

Knowledge Modeling (I) - Protege

一、下载配置

Protege配置




主页:

<https://protege.stanford.edu/>

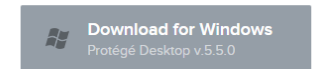


Protégé Desktop is a feature rich ontology editing environment with full support for the OWL 2 Web Ontology Language, and direct in-memory connections to description logic reasoners like HermiT and Pellet.

Protégé Desktop supports creation and editing of one or more ontologies in a single workspace via a completely customizable user interface. Visualization tools allow for interactive navigation of ontology relationships. Advanced explanation support aids in tracking down inconsistencies. Refactor operations available including ontology merging, moving axioms between ontologies, rename of multiple entities, and more.

 Screenshots  Documentation  Resources

- ✓ W3C standards compliant
- ✓ Customizable user interface
- ✓ Visualization support
- ✓ Ontology refactoring support
- ✓ Direct interface to reasoners
- ✓ Highly pluggable architecture
- ✓ Cross compatible with WebProtégé



Download platform independent version
(requires a Java Runtime Environment)

[Older versions »](#)

【此处示例采用windows版本】

点击 Download Now 进入下载页面

点击 Download for Windows 下载软件包


得到 Protege Desktop v.5.5.0 版本的压缩包

Protege配置



Mac版本下载

打开链接：

<https://github.com/protegeproject/protege-distribution/releases>



▼ Assets 6

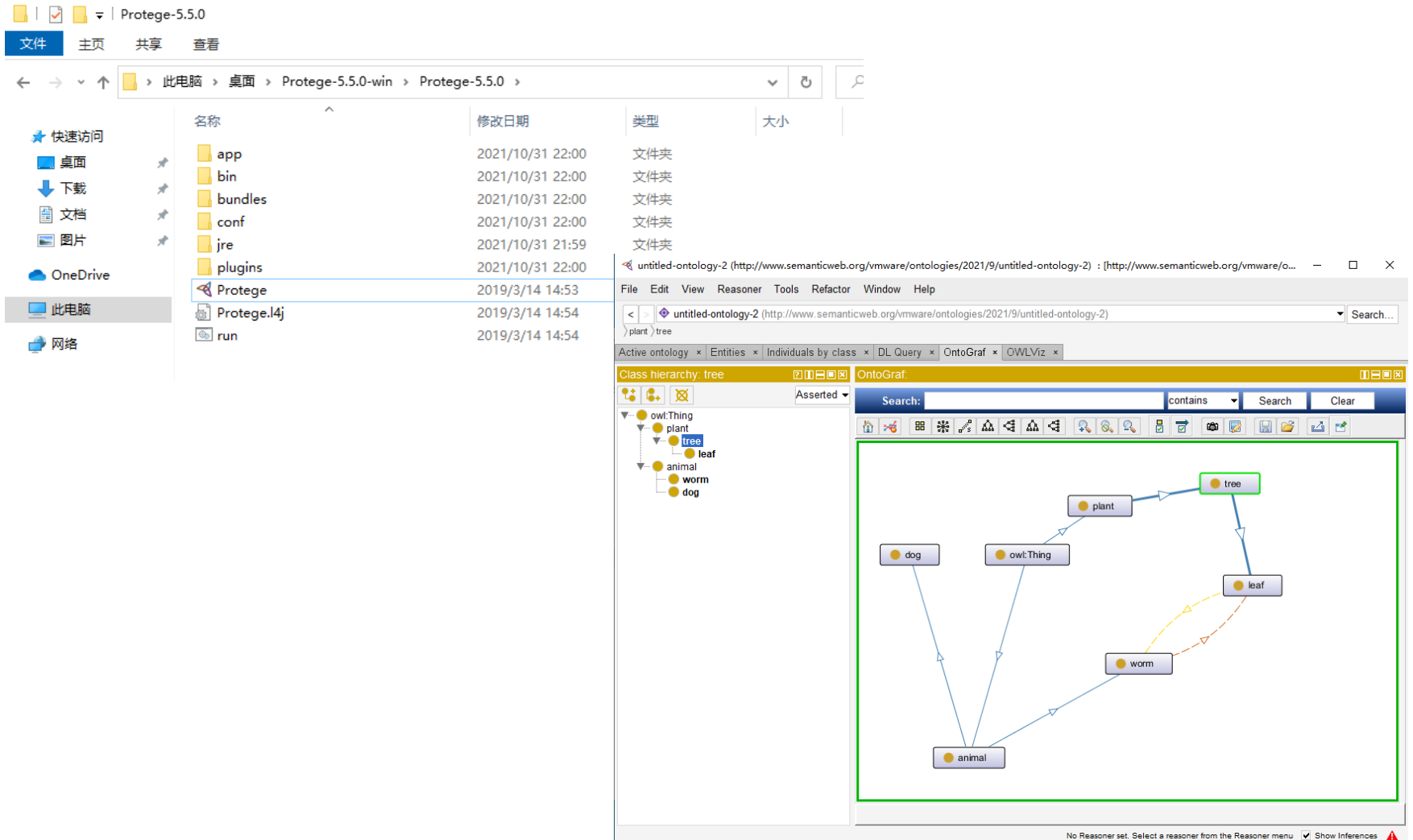
 Protege-5.5.0-linux.tar.gz	124 MB
 Protege-5.5.0-os-x.zip	108 MB
 Protege-5.5.0-platform-independent.zip	54.3 MB
 Protege-5.5.0-win.zip	117 MB
 Source code (zip)	
 Source code (tar.gz)	

下载 Protege-5.5.0-os-x.zip

解压后只有一个.app文件，拷贝到应用程序后，即视为安装完成

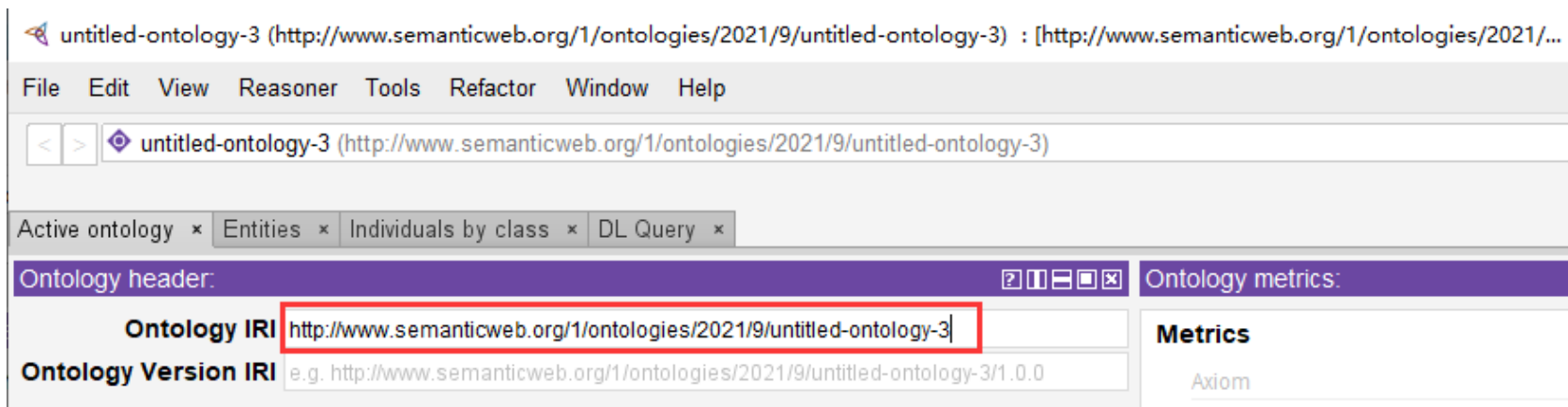
Protege配置

解压完成后直接打开Protege.exe即可正常使用



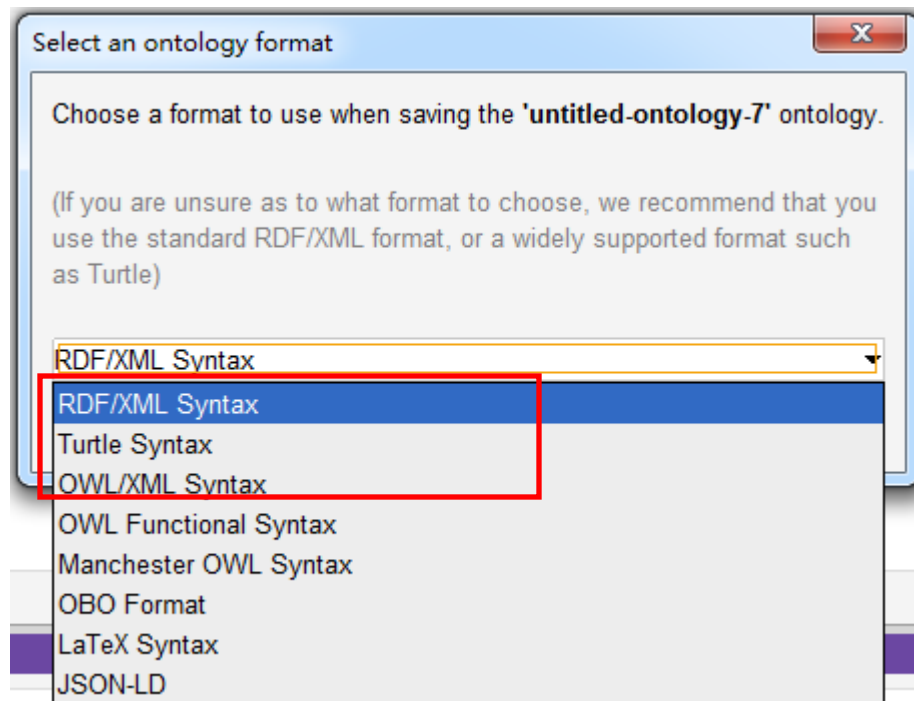
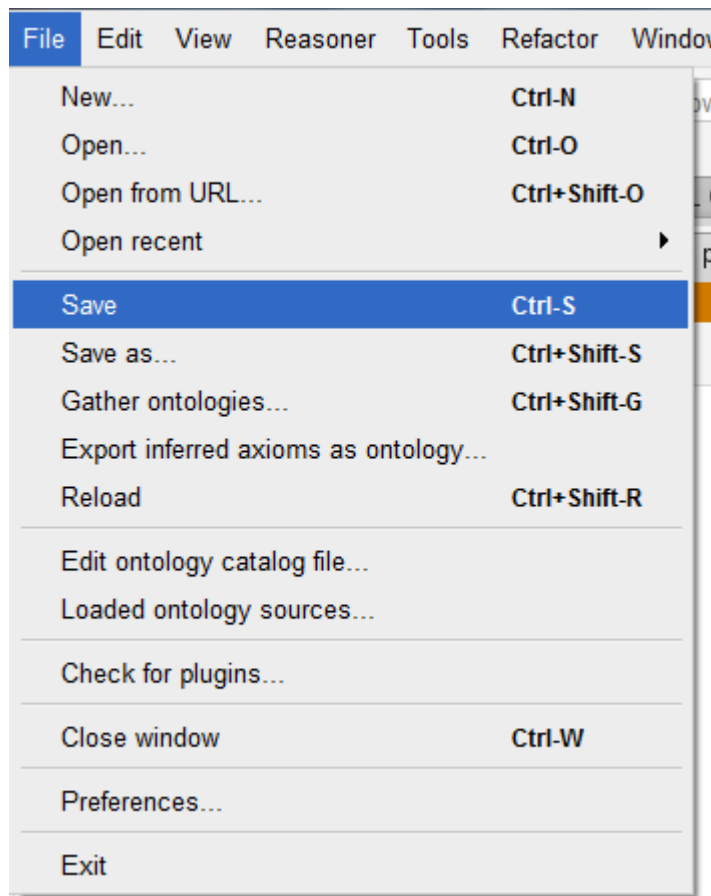
二、知识（本体）建模示例

设置本体IRI



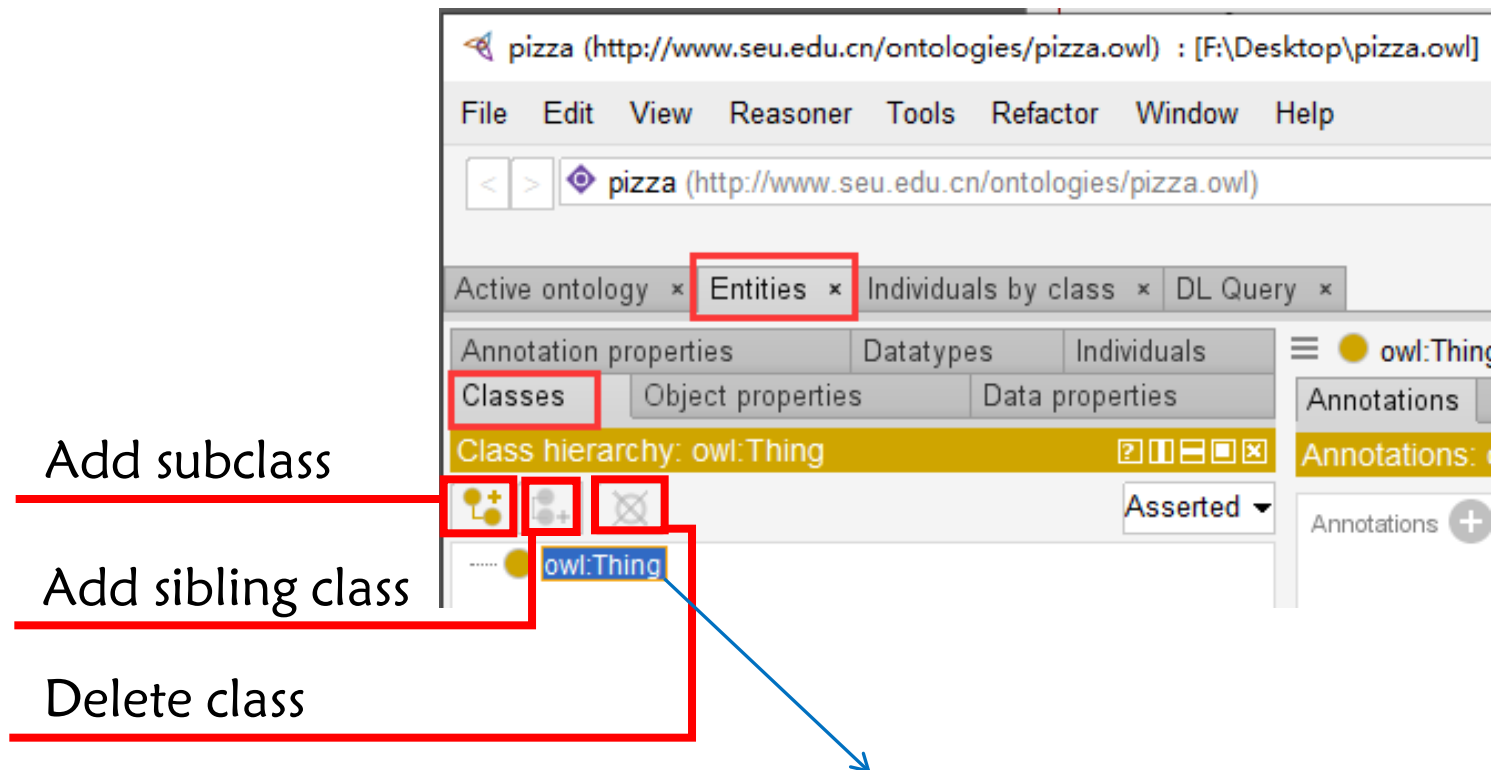
设置为: <http://www.seu.edu.cn/ontologies/pizza.owl>

设置保存格式



创建Class

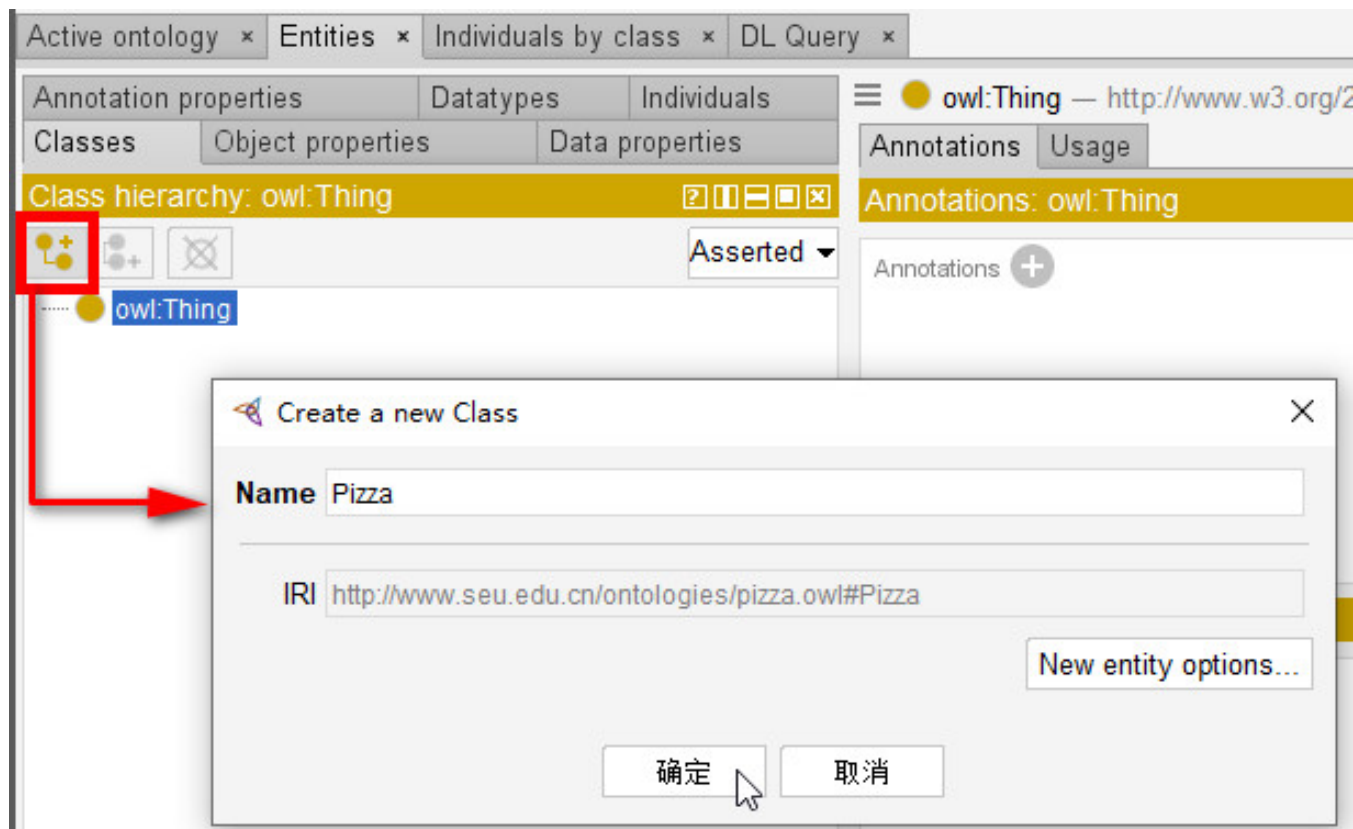
选择 “Entities” → “Classes”，创建Classes



初始的class hierarchy tree

创建Class

选中“owl: Thing”，创建其subclass “Pizza”



创建Class

创建“owl: Thing”的subclass “PizzaTopping”与“PizzBase”

Active ontology x Entities x Individuals by class x DL Query

Annotation properties Datatypes Individuals

Classes Object properties Data properties

Class hierarchy: owl:Thing

Asserted

owl:Thing

- PizzaTopping
- PizzaBase
- Pizza

Add subclass

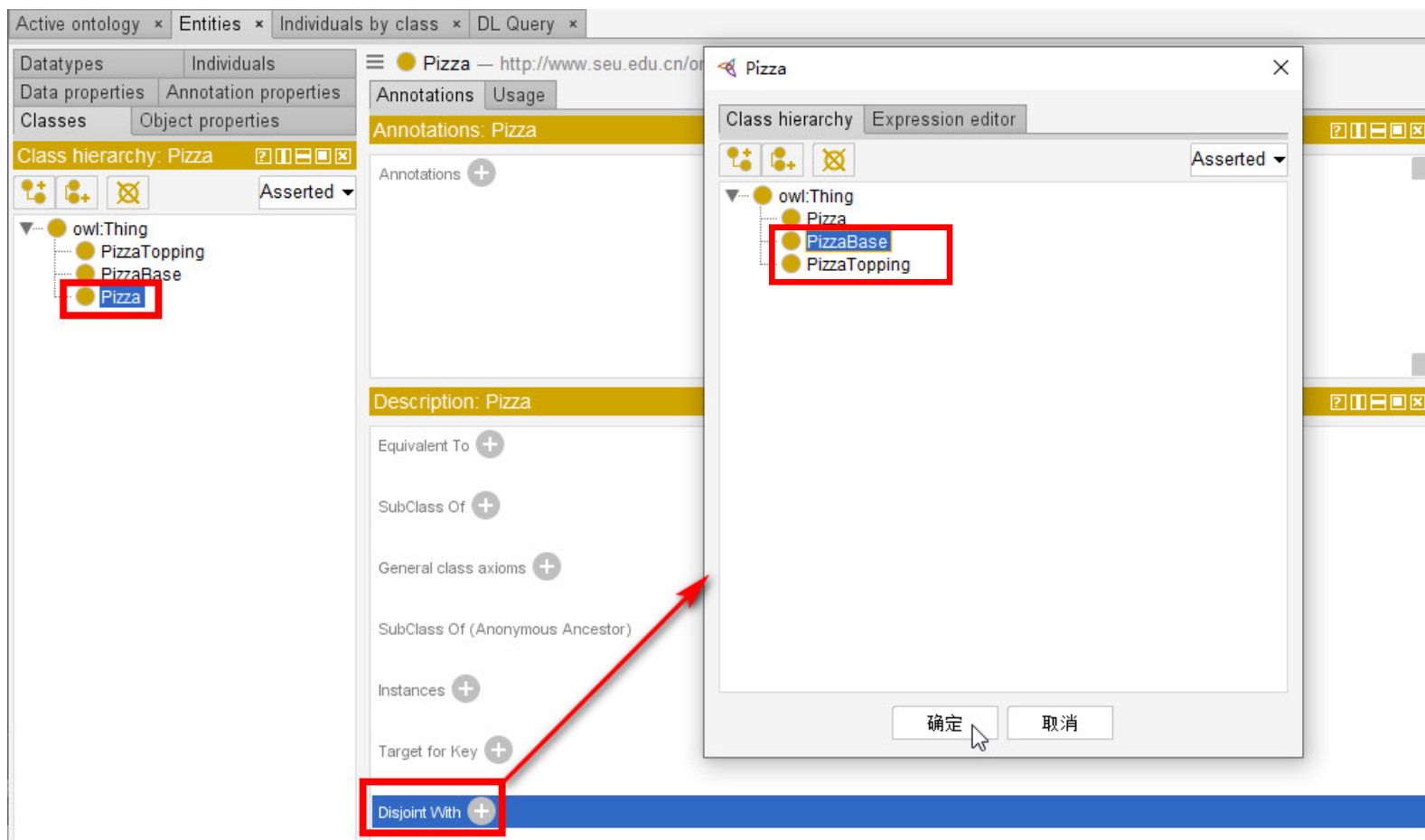
Add sibling class

小练习

创建“Pizza”的subclass “CheesePizza”,与“Pizza”、“PizzaBase”、“PizzaTopping”的superclass “Food”,同时也是“owl:Thing”的subclass。

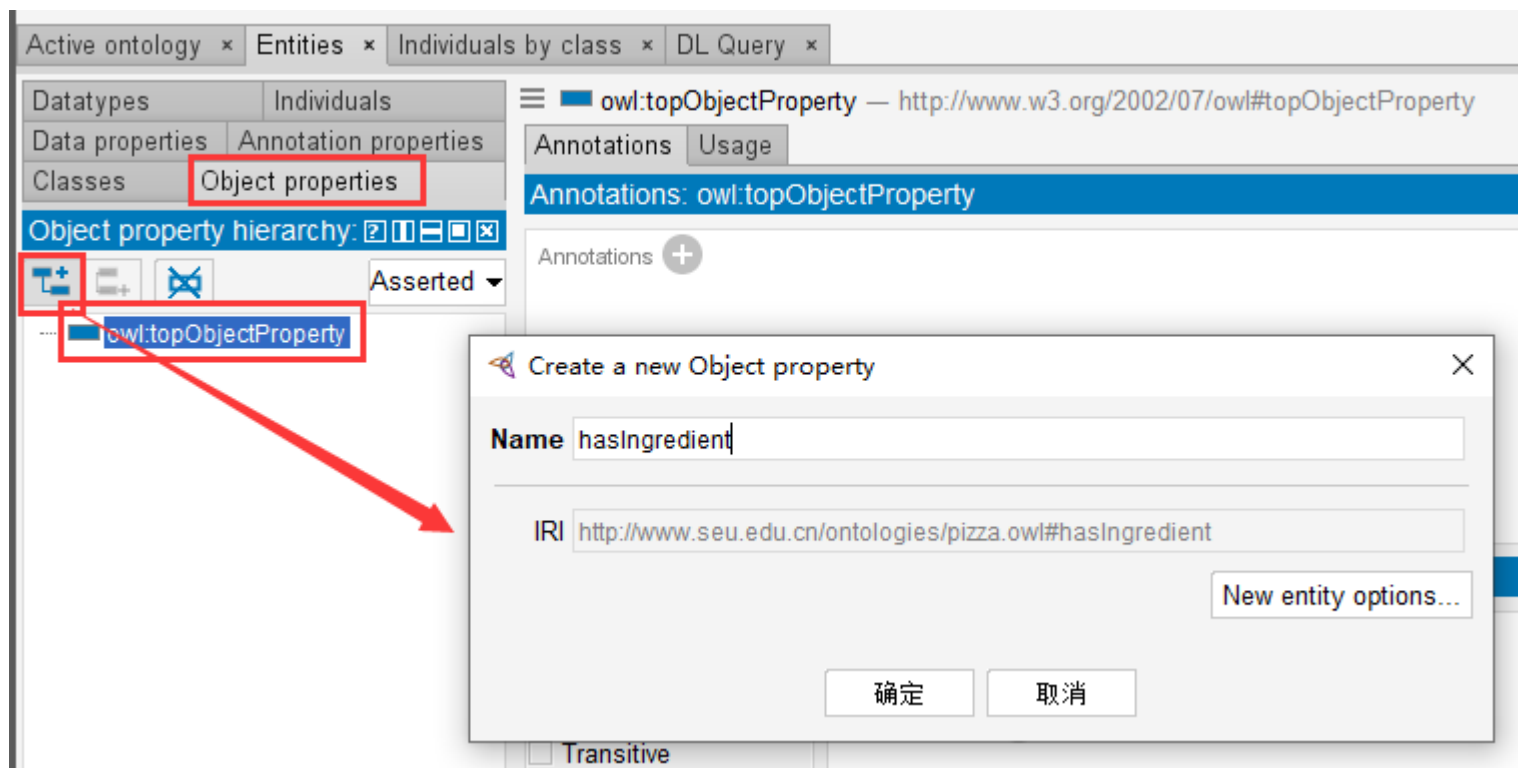
创建disjoint关系

为“Pizza”同时选择多个disjoint class，则两两均disjoint



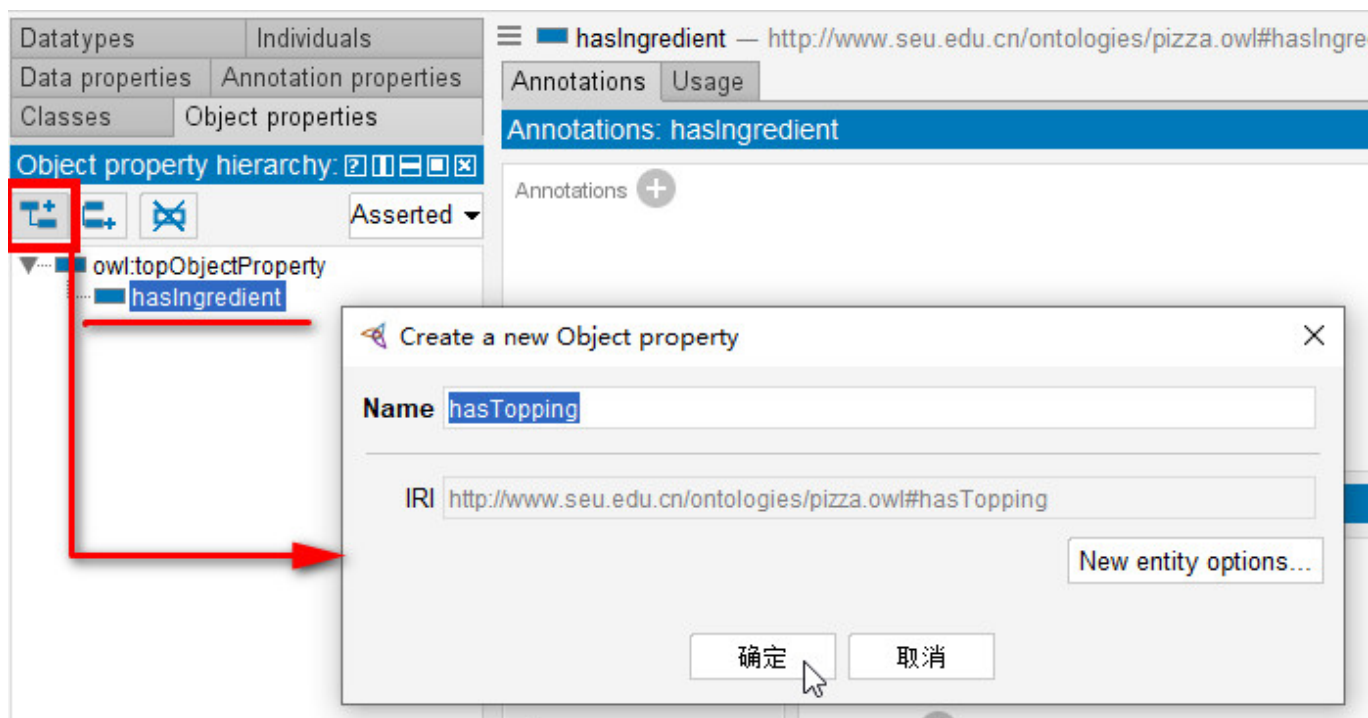
创建Object Property (properties between individuals)

选择 “Entities” → “Object properties”，创建
“owl:topObjectProperty” 的 subproperty “hasIngredient”



创建Object Property

创建“hasIngredient”的subproperty “hasTopping”
与“hasBase”



设置Object Property的domain

设置“hasTopping”的domain为“Pizza”

The screenshot displays the Protégé OWL editor interface. On the left, the 'Object property hierarchy' panel shows a tree structure where 'hasTopping' is highlighted with a red box. The main workspace shows the 'Annotations: hasTopping' panel. Below this, the 'Description: hasTopping' panel is visible, featuring a list of property characteristics on the left and a list of domains on the right. The 'Domains (intersection)' section is highlighted with a red box, and a red arrow points to the 'Pizza' class in the domain list. A dialog box titled 'hasTopping' is open, showing the 'Object restriction creator' tab with a class hierarchy where 'Pizza' is selected. At the bottom right, there are buttons for '确定' (OK) and '取消' (Cancel).

Datatypes | Individuals
Data properties | Annotation properties
Classes | Object properties
Object property hierarchy: [?] [I] [E] [X]
[?] [I] [E] [X] [X] Asserted ▼

owl:topObjectProperty
└─ hasIngredient
 └─ hasBase
 └─ hasTopping

Annotations: hasTopping [?] [I] [E] [X]
Annotations +

Character: [?] [I] [E] [X] Description: hasTopping [?] [I] [E] [X]
[?] [I] [E] [X] [X] [X] [X] [X] Asserted ▼

☐ Functional
☐ Inverse functional
☐ Transitive
☐ Symmetric
☐ Asymmetric
☐ Reflexive
☐ Irreflexive

Equivalent To +
SubProperty Of +
Inverse Of +
Domains (intersection) +
Ranges (intersection) +
Disjoint With +
SuperProperty Of (Chain) +

hasTopping [?] [I] [E] [X]
Class hierarchy | Object restriction creator
Data restriction creator | Class expression editor
[?] [I] [E] [X] [X] [X] [X] [X] Asserted ▼

owl:Thing
└─ Pizza
 └─ PizzaBase
 └─ PizzaTopping

确定 取消

设置Object Property的range

设置“hasTopping”的range为“PizzaTopping”

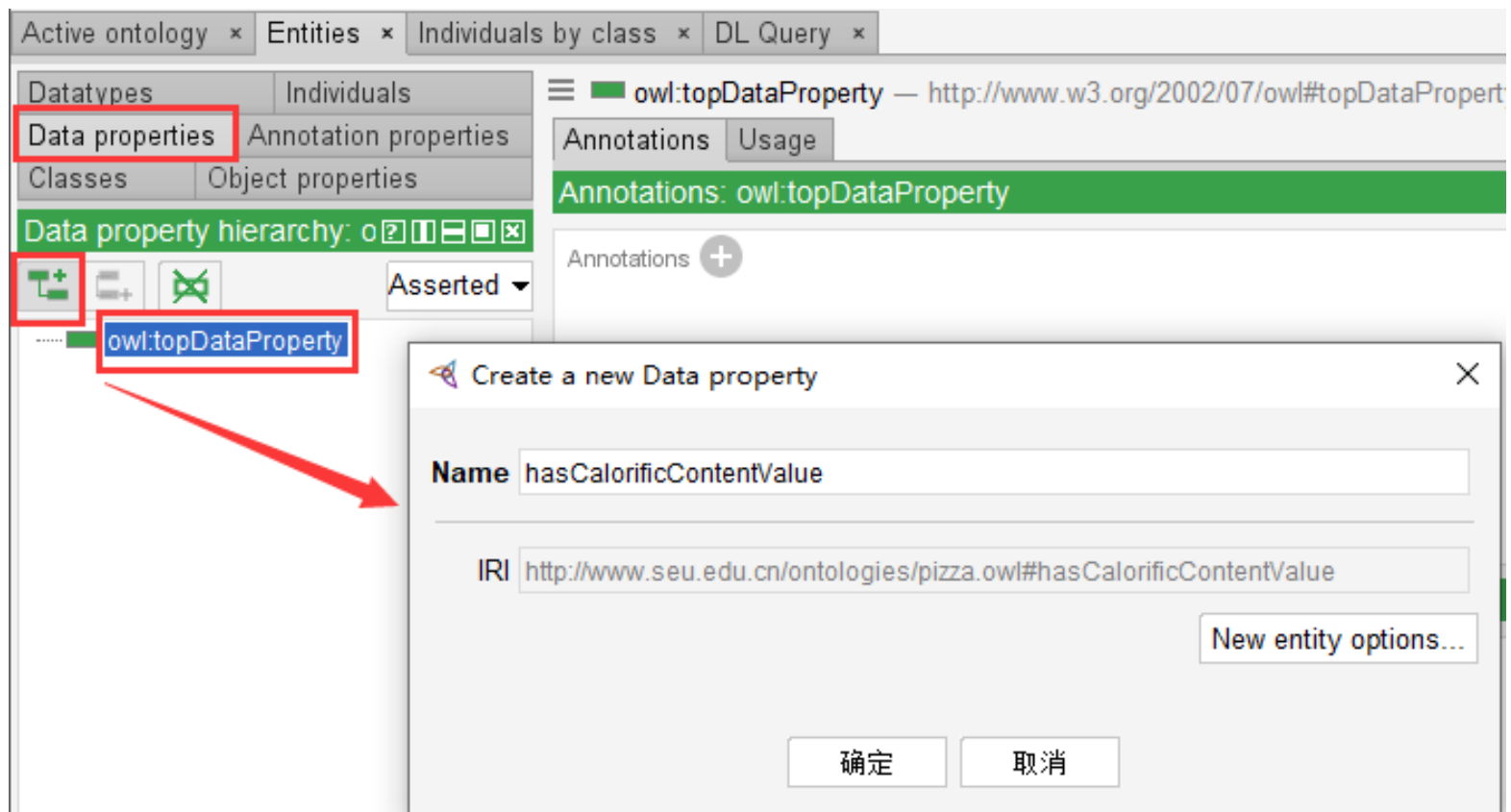
The screenshot displays the Protege ontology editor interface. On the left, the 'Object property hierarchy' tree shows the 'hasTopping' property selected and highlighted with a red rectangle. The main workspace shows the 'hasTopping' property details, including its URI and a list of annotations. The 'Description' tab is active, showing the 'Ranges (intersection)' section. A red arrow points to the green '+' button next to 'Ranges (intersection)', which is also highlighted with a red rectangle. A dialog box titled 'hasTopping' is open, showing the 'Class hierarchy' tab. In this dialog, the 'PizzaTopping' class is selected and highlighted with a red rectangle. The dialog has '确定' (OK) and '取消' (Cancel) buttons at the bottom.

小练习

创建Class “PizzaFlavor” ,
创建Object Property “Flavor” , domain为 “Pizza” , Range为
“PizzaFlavor”

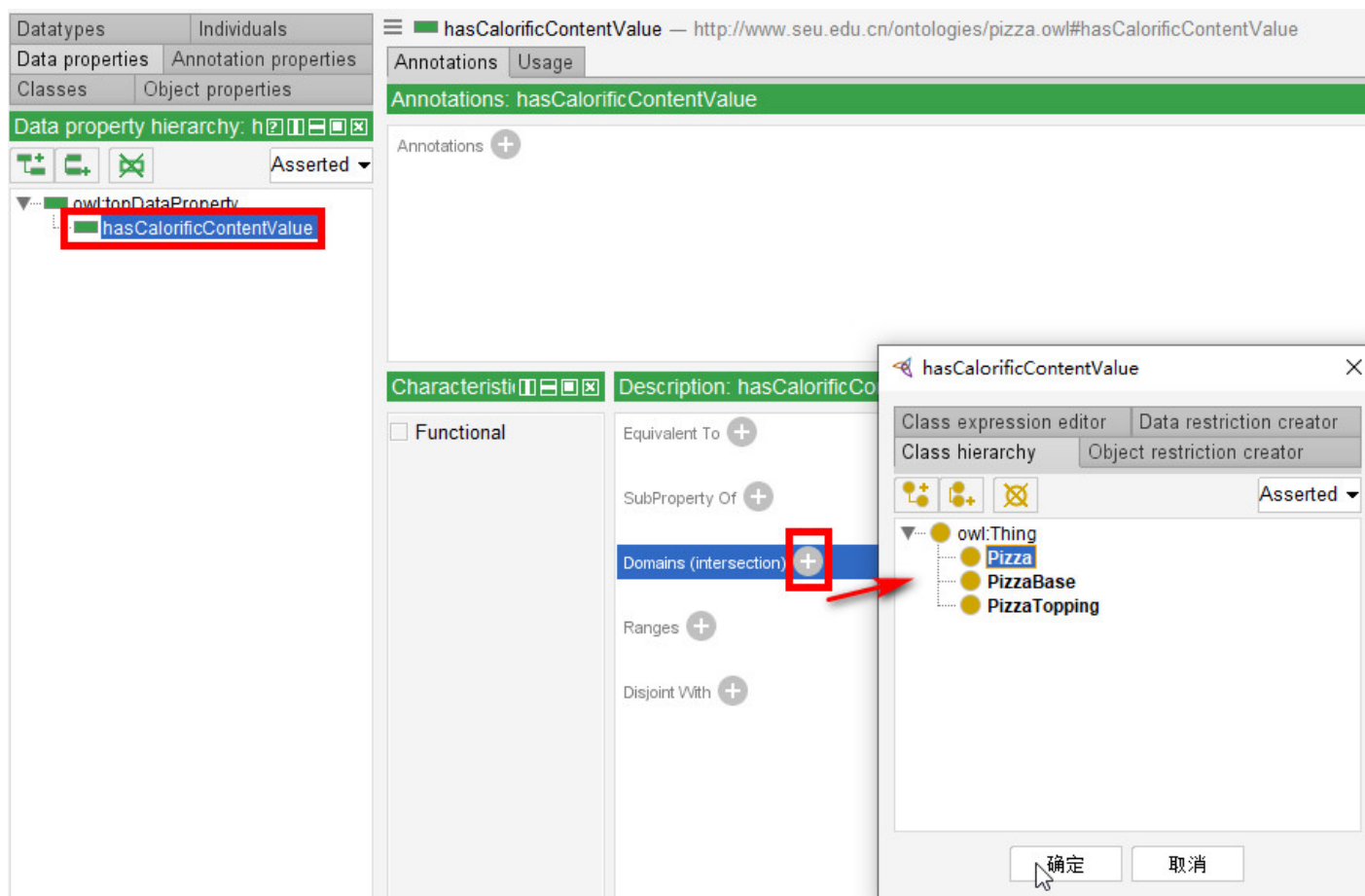
创建Data Property (the property between an individual and a literal)

选择 “Entities” → “Data properties”，创建
“owl:topDataProperty” 的 subproperty
“hasCalorificContentValue”



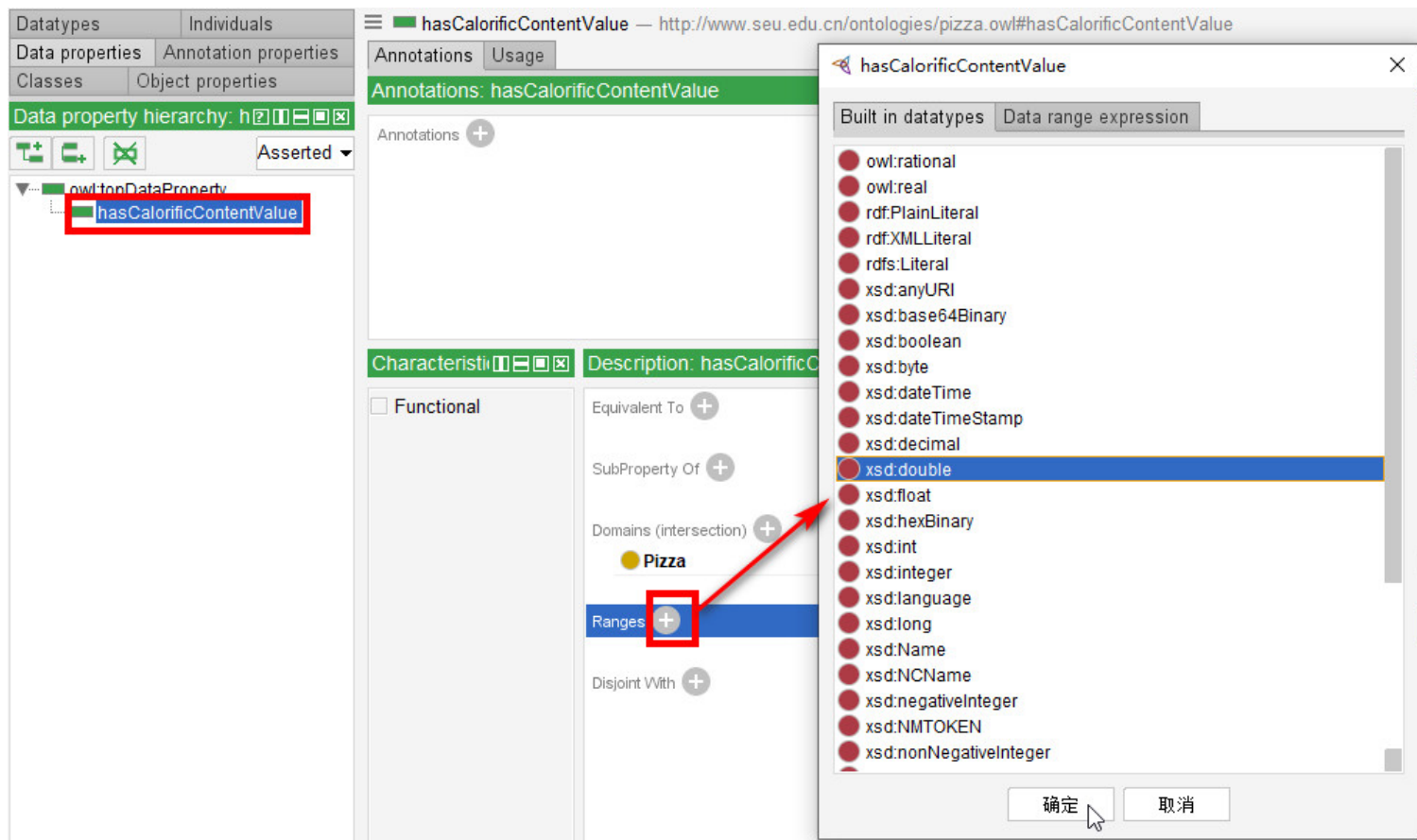
设置Data Property的domain

设置 “hasCalorificContentValue” 的domain为 “Pizza”



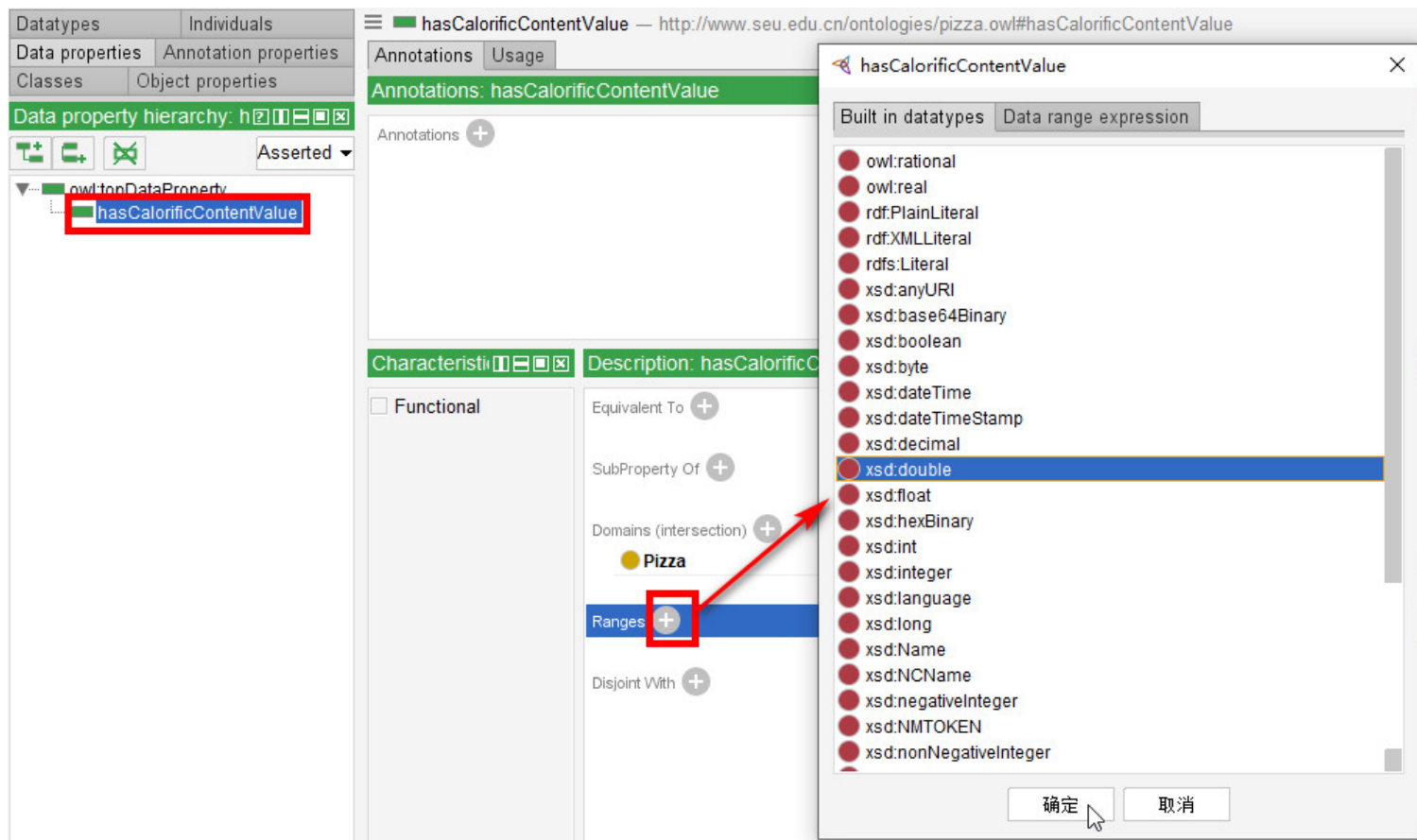
设置Data Property的range

设置 “hasCalorificContentValue” 的range为 “xsd:double”



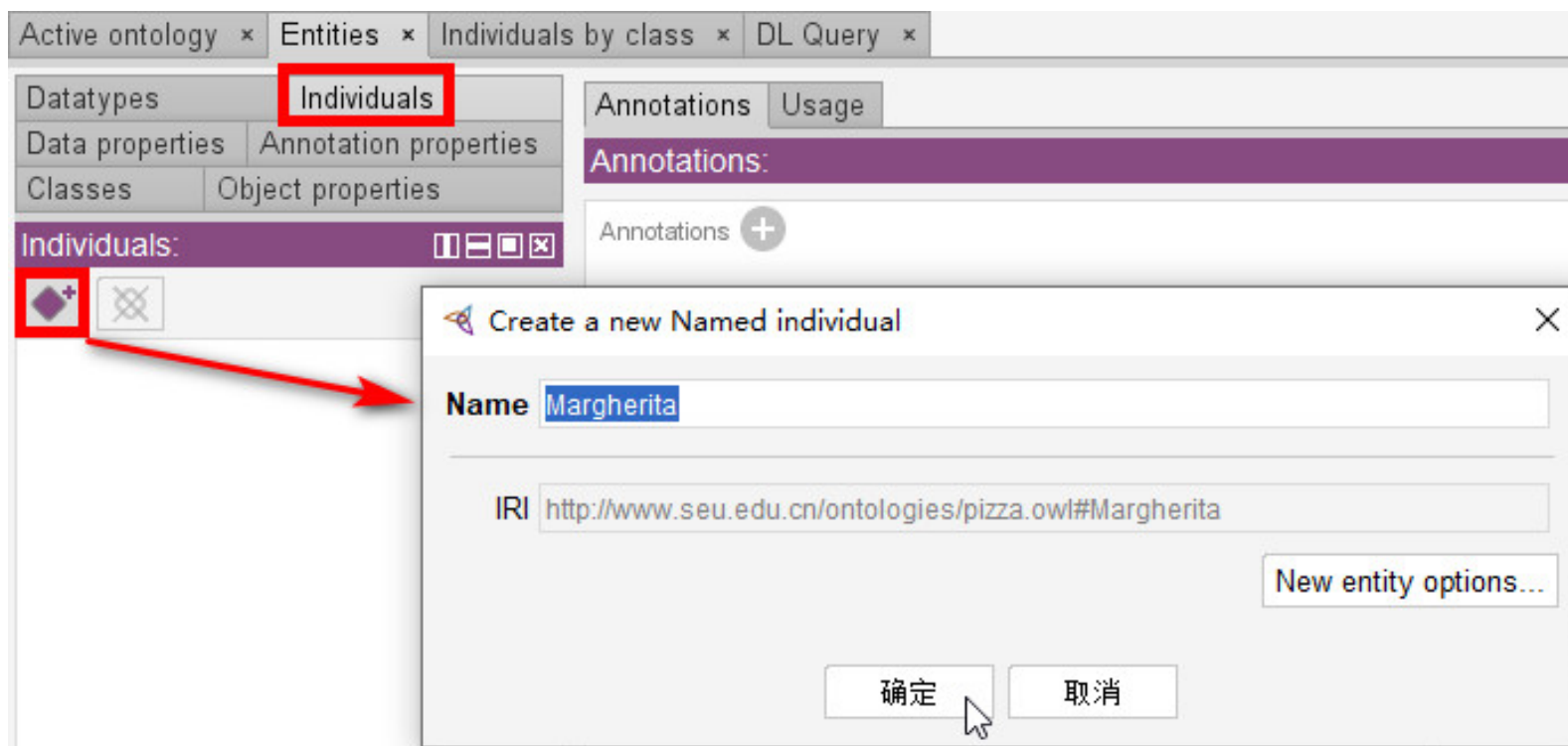
设置Data Property的range

设置 “hasCalorificContentValue” 的range为 “xsd:double”



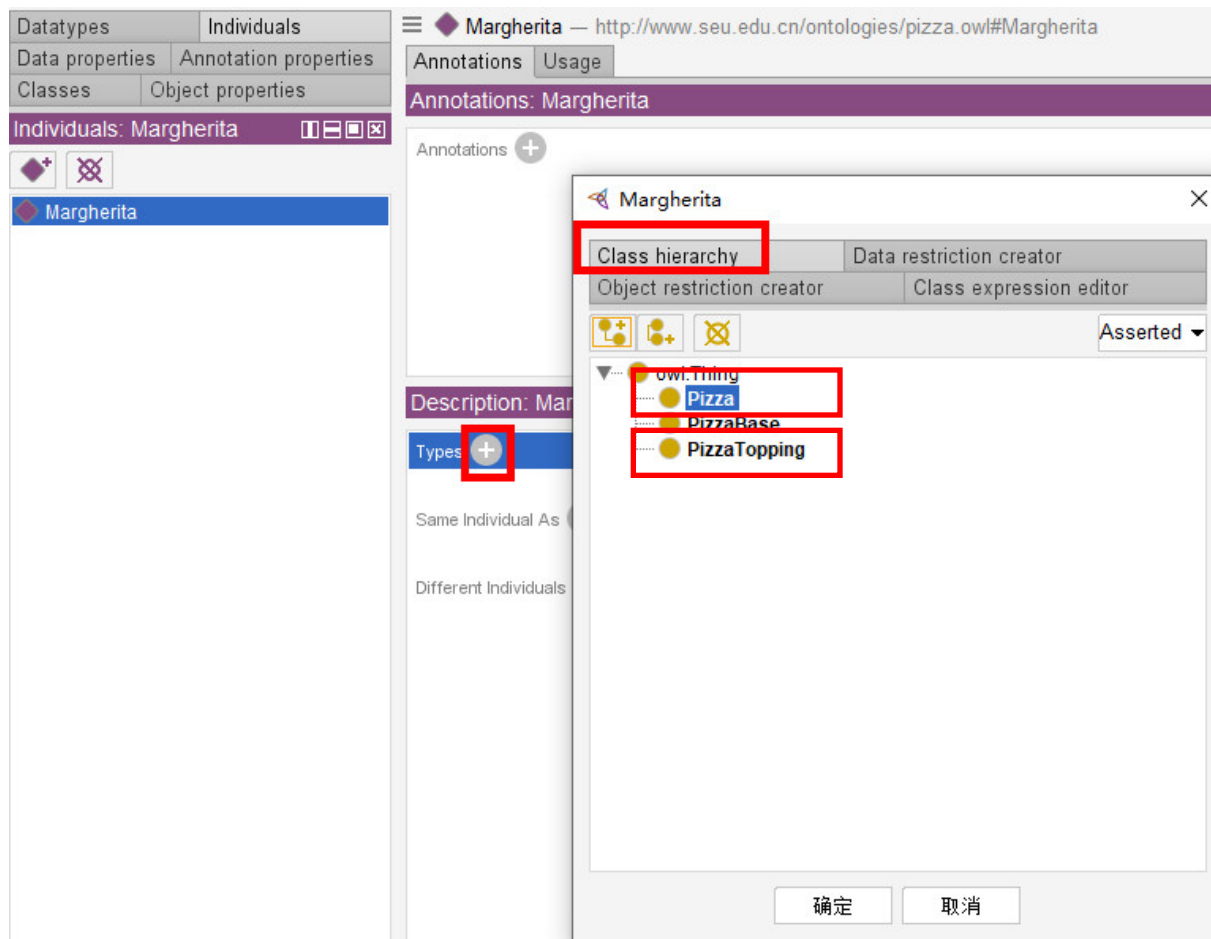
创建Individual

设置“Entities” → “Individuals”，创建Individual
“Margherita”



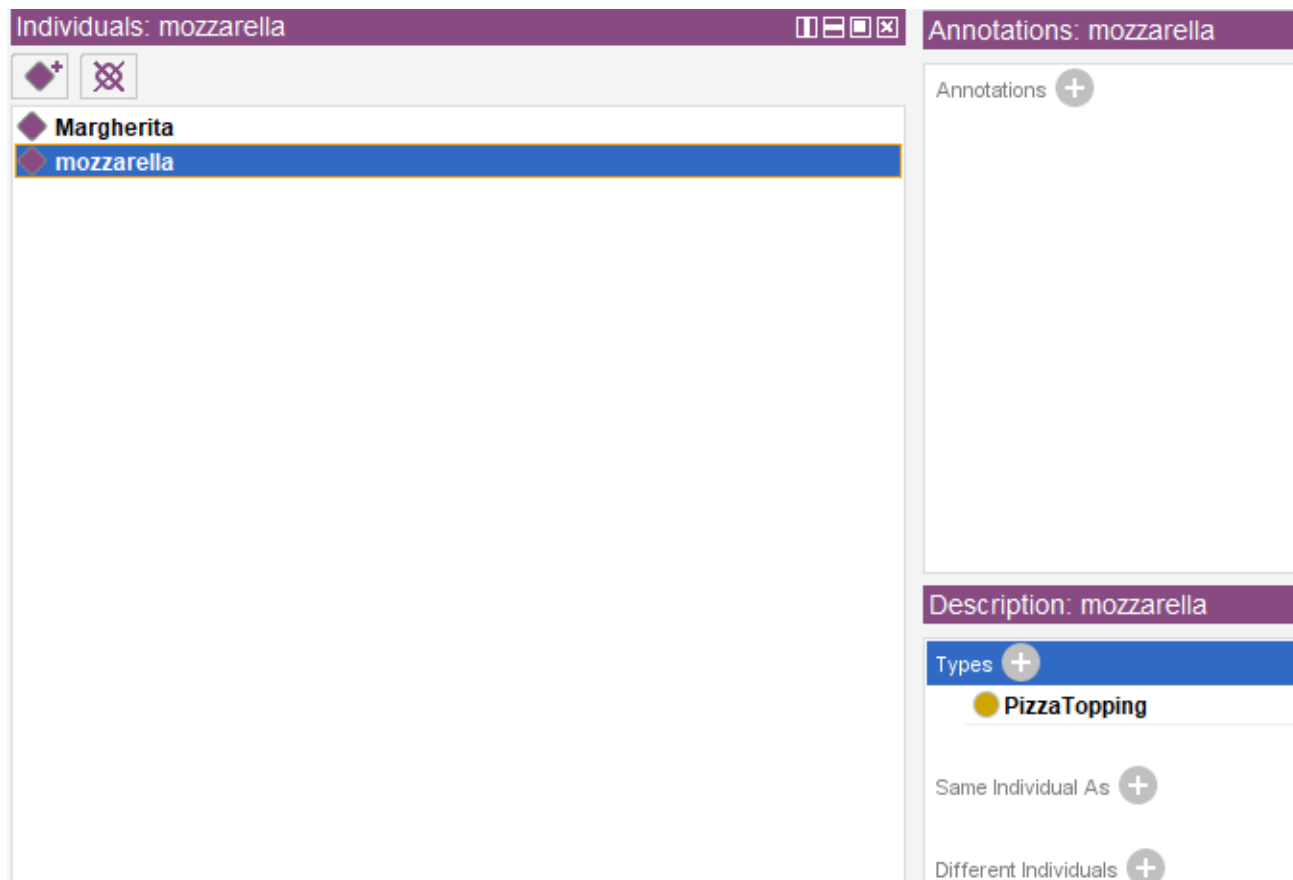
设置Individual Types

选择 “Margherita” 的Type为 “Pizza” 与 “PizzaTopping”



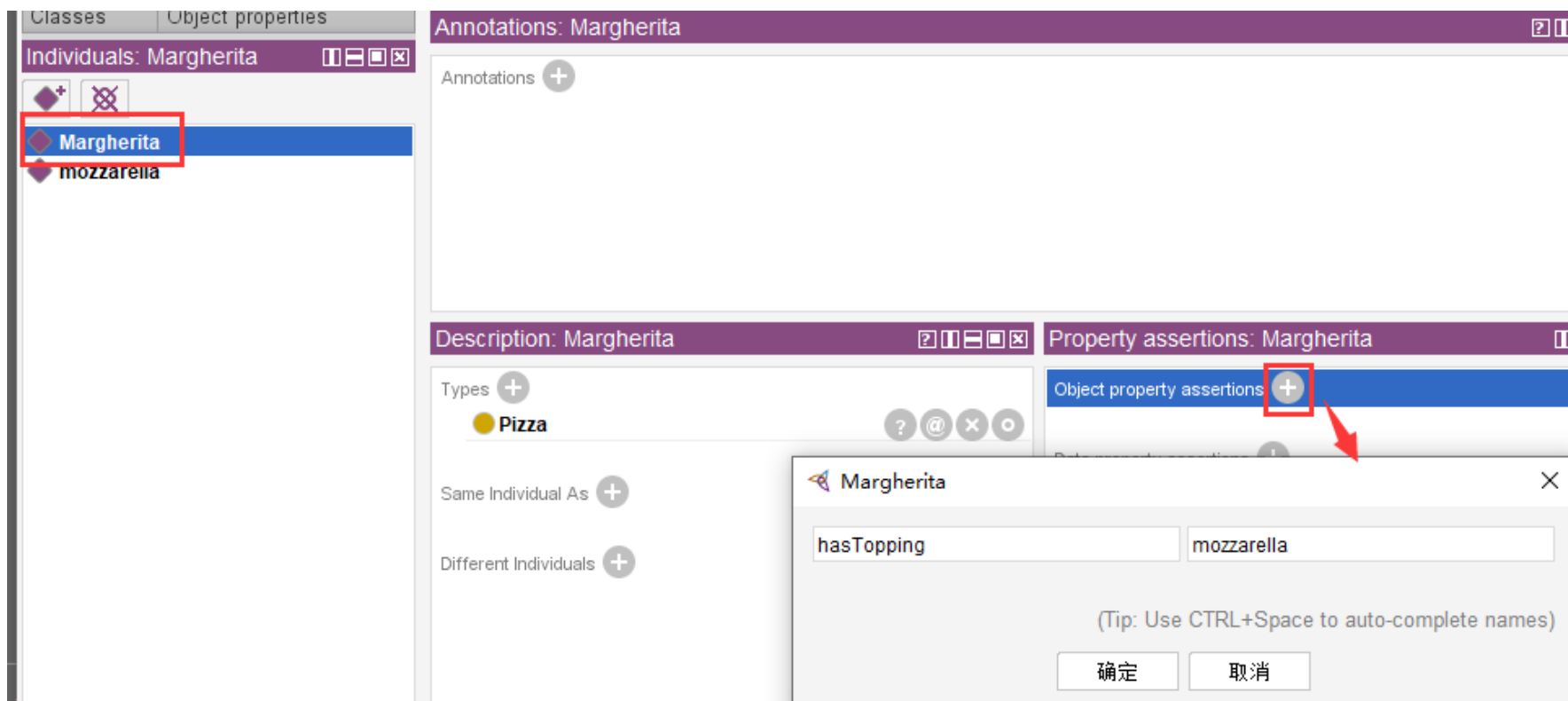
创建Individual

类似地，创建Individual “mozzarella”，设置其Type为“PizzaTopping”



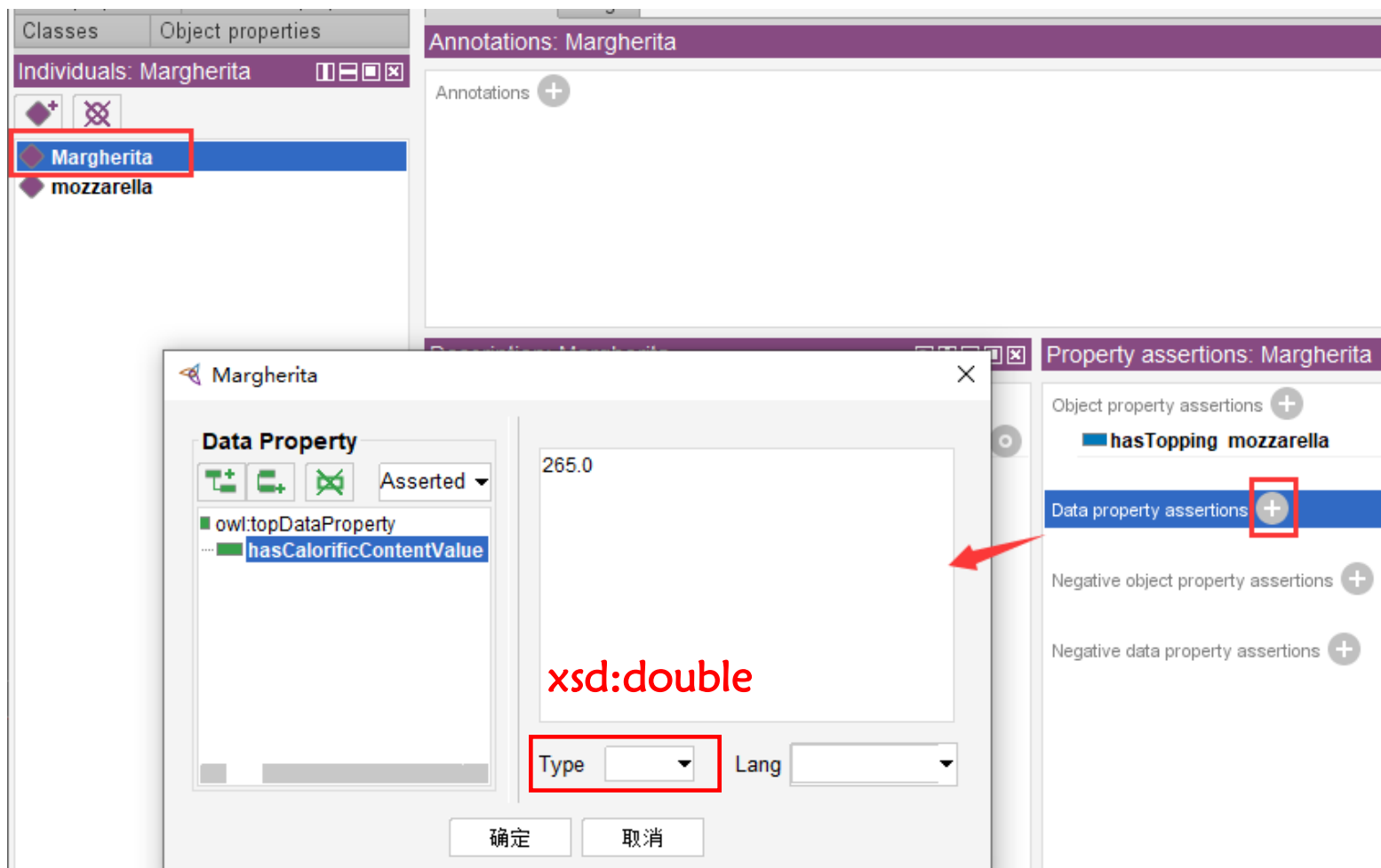
创建关于Individual的面向object property的assertion

“Margherita” “hasTopping” “mozzarella”



创建关于Individual的面向data property的assertion

“Margherita” “hasCalorificContentValue” “265.0”

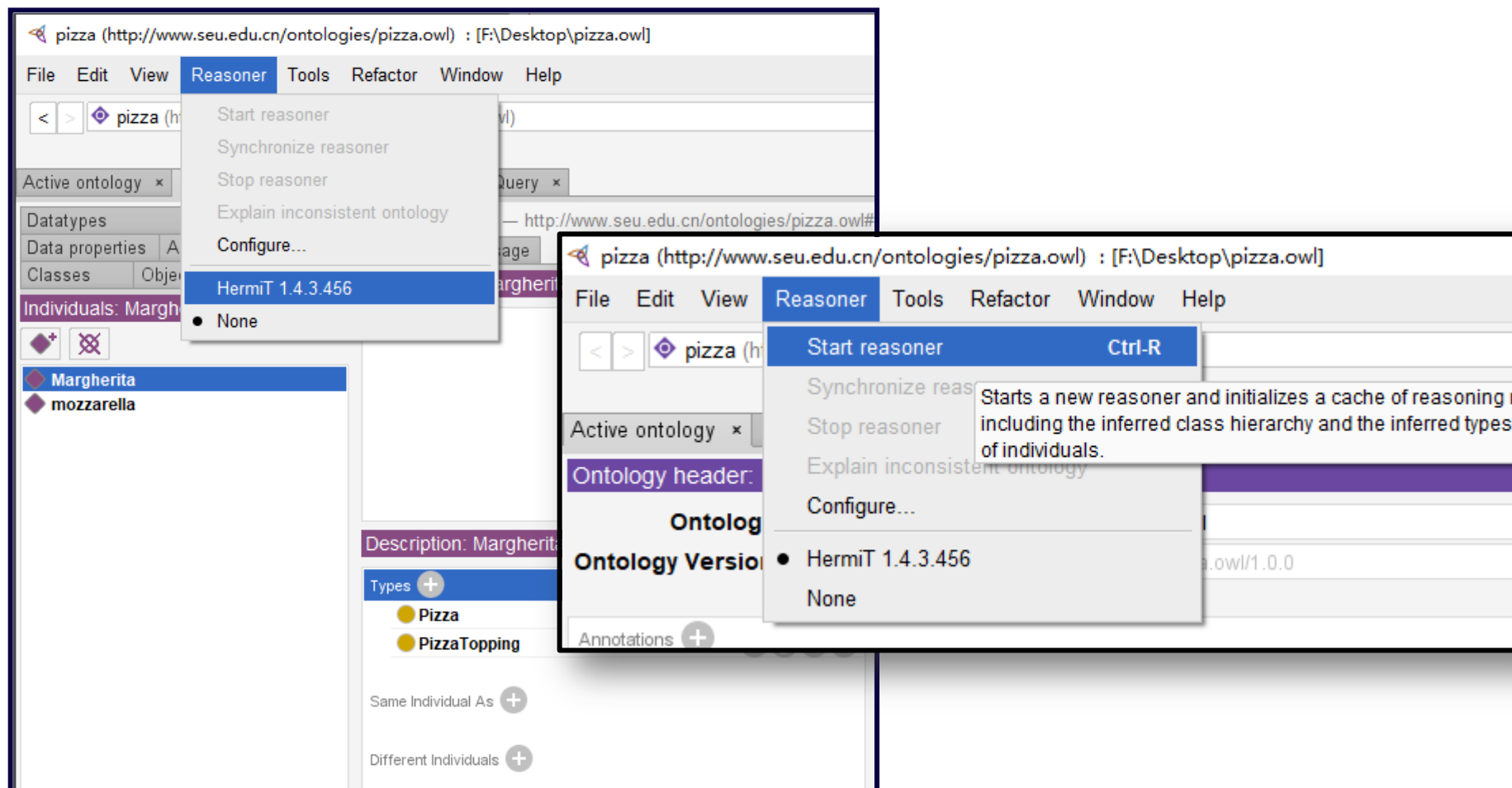


小练习

创建 “Pepperoni” “hasCalorificContentValue” “185.2”

推理

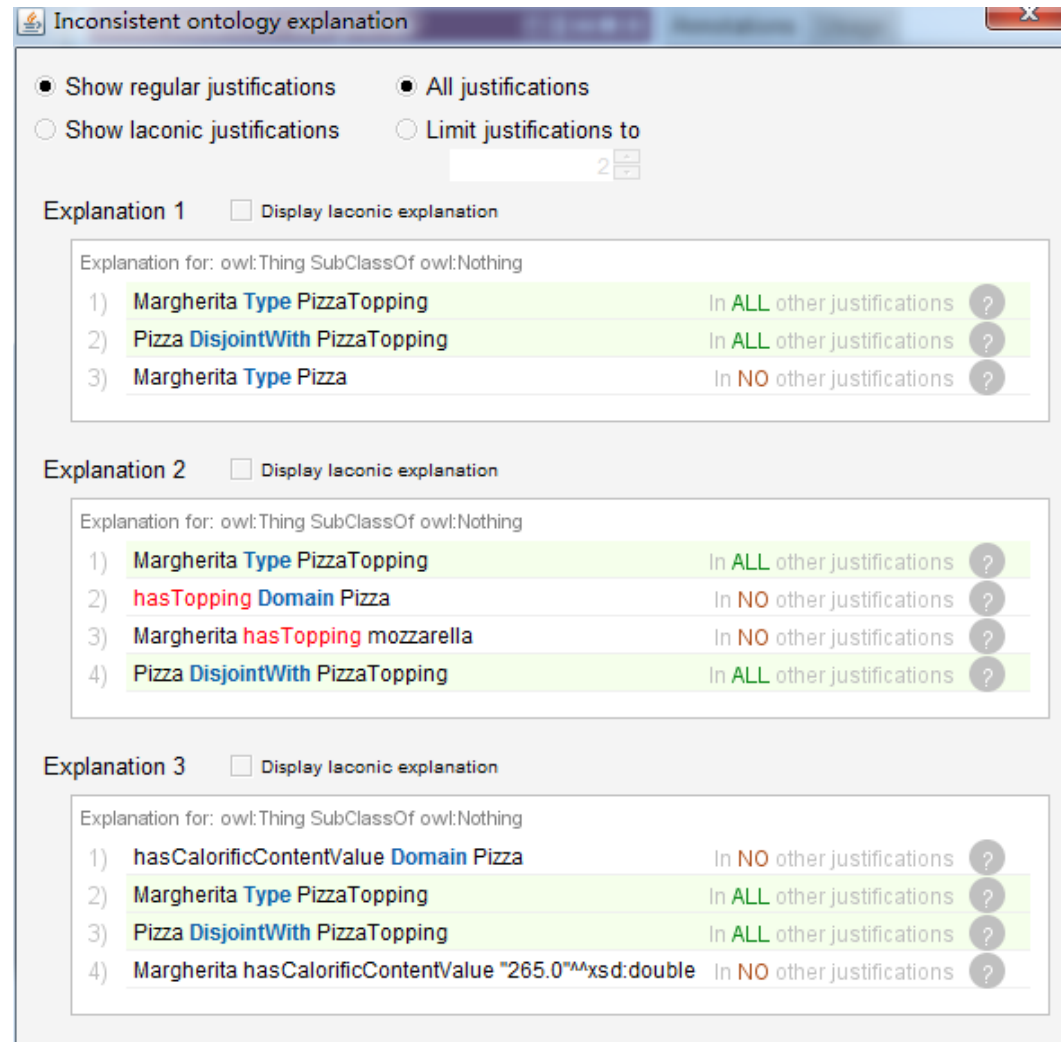
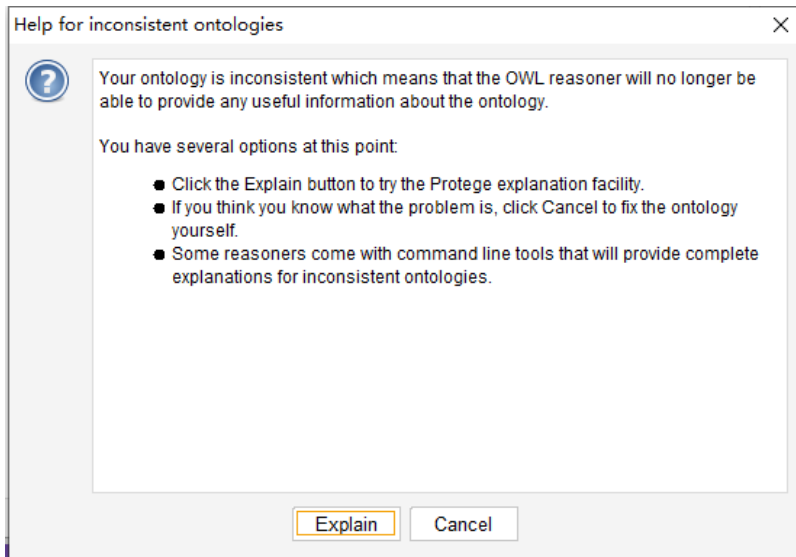
先选择“HermiT 1.4.3.456”，再选择“Start reasoner”



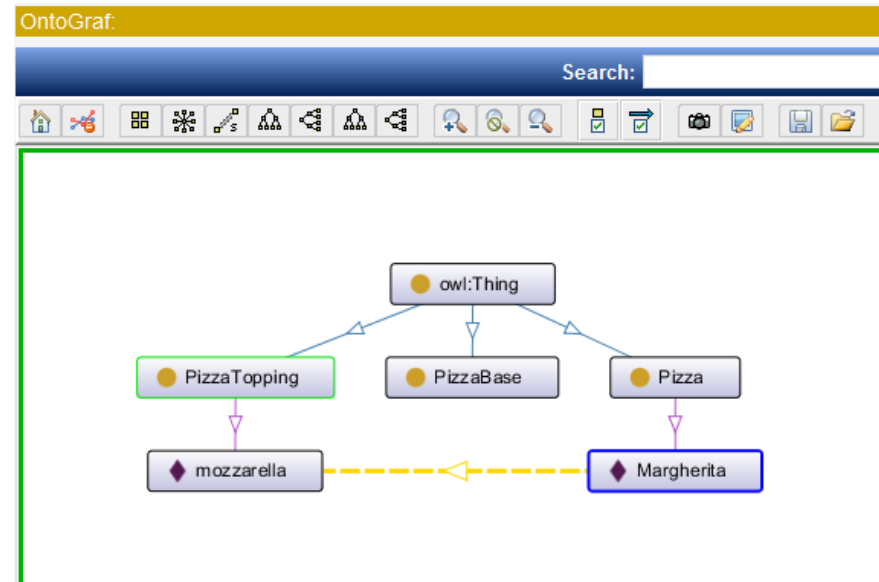
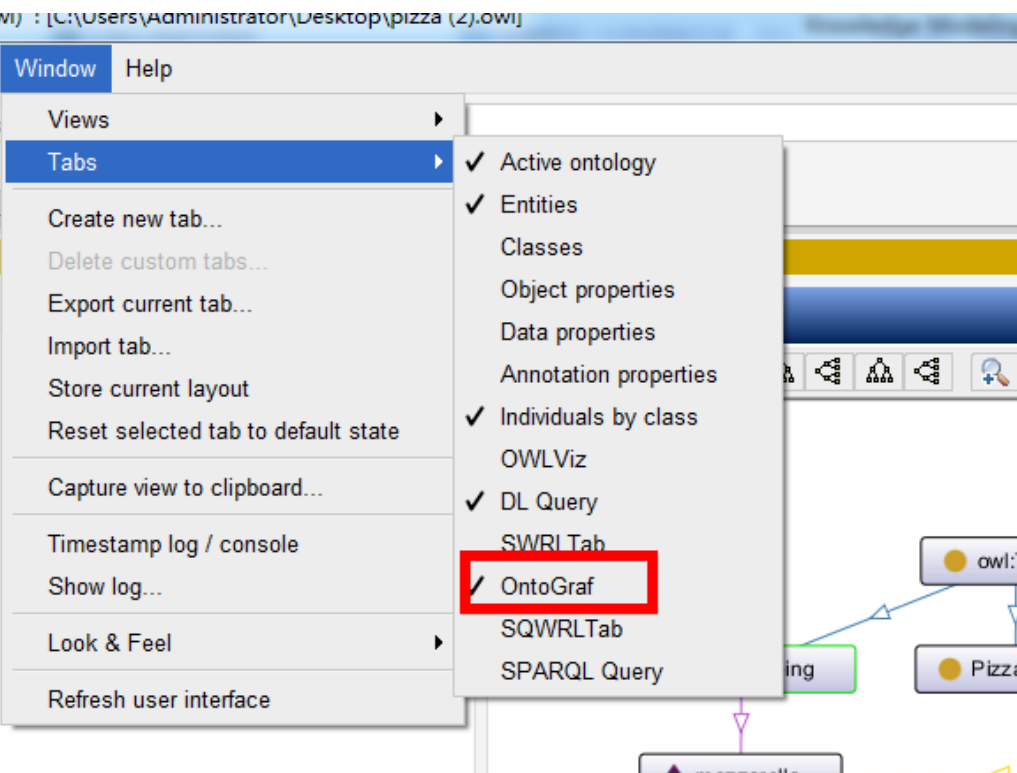
推理

Inconsistent Ontology

选择 Explain



可视化



三、课堂作业

创建一个包含axioms和assertions的
consistent ontology（任选感兴趣的领域），
要求：

- 1) 包含Class、Individual、Object Property、Data Property
- 2) 定义Property Domain、Range、Individual Type
- 3) 最终以Turtle形式导出，三元组数量不低于25条