# CO7216 Semantic Web

Surgery 1 Model Solutions

## Exercise 1- Solution:

```xml
<?xml version="1.0"?>
<rdf:RDF
    xmlns:xsp="http://www.owl-ontologies.com/2005/08/07/xsp.owl#"
    xmlns:owl2xml="http://www.w3.org/2006/12/owl2-xml#"
    xmlns:swrlb="http://www.w3.org/2003/11/swrlb#"
    xmlns:swrl="http://www.w3.org/2003/11/swrl#"
    xmlns:protege="http://protege.stanford.edu/plugins/owl/protege#"
    xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
    xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
    xmlns:owl="http://www.w3.org/2002/07/owl#"
    xmlns:order="http://www.cs.le.ac.uk/CO7216/Order#"
  xml:base="http://www.cs.le.ac.uk/CO7216/Order">
  <owl:Ontology rdf:about=""/>


  <rdfs:Class rdf:ID="Item"/>
  <rdfs:Class rdf:ID="purchaseOrder"/>
  <rdfs:Class rdf:ID="Address"/>
  <rdfs:Class rdf:ID="ShippingInfo"/>
  <rdf:Property rdf:ID="USPrice">
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#float"/>
  </rdf:Property>
  <rdf:Property rdf:ID="productName">
    <rdfs:domain rdf:resource="#Item"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </rdf:Property>
  <rdf:Property rdf:ID="shipping_id">
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    <rdfs:domain rdf:resource="#ShippingInfo"/>
  </rdf:Property>
  <rdf:Property rdf:ID="id">
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    <rdfs:domain rdf:resource="#purchaseOrder"/>
  </rdf:Property>
  <rdf:Property rdf:ID="item_id">
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    <rdfs:domain rdf:resource="#Item"/>
  </rdf:Property>
  <rdf:Property rdf:ID="name">
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    <rdfs:domain rdf:resource="#Address"/>
  </rdf:Property>
  <rdf:Property rdf:ID="hasItem">
    <rdfs:range rdf:resource="#Item"/>
    <rdfs:domain rdf:resource="#purchaseOrder"/>
  </rdf:Property>
  <rdf:Property rdf:ID="country">
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    <rdfs:domain rdf:resource="#Address"/>
  </rdf:Property>
  <rdf:Property rdf:ID="comment">
    <rdfs:domain rdf:resource="#Item"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </rdf:Property>
  <rdf:Property rdf:ID="hasShippingInfo">
    <rdfs:domain rdf:resource="#purchaseOrder"/>
```

```xml
        <rdfs:range rdf:resource="#ShippingInfo"/>
    </rdf:Property>
    <rdf:Property rdf:ID="partNum">
        <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
        <rdfs:domain rdf:resource="#Item"/>
    </rdf:Property>
    <rdf:Property rdf:ID="quantity">
        <rdfs:domain rdf:resource="#Item"/>
        <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
    </rdf:Property>
    <rdf:Property rdf:ID="hasShippingAddress">
        <rdfs:domain rdf:resource="#ShippingInfo"/>
        <rdfs:range rdf:resource="#Address"/>
    </rdf:Property>
    <rdf:Property rdf:ID="street">
        <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
        <rdfs:domain rdf:resource="#Address"/>
    </rdf:Property>

    <order:purchaseOrder rdf:ID="purchaseOrder_1">
        <order:hasItem>
            <order:Item rdf:ID="Item_2">
                <order:quantity rdf:datatype="http://www.w3.org/2001/XMLSchema#int"
                >1</order:quantity>
                <order:comment
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
                >Hurry, my lawn is going wild!</order:comment>
                <order:productName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
                >Lawnmower</order:productName>
                <order:item_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
                >I1-01</order:item_id>
                <order:partNum
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
                >872-AA</order:partNum>
            </order:Item>
        </order:hasItem>
        <order:id rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >I-01</order:id>
        <order:hasShippingInfo>
            <order:ShippingInfo rdf:ID="ShippingInfo_1">
                <order:shipping_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
                >SH-01</order:shipping_id>
                <order:hasShippingAddress>
                    <order:Address rdf:ID="Address_1">
                        <order:name
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
                        >Alice Smith</order:name>
                        <order:street
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
                        >123 Maple Street</order:street>
                        <order:country
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
                        >US</order:country>
                    </order:Address>
                </order:hasShippingAddress>
            </order:ShippingInfo>
        </order:hasShippingInfo>
    </order:purchaseOrder>
</rdf:RDF>
```

# Exercise 2 - Solution:

Some typical answers are below, but these may not be the only answers:

*Concepts:* `Bill, Restaurant, Staff, foodItems, CheckCover, Theme` *etc*
*Relationships:* `cooks, isCookedby, manages, isManagedBy,`
`hasThemeEvenings, isOrganisedBy, cleans` *etc*
*Specified as RDFS*:
`cooks (domain: Chef, range: FoodItem),`
`containsBill(domain: Checkcover, range: Bill),`
`notServedWith(domain: FoodItem, range: FoodItem)` *etc*
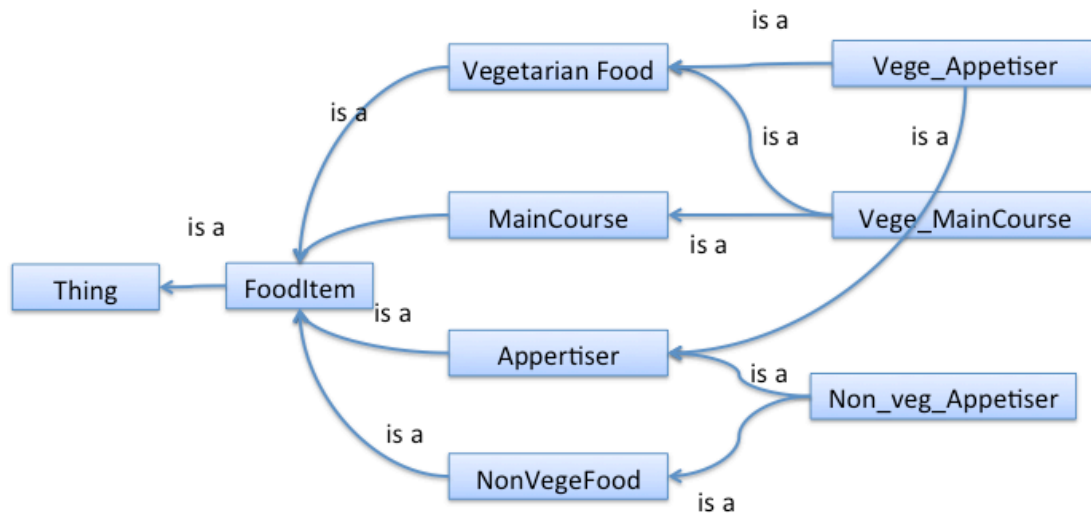
Hierarchy for FoodItem illustrated in Figure 1.



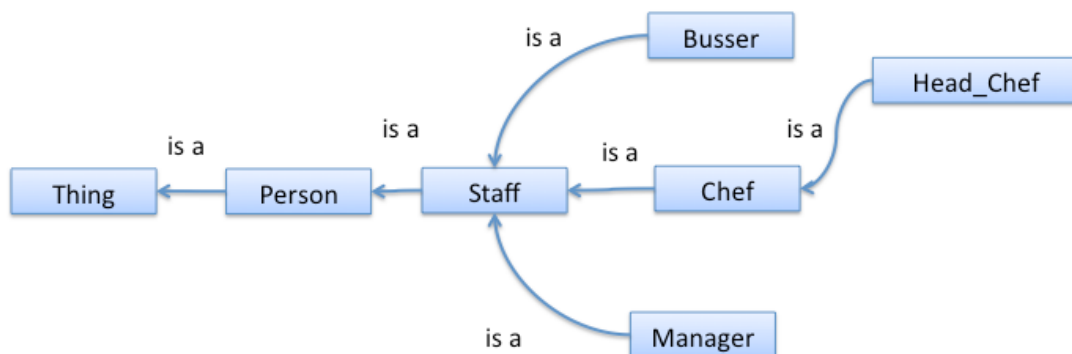Figure 1

Hierarchy for Staff illustrated in Figure 2.



Figure 2