:subClassOf
rdf:resource="&Ontology1292174488355;Person"/>
      <rdfs:comment xml:lang="de">Ein Dozent der Vorlesung
gibt</rdfs:comment>
      <rdfs:comment xml:lang="en">A lecturer who gives
lectures</rdfs:comment>
    </owl:Class>
```

```
  <!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#Person -->
```

```
    <owl:Class rdf:about="&Ontology1292174488355;Person"/>
```

```
  <!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#Room -->
```

```
    <owl:Class rdf:about="&Ontology1292174488355;Room">
      <rdfs:comment xml:lang="de">Ein Raum der Fakultät</
rdfs:comment>
      <rdfs:comment xml:lang="en">A room of the faculty</
rdfs:comment>
    </owl:Class>
```

```
  <!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#Student -->
```

```
    <owl:Class rdf:about="&Ontology1292174488355;Student">
      <rdfs:subClassOf
rdf:resource="&Ontology1292174488355;Person"/>
      <rdfs:comment xml:lang="de">Ein Student der an
Vorlesungen teilnimmt</rdfs:comment>
      <rdfs:comment xml:lang="en">A student taking part in
lectures</rdfs:comment>
    </owl:Class>
```

```
  <!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#Tutor -->
```

```
    <owl:Class rdf:about="&Ontology1292174488355;Tutor">
```

```
        <rdfs:subClassOf
rdf:resource="&Ontology1292174488355;Person"/>
    </owl:Class>
```

```
    <!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#Adrian_Paschke -->
```

```
        <owl:NamedIndividual
rdf:about="&Ontology1292174488355;Adrian_Paschke">
            <rdf:type
rdf:resource="&Ontology1292174488355;Lecturer"/>
            <rdfs:comment xml:lang="de">Prof. Paschke</rdfs:comment>
            <rdfs:comment xml:lang="en">Prof. Paschke</rdfs:comment>
            <gives
rdf:resource="&Ontology1292174488355;Web_Based_Information_Systems"/>
        </owl:NamedIndividual>
```

```
    <!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#Algorithmen_und_Programmierung_1 -->
```

```
        <owl:NamedIndividual
rdf:about="&Ontology1292174488355;Algorithmen_und_Programmierung
_1"/>
```

```
    <!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#Algorithmen_und_Programmierung_2 -->
```

```
        <owl:NamedIndividual
rdf:about="&Ontology1292174488355;Algorithmen_und_Programmierung
_2">
            <has_prerequisite
rdf:resource="&Ontology1292174488355;Algorithmen_und_Programmier
ung_1"/>
        </owl:NamedIndividual>
```

```
    <!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#Raum_005 -->
```

```
        <owl:NamedIndividual
rdf:about="&Ontology1292174488355;Raum_005">
            <rdf:type rdf:resource="&Ontology1292174488355;Room"/>
        </owl:NamedIndividual>
```

```
    <!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#Robert_Bvðhnke -->
```

```
        <owl:NamedIndividual
rdf:about="&Ontology1292174488355;Robert_Bvðhnke">
```

```

        <rdf:type rdf:resource="&Ontology1292174488355;Student"/
>
        <rdfs:comment xml:lang="de">Das bin ich</rdfs:comment>
        <rdfs:comment xml:lang="en">That's me</rdfs:comment>
        <has_finished
rdf:resource="&Ontology1292174488355;Algorithmen_und_Programmierung_1"/>
        <takes_part_in
rdf:resource="&Ontology1292174488355;Web_Based_Information_Systems"/>
        </owl:NamedIndividual>

        <!-- http://www.semanticweb.org/ontologies/2010/11/
Ontology1292174488355.owl#Web_Based_Information_Systems -->

        <owl:NamedIndividual
rdf:about="&Ontology1292174488355;Web_Based_Information_Systems"
>
        <rdf:type rdf:resource="&Ontology1292174488355;Lecture"/
>
        <is_given_by
rdf:resource="&Ontology1292174488355;Adrian_Paschke"/>
        <takes_place_in
rdf:resource="&Ontology1292174488355;Raum_005"/>
        </owl:NamedIndividual>
</rdf:RDF>

<!-- Generated by the OWL API (version 3.1.0.20069) http://
owlapi.sourceforge.net -->

```

e)

We consulted http://watson.kmi.open.ac.uk/WatsonWUI/onto_check.html?q=http://www.cs.vu.nl/~kubbe/webkr/alldata.rdfs
and expanded upon their ideas by adding a chained property http://www.semanticweb.org/ontologies/2010/11/Ontology1292174488355.owl#fulfills_prerequisites

