Programming Assignment 3: Building an OWL Ontology

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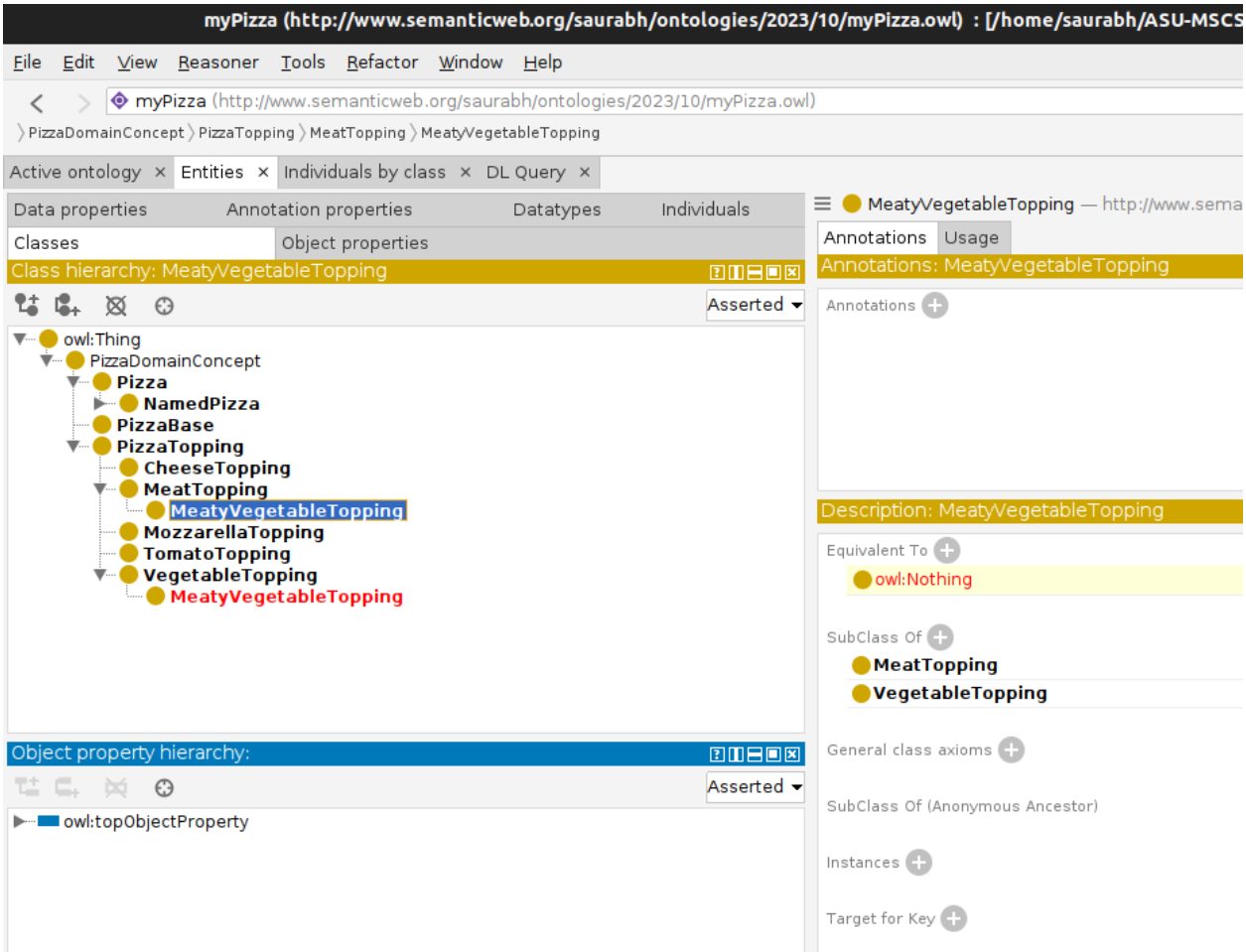
Question 1

Do any of your classes come out as inconsistent? (They will be shown in red in the Class hierarchy tab; you may need to expand to see the red.) Explain why and describe a way to resolve the inconsistency.

Answer:

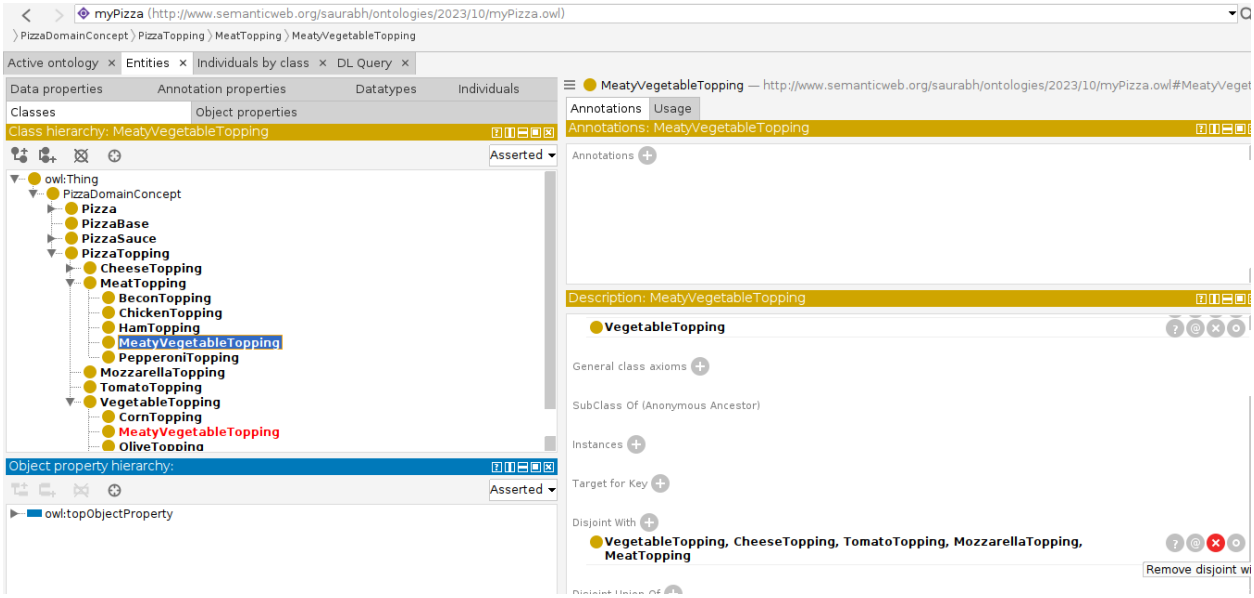
Yes, “MeatyVegetableTopping” class comes out as inconsistent. When we added the "MeatyVegetableTopping" and linked it to both the "MeatTopping" and "VegetableTopping" classes, we noticed a lack of consistency in the classes. This occurs because a single topping shouldn't be assigned to two distinct topping categories.



Explanation of inconsistency

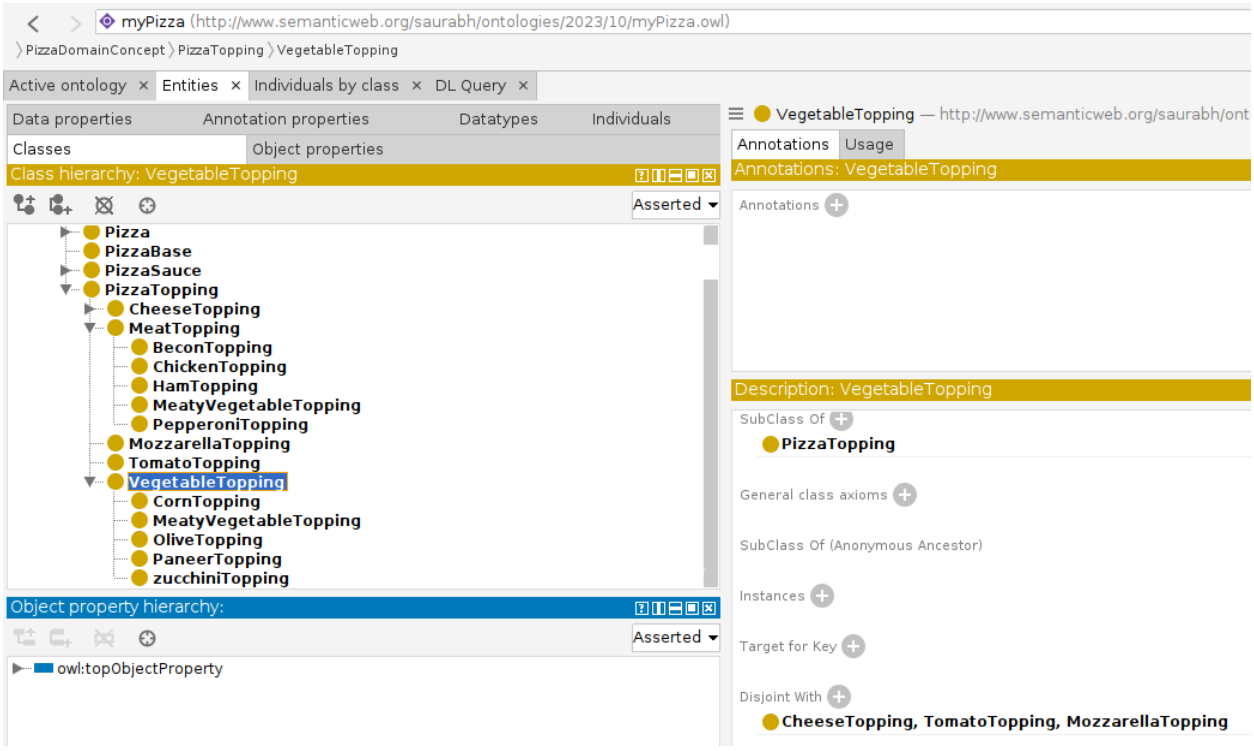
There are 2 possible points for it. (Refer below image)

1. "MeatyVegetableTopping" has two parent classes, named "MeatTopping" and "VegetableTopping." If you examine the "Disjoint With +" property (in "Description View") of both classes, you would notice the occurrence of another parent. In the "Disjoint With +" property of "MeatTopping," you would see "VegetableTopping," and vice versa. This causes inconsistency.
2. The issue can still persist if you examine all subclasses of "PizzaTopping" in the "Disjoint With +" of "MeatyVegetableTopping." The possible cause of this issue is when you perform the following steps in the specified order:
   a. Create "MeatTopping" and "VegetableTopping" classes first.
   b. Add the "disjoint with +" property for all subclasses of "PizzaTopping" for both of them.
   c. Create "MeatyVegetableTopping" as a subclass of "MeatTopping" or "VegetableTopping." "MeatyVegetableTopping" will copy all properties of the superclass.



Way to resolve the inconsistency

1. Remove “VegetableTopping” from “Disjoint With +” of the “MeatTopping” class or vice versa. Remove dependency from each other.
2. Remove all classes (which shows inconsistency with meat or veg class) from “Disjoint With +” of the “MeatVegetableTopping” class.



Question 6

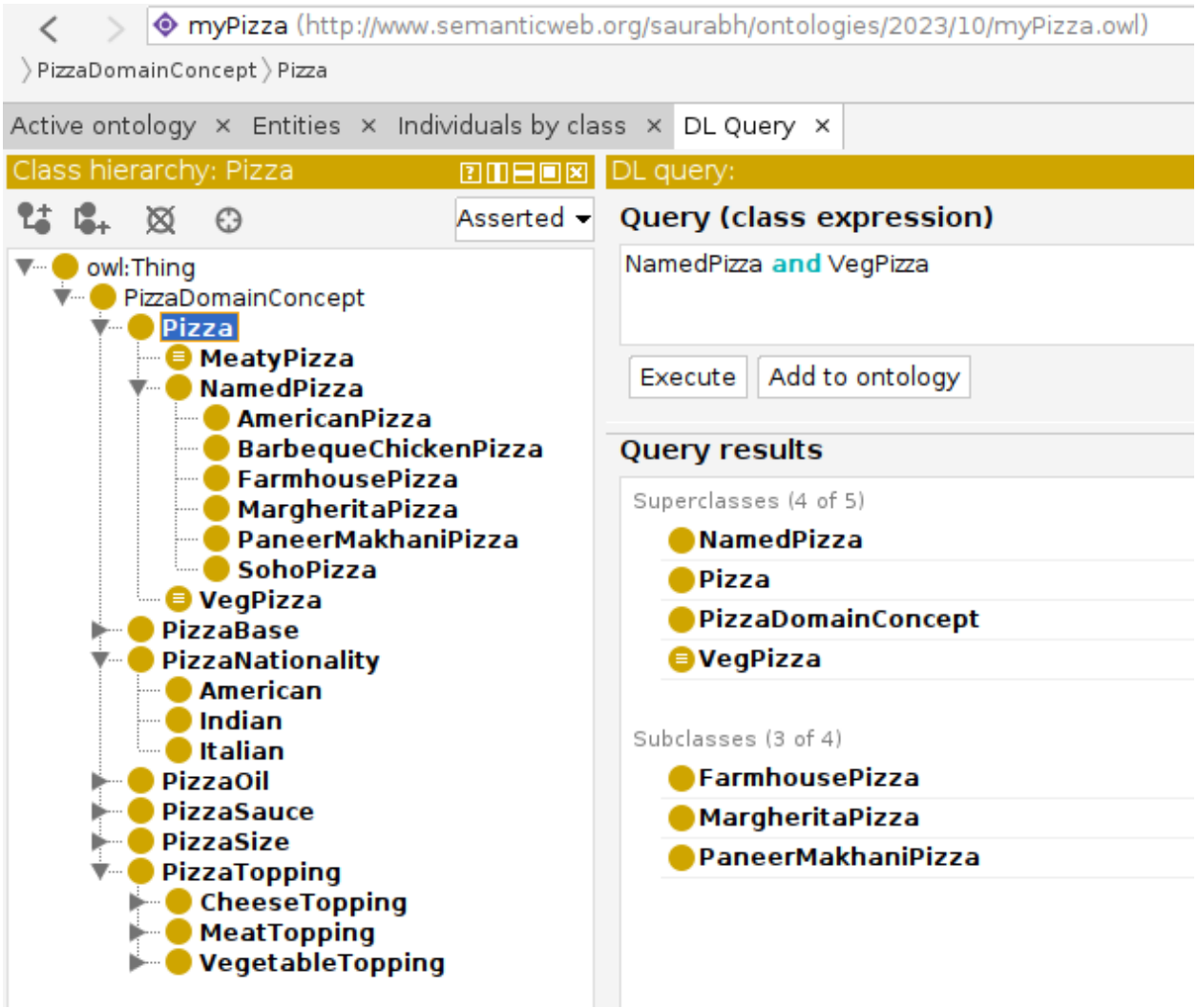
Q6. First query of your own choice.

>>> “NamedPizza and VegPizza”

Q6-1. Explanation of the First query.

This query finds all the pizza defined by me(in NamedPizza class) having vegetable options only. This query is equivalent of which equivalent to “NamedPizza and Pizza and (hasTopping some VegetableTopping)”

Q6-2. Screenshot of the First query.



Question 7

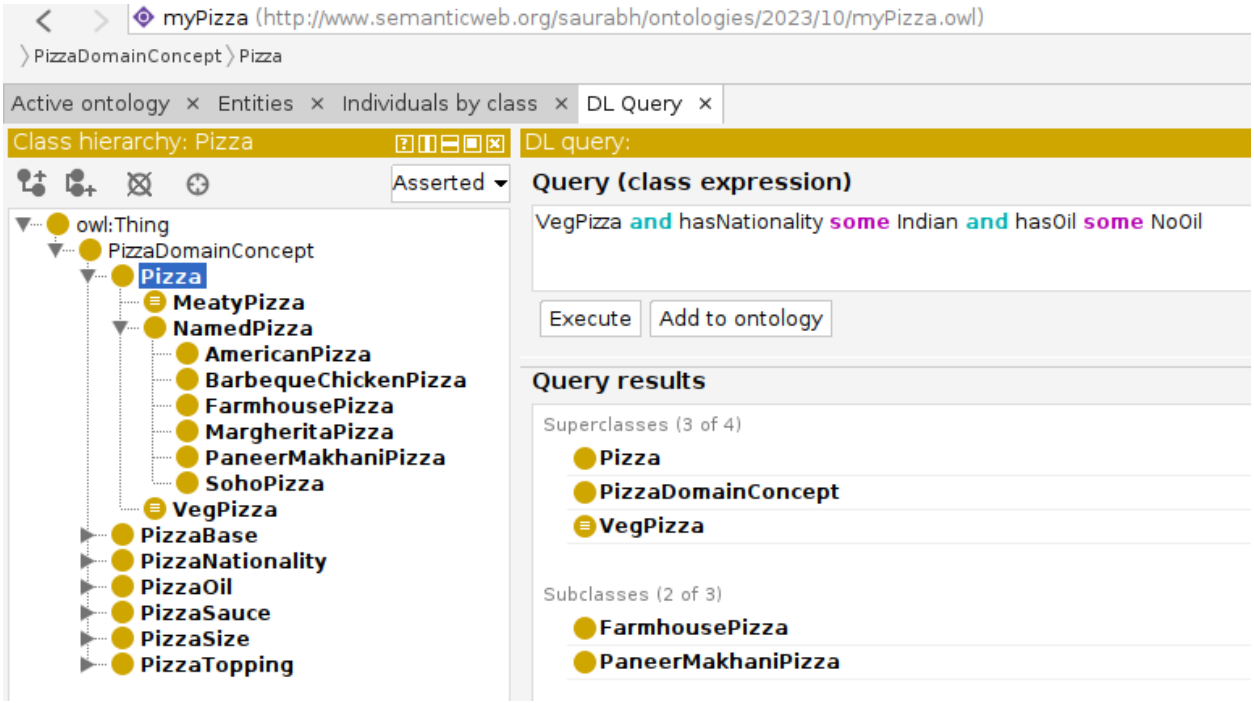
Q7. Second query of your own choice.

>>> “VegPizza and hasNationality some Indian and hasOil some NoOil”

Q7-1. Explanation of the Second query.

This query is for vegetarian Indians who do not like oil in their food. This returns Vegetable Pizza having Indian nationality with No Oil in pizza.

Q7-2. Screenshot of the Second query.



Q2-Add two more pizzas.

1. Paneer Makhani Pizza
2. Barbeque Chicken Pizza

Q3-Add two more PizzaBase.

1. Neapolitan Dough Base
2. Multigrain Dough Base

Q4-Add two more PizzaTopping.

1. Chicken Topping
2. Olive Topping

Q5-Add at least four more properties.

1. Pizza Sauce
2. Pizza Size
3. Pizza Nationality
4. Pizza Oil