《语义网与知识图谱》实验手册

实验二 RDF（RDFS）应用二

目的：

（1） 理解语义网资源描述语言；

（2） 掌握 RDF(S)的使用。

内容：

【习题 1】 Translate the culinary-allergic example ontology presented in follow into RDF/XML syntax.

```
ex:vegetableThaiCurry  ex:thaiDishBasedOn    ex:coconutMilk .
ex:sebastian           rdf:type              ex:AllergicToNuts .
ex:sebastian           ex:eats               ex:vegetableThaiCurry .

ex:AllergicToNuts      rdfs:subClassOf       ex:Pitiable .
ex:thaiDishBasedOn     rdfs:domain           ex:Thai .
ex:thaiDishBasedOn     rdfs:range            ex:Nutty .
ex:thaiDishBasedOn     rdfs:subPropertyOf    ex:hasIngredient .
ex:hasIngredient       rdf:type    rdfs:ContainerMembershipProperty.
```

```
<?xml version=”1.0”?>
<rdf:RDF    xmlns:rdf=”http://www.w3.org/1999/02/22-tdf-syntax-ns#”
            xmlns:rdfs=”http://www.w3.org/2000/01/rdf-schema#”
            xlmns:ex=”not given”>

    <rdf:Description    rdf:about=”vegetableThaiCurry”>
        <ex:thaiDishBasedOn>coconutMilk</ex:thaiDishBasedOn>
    </rdf:Description>
    <rdf:Description    rdf:about=”sebastian”>
        <rdf:type>AllergicToNuts</rdf:type>
    </rdf:Description>
    <rdf:Description    rdf:about=”sebastian”>
        <ex:eats>vegetableThaiCurry</ex:eats>
    </rdf:Description>

    <rdf:Description    rdf:about=”AllergicToNuts”>
        <rdfs:subClassOf>Pitiable</rdfs:subClassOf>
    </rdf:Description>
    <rdf:Description    rdf:about=”thaiDishBasedOn”>
        <rdfs:domain>Thai</rdfs:domain>
    </rdf:Description>
    <rdf:Description    rdf:about=”thaiDishBasedOn”>
```

```
        <rdfs:range>Nutty</rdfs:range>
    </rdf:Description>
    <rdf:Description  rdf:about="thaiDishBasedOn">
        <rdfs:subPropertyOf>hasIngredient</rdfs:subPropertyOf>
    </rdf:Description>
    <rdf:Description  rdf:about="hasIngredient">
        <rdf:type>ContainerMembershipProperty</rdf:type>
    </rdf:Description>
</rdf:RDF>
```

【习题 2】 Decide whether the following propositions can be satisfactorily modeled in RDFS and, if so, give the corresponding RDF(S) specification.

- Every pizza is a meal.
- Pizzas always have at least two toppings.
- Every pizza from the class PizzaMargarita has a Tomato topping.
- Everything having a topping is a pizza.
- No pizza from the class PizzaMargarita has a topping from the class Meat.
- "Having a topping" is a containedness relation.

- Every pizza is a meal.

Can be modeled.

```
ex:pizza  rdfs:subClassOf  ex:meal
<rdf:Description  rdf:about="pizza">
    <rdfs:subClassOf>meal</rdfs:subClassOf>
</rdf:Description>
```

- Pizzas always have at least two toppings.

Can't be modeled.

- Every pizza from the class PizzaMargarita has a Tomato topping.

Can be modeled.

```
Ex:pizzaFromtheClassPizzaMaragarita  ex:has  ex:TomatoTopping
<rdf:Description  rdf:about="pizzaFromtheClassPizzaMaragarita  ">
    <ex:has>TomatoTopping</ex:has>
</rdf:Description>
```

- Everything having a topping is a pizza. (是 pizza having topping, so, having topping 的 domain 是 pizza)

Can be modeled.

```
Ex:HavingTopping  rdfs:domain  ex:pizza
<rdf:Description  rdf:about="HavingTopping  ">
    <rdfs:domain>pizza</rdfs:domain>
</rdf:Description>
```

- No pizza from the class PizzaMargarita has a topping from the class Meat.
Can't be modeled.

- "Having a topping" is a containedness relation.
Can be modeled.
Ex:HavingATopping rdf:type rdfs:subClassOf
<rdf:Description rdf:about="HavingATopping ">
<rdf:type>subClassOf</rdf:type>
</rdf:Description>

【习题 3】 Model the following sentences in XML:
1. Mary is a woman.
2. Every mother is a woman.
3. Mary is John's wife.
4. Mothers are women who are also parents.
5. At least one child of a grandparent has also a child.

```
<?xml version="1.0"?>
<rdf:RDF
    xmlns:rdf="http://www.w3.org/1999/02/22-tdf-syntax-ns#"
    xmlns:ex="not given">
(- Mary is a woman.)
<rdf:Description rdf:about="Mary">
    <rdf:type rdf:resource="woman"/>
</rdf:Description>

(- Every mother is a woman.)
<rdf:Description rdf:about="mother">
    <rdf:type rdf:resource="woman"/>
</rdf:Description>

(- Mary is John's wife.)
<rdf:Description rdf:about="Mary">
    <rdf:type rdf:resource="John's wife"/>
</rdf:Description>

(- Mothers are women who are also parents.)
<rdf:Description rdf:about="mothers">
    <rdf:type rdf:resource="women"/>
    <rdf:type rdf:resource="parents"/>
</rdf:Description>

(- At least one child of a grandparent has also a child.)
<rdf:Description rdf:about="One child of a grandparent">
    <ex:has rdf:resource="a child"/>
```

```
</rdf:Description>
```

【习题 4】Model the sentences from Exercise 3 in RDF graph.