

### Ontology Question

1. What are the subclasses of Pizza?

**Answer:** CheesyPizza, InterestingPizza, MeatyPizza, NamedPizza, NonVegetarianPizza, ReallItalianPizza, SpicyPizza, SpicyPizzaEquivalent, ThinAndCrispyPizza, UnclosedPizza, VegetatrianPizza, VegetatrianPizza1, and VegetatrianPizza2.

2. What are the classes that CheesyPizza equivalent to?

**Answer:** CheesyPizza equivalent to Pizza and (hasTopping some CheeseTopping).

3. What are the superclasses of CheesyVegetableTopping?

**Answer:** CheeseTopping and VegetableTopping are superclasses of CheesyVegetableTopping.

4. What are the subclasses of SeafoodTopping?

**Answer:** AnchoviesTopping, MixedSeafoodTopping, and PrawnsTopping are the subclasses of SeafoodTopping.

5. Please interpret the meaning of InterestingPizza in plain English.

**Answer:** skos:definition "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. e.g., has at least 3 toppings from PizzaTopping. @en

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

**Answer:** skos:definition "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." @en

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

**Answer:** skos:prefLabel "Mozzarella"@en

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

**Answer:** rdfs:comment "Any pizza that only has vegetarian toppings or no toppings is a VegetarianPizzaEquiv1. Should be inferred to be equivalent to VegetarianPizzaEquiv2. Not equivalent to VegetarianPizza because PizzaTopping is not covering" @en.

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

**Answer:** rdfs:comment "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."@en.

10. What are the classes that disjoint with ArtichokeTopping?

**Answer:** CaperTopping, GarlicTopping, OliveTopping, TomatoTopping, SpinachTopping, OnionTopping, PepperTopping, LeekTopping, MushroomTopping, PetitPoisTopping, RocketTopping, and AsparagusTopping are the classes that disjoint with ArtichokeTopping.

## Thai Pizza Ontology

Before I provide more Thai-style pizza, I'd like to inform you about the inspiration. A YouTube channel called KIK IN MECA presents the United States pizza marketing strategies that focus on Thai-style pizzas. Its uniqueness is to combine traditional pizza recipes with Thai recipes which attract Americans for creativity.



Figure 1: Inspired YouTube Channels [1]

I selected Thai Recipes to create Thai style pizza including Spicy Minced Pork(ลาบหมู) and Stir-Fried Minced Pork with Holy Basil(ผัดกะเพราหมูสับ). I also selected savory dessert to create Thai style pizza which is Dried Shredded Pork with Thai Chili Paste(หมูหยองพริกเผา) to made three Thai style pizza.

### Thai style pizzas

**It Already have in Pizza ontology.**

1. SpicyMincedPork Pizza
  - a. Ingredients
    - i. MincedPorkTopping
    - ii. ChiliTopping
    - iii. FishSauceTopping
    - iv. LimeJuiceSauce
    - v. RedOnionTopping

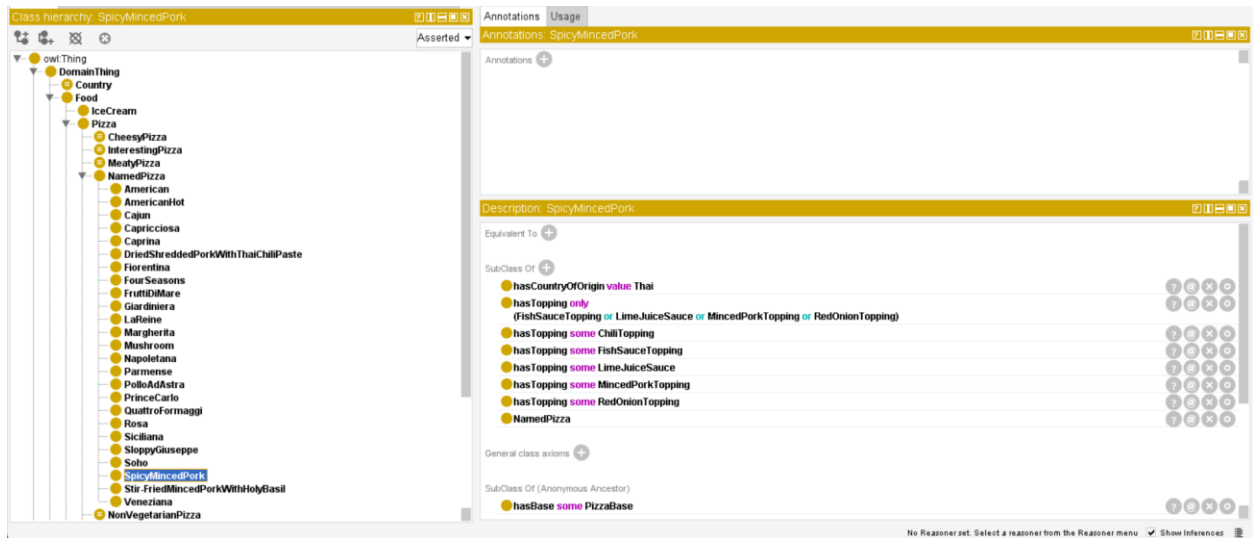


Figure 2: Spicy Minced Pork Pizza

Figure 2 shows that spicy minced pork pizza should contain minced pork(หมูสับ), chili(พริก  
ป่น), fish sauce(น้ำปลา), lime juice(น้ำมะนาว), and red onion(หอมแดง) which this recipe originate in  
Thailand.

## 2. Stir-FriedMincedPorkWithHolyBasil Pizza

### a. Ingredients

- i. MincedPorkTopping
- ii. ChiliTopping
- iii. OysterSauceTopping
- iv. HolyBasilTopping

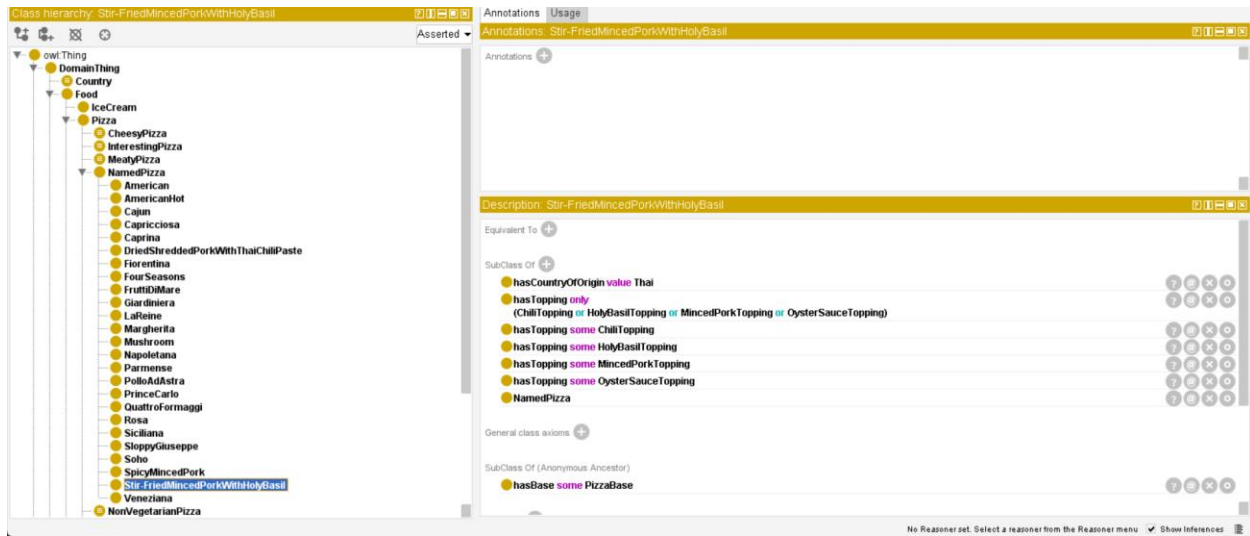


Figure 3: Stir-Fried Minced Pork Pizza

Figure 3 shows that stir-fried minced pork pizza should contain minced pork(หมูสับ), chili(พริกปั่น), oyster sauce(ซอสหอยนางรม), and holy basil(ใบกะเพรา) which this recipe originate in Thailand.

### 3. DriedShreddedPorkWithThaiChiliPaste Pizza

#### a. Ingredients

- ThaiChiliPasteTopping
- DriedShreddedPorkTopping

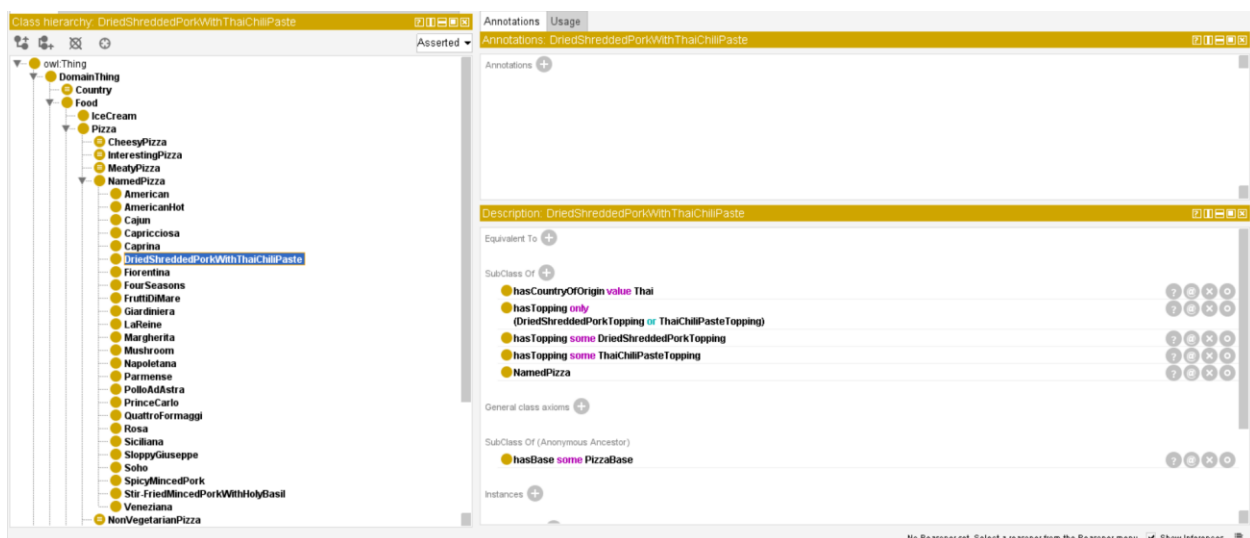


Figure 4: Dried Shredded Pork with Thai Chili Paste Pizza

Figure 4 shows that dried shredded pork pizza with Thai chili paste should contain only dried shredded pork(หมูหยอง), and Thai chili paste(พริกเผา)

## Pizza Toppings

1. MincedPorkTopping
2. ChiliTopping
3. FishSauceTopping
4. LimeJuiceSauce
5. OysterSauceTopping
6. HolyBasilTopping
7. ThaiChiliPasteTopping
8. DriedShreddedPorkTopping

\*Note that RedOnionTopping already has pizza ontology before I modify pizza ontology.

## MincedPorkTopping

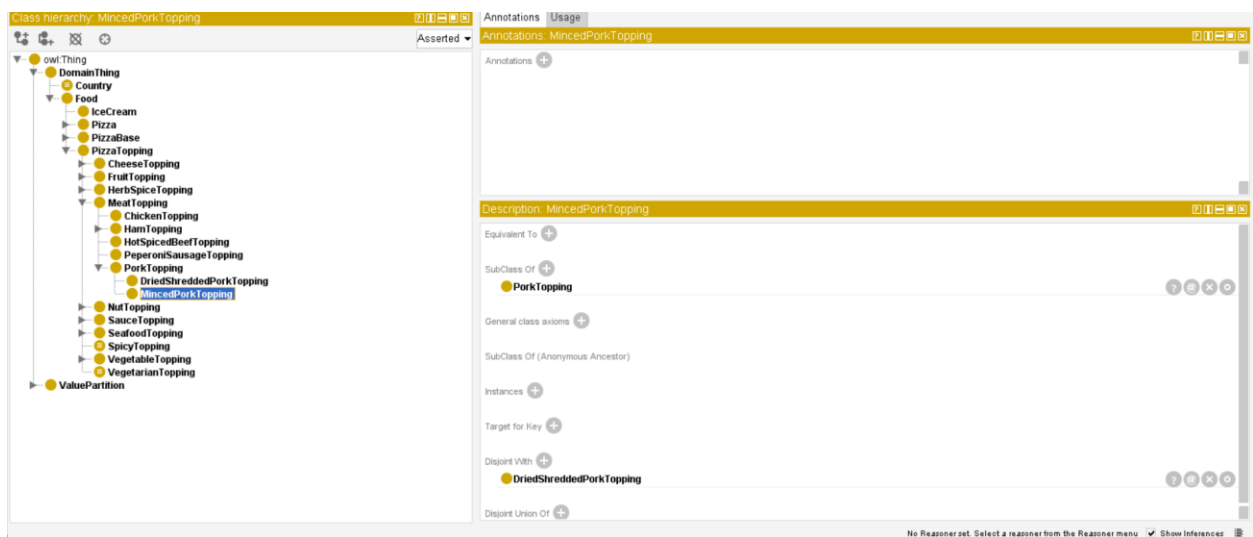


Figure 5: Minced Pork Topping

Figure 5 shows that minced pork is subclass of PorkTopping which minced pork has no flavor.

## ChiliTopping

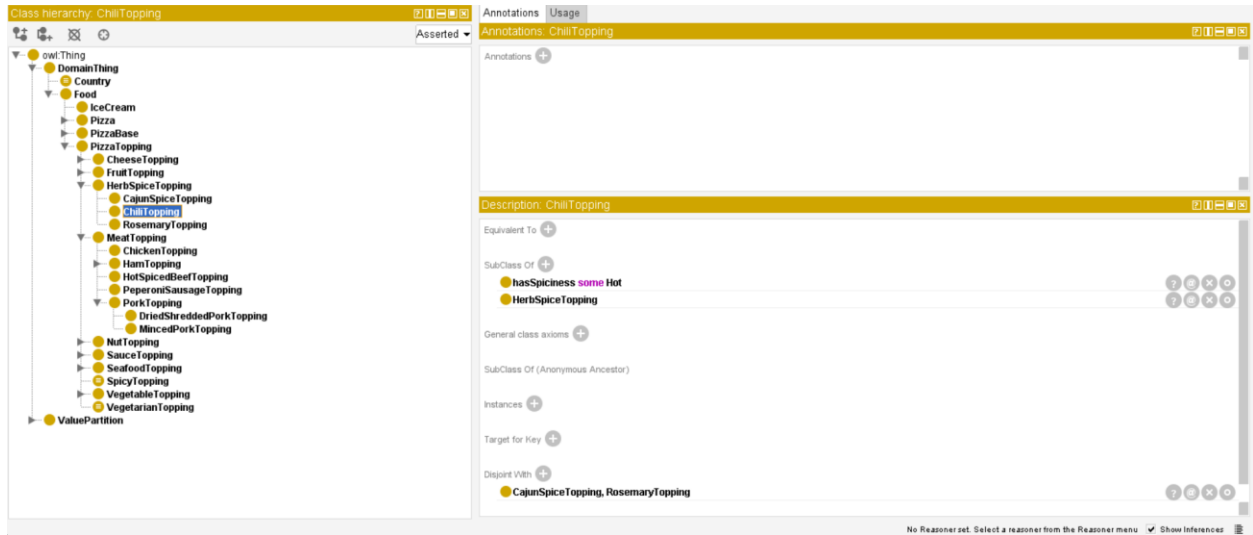


Figure 6: Chili

Figure 6 shows that chili is a subclass of HerbSpiceTopping, and chili has spiciness flavor which is hot.

## FishSauceTopping

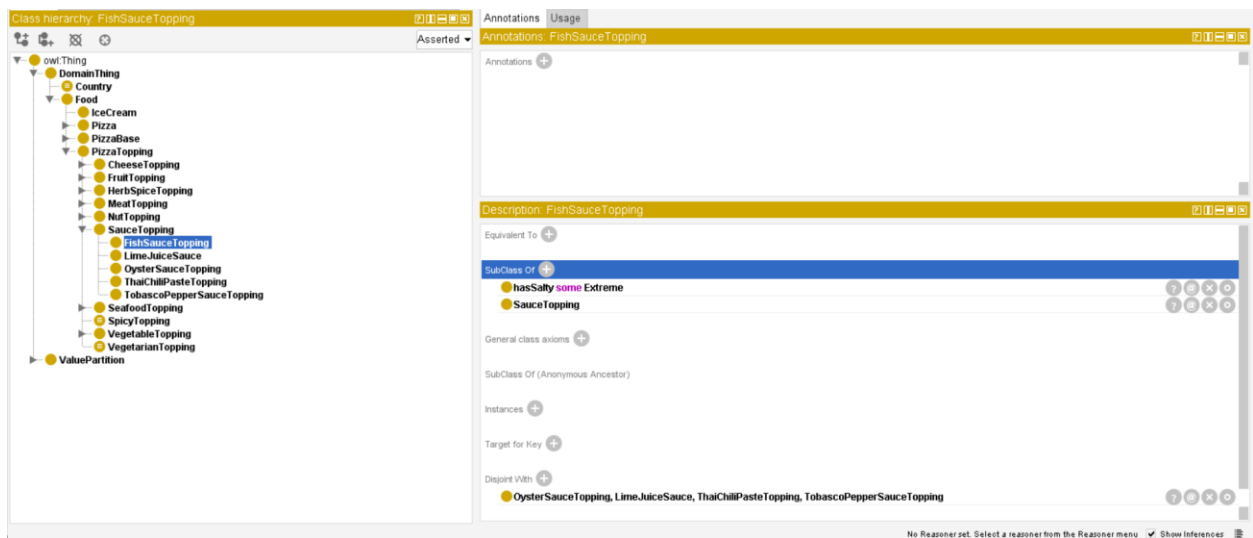


Figure 7: Fish Sauce

Figure 7 shows that fish sauce is a subclass of SauceTopping, and fish sauce has salty flavor which is extreme.

## LimeJuiceSauce

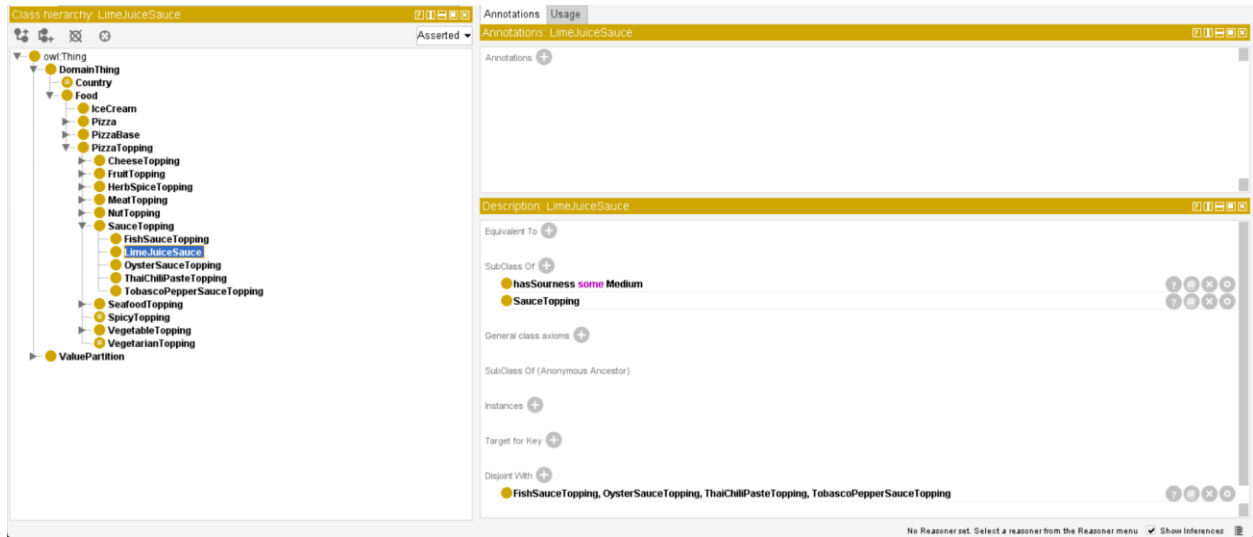


Figure 8: Lime Juice Sauce

Figure 8 shows that lime juice sauce is a subclass of SauceTopping, and lime juice sauce has sourness flavor which is medium.

## OysterSauceTopping

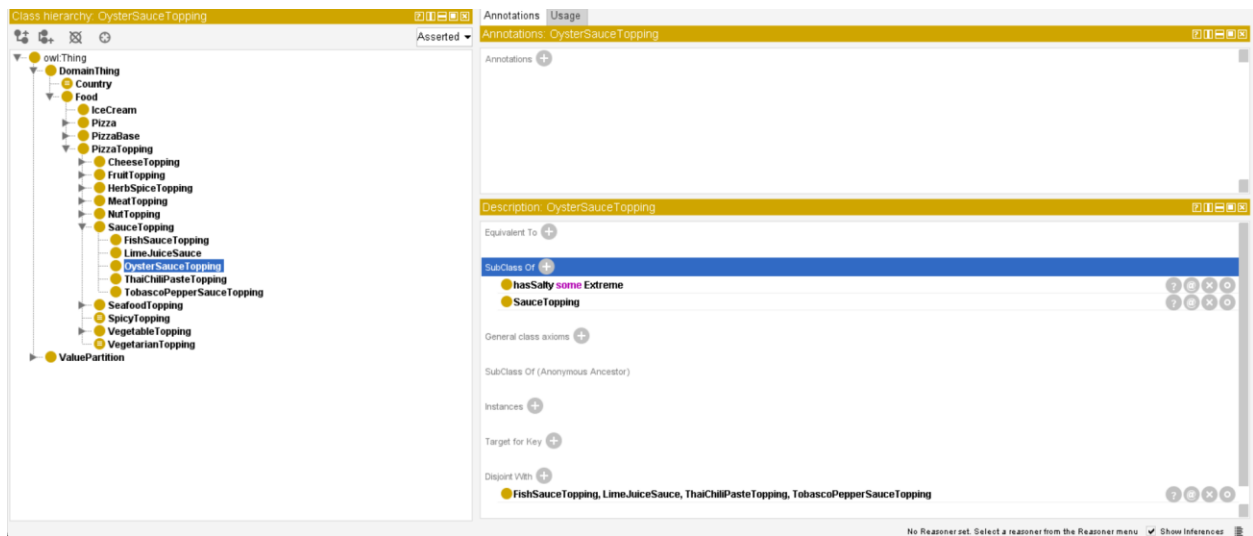


Figure 9: Oyster Sauce

Figure 9 shows that oyster sauce is a subclass of SauceTopping, and oyster sauce has salty flavor which is extreme.



## HolyBasilTopping

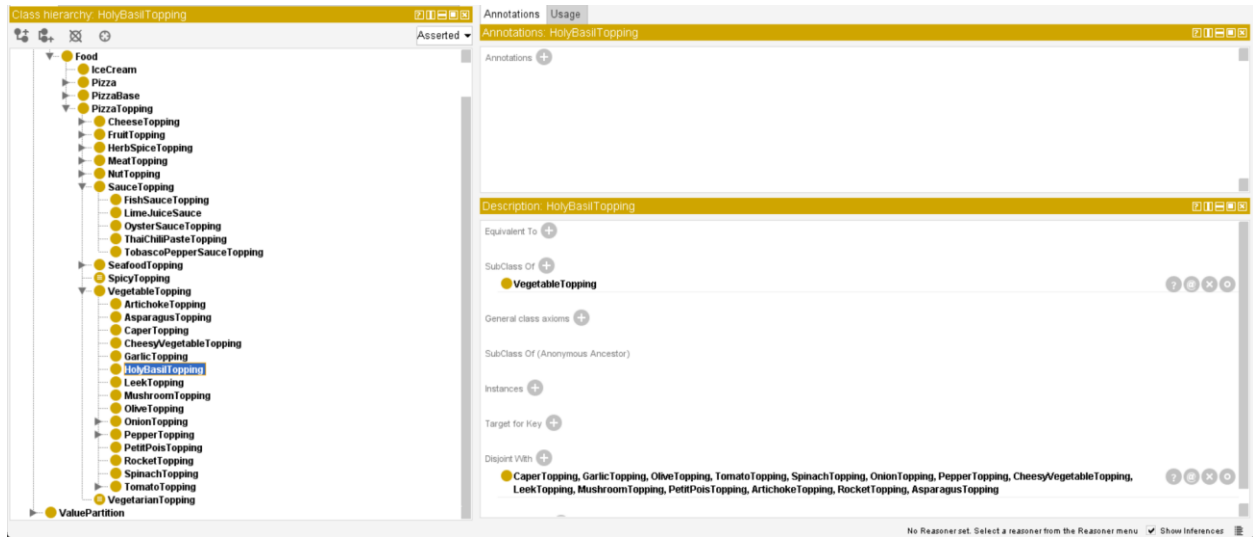


Figure 10: Holy Basil

Figure 10 shows that holy basil is a subclass of VegetableTopping, and holy basil has no flavor.

## ThaiChiliPasteTopping

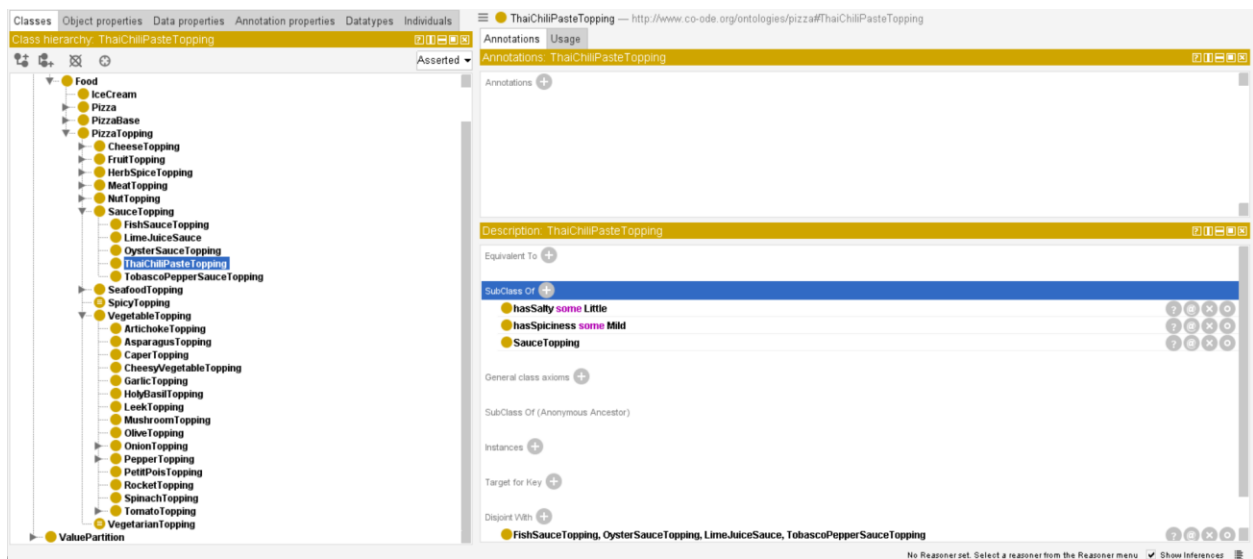


Figure 11: Thai Chili Paste

Figure 11 shows that Thai chili paste is a subclass of SauceTopping and Thai chili paste has two flavors including salty and spiciness. Thai chili paste has little salty and mild spiciness.

## DriedShreddedPorkTopping

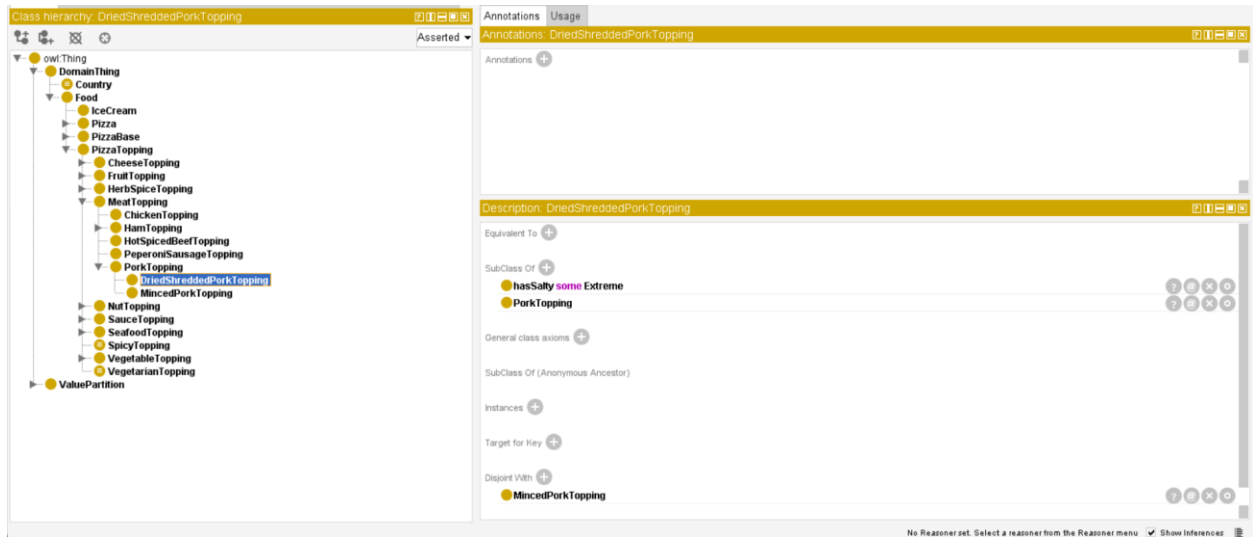


Figure 12: Dried Shredded Pork

Figure 12 shows that dried shredded pork is a subclass of **PorkTopping**, and dried shredded pork has salty flavor which is extreme.

## **Shop**

### KKPizza

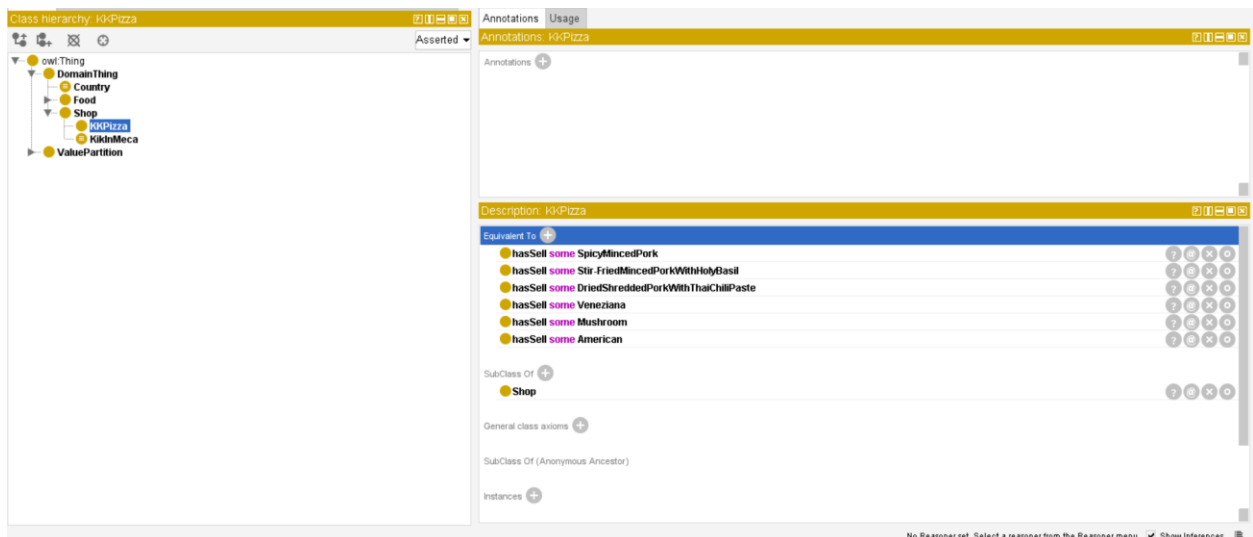


Figure 13: KKPizza Shop

Figure 13 shows that KKPizza shop is a subclass of shop and KKPizza sells 6 pizzas including spicy minced pork, stir-fired minced pork with holy basil, dried shredded pork with Thai chili paste, Veneziana, Mushroom, and American. KKPizza is an imagination shop by Pitchaya.

### KikInMeca

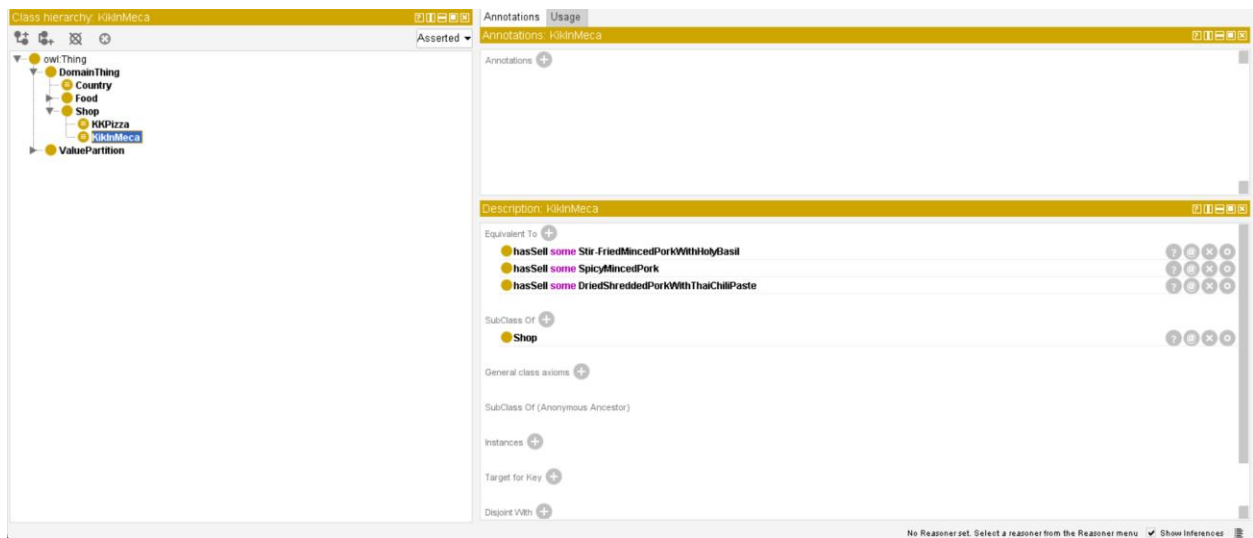


Figure 14: KikInMeca Shop

Figure 14 shows that KikInMeca shop is a subclass of shop and KikInMeca sells 3 pizzas including spicy minced pork, stir-fired minced pork with holy basil, and dried shredded pork with Thai chili paste.

## Additional Property

### Sourness

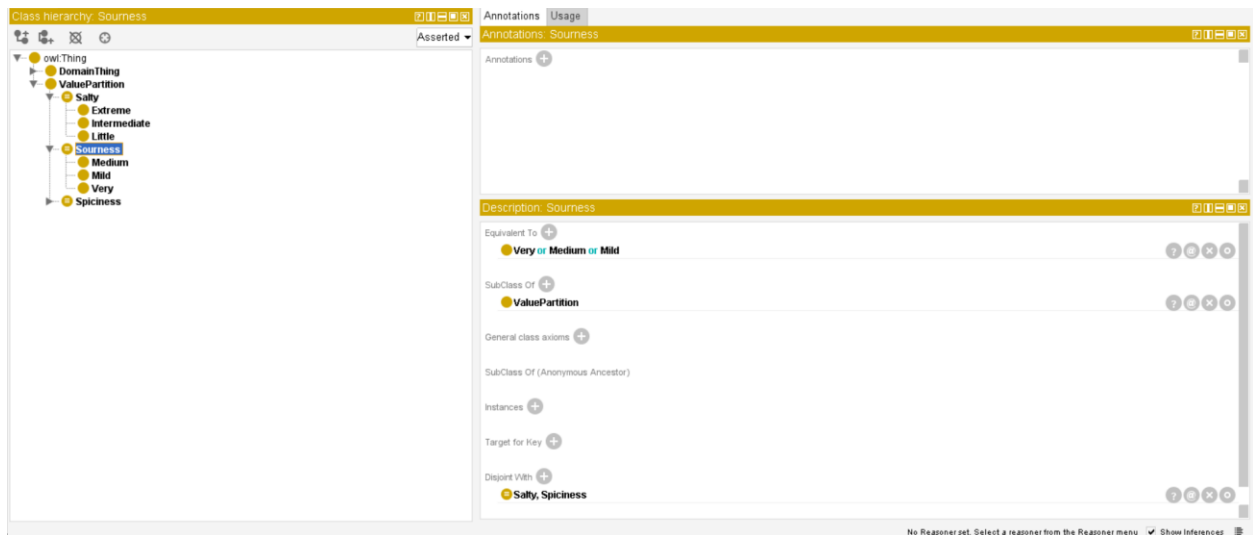


Figure 15: Sourness Flavor

Figure 15 shows that sourness has 3 levels including very, medium, mild. Due to some lime juice sauce having sour flavor, I added sour flavor to pizza ontology.

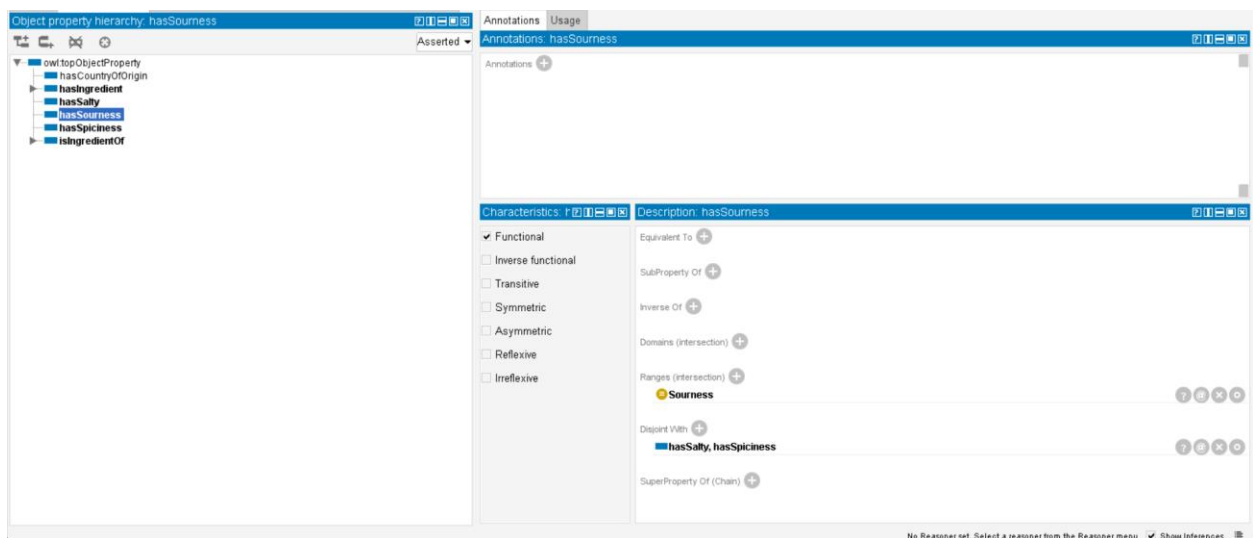


Figure 16: hasSourness Property

Figure 16 shows that has Sourness added to object property which is an intersection with sourness.

## Salty

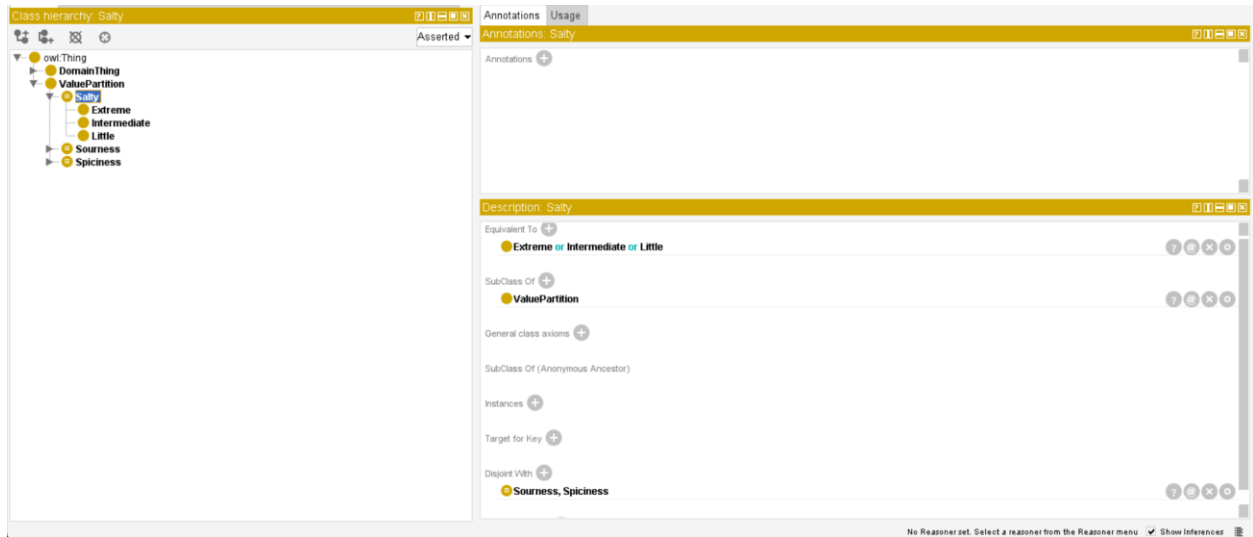


Figure 17: Salty Flavor

Figure 17 shows that salty has 3 levels including extreme, intermediate, and little. Due to some sauces and meat having salty flavor, I added salty flavor to pizza ontology.

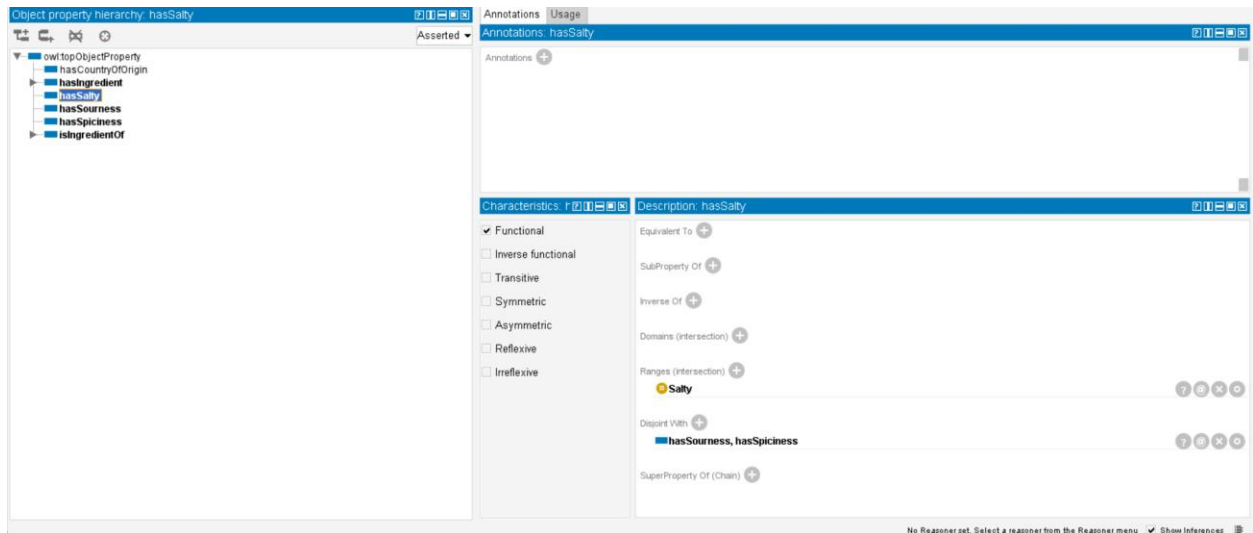


Figure 18: hasSalty

Figure 18 shows that hasSalty added to object property which is an intersection with sourness.

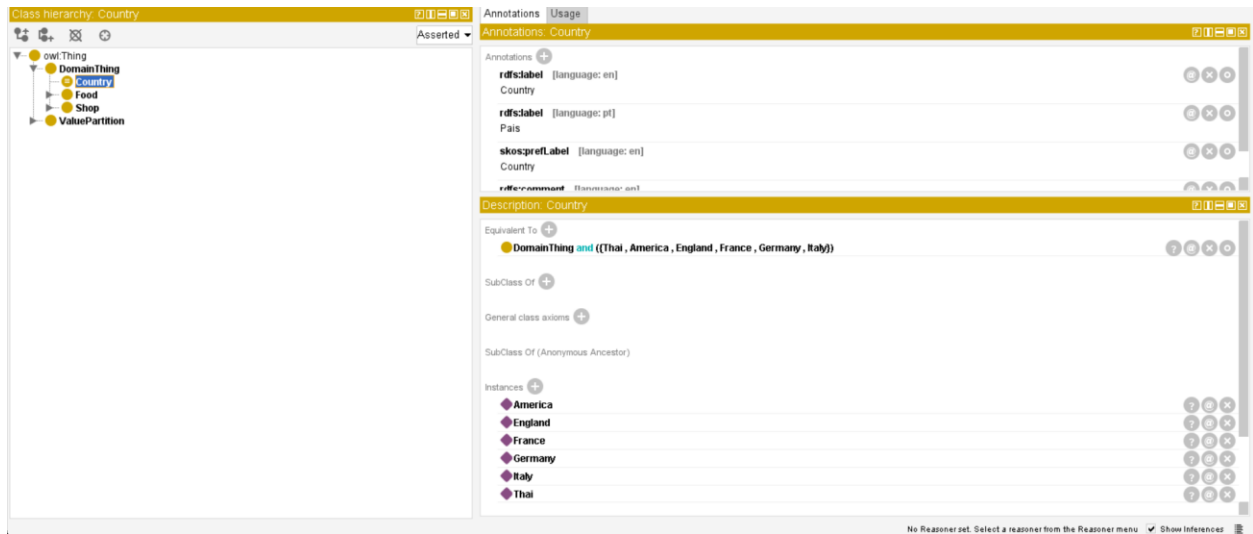


Figure 19: Add Thai into Country Class

Figure 19 shows that I added Thai into instances of Country Class.

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### **References**

- [1] “ก๊ออินฌก,” YouTube, <https://www.youtube.com/@user-fn7fc7zk3w/videos> (accessed Nov. 23, 2023).