Krissanapong Palakham 6288102

Ontology Individual Assignment

I. Ontology Question

1) **What are the subclasses of Pizza?**
    i. NamedPizza
    ii. UnclosedPizza
2) **What are the classes that CheesyPizza is equivalent to?**
    i. Pizza
    ii. hasTopping some CheeseTopping
3) **What are the superclasses of CheesyVegetableTopping?**
    i. VegetableTopping
    ii. CheeseTopping
4) **What are the subclasses of SeafoodTopping**
    i. PizzaTopping
    ii. hasSpiciness some Mild
5) **Please interpret the meaning of InterestingPizza in plain English.**

Any pizza that has at least 3 toppings. Note that this is a cardinality constraint on the hasTopping property and NOT a qualified cardinality constraint (QCR). A QCR would specify from which class the members in this relationship must be. eg has at least 3 toppings from PizzaTopping. This is currently not supported in OWL.

6) **Please interpret the meaning of VegetarianPizza in plain English.**

Any pizza that does not have fish topping and does not have meat topping is a VegetarianPizza. Note that instances of this class do not need to have any toppings at all.

7) **Please interpret the meaning of MozzarellaTopping in plain English.**

None

8) **Please interpret the meaning of VegetarianPizza2 in plain English.**

An alternative to VegetarianPizzaEquiv1 that does not require a definition of VegetarianTopping. Perhaps more difficult to maintain. Not equivalent to VegetarianPizza

9) Please interpret the meaning of IceCream in plain English.

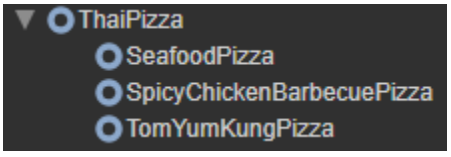
A class to demonstrate mistakes made with setting a property domain. The property hasTopping has a domain of Pizza. This means that the reasoner can infer that all individuals using the hasTopping property must be of type Pizza. Because of the restriction on this class, all members of IceCream must use the hasTopping property, and therefore must also be members of Pizza. However, Pizza and IceCream are disjoint, so this causes an inconsistency. If they were not disjoint, IceCream would be inferred to be a subclass of Pizza.

10) What are the classes that disjoint with ArtichokeTopping?

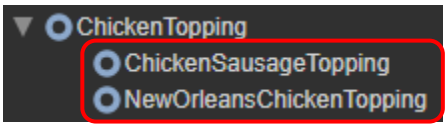
i. ArtichokeTopping
ii. AsparagusTopping
iii. CaperTopping
iv. GarlicTopping
v. LeekTopping
vi. MushroomTopping
vii. OliveTopping
viii. OnionTopping
ix. PepperTopping
x. PetitPoisTopping
xi. RocketTopping
xii. SpinachTopping
xiii. TomatoTopping

II. Thai Pizza Ontology

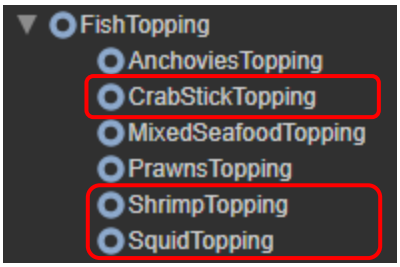
a. Classes



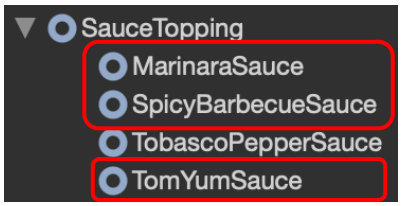
This class is ThaiPizza class that is a subclass of Pizza representing the 3 Thai Pizza Style including SeafoodPizza, SpicyChickenBarbecuePizza, and TomYumKungPizza as subclasses.



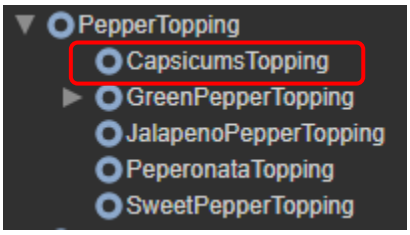
This class is the ChickenTopping which is a subclass of the MeatTopping. I added more subclasses including ChickenSausageTopping and NewOrleansChickenTopping.



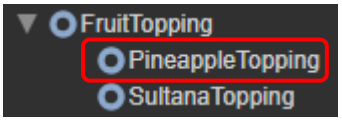
This class is the FishTopping class which is a subclass of PizzaTopping. I added more classes that are toppings put on the ThaiPizza including CrabStickTopping, ShrimpTopping, and SquidTopping.



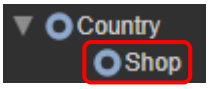
This class is the SauceTopping class which is a subclass of PizzaTopping. I added more classes including MarinaSauce, SpicyBarbecueSauce, and TomYumSauce.



This class is the PepperTopping class which is a subclass of PizzaTopping. I added more class which is CapsicumsTopping.

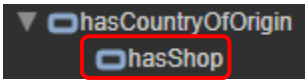


This class is the FruitTopping class which is a subclass of PizzaTopping. I added more class which is the PineappleTopping class.



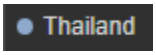
This last class is the Country class that I added the subclass which is the Shop class showing the shop in the country.

b. Properties

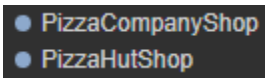


I created an object property which is the hasShop property representing the shop where is in the country.

c. Individuals

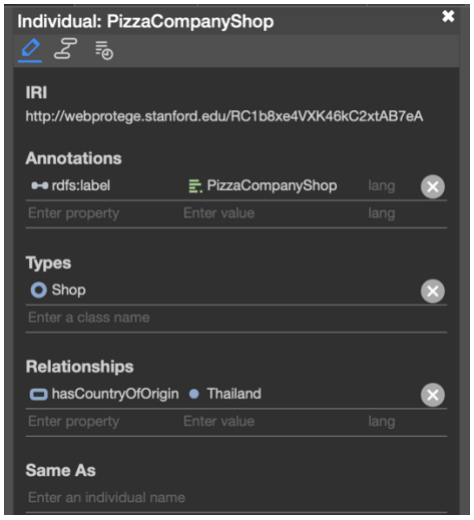


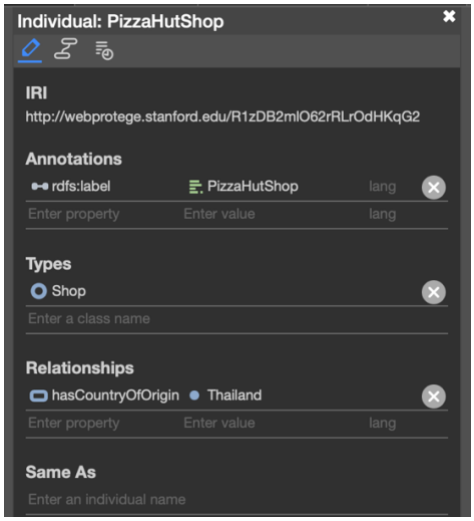
The first individual I added is Thailand which is an individual of Country class.



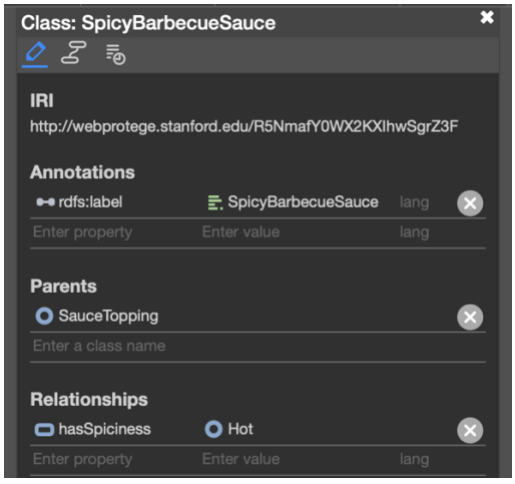
The other 2 individuals I added are PizzaCompanyShop and PizzaHutShop which are individuals of Shop class to represent a pizza shop.

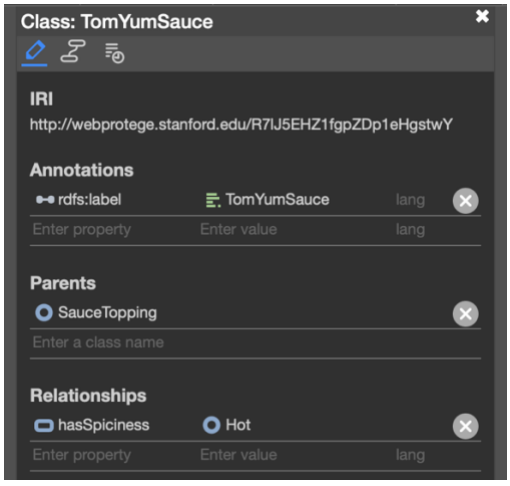
d. Relationships



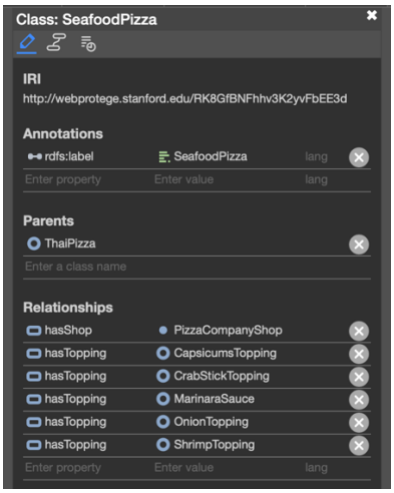


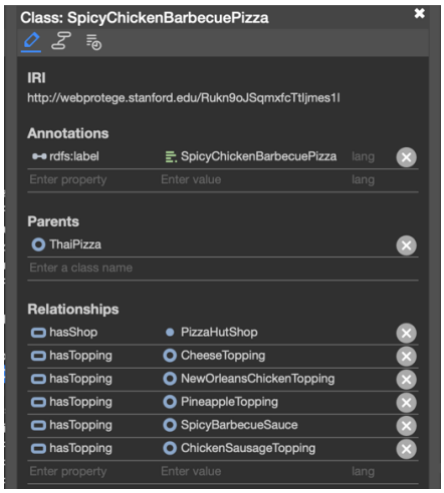
The first relationship is the PizzaCompanyShop and PizzaHutShop individuals that has relation hasCountryOfOrigin with Thailand country to represent the pizza shop is establish in Thailand.

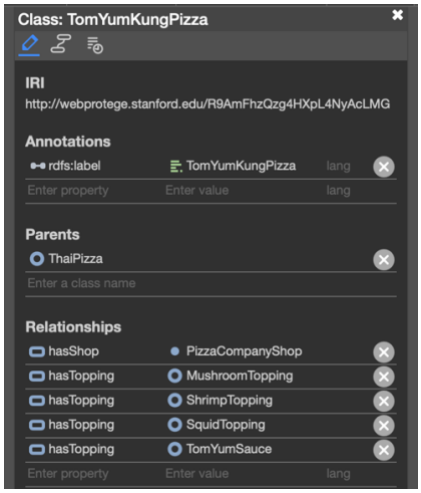




According to above images, it shows the relation of SpicyBarbecueSauce and TomYumSauce classes with hasSpiciness to represent these sauces are hot.







The last class relationships are included as follow:

1) **SeafoodPizza** – The relationship contains hasShop with PizzaCompanyShop that represents this pizza style is created by the Pizza Company Shop. Besides, it related to hasTopping with all required toppings including CapsicumsTopping, CrabStickTopping, MarinaraSauce, OnionTopping, and ShrimTopping.
2) **SpicyChickenBaebecuePizza** – The relationship contains hasShop with PizzaHutShop that represents this pizza is created by the Pizza Hut Shop. Besides, it related to hasTopping with all required toppings including CheeseTopping, NewOrleansChickenTopping, PineappleTopping, SpicyBarbecueSauce, and ChickenSausageTopping. Because of NewOrleansChickenTopping, ChickenSausageTopping, and SpicyBarbecueSauce that had a relation with Spiciness class, this pizza will have a spicy taste.
3) **TomYumKungPizza** – The relationship contains hasShop with PizzaCompanyShop that represents this pizza is created by the Pizza Company Shop. Besides, it related to hasTopping with all required toppings including MushroomTopping, ShrimpTopping, SquidTopping, and TomYumSauce. Because of MushroomTopping and TomYumKungSauce that had a relation with Spiciness class, this pizza will have a spicy test.

According to above relationship, you will see the shop that all pizzas are created. All shops are related to the hasCountryOfOrigin property with Thailand individual, so it could be said all pizza shops are established in Thailand.