

Ad 1 & 2

```
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns="http://example.org/conkerslibrary#">

  <rdfs:Class rdf:ID="MultimediaItem" />
    <rdfs:Class rdf:ID="Book">
      <rdfs:subClassOf rdf:resource="#MultimediaItem"/>
    </rdfs:Class>
</rdf:RDF>

<rdf:Description rdf:about="http://example.org/conkerslibrary#book-it">
  <dc:author>Stephen King</dc:author>
  <dc:title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">
    It
  </dc:title>
  <dc:date rdf:datatype="http://www.w3.org/2001/XMLSchema#date">1986-09-15</dc:date>
  <dc:language>en</dc:language>
  <rdf:type rdf:resource="http://example.org/conkerslibrary#Book"/>
</rdf:Description>

<rdf:Description rdf:about="http://example.org/conkerslibrary#book-
  salems_lot">
  <dc:artist>Stephen King</dc:artist>
  <dc:title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">
    Salem's Lot
  </dc:title>
  <dc:date rdf:datatype="http://www.w3.org/2001/XMLSchema#date">1975-10-17</dc:date>
  <dc:language>en</dc:language>
  <rdf:type rdf:resource="http://example.org/conkerslibrary#Book"/>
</rdf:Description>

<rdf:Description rdf:about="http://example.org/conkerslibrary#book-
  black_house">
  <dc:authors rdf:parseType="Collection">
    <rdf:Description>
      <rdf:first rdf:datatype="http://www.w3.org/2001/xmlSchema#string">
        Stephen King
      </rdf:first>
      <rdf:rest>
        <rdf:Description>
          <rdf:first rdf:datatype="http://www.w3.org/2001/
            xmlSchema#string">
            Peter Straub
          </rdf:first>
          <rdf:rest rdf:nodeID="http://www.w3.org/1999/02/22-rdf-
            syntax-ns#nil"/>
        </rdf:Description>
      </rdf:rest>
    </rdf:Description>
  </dc:authors>
  <dc:title rdf:datatype="http://www.w3.org/2001/XMLSchema#string">
    Black House
  </dc:title>
  <dc:date rdf:datatype="http://www.w3.org/2001/XMLSchema#date">2001-09-15</dc:date>
  <dc:language>en</dc:language>
  <rdf:type rdf:resource="http://example.org/conkerslibrary#Book"/>
</rdf:Description>

<rdf:Description rdf:about="http://example.org/conkerslibrary#">
  <MyFavouriteBooks>
    <rdf:Bag>
      <rdf:li rdf:resource="http://example.org/conkerslibrary#book-it"/>
      <rdf:li rdf:resource="http://example.org/conkerslibrary#book-
        salems_lot"/>
    </rdf:Bag>
  </MyFavouriteBooks>
</rdf:Description>
</rdf:RDF>
```

Ad 3.1

Dublin Core - used to describe resources for the purposes of discovery.

SIOC - provides methods for interconnecting discussion methods such as blogs, forums and mailing lists to each other.

FOAF - is an RDF based schema to describe persons and their social network in a semantic way.

RSS 1.0 - is a family of web feed formats used to publish frequently updated works - such as blog entries, news headlines, audio, and video - in a standardized format.

RDF Review Vocabulary - Vocabulary for expressing reviews and ratings using the Resource Description Framework.

Redwood - An ontology that describes tags, as used in the popular del.icio.us and Flickr systems, and allows for relationships between tags to be described.

Ad 3.3

Returns variables and their bindings directly.

Ad 3.4

Returns a single RDF graph specified by a graph template. The result is an RDF graph formed by taking each query solution in the solution sequence, substituting for the variables in the graph template, and combining the triples into a single RDF graph by set union.

Ad 4.5

- **name and e-mail:**

```
SELECT DISTINCT ?name ?email
WHERE
{
    ?x rdf:type foaf:Person;
    foaf:name ?name;
    foaf:mbox ?mail
}
```

- **+ optional homepage**

```
SELECT DISTINCT ?name ?email ?homepage
WHERE
{
    ?x rdf:type foaf:Person;
    foaf:name ?name;
    foaf:mbox ?mail.
    OPTIONAL { ?x foaf:homepage ?homepage }
}
```

- **+ sorted by name descending**

```
SELECT DISTINCT ?name ?email ?homepage
WHERE
{
    ?x rdf:type foaf:Person;
    foaf:name ?name;
    foaf:mbox ?mail.
    OPTIONAL { ?x foaf:homepage ?homepage }
}
ORDER BY DESC (?name)
```

Ad 5

- **name starts with 'K'**

```
SELECT DISTINCT ?x
WHERE
{
    ?x rdf:type foaf:Person;
    foaf:name ?name.
    FILTER regex(?name, "^K")
}
```

- **older than 18 yo**

```
SELECT DISTINCT ?x
WHERE
{
    ?x rdf:type foaf:Person;
    foaf:age ?age.
    FILTER ?age > 18
}
```

- **name starts with 'K' or older than 18 yo (case insensitive search)**

```
SELECT DISTINCT ?x
WHERE
{
    ?x rdf:type foaf:Person;
    foaf:name ?name;
    foaf:age ?age.
    FILTER regex(?name, "^K", "i") || (?age > 18)
}
```

- people with e-mails on student.agh.edu.pl server

```
SELECT DISTINCT ?x
WHERE
{
    ?x rdf:type foaf:Person;
    foaf:mbox ?mbox.
    FILTER regex(?mbox, "student\.agh\.edu\.pl$")
}
```

- names of people, who have homepage or e-mail on the mentioned server

```
SELECT DISTINCT ?name
WHERE
{
    ?x rdf:type foaf:Person;
    foaf:name ?name;
    foaf:homepage ?homepage;
    foaf:mbox ?mbox.
    FILTER regex(?homepage, "^http://student\.agh\.edu\.pl") || regex(?mbox,
"student\.agh\.edu\.pl$")
}
```

Ad 6

The RDF datasets such as those mentioned have an enormous collection of documents. The time necessary to process a query is dependent on both the size of the data set as well as the complexity of the query itself which makes searching through such huge datasets very time consuming.