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DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING
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NAAC ACCREDITED with "A" GRADE (CGPA : 3.18)
DEPARTMENT OF INFORMATION TECHNOLOGY

COURSE CODE: DJ19ITL801 **DATE:** 21/02/2024

COURSE NAME: Semantic Web Technology Laboratory **CLASS**: Final Year B Tech

EXPERIMENT NO. 5

CO/LO: Model ontologies using Resource Description Framework (RDF) and Web Ontology Language (OWL)

AIM / OBJECTIVE:

Design of Ontology using RDFS

THEORY:

RDF, or "Resource Description Framework," is a data structure. It's a data structure with some special properties, that makes it interesting to people: RDF is a standard - Being a "standard" means that lots of people have thought about it, and lots of people are making things with it. People also write useful tools for standards. Being a standard is a great thing for any data structure. A standard creates a medium for communication. RDF describes graphs - Being in the shape of a Graph means that it gets around a lot of problems that arise when you must put things in the shape of a tree. "Tree" views of the world are notoriously stubborn, and tend to reflect a particular perspective, interest, value, or goal. Graph structures are perfectly malleable, and allow for any arbitrary description of things, and the relationships between them.

RDF data can overlap - RDF is designed so that if some data presents an incomplete picture, you can amend it from afar (see "Networked Data.") Say there's a public database of baseball players, but for some reason it's missing their batting averages. You can attach batting average information to the public database. People still must know about your amendment and agree to use it. But once they do, the technology is not an obstacle- overlapping was already considered in the construction of the spec. Overlapping data can be automatically merged. RDF is an essential ingredient to the Semantic Web. RDF is a data structure. It can be described in many ways. RDFS is a vocabulary, in RDF, that explains how nodes of a graph relate.

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PROCEDURE / ALGORITHM:

Design an ontology using RDFS and draw the graph using RDF Grapher:

CODE:

```
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#>.
@prefix ex: <http://www.example.com/org#>.
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>.

# Classes
ex:Organization rdf:type rdfs:Class.
ex:Department rdf:type rdfs:Class.
ex:Employee rdf:type rdfs:Class.

# Properties
ex:hasDepartment rdf:type rdf:Property ;
    rdfs:domain ex:Organization ;
    rdfs:range ex:Department .
ex:hasEmployee rdf:type rdf:Property ;
    rdfs:domain ex:Department ;
    rdfs:range ex:Employee .

ex:worksIn rdf:type rdf:Property ;
    rdfs:domain ex:Employee ;
    rdfs:range ex:Department .
ex:belongsTo rdf:type rdf:Property ;
    rdfs:domain ex:Department ;
    rdfs:range ex:Organization .
# Individuals
ex:Company1 rdf:type ex:Organization .
ex:Company2 rdf:type ex:Organization .
ex:IT_Department rdf:type ex:Department .
ex:HR_Department rdf:type ex:Department .
ex:JohnSmith rdf:type ex:Employee .
ex:JaneDoe rdf:type ex:Employee .

# Relationships
ex:Company1 ex:hasDepartment ex:IT_Department .
ex:Company1 ex:hasDepartment ex:HR_Department .

ex:IT_Department ex:hasEmployee ex:JohnSmith .
ex:HR_Department ex:hasEmployee ex:JaneDoe .
```

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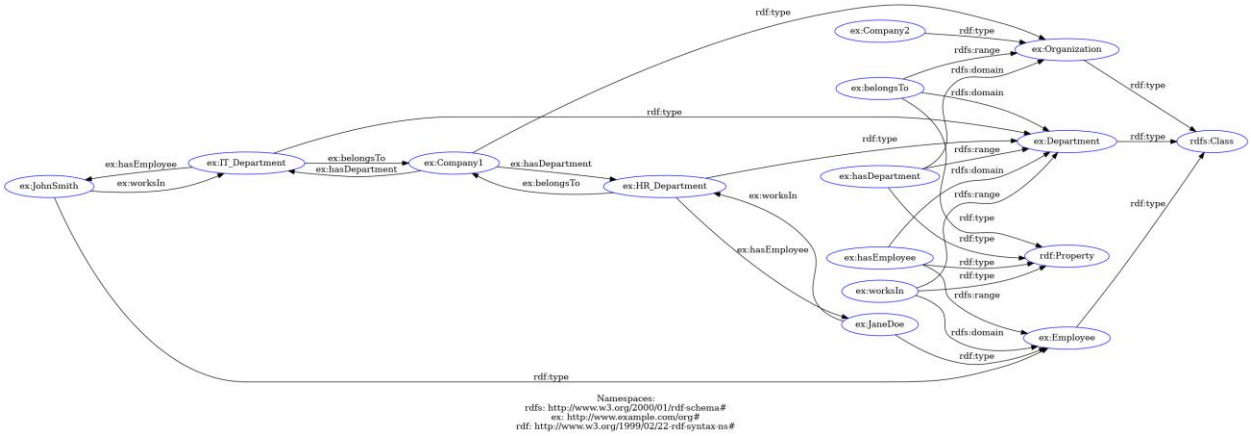
```
ex:JohnSmith ex:worksIn ex:IT_Department .
ex:JaneDoe ex:worksIn ex:HR_Department .

ex:IT_Department ex:belongsTo ex:Company1 .
ex:HR_Department ex:belongsTo ex:Company1 .
```

OUTPUT:



CONCLUSION:

Thus, we have designed a Recipe ontology using RDFS.

BOOKS AND WEB RESOURCES:

1. https://www.w3.org/TR/rdf-schema/
2. https://cambridgesemantics.com/blog/semantic-university/learn-owl-rdfs/
3. https://w3schools.sinsixx.com/rdf/rdf_schema.asp.htm
4. https://www. ldf.fi/service/rdf-grapher