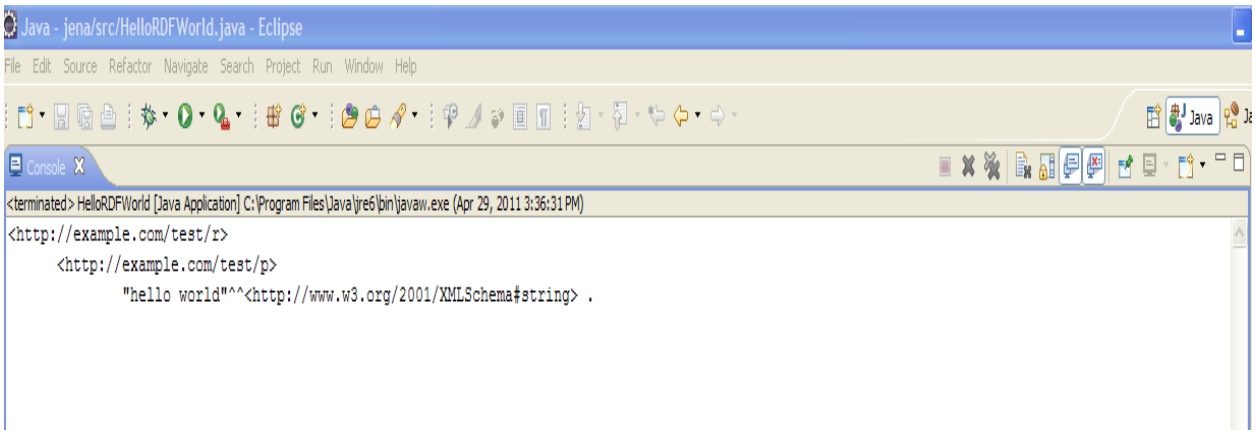
```
//1.A simple hello world program

import com.hp.hpl.jena.rdf.model.Model;

import com.hp.hpl.jena.datatypes.xsd.XSDDatatype;

import com.hp.hpl.jena.rdf.model.ModelFactory;

import com.hp.hpl.jena.rdf.model.Property;

import com.hp.hpl.jena.rdf.model.Resource;

public class HelloRDFWorld{

        public static void main(String[] args){

                Model m =ModelFactory.createDefaultModel();

                String NS="http://example.com/test/";

                Resource r=m.createResource(NS+"r");

                Property p=m.createProperty(NS+ "p");

                r.addProperty(p,"hello world",XSDDatatype.XSDstring);

                m.write(System.out,"Turtle");


        }

}
```

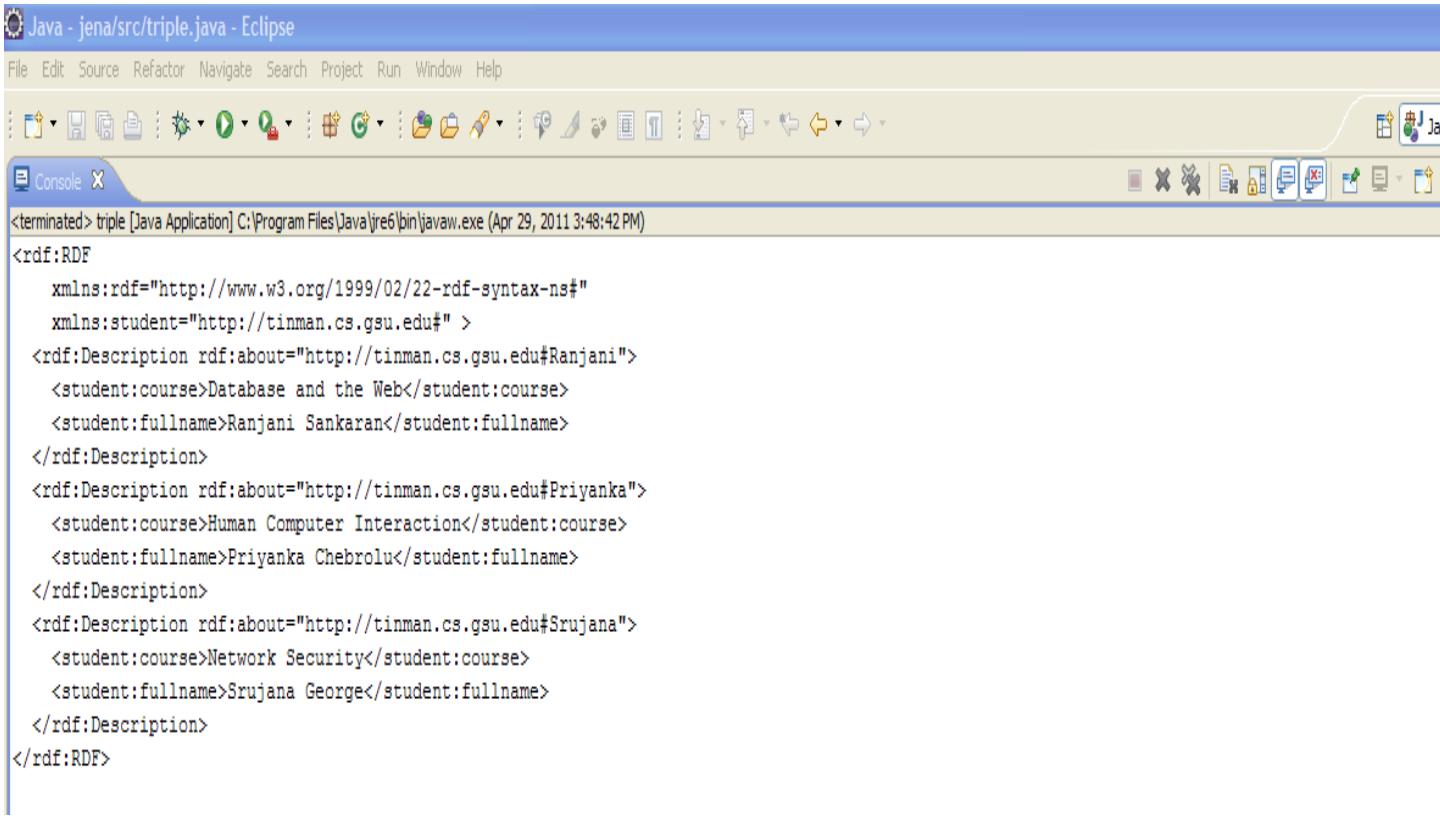
Output:



```
//2.Program to output an rdf based on the resources and properties created.


import com.hp.hpl.jena.rdf.model.*;
import java.io.PrintWriter;
public class triple extends Object {
public static void main (String args[]) {
      String sURI =     "http://tinman.cs.gsu.edu#";
      String sRelated = "fullname";
      String sCourse = "course";
try {
// Create an empty graph
      Model model = ModelFactory.createDefaultModel();
      model.setNsPrefix( "student", "http://tinman.cs.gsu.edu#" );

// Create the resource
Resource postcon = model.createResource(sURI+"Ranjani");
Resource postcon1 = model.createResource(sURI+"Priyanka");
Resource postcon2 = model.createResource(sURI+"Srujana");

// Create the predicate (property)

//fullname
Property fullname = model.createProperty(sURI, sRelated);
Property fullname1 = model.createProperty(sURI, sRelated);
Property fullname2 = model.createProperty(sURI, sRelated);

//subject
Property course = model.createProperty(sURI, sCourse);
Property course1 = model.createProperty(sURI, sCourse);
Property course2 = model.createProperty(sURI, sCourse);

// Add the properties with associated values (objects)

//property for fullname

postcon.addProperty(fullname,
"Ranjani Sankaran");
postcon1.addProperty(fullname1,
"Priyanka Chebrolu");
postcon2.addProperty(fullname2,
"Srujana George");

//property for course
postcon.addProperty(course,
"Database and the Web");
postcon1.addProperty(course1,
"Human Computer Interaction");
postcon2.addProperty(course2,
"Network Security");

//Print RDF/XML of model to system output
model.write(new PrintWriter(System.out));

} catch (Exception e) {
System.out.println("Failed: " + e);
```

```
}
}
}
```

Output:


Java - jena/src/triple.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Console
<terminated> triple [Java Application] C:\Program Files\Java\jre6\bin\javaw.exe (Apr 29, 2011 3:48:42 PM)
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:student="http://tinman.cs.gsu.edu#" >
<rdf:Description rdf:about="http://tinman.cs.gsu.edu#Ranjani">
<student:course>Database and the Web</student:course>
<student:fullname>Ranjani Sankaran</student:fullname>
</rdf:Description>
<rdf:Description rdf:about="http://tinman.cs.gsu.edu#Priyanka">
<student:course>Human Computer Interaction</student:course>
<student:fullname>Priyanka Chebrolu</student:fullname>
</rdf:Description>
<rdf:Description rdf:about="http://tinman.cs.gsu.edu#Srujana">
<student:course>Network Security</student:course>
<student:fullname>Srujana George</student:fullname>
</rdf:Description>
</rdf:RDF>

```
//3. Creates model and appends resources, properties to it. Iterates through the statements.


import java.io.PrintWriter;

import java.util.*;

import com.hp.hpl.jena.rdf.model.*;


/**

 * A small family tree held in a Jena Model

 */

public class Student {


 // Namespace declarations

 static final String familyUri = "http://tinman.cs.gsu.edu#";



 // Jena model representing the family

 private Model model;


 /**

  * Creates a model and populates it with family members and their

  * relationships

  */

 private Student() {


  // Create an empty Model
```

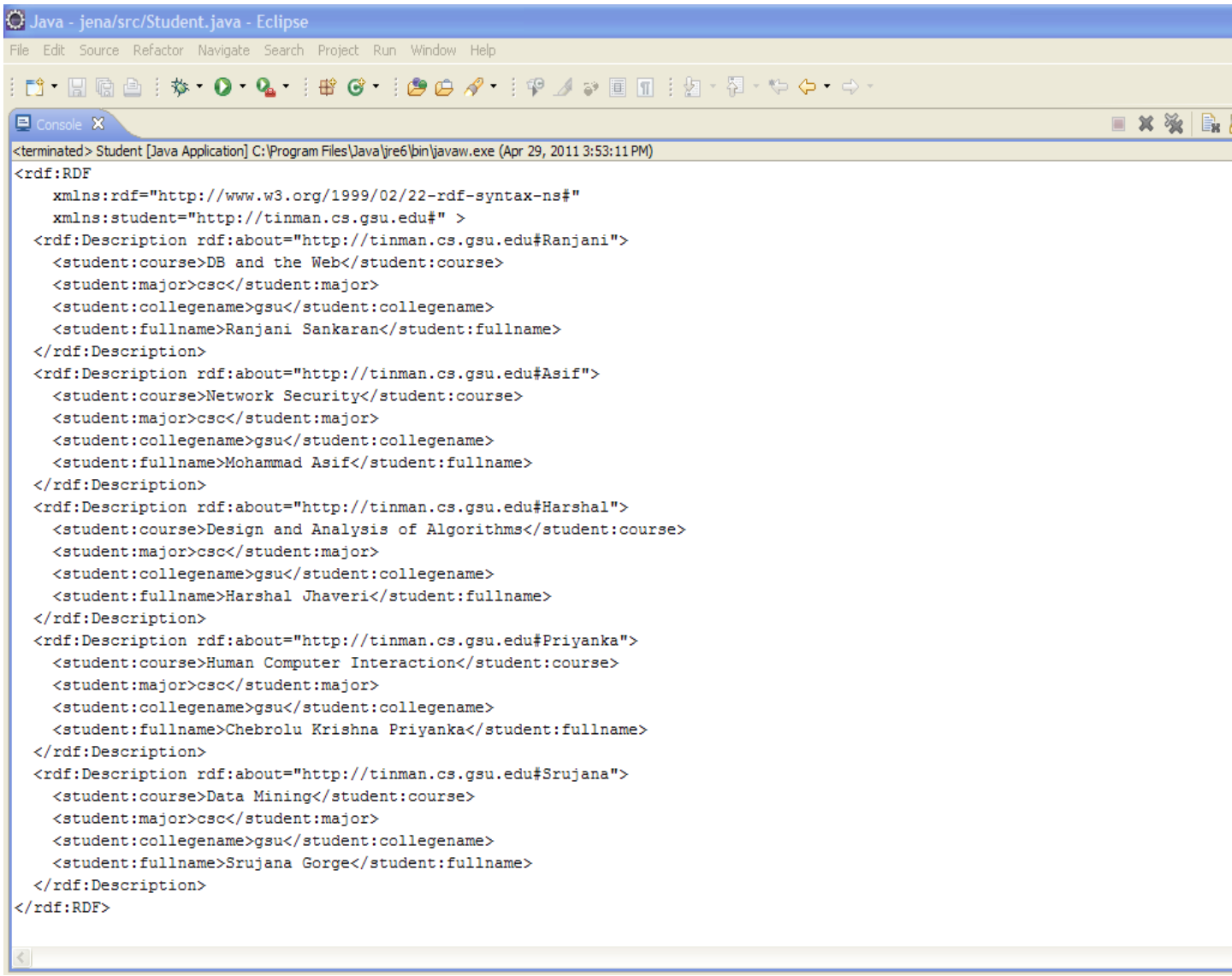
```
model = ModelFactory.createDefaultModel();

model.setNsPrefix( "student", "http://tinman.cs.gsu.edu#" );


String fullName = "fullname";

String College = "collegename";

String Major = "major";

String Course = "course";




// Create the types of Property we need to describe relationships

// in the model

Property fullname = model.createProperty(familyUri,fullName);

Property college = model.createProperty(familyUri,College);

Property major = model.createProperty(familyUri,Major);

Property course = model.createProperty(familyUri,Course);







// Create resources representing the people in our model

Resource ranjani = model.createResource(familyUri+"Ranjani");

Resource priyanka = model.createResource(familyUri+"Priyanka");

Resource srujana = model.createResource(familyUri+"Srujana");

Resource asif = model.createResource(familyUri+"Asif");

Resource harshal = model.createResource(familyUri+"Harshal");
```

```
// Add properties to describing the relationships between them
ranjani.addProperty(fullname,"Ranjani Sankaran");
priyanka.addProperty(fullname,"Chebrolu Krishna Priyanka");
srujana.addProperty(fullname,"Srujana Gorge");
asif.addProperty(fullname,"Mohammad Asif");
harshal.addProperty(fullname,"Harshal Jhaveri");

// Statements can also be directly created ...
Statement statement1 = model.createStatement(ranjani,college,"gsu");
Statement statement2 = model.createStatement(priyanka,college,"gsu");
Statement statement3 = model.createStatement(srujana,college,"gsu");
Statement statement4 = model.createStatement(asif,college,"gsu");
Statement statement5 = model.createStatement(harshal,college,"gsu");

// ... then added to the model:
model.add(statement1);
model.add(statement2);
model.add(statement3);
model.add(statement4);
model.add(statement5);

// Arrays of Statements can also be added to a Model:
Statement statements[] = new Statement[5];
```

```
  statements[0] = model.createStatement(ranjani,major,"csc");
  statements[1] = model.createStatement(priyanka,major,"csc");
  statements[2] = model.createStatement(srujana,major,"csc");
  statements[3] = model.createStatement(asif,major,"csc");
  statements[4] = model.createStatement(harshal,major,"csc");
  model.add(statements);



  // A List of Statements can also be added
  List list = new ArrayList();


  list.add(model.createStatement(ranjani,course,"DB and the Web"));
  list.add(model.createStatement(priyanka,course,"Human Computer Interaction"));
  list.add(model.createStatement(srujana,course,"Data Mining"));
  list.add(model.createStatement(asif,course,"Network Security"));
  list.add(model.createStatement(harshal,course,"Design and Analysis of Algorithms"));


  model.add(list);
  model.write(new PrintWriter(System.out));
}


/**
 * Creates a FamilyModel and dumps the content of its RDF representation
 */
public static void main(String args[]) {
```

```
  // Create a model representing the family
  Student thestudent = new Student();


  // Dump out a String representation of the model




 }
}
```

Output:




```
4.  //*****************************************
 //List students who have taken a course
    ResIterator students_course = model.listSubjectsWithProperty(course);

    // Because subjects of statements are Resources, the method returned a
ResIterator
    while (students_course.hasNext()) {

      // ResIterator has a typed nextResource() method
      Resource person = students_course.nextResource();

      // Print the URI of the resource
      System.out.println("The list of students who have taken
coures"+person.getURI());
    }
```

```
    // Can also find all the courses by getting the objects of all "course"
statements
    // Objects of statements could be Resources or literals, so the Iterator
returned
    // contains RDFNodes
    NodeIterator courses = model.listObjectsOfProperty(course);
    System.out.println("****LIST OF COURSES***");
    while (courses.hasNext()) {

      System.out.println(courses.nextNode().toString());
      }



    // To find all the courses taken by a student, the model itself can be
queried
    NodeIterator moreStudents1 = model.listObjectsOfProperty(priyanka,
course);
    System.out.println("****LIST OF COURSES TAKEN BY PRIYANKA***");
    while (moreStudents1.hasNext()) {

      System.out.println(moreStudents1.nextNode().toString());
      }

    // But it's more elegant to ask the Resource directly
    // This method yields an iterator over Statements
    StmtIterator moreStudents2 = priyanka.listProperties(course);

    System.out.println("****LIST OF COURSES TAKEN BY PRIYANKA (USING DIRECT
METHOD)***");
    while (moreStudents2.hasNext()) {

      System.out.println(moreStudents2.next().toString());
      }

  //*******************USING SELECTORS TO QUERY**********************
 // Find the exact statement "priyanka has taken DB and the Web"

    StmtIterator moreStudents5 = model.listStatements(priyanka,course,"DB and
the Web");
    System.out.println("***priyanka has taken DB and the Web****");

    while (moreStudents5.hasNext()) {

      System.out.println(moreStudents5.next().toString());
      }


    // Find all statements with ranjani as the subject and "csc" as the
object

    StmtIterator moreStudents6 = model.listStatements(ranjani,null,"csc");
    System.out.println("***ranjani as the subject and \"csc\" as the
object****");
```

```
    while (moreStudents6.hasNext()) {

      System.out.println(moreStudents6.next().toString());
      }
```

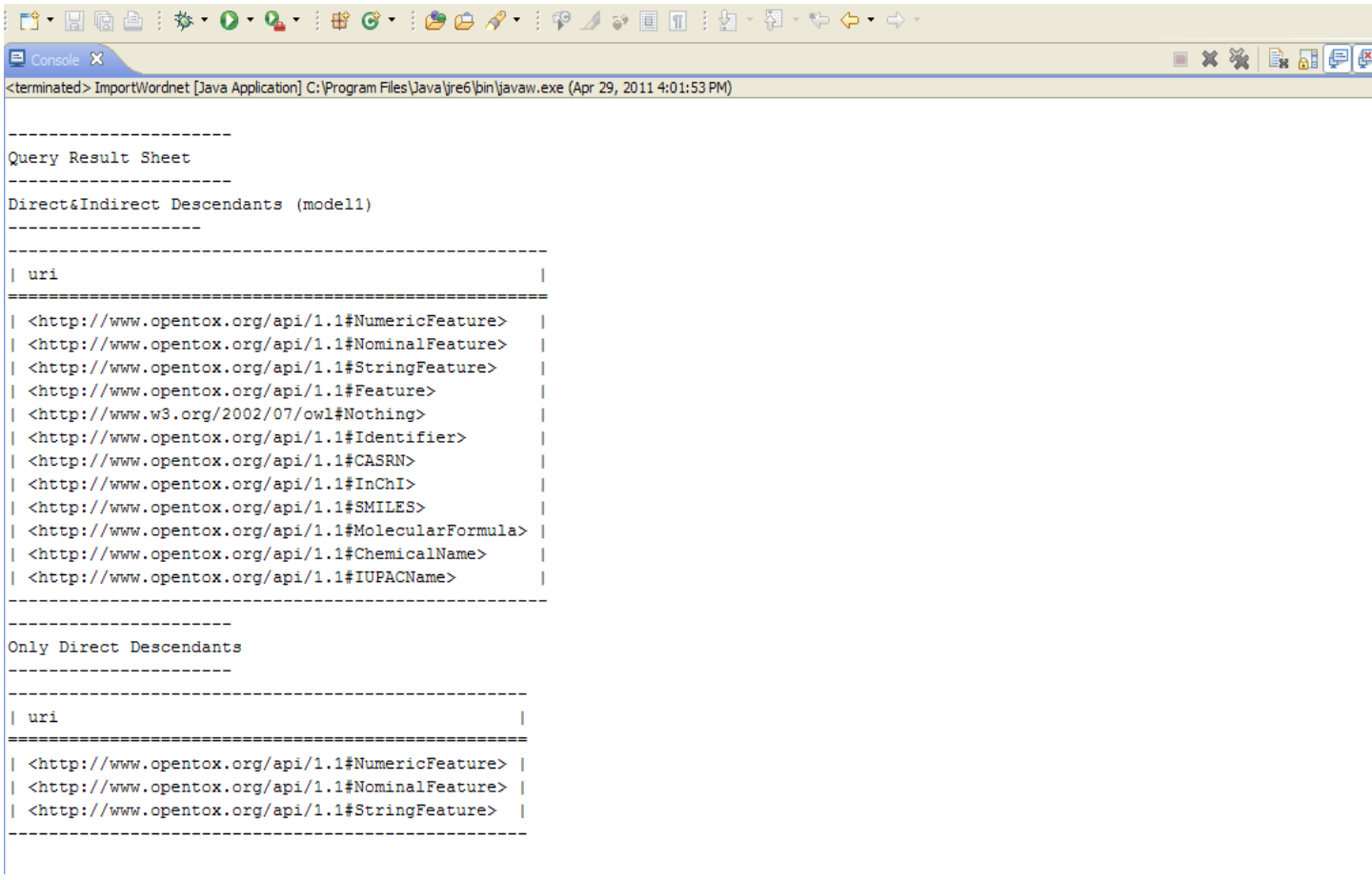
Output:

```
The list of students who have taken coureshttp://tinman.cs.gsu.edu#Ranjani
The list of students who have taken coureshttp://tinman.cs.gsu.edu#Asif
The list of students who have taken coureshttp://tinman.cs.gsu.edu#Priyanka
The list of students who have taken coureshttp://tinman.cs.gsu.edu#Harshal
The list of students who have taken coureshttp://tinman.cs.gsu.edu#Srujana
****LIST OF COURSES***
Human Computer Interaction
Design and Analysis of Algorithms
Network Security
DB and the Web
Data Mining
****LIST OF COURSES TAKEN BY PRIYANKA***
Human Computer Interaction
DB and the Web
****LIST OF COURSES TAKEN BY PRIYANKA (USING DIRECT METHOD)***
[http://tinman.cs.gsu.edu#Priyanka, http://tinman.cs.gsu.edu#course, "DB and the Web"]
[http://tinman.cs.gsu.edu#Priyanka, http://tinman.cs.gsu.edu#course, "Human Computer Interaction"]
***priyanka has taken DB and the Web****
[http://tinman.cs.gsu.edu#Priyanka, http://tinman.cs.gsu.edu#course, "DB and the Web"]
***ranjani as the subject and "csc" as the object****
[http://tinman.cs.gsu.edu#Ranjani, http://tinman.cs.gsu.edu#major, "csc"]
```

```
//5.Creating model with and without reasoner and executing a simple sparql
query


import com.hp.hpl.jena.graph.query.Query;
import com.hp.hpl.jena.ontology.OntModel;
import com.hp.hpl.jena.ontology.OntModelSpec;
import com.hp.hpl.jena.query.QueryExecution;
import com.hp.hpl.jena.query.QueryExecutionFactory;
import com.hp.hpl.jena.query.QueryFactory;
import com.hp.hpl.jena.query.ResultSetFormatter;
import com.hp.hpl.jena.rdf.model.ModelFactory;

public class ImportWordnet {

public static void main (String args[]) {
```

```
        String SOURCE = "http://www.opentox.org/api/1.1";
        String NS = SOURCE + "#";
       //create a model using reasoner
        OntModel model1 = ModelFactory.createOntologyModel(
OntModelSpec.OWL_MEM_MICRO_RULE_INF);
       //create a model which doesn't use a reasoner
        OntModel model2 = ModelFactory.createOntologyModel(
OntModelSpec.OWL_MEM);

        // read the RDF/XML file
        model1.read( SOURCE, "RDF/XML" );
        model2.read( SOURCE, "RDF/XML" );
        //prints out the RDF/XML structure
       // qe.close();
        System.out.println(" ");


    // Create a new query
    String queryString =
      "PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#> "+
        "PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>  "+
        "select ?uri "+
        "where { "+
         "?uri rdfs:subClassOf <http://www.opentox.org/api/1.1#Feature>  "+
        "} \n ";
    com.hp.hpl.jena.query.Query query = QueryFactory.create(queryString);

    System.out.println("----------------------");

    System.out.println("Query Result Sheet");

    System.out.println("----------------------");

    System.out.println("Direct&Indirect Descendants (model1)");

    System.out.println("--------------------");


    // Execute the query and obtain results
    QueryExecution qe = QueryExecutionFactory.create(query, model1);
    com.hp.hpl.jena.query.ResultSet results =  qe.execSelect();

    // Output query results
    ResultSetFormatter.out(System.out, results, query);

    qe.close();

    System.out.println("----------------------");
    System.out.println("Only Direct Descendants");
    System.out.println("----------------------");

    // Execute the query and obtain results
    qe = QueryExecutionFactory.create(query, model2);
    results =  qe.execSelect();

    // Output query results
```

```
    ResultSetFormatter.out(System.out, results, query);
   qe.close();
}
}
```

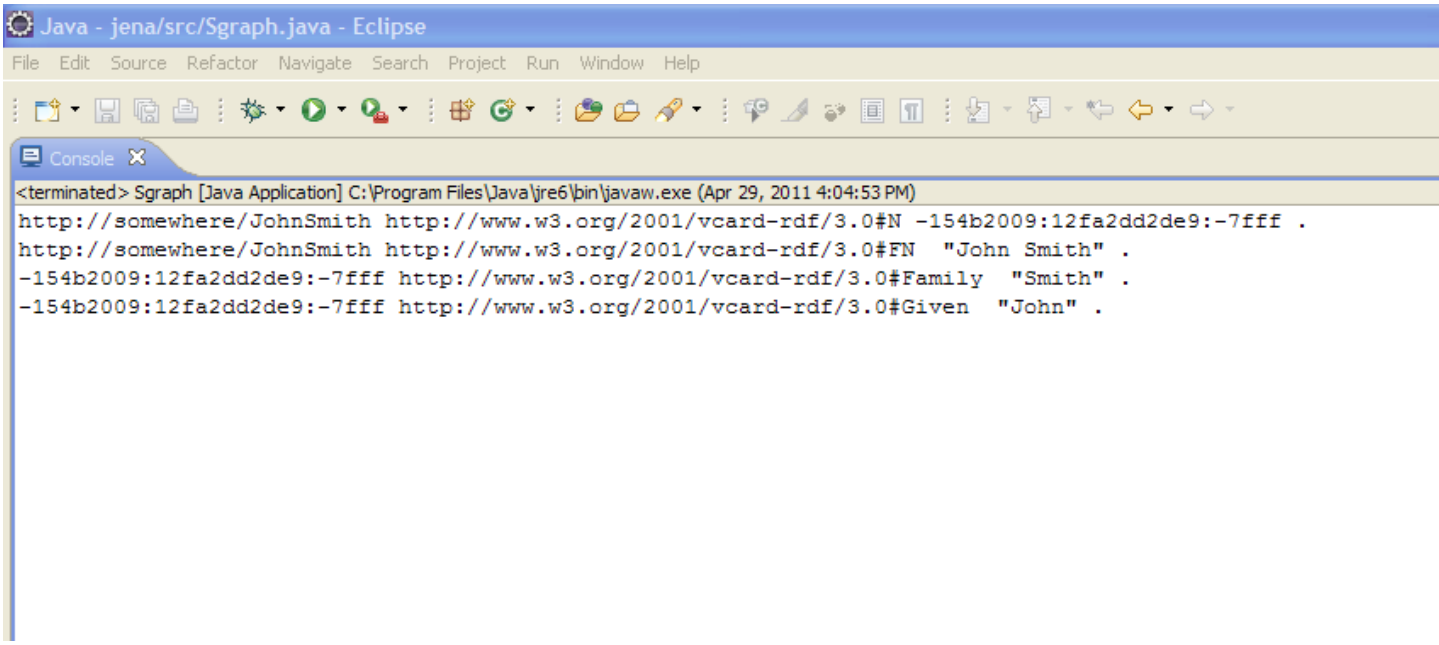


```
<terminated> ImportWordnet [Java Application] C:\Program Files\Java\jre6\bin\javaw.exe (Apr 29, 2011 4:01:53 PM)

----------------------
Query Result Sheet
----------------------
Direct&Indirect Descendants (model1)
-------------------
-----------------------------------------------------
| uri                                               |
=====================================================
| <http://www.opentox.org/api/1.1#NumericFeature>   |
| <http://www.opentox.org/api/1.1#NominalFeature>   |
| <http://www.opentox.org/api/1.1#StringFeature>    |
| <http://www.opentox.org/api/1.1#Feature>          |
| <http://www.w3.org/2002/07/owl#Nothing>           |
| <http://www.opentox.org/api/1.1#Identifier>       |
| <http://www.opentox.org/api/1.1#CASRN>            |
| <http://www.opentox.org/api/1.1#InChI>            |
| <http://www.opentox.org/api/1.1#SMILES>           |
| <http://www.opentox.org/api/1.1#MolecularFormula> |
| <http://www.opentox.org/api/1.1#ChemicalName>     |
| <http://www.opentox.org/api/1.1#IUPACName>        |
-----------------------------------------------------
----------------------
Only Direct Descendants
----------------------
-------------------------------------------------
| uri                                           |
=================================================
| <http://www.opentox.org/api/1.1#NumericFeature> |
| <http://www.opentox.org/api/1.1#NominalFeature> |
| <http://www.opentox.org/api/1.1#StringFeature>  |
-------------------------------------------------
```

```
        //6.Creating model,resources and properties with vcards



        import com.hp.hpl.jena.rdf.model.*;

        import com.hp.hpl.jena.vocabulary.*;



        /** Tutorial 3 Statement attribute accessor methods

         *

         * @author  bwm - updated by kers/Daniel

         * @version Release='$Name:  $' Revision='$Revision: 1.3 $' Date='$Date: 2005/10/06 17:49:05
$'

         */

        public class Sgraph extends Object {

           public static void main (String args[]) {


              // some definitions

              String personURI    = "http://somewhere/JohnSmith";

              String givenName    = "John";

              String familyName   = "Smith";

              String fullName     = givenName + " " + familyName;

              // create an empty model

              Model model = ModelFactory.createDefaultModel();


              // create the resource

              //   and add the properties cascading style
```

```
Resource johnSmith
 = model.createResource(personURI)
       .addProperty(VCARD.FN, fullName)
       .addProperty(VCARD.N,
                  model.createResource()
                     .addProperty(VCARD.Given, givenName)
                     .addProperty(VCARD.Family, familyName));

// list the statements in the graph
StmtIterator iter = model.listStatements();

// print out the predicate, subject and object of each statement
while (iter.hasNext()) {
   Statement stmt      = iter.nextStatement();        // get next statement
   Resource  subject   = stmt.getSubject();   // get the subject
   Property  predicate = stmt.getPredicate(); // get the predicate
   RDFNode   object    = stmt.getObject();    // get the object

   System.out.print(subject.toString());
   System.out.print(" " + predicate.toString() + " ");
   if (object instanceof Resource) {
      System.out.print(object.toString());
   } else {
      // object is a literal
      System.out.print(" \"" + object.toString() + "\"");
```

```
            }

            System.out.println(" .");

          }

        }

      }
```



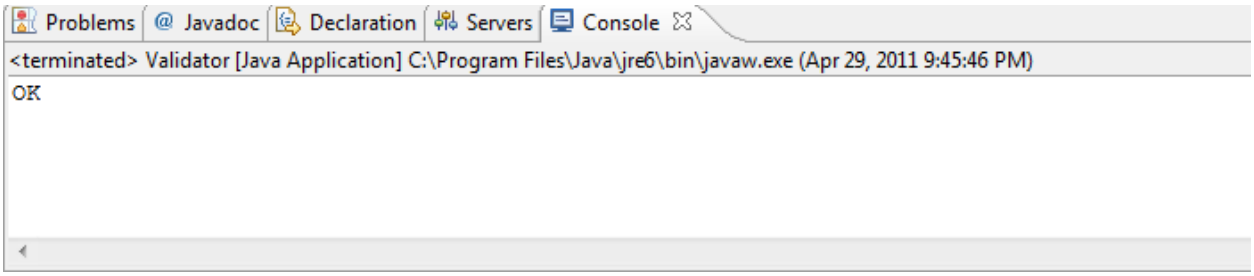
7.validator checks the correctness of the RDF formats.

```
import java.util.Iterator;
import com.hp.hpl.jena.rdf.model.InfModel;
import com.hp.hpl.jena.rdf.model.Model;
import com.hp.hpl.jena.rdf.model.ModelFactory;
import com.hp.hpl.jena.reasoner.ValidityReport;
import com.hp.hpl.jena.util.FileManager;


public class Validator
{
      public static void main(String args[])
      {
            Model data = FileManager.get().loadModel("student.rdf");
          InfModel infmodel = ModelFactory.createRDFSModel(data);
          ValidityReport validity = infmodel.validate();
```

```
            if (validity.isValid()) {
                System.out.println("OK");
            } else {
                System.out.println("Conflicts");
                for (Iterator i = validity.getReports(); i.hasNext(); ) {
                    System.out.println(" - " + i.next());
                }
            }

        }
}
```

Output:

Correct--




```
//8. Example implementing the reasoner in jena

import com.hp.hpl.jena.rdf.model.InfModel;

import com.hp.hpl.jena.reasoner.Reasoner;

import com.hp.hpl.jena.rdf.model.Model;

import com.hp.hpl.jena.rdf.model.ModelFactory;

import com.hp.hpl.jena.rdf.model.Property;

import com.hp.hpl.jena.rdf.model.Resource;

import com.hp.hpl.jena.rdf.model.Statement;

import com.hp.hpl.jena.rdf.model.StmtIterator;

import com.hp.hpl.jena.reasoner.ReasonerRegistry;

import com.hp.hpl.jena.util.FileManager;
```

```
import com.hp.hpl.jena.util.PrintUtil;
import com.hp.hpl.jena.vocabulary.RDF;



public class SchemaDemo {
        public static void main(String args[])
        {
                Model schema = FileManager.get().loadModel("owlDemoSchema.owl");
           Model data = FileManager.get().loadModel("owlDemoData.rdf");

           Reasoner reasoner = ReasonerRegistry.getOWLReasoner();
           reasoner = reasoner.bindSchema(schema);
           InfModel infmodel = ModelFactory.createInfModel(reasoner, data);

           Resource nForce = infmodel.getResource("urn:x-hp:eg/nForce");
           System.out.println("nForce *:");
           printStatements(infmodel, nForce, null, null);

           Resource gamingComputer = infmodel.getResource("urn:x-hp:eg/GamingComputer");
           Resource whiteBox = infmodel.getResource("urn:x-hp:eg/whiteBoxZX");
           if (infmodel.contains(whiteBox, RDF.type, gamingComputer)) {
              System.out.println("White box recognized as gaming computer");
           } else {
              System.out.println("Failed to recognize white box correctly");
           }
```

```
        }

        public static void printStatements(Model m, Resource s, Property p, Resource o) {

    for (StmtIterator i = m.listStatements(s,p,o); i.hasNext(); ) {

      Statement stmt = i.nextStatement();

      System.out.println(" - " + PrintUtil.print(stmt));

    }

  }


}
```

Output: