Cairo University
Faculty of Computers & Artificial Intelligence
Computer Science Department
Year 2021 – 2022
First Term

Lab 7

Jena

Requirements:

a- Java IDE (Eclipse)

b- Java 8 installed

c- Apache Jena Libraries

Agenda

1- Introduction

2- Model Creation

3- RDF files reading

4- Querying and Navigating Examples

Cairo University
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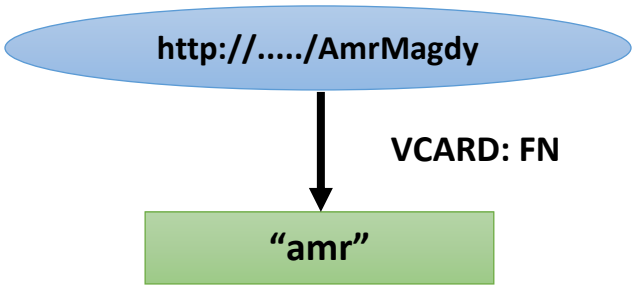
1- Introduction

The Resource Description Framework (RDF) is a standard for describing resources. For our purposes we can think of resource as anything we can identify.

RDF is best thought of in the form of node and arc diagrams. For example if we said "AmrMagdy has a first name amr" might look like this in RDF:



2- Model Creation

To create this example using a java code you can write this in a java file main function

```
// some definitions
String personURI    = "http://somewhere/AmrMagdy";
String firstName     = "amr";

// create an empty Model
Model model = ModelFactory.createDefaultModel();

// create the resource
Resource AmrMagdy = model.createResource(personURI);
```

```
// add the property
 AmrMagdy.addProperty(VCARD.FN, firstName);
model.write(System.out);
```

But this takes a long time if your want to build a full model with a list of resources and properties. It's better to write a text file in RDF format then load it using java code.

1- RDF files reading

First we should know how to write statements in RDF format. Here are some examples:

a- AmrMagdy has a user name amr and an email amr@fci.com and age 25 as an integer

b- IslamHassan has a user name islam and an email islam@fci.com and age 23 as integer

c- Product book1 has a name "modern family" and category "children book" and number in stock 100

d- Product book2 has a name "best friends" and category "children book" and number in stock 150

e- Example: Offer1 with name doubleBook and quantity of 2 as integer and price 100 dollars as double.

f- Offer1 contain product book1 and contains product book2

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

Cairo University
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Year 2021 – 2022
First Term

```
<!DOCTYPE rdf:RDF [

<!ENTITY xsd "http://www.w3.org/2001/XMLSchema#" > ]>

<rdf:RDF

 xmlns:xsd="http://www.w3.org/2001/XMLSchema#"

 xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"

 xmlns:example="http://www.myExample.com/amazon.owl#">

<rdf:Description

rdf:about="http://www.myExample.com/amazon.owl#AmrMagdy">

<example:username>amr</example:username>

<example:email>amr@fci.com</example:email>

<example:age rdf:datatype="&xsd;integer">27</example:age>

</rdf:Description>


<rdf:Description

rdf:about="http://www.myExample.com/amazon.owl#IslamHassan">

<example:username>islam</example:username>

<example:email> islam@fci.com </example:email>

<example:age rdf:datatype="&xsd;integer">23</example:age>

</rdf:Description>


<rdf:Description

rdf:about="http://www.myExample.com/amazon.owl#book1">
```

```
<example:name>modern family</example:name>

<example:category> children book </example:category>

<example:stock rdf:datatype="&xsd;integer">100</example:stock>

</rdf:Description>



<rdf:Description

rdf:about="http://www.myExample.com/amazon.owl#book2">

<example:name>best friends</example:name>

<example:category> children book </example:category>

<example:stock rdf:datatype="&xsd;integer">150</example:stock>

</rdf:Description>



<rdf:Description

rdf:about="http://www.myExample.com/amazon.owl#offer1">

<example:offername>double book</example:offername>

<example:quantity rdf:datatype="&xsd;integer">2</example:quantity>

<example:price rdf:datatype="&xsd;double">100</example:price>

<example:contains rdf:resource="http://www.myExample.com/amazon.owl#book1"/>

<example:contains rdf:resource="http://www.myExample.com/amazon.owl#book2"/>

</rdf:Description>



</rdf:RDF>
```

Now we can load this file using this java code after saving it in .rdf file:

```
// create an empty model
        Model model = ModelFactory.createDefaultModel();

       // use the FileManager to find the input file
        InputStream in = FileManager.get().open( "E:\\test.rdf" );
       if (in == null) {
       thrownew IllegalArgumentException(
       "File:  not found");
       }

       // read the RDF/XML file
       model.read(in, null);

       // write it to standard out
       model.write(System.out);
```

2- Querying and Navigating Examples

If you want to list all resources with a specific property. for example all resources that have property username, you can write down this java code:

```
String usernameURL="http://www.myExample.com/amazon.owl#username";
       Property property=model.createProperty(usernameURL);

       ResIterator iter = model.listSubjectsWithProperty(property);
           System.out.println("The database contains fname for:");
       while (iter.hasNext()) {
              System.out.println("  " + iter.nextResource()
                                          .getProperty(property)
                                          .getString());
           }
```

Cairo University
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If you want to get a value of specific property for a specific resource. For example names of products that offer1 contains, you can write this java code:

```
String resourceURL="http://www.myExample.com/amazon.owl#offer1";
           String contURL="http://www.myExample.com/amazon.owl#contains";
              Property containsroperty=model.createProperty(contURL);
           Resource offer1 = model.getResource(resourceURL);

           String
productnameURL="http://www.myExample.com/amazon.owl#category";
           Property productNameroperty=model.createProperty(productnameURL);

           StmtIterator iterBooks =  offer1.listProperties(containsroperty);
           while(iterBooks.hasNext())
           {
              System.out.println("  " + iterBooks.nextStatement()
                     .getProperty(productNameroperty).getString());
           }
```