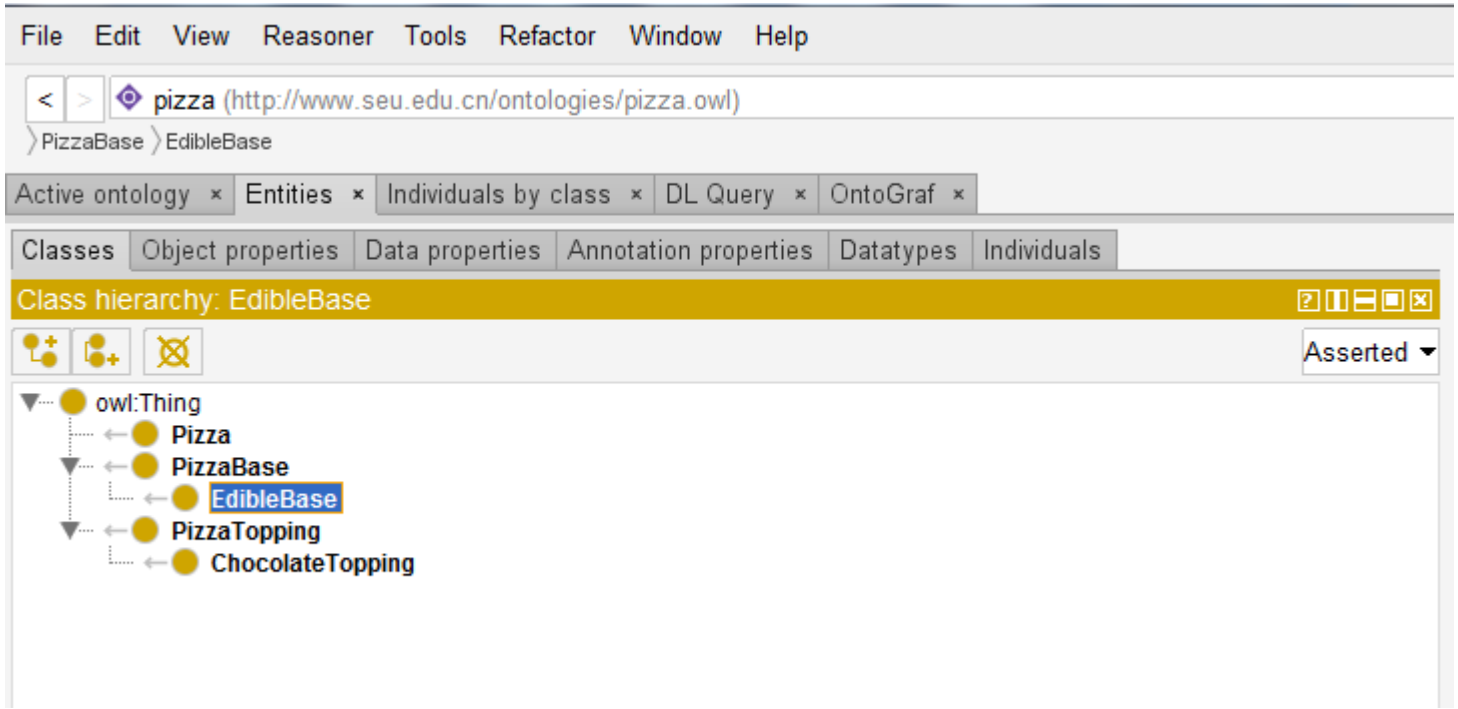
Knowledge Modeling (II) - Protege

一、全称量词、存在量词示例

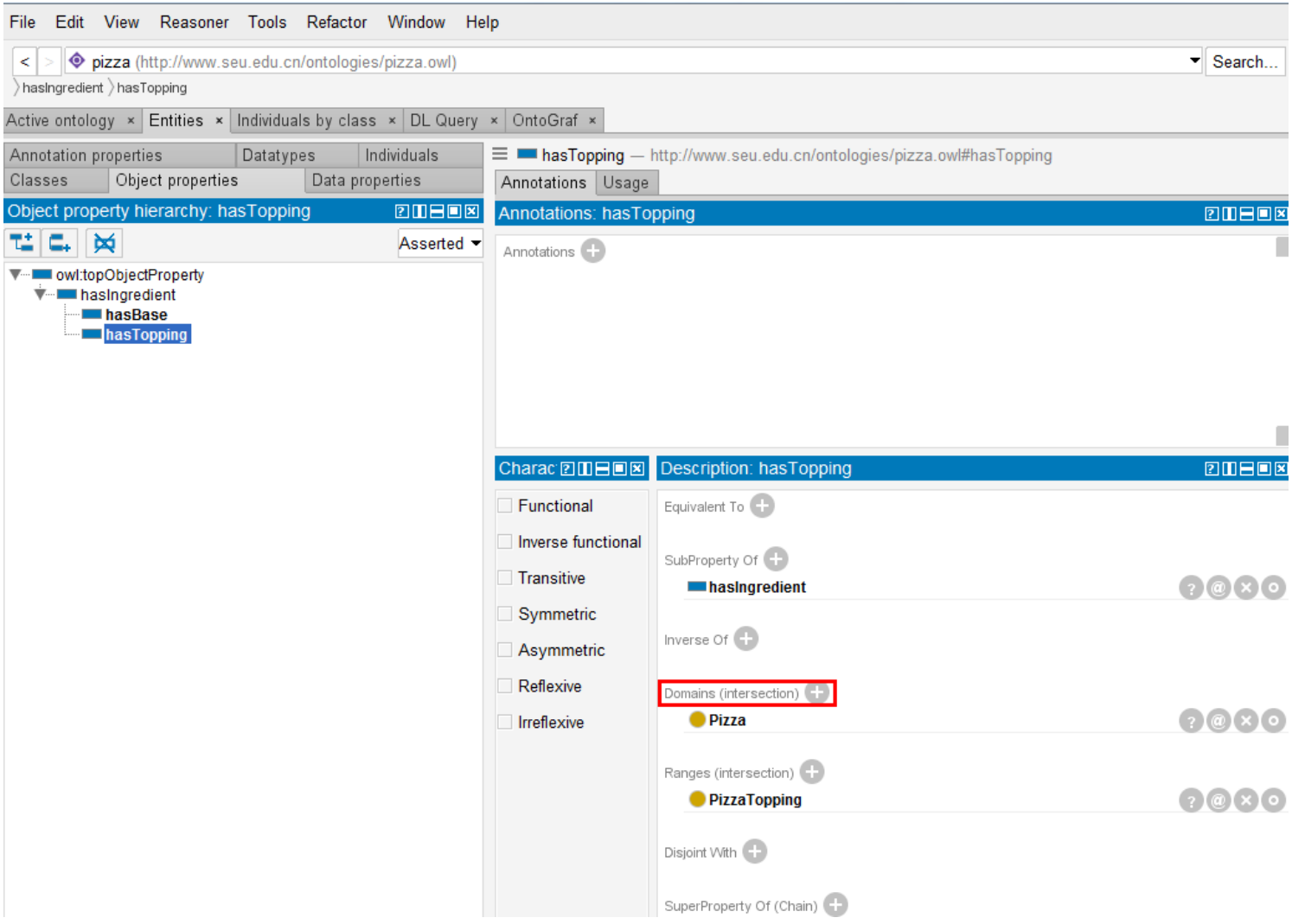
全称量词、存在量词示例

1. 打开“pizza_2.owl”文件；
2. 增加“PizzaBase”的subclass“EdibleBase”与“PizzaTopping”的subclass“ChocolateTopping”



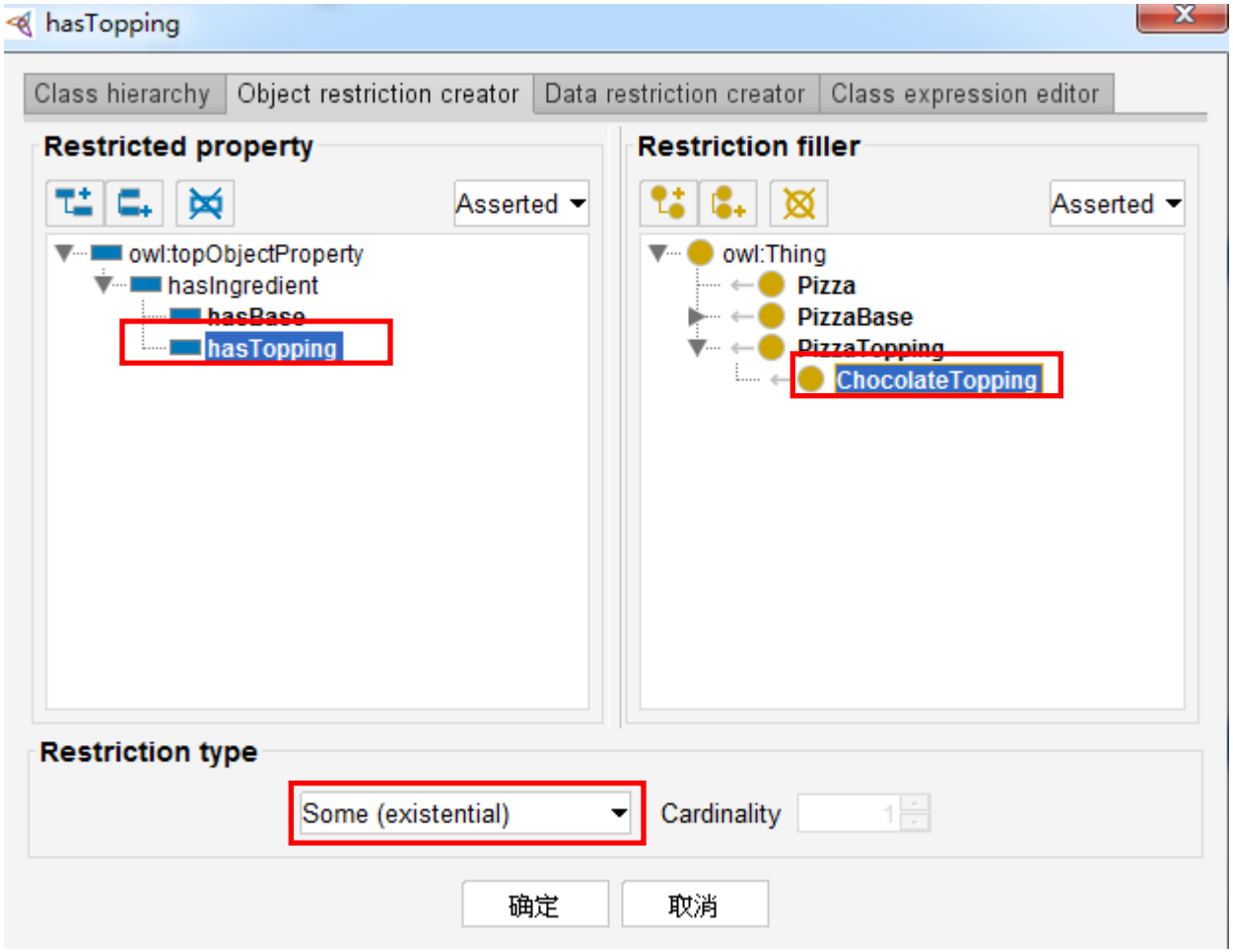
存在量词示例

选择“Object properties”中的“hasTopping”；

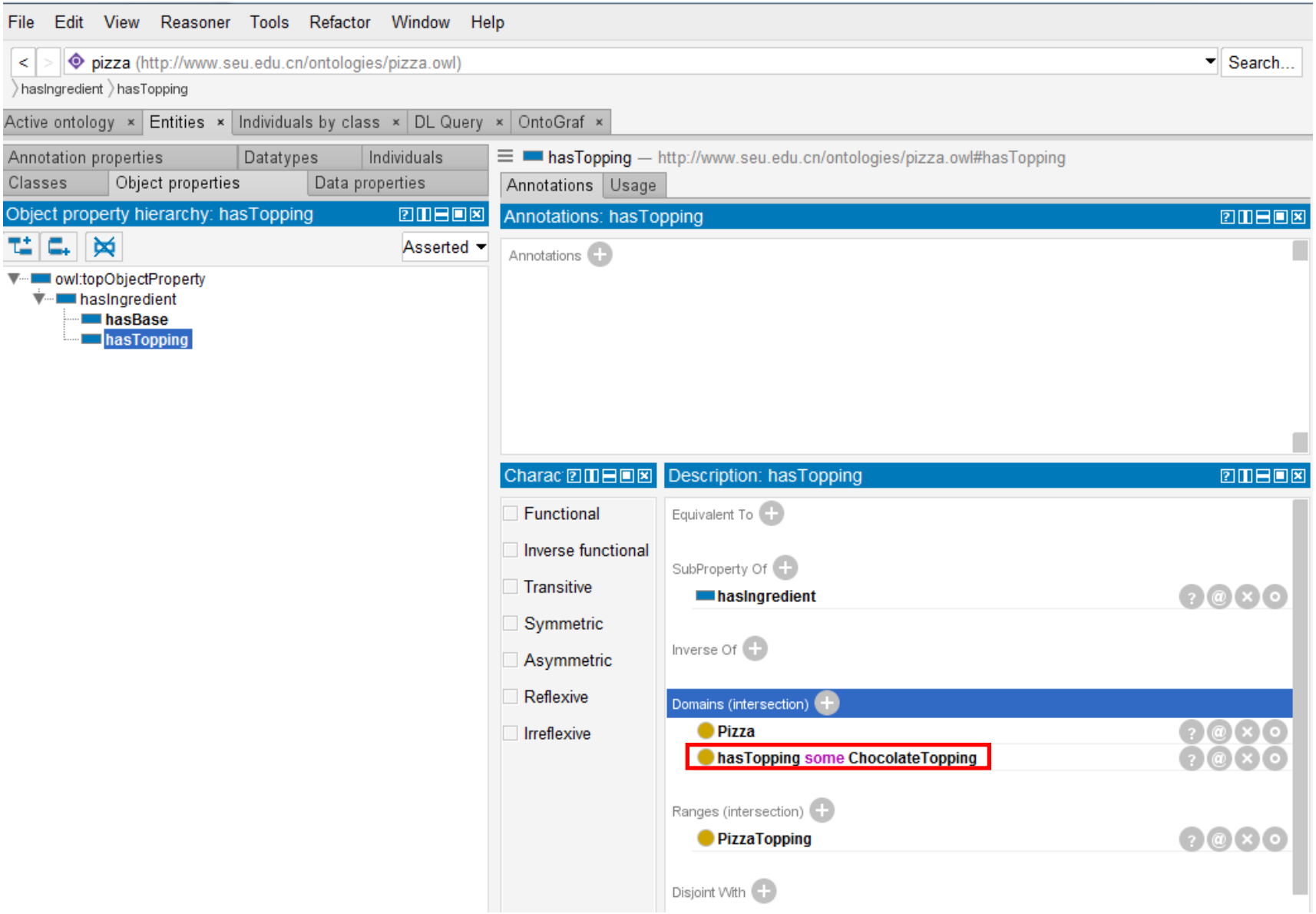


存在量词示例

选择Restricted property、Restriction filler、Restriction type

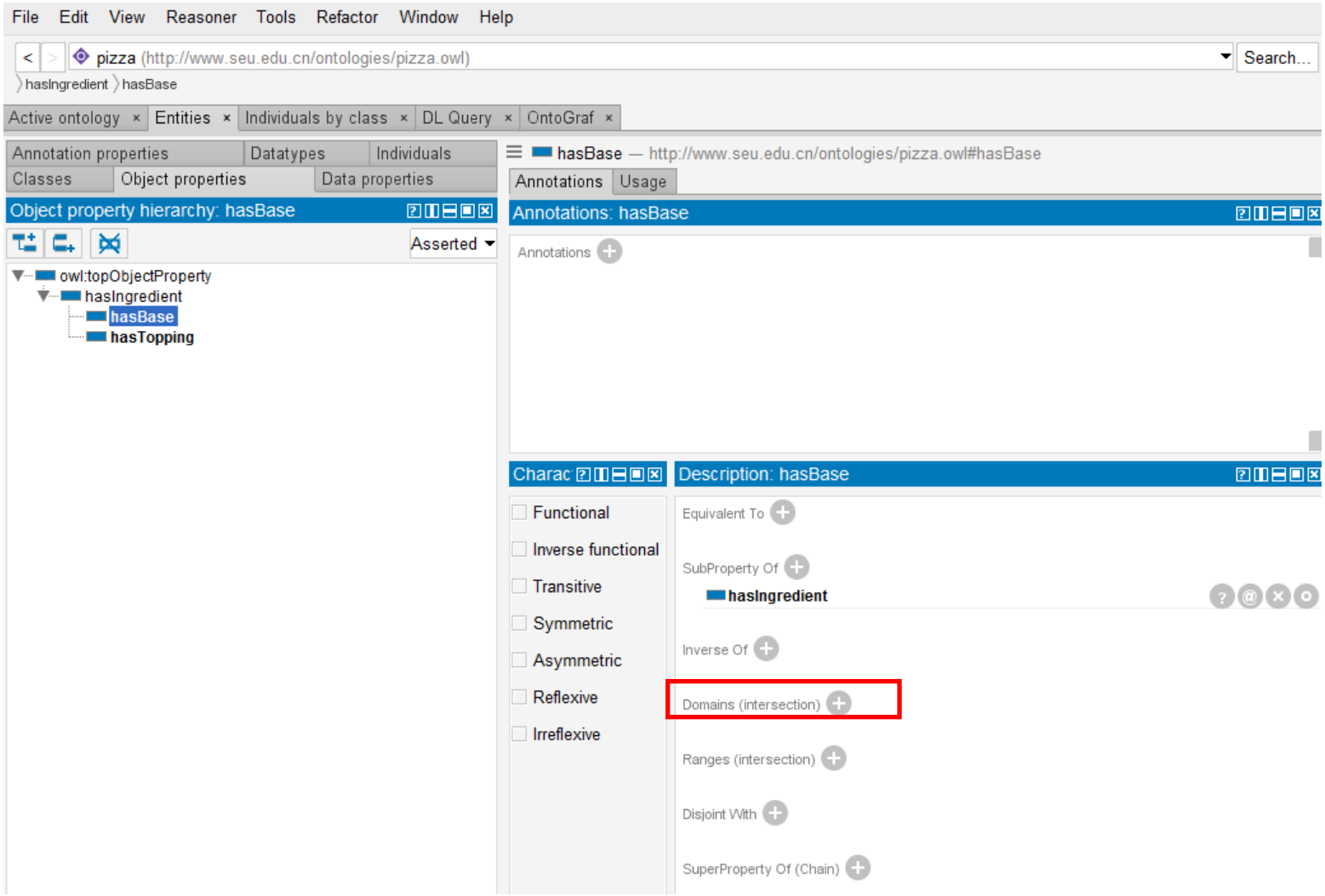


存在量词示例


File Edit View Reasoner Tools Refactor Window Help
pizza (http://www.seu.edu.cn/ontologies/pizza.owl)
Search...
hasIngredient hasTopping
Active ontology Entities Individuals by class DL Query OntoGraf
Annotation properties Datatypes Individuals
Classes Object properties Data properties
Object property hierarchy: hasTopping
Asserted
owl:topObjectProperty
hasIngredient
hasBase
hasTopping
hasTopping — http://www.seu.edu.cn/ontologies/pizza.owl#hasTopping
Annotations Usage
Annotations: hasTopping
Annotations
Charac
Description: hasTopping
Functional
Inverse functional
Transitive
Symmetric
Asymmetric
Reflexive
Irreflexive
Equivalent To
SubProperty Of
hasIngredient
Inverse Of
Domains (intersection)
Pizza
hasTopping some ChocolateTopping
Ranges (intersection)
PizzaTopping
Disjoint With

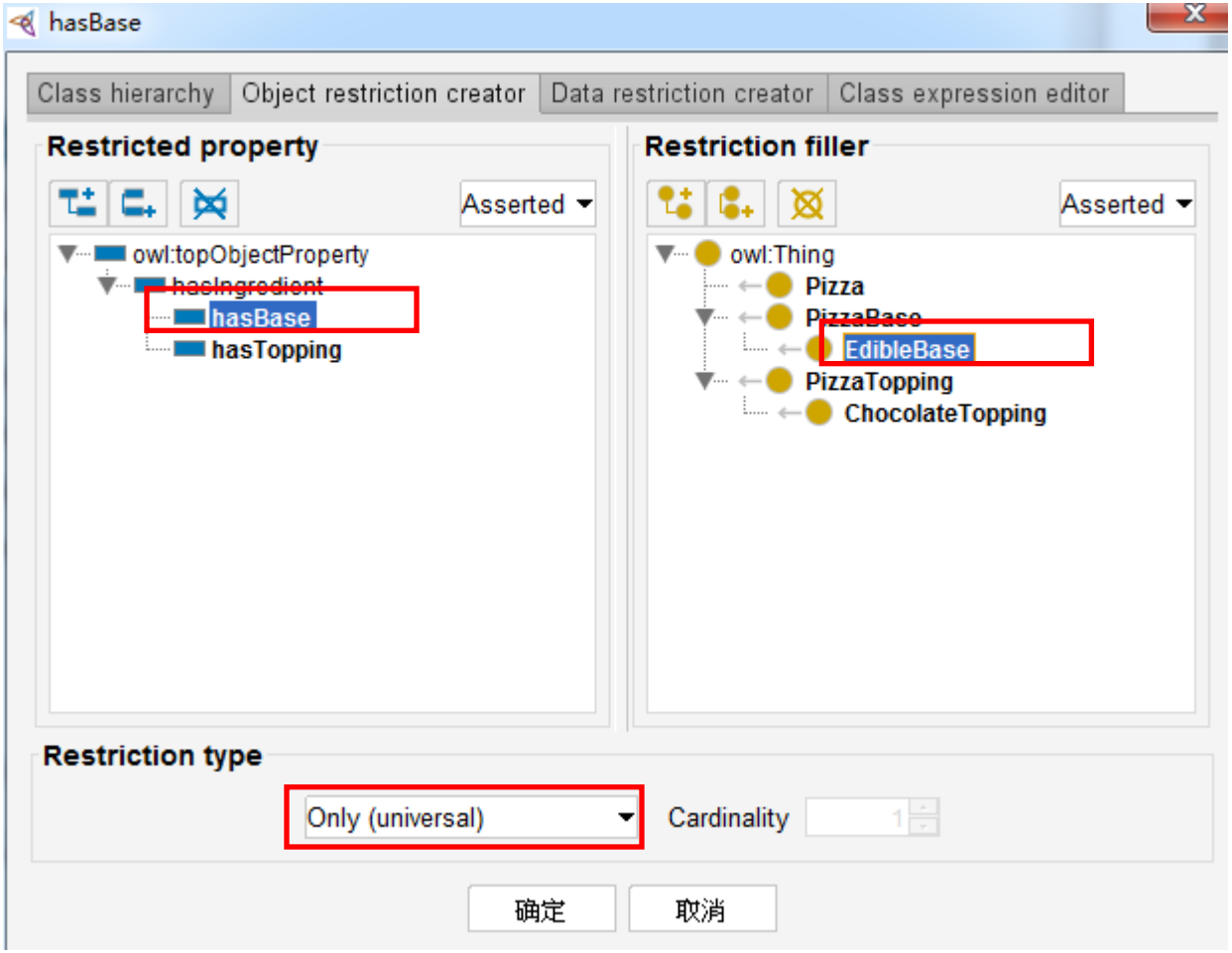
全称量词示例

选择“Object properties”中的“hasBase”；

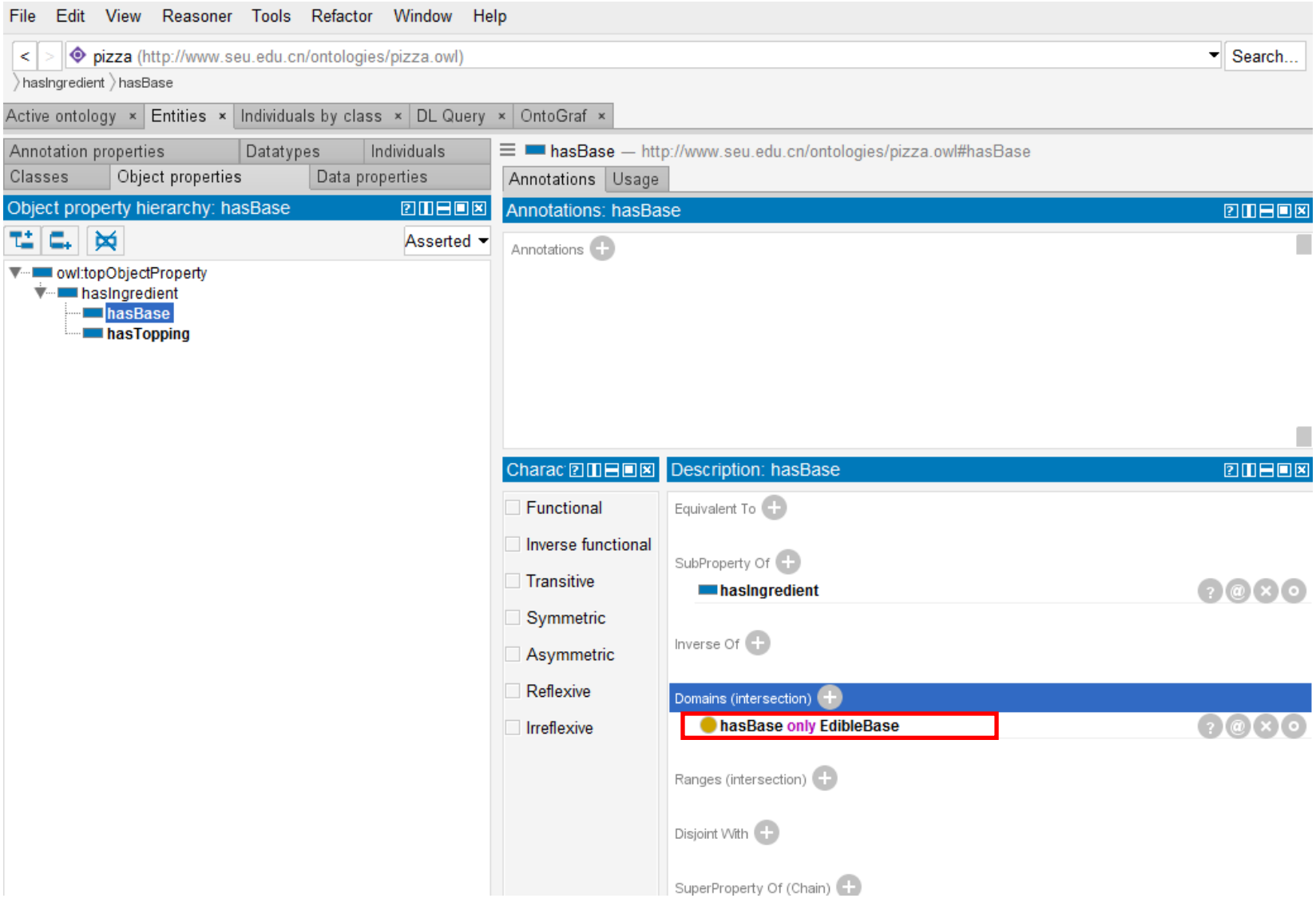


全称量词示例

选择Restricted property、Restriction filler、Restriction type



全称量词示例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Annotations Usage
Annotations: hasBase
Annotations
Charac
Functional
Inverse functional
Transitive
Symmetric
Asymmetric
Reflexive
Irreflexive
Description: hasBase
Equivalent To
SubProperty Of
hasIngredient
Inverse Of
Domains (intersection)
hasBase only EdibleBase
Ranges (intersection)
Disjoint With
SuperProperty Of (Chain)

作业一：

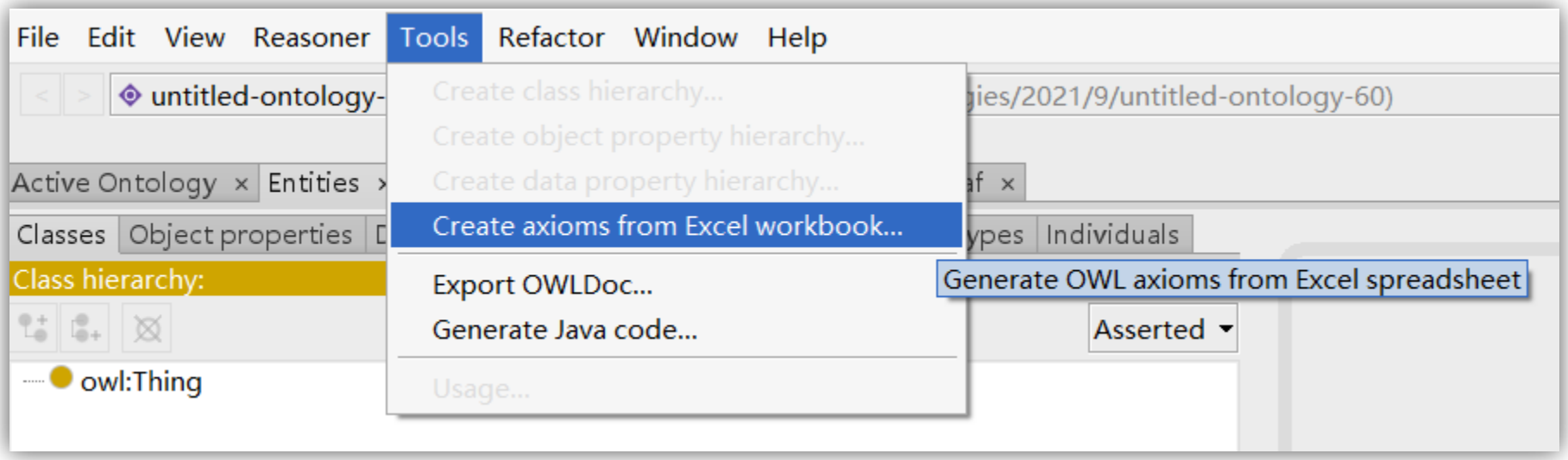
创建一个包含axioms和assertions的consistent ontology（任选感兴趣的领域），要求：

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
4）体现全称量词与存在量词

二、从Excel表导入本体

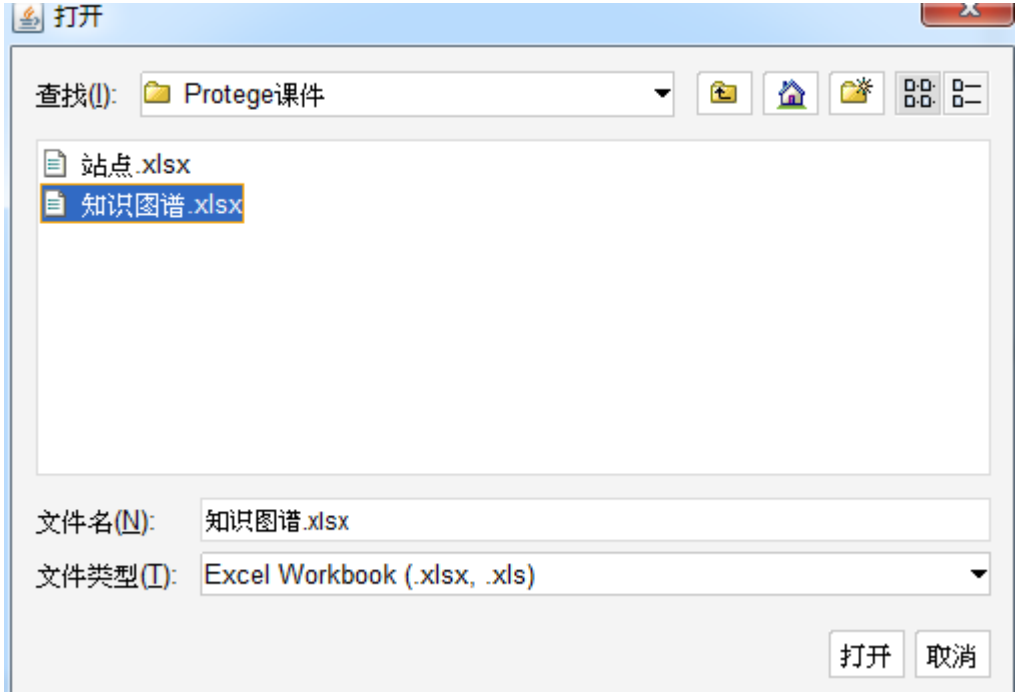
从Excel表导入本体

选择 “Tools” → “Create axioms from Excel workbook”

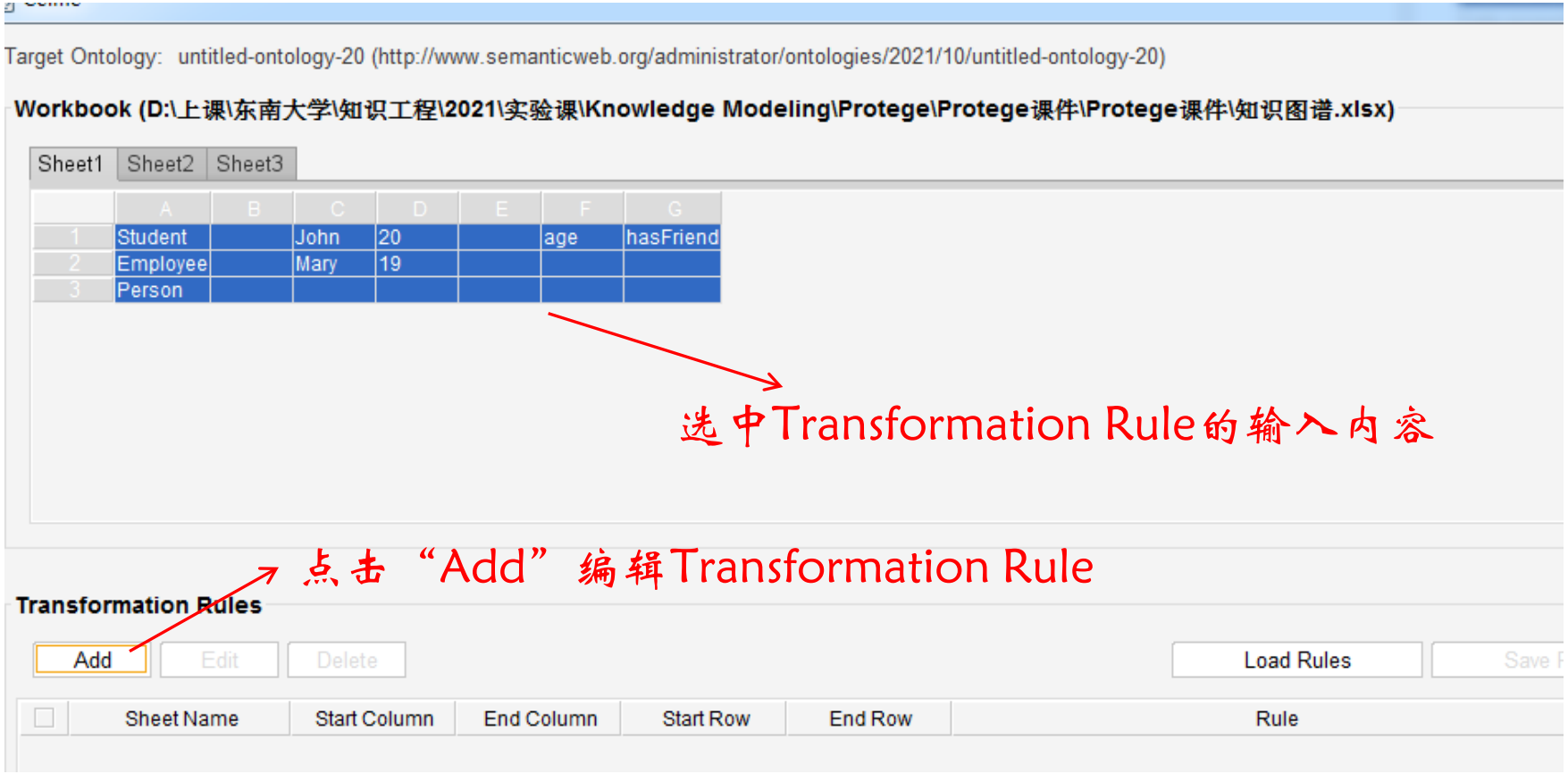


从Excel表导入本体

打开Excel文件“知识图谱.xlsx”

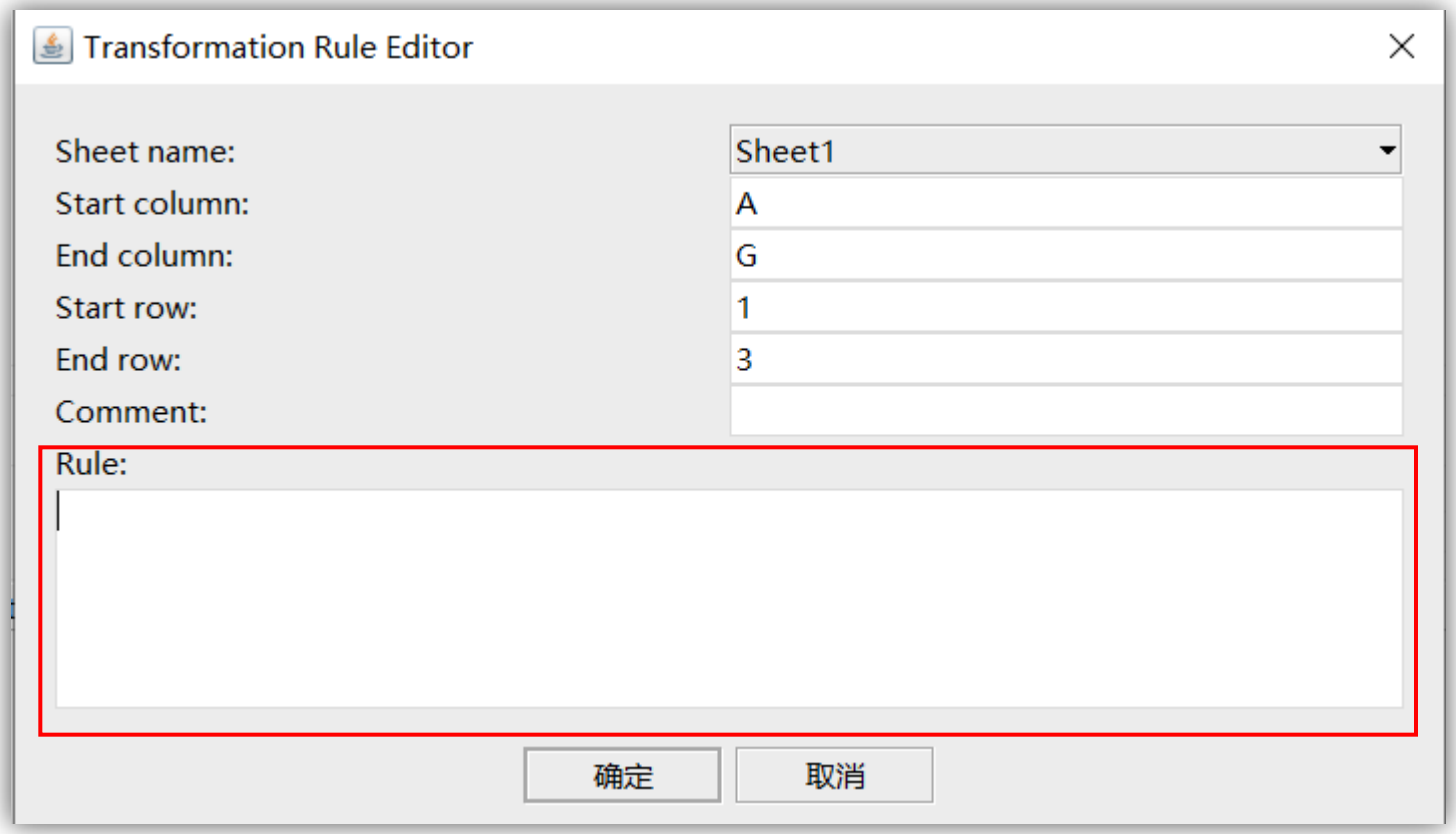


从Excel表导入本体



从Excel表导入本体

使用MappingMaster DSL的语法规则编辑Transformation Rule



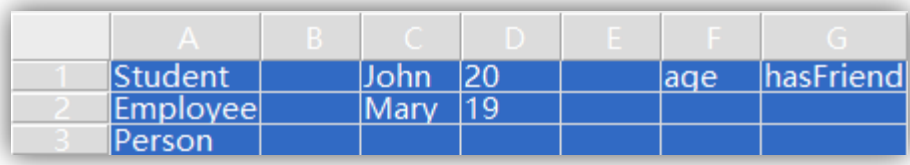
完整的语法规则:https://github.com/protegeproject/mapping-master/wiki/MappingMasterDSL

从Excel表导入本体

Rule示例：

- 作为类名导入

Class:@A1 /*指定A1单元格作为类名*/
Class:@A* /*指定A列所有内容作为类名*/
Class:@*1 /*指定第1行所有内容作为类名*/



	A	B	C	D	E	F	G
1	Student		John	20		age	hasFriend
2	Employee		Mary	19			
3	Person						

- 导入类的同时，创建类之间的公理

Class:@A1
SubClassOf:@A3 /*A1是A3的子类*/

从Excel表导入本体

Rule示例：

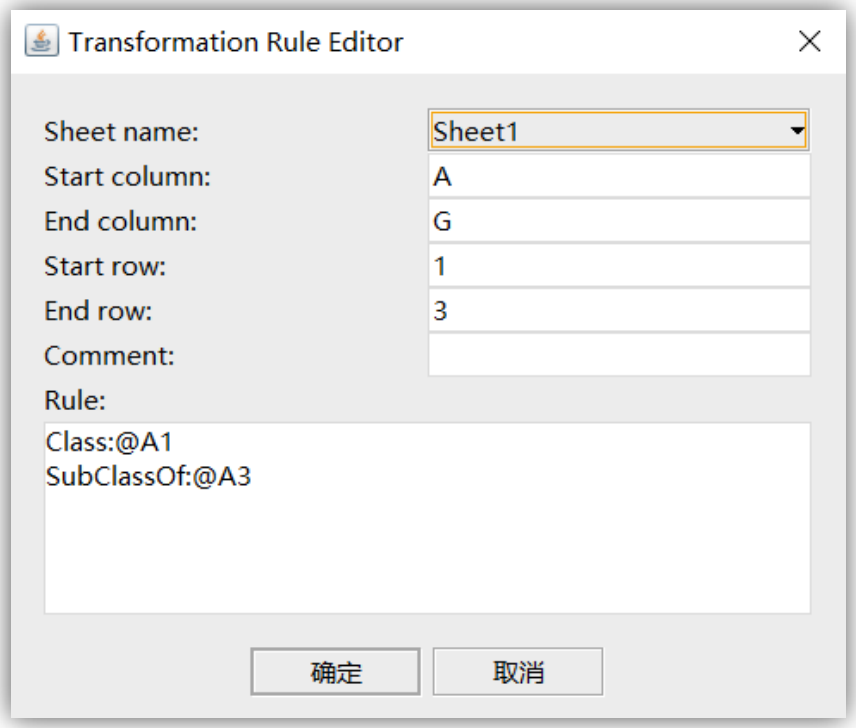
- 作为类名导入

Class:@A1 /*指定A1单元格作为类名*/
Class:@A* /*指定A列所有内容作为类名*/
Class:@*1 /*指定第1行所有内容作为类名*/

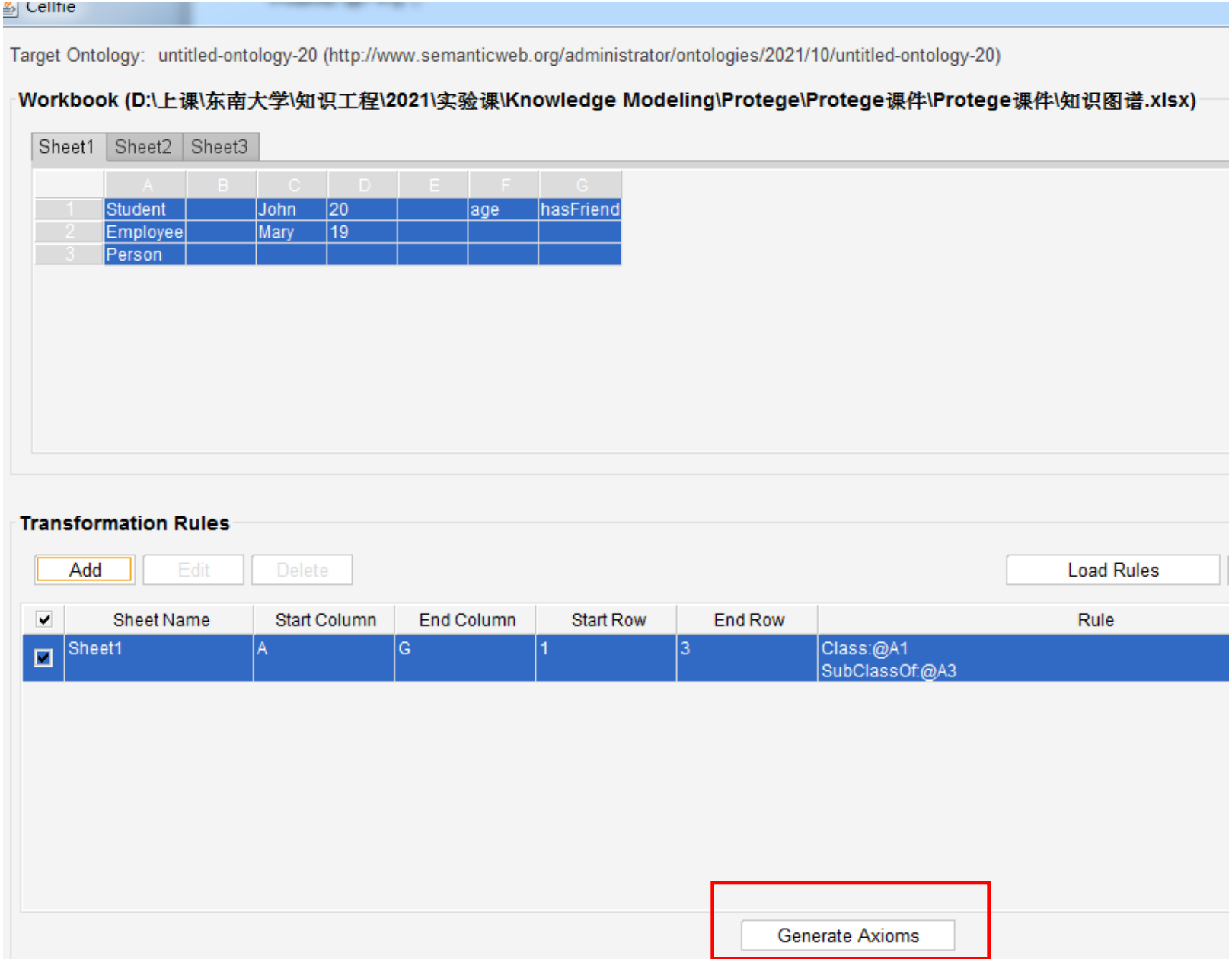
	A	B	C	D	E	F	G
1	Student		John	20		age	hasFriend
2	Employee		Mary	19			
3	Person						

- 导入类的同时，创建类之间的公理

Class:@A1
SubClassOf:@A3 /*A1是A3的子类*/



从Excel表导入本体



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Rule示例：

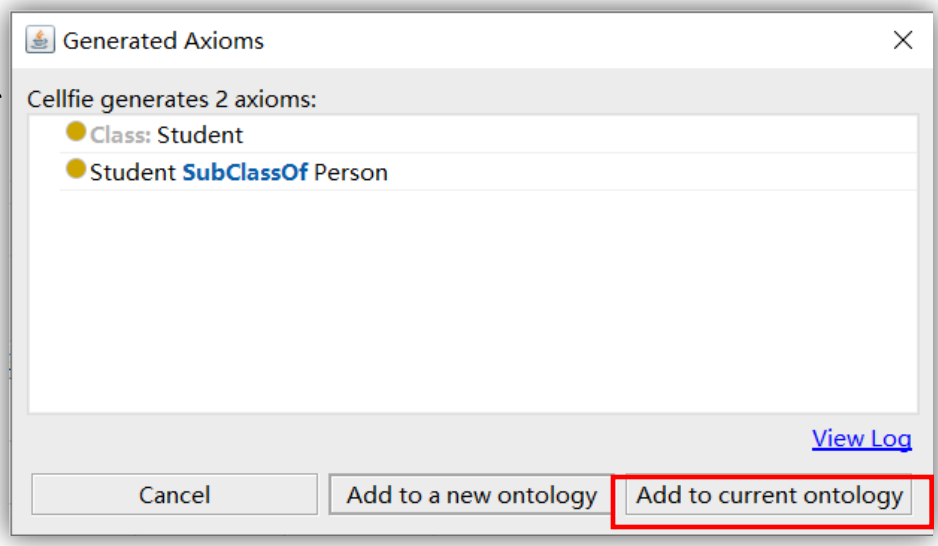
- 作为类名导入

Class:@A1 /*指定A1单元格作为类名*/
Class:@A* /*指定A列所有内容作为类名*/
Class:@*1 /*指定第1行所有内容作为类名*/

	A	B	C	D	E	F	G
1	Student		John	20		age	hasFriend
2	Employee		Mary	19			
3	Person						

- 导入类的同时，创建类之间的公理

Class:@A1
SubClassOf:@A3 /*A1是A3的子类*/



从Excel表导入本体

Rule示例：

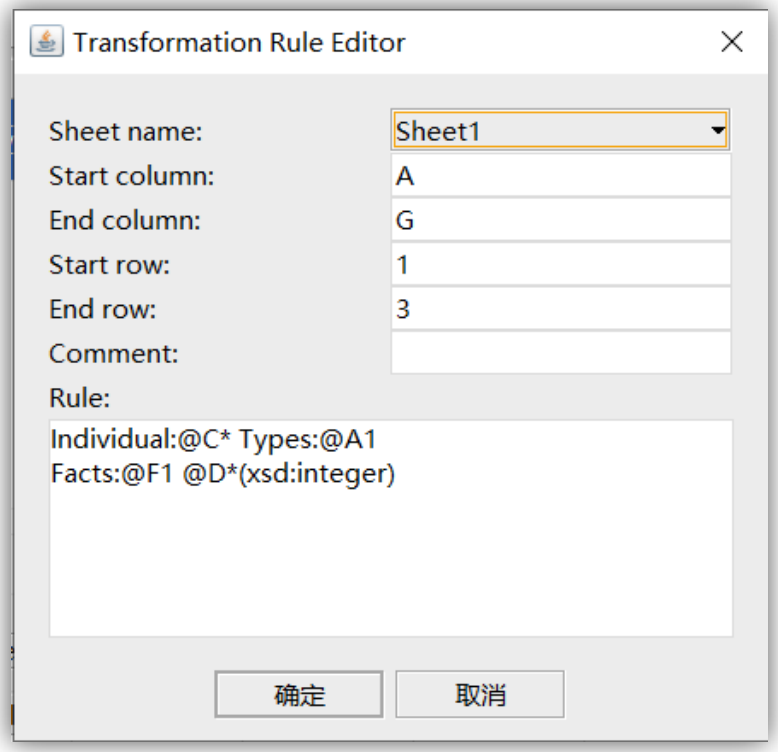
- 作为实例导入

Individual:@C* Types:@A1
/*指定C列所有内容作为实例，类型为Student*/

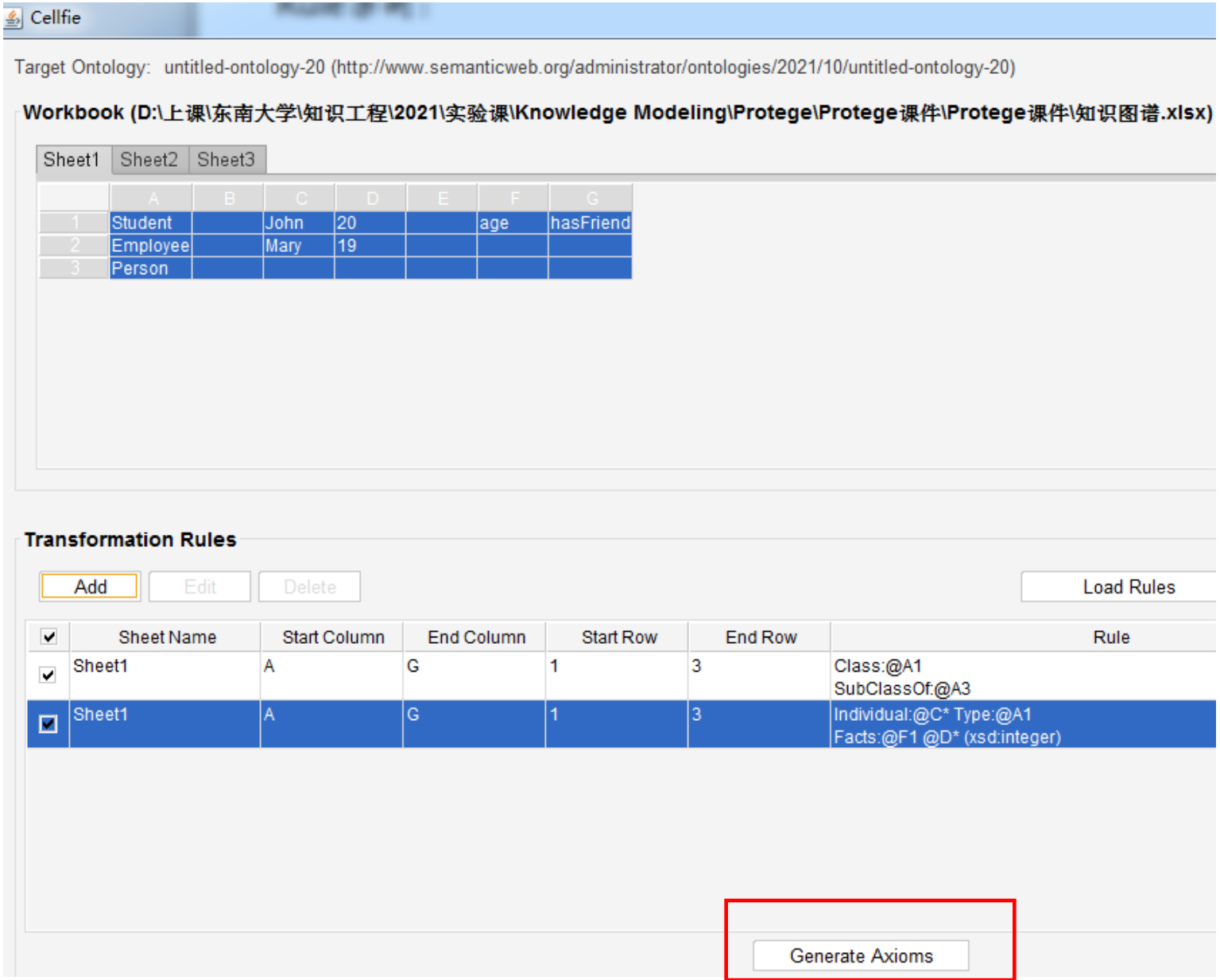
	A	B	C	D	E	F	G
1	Student		John	20		age	hasFriend
2	Employee		Mary	19			
3	Person						

- 导入实例的同时，创建实例属性

Individual:@C* Types:@A1
Facts:@F1 @D* (xsd:integer)
/*创建数据属性age，值为对应的D列的值，
类型为Int（默认为String）*/



从Excel表导入本体



从Excel表导入本体

Rule示例：

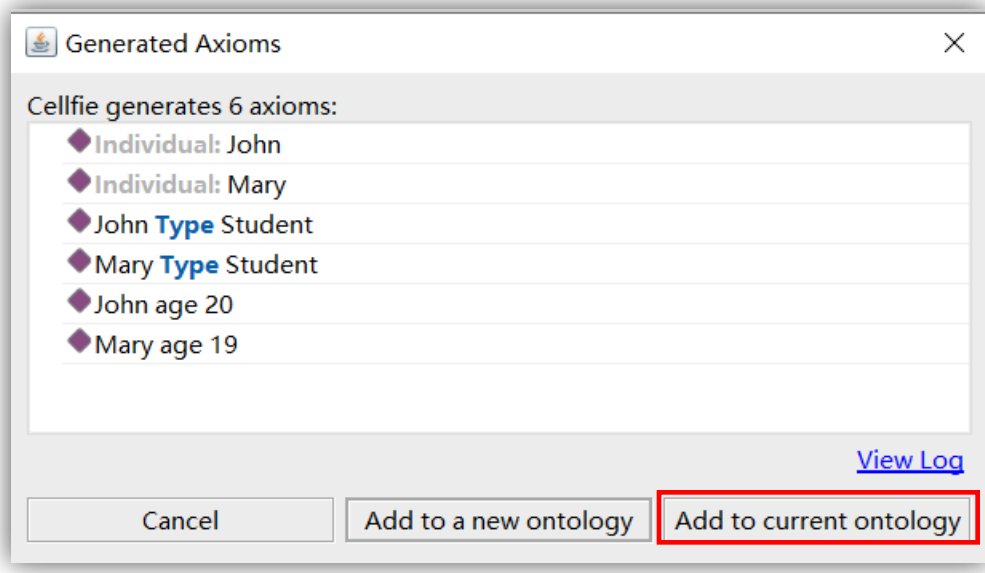
- 作为实例导入

Individual:@C* Types:@A1
/*指定C列所有内容作为实例，类型为Student*/

	A	B	C	D	E	F	G
1	Student		John	20		age	hasFriend
2	Employee		Mary	19			
3	Person						

- 导入实例的同时，创建实例属性

Individual:@C* Types:@A1
Facts:@F1 @D* (xsd:integer)
/*创建数据属性age，值为对应的D列的值，类型为Int（默认为String）*/



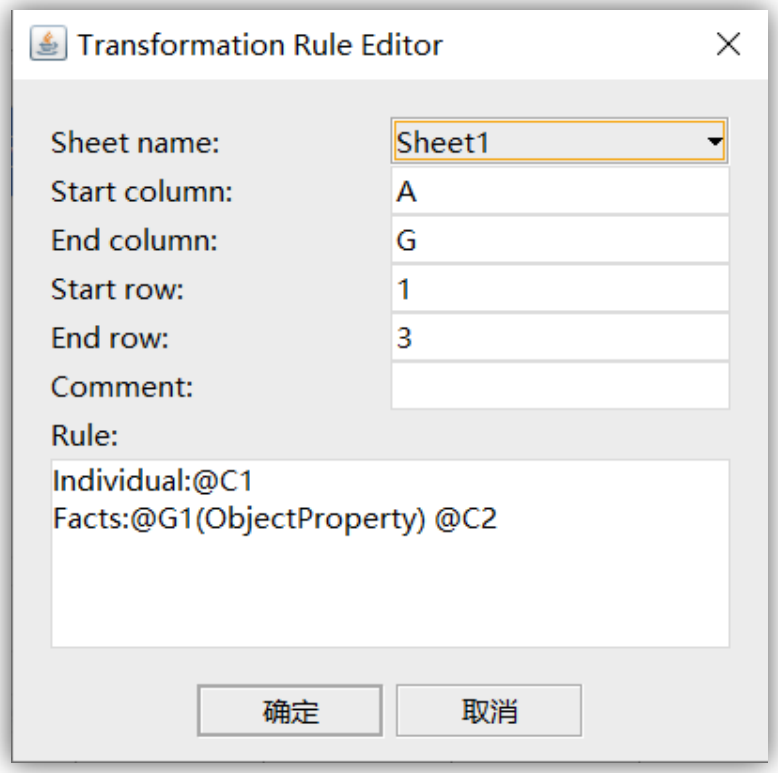
从Excel表导入本体

Rule示例：

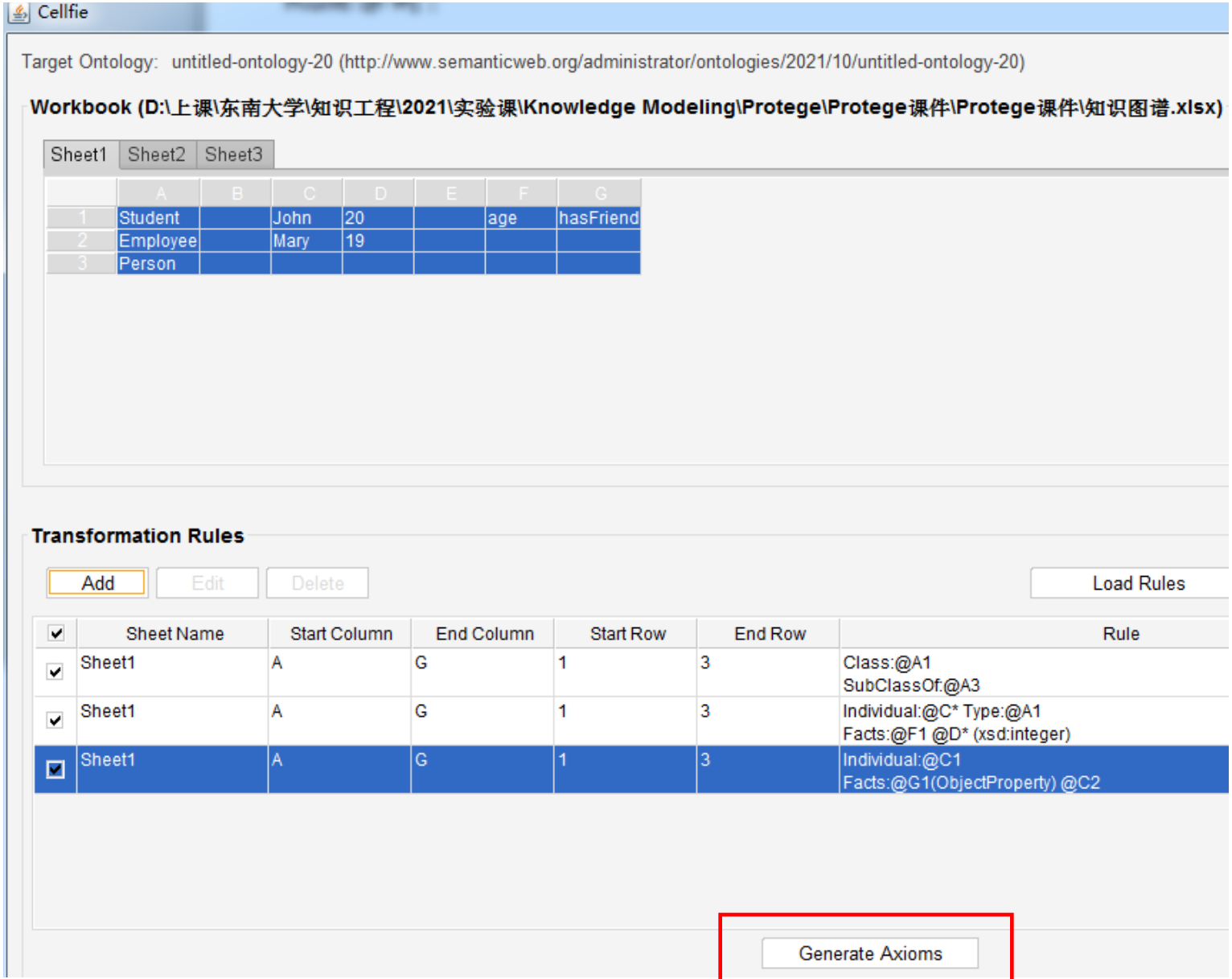
- 导入实例的同时，创建实例属性

Individual:@C1
Facts:@G1(ObjectProperty) @C2
/*创建对象属性hasFriend，值为Mary*/

	A	B	C	D	E	F	G
1	Student		John	20		age	hasFriend
2	Employee		Mary	19			
3	Person						



从Excel表导入本体



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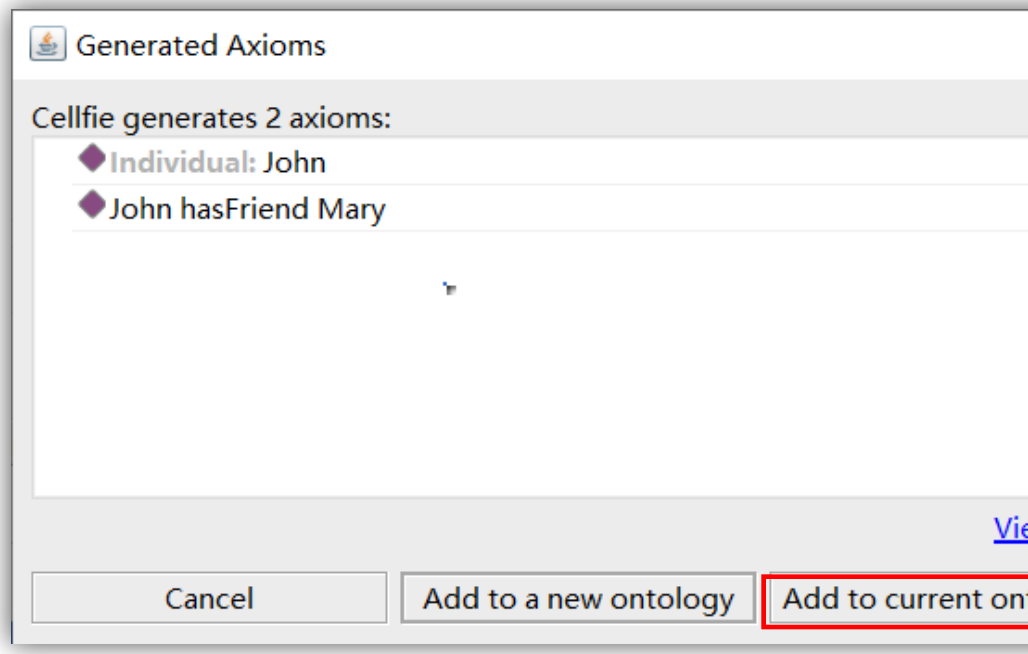
Rule示例：

- 导入实例的同时，创建实例属性

Individual:@C1
Facts:@G1(ObjectProperty) @C2
/*创建对象属性hasFriend，值为Mary*/

	A	B	C	D	E	F	G
1	Student		John	20		age	hasFriend
2	Employee		Mary	19			
3	Person						



三、课堂作业

给定Excel表格“站点.xlsx”，编写相应规则将其导入Protege。

要求：

1）尽可能多地生成三元组；

2）将生成结果可视化。