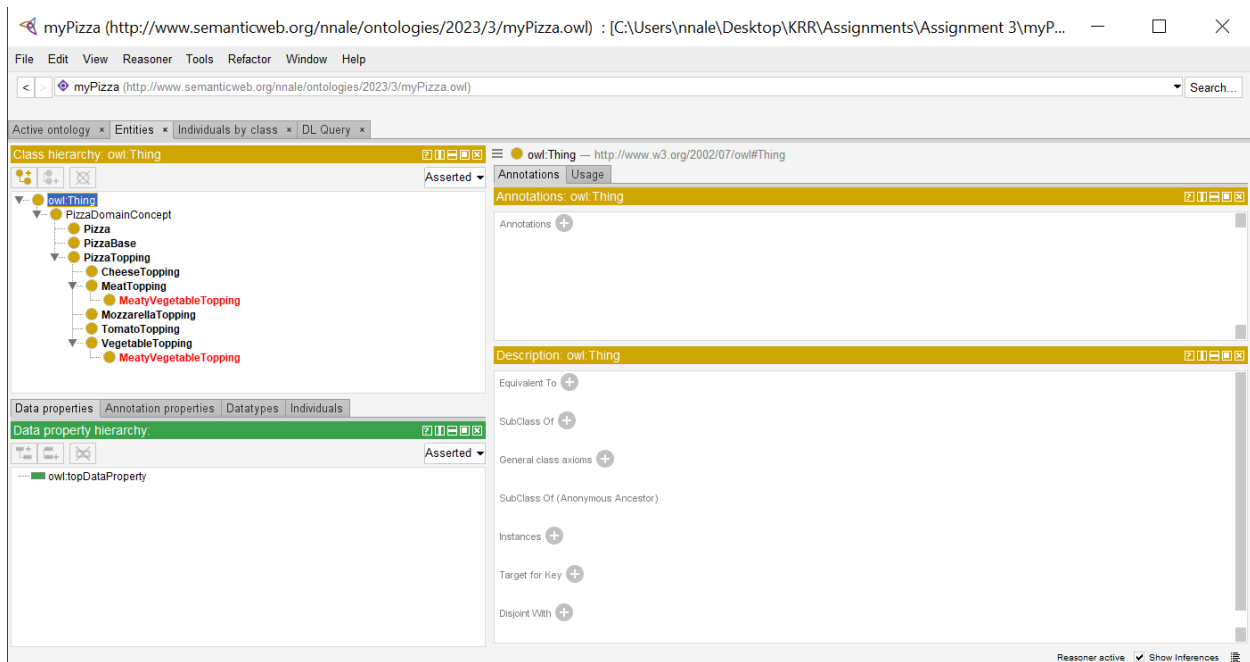


# Programming Assignment 3: Building an OWL Ontology

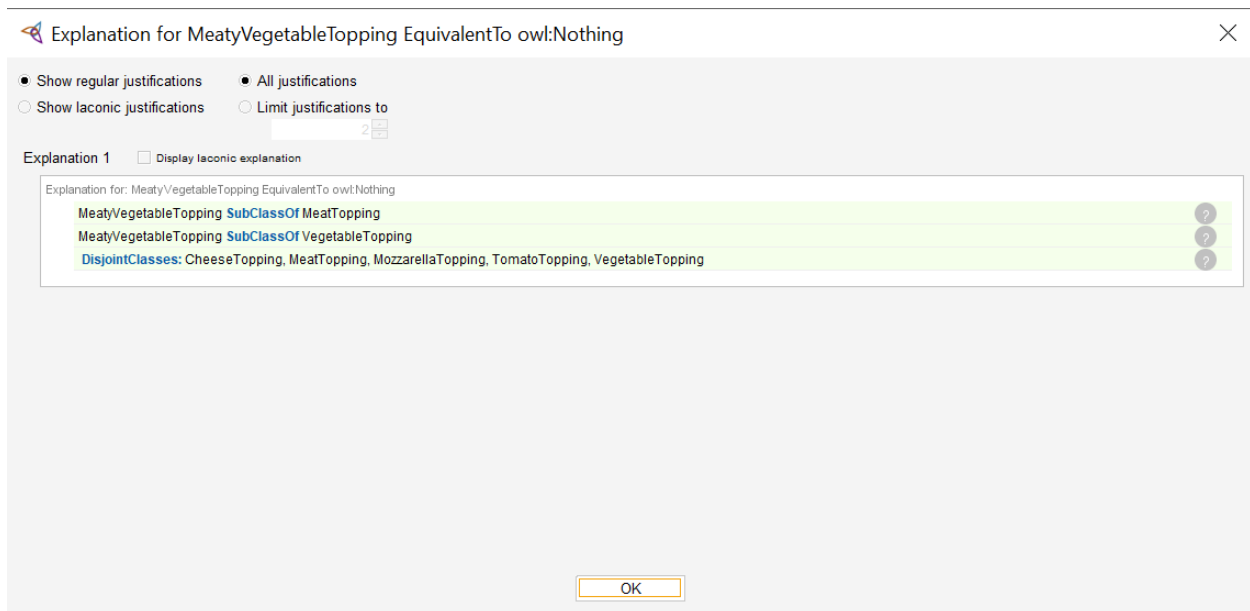
Ninad Nale

## Q1. Do any of your classes come out as inconsistent?

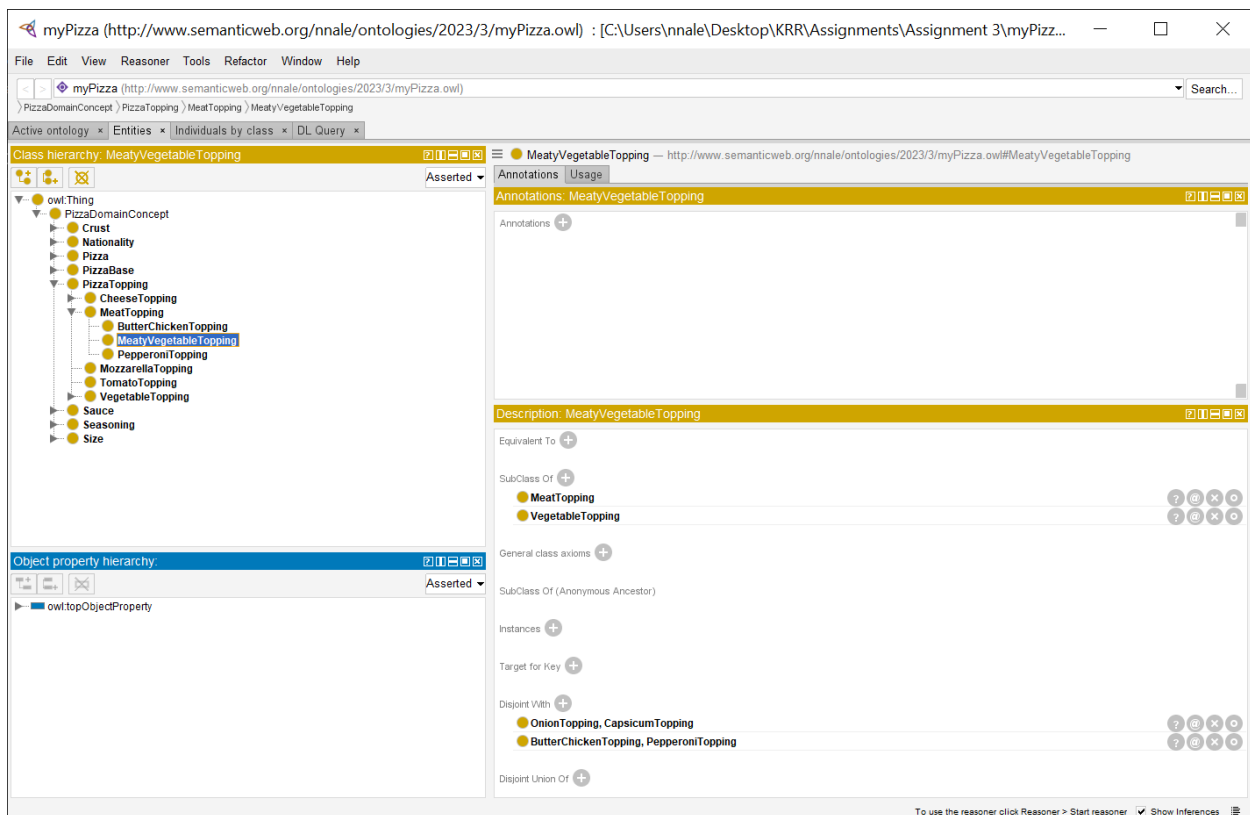
**Ans:** Yes, 2 of the classes came out as inconsistent when we added disjoints. When we introduced the topping MeatyVegetableTopping and assigned it to both MeatTopping and VegetableTopping categories, we observed inconsistency in the classes. This is because the same topping cannot be assigned to two different topping categories.



**Explanation of inconsistency:** The introduction of MeatyVegetableTopping as a subclass of both MeatTopping and VegetableTopping resulted in an inconsistency when we attempted to make the latter two classes disjoint from each other. This is because, by making MeatyVegetableTopping disjoint from both MeatTopping and VegetableTopping it would also be disjoint from itself, which is not logically possible and leads to inconsistency.



**Resolution:** To resolve the inconsistency caused by the introduction of MeatyVegetableTopping we can modify the class hierarchy by making MeatTopping and VegetableTopping not disjoint with each other but only disjoint with other types of toppings.



**Q6. First query of your own choice.**

**Ans:** NamedPizza and hasNationality some Indian and hasTopping some TomatoTopping

**Q6-1. Explanation of the First query.**

**Ans:** This query finds all the NamedPizza types which have Indian Nationality, and only those which have TomatoTopping.

**Q6-2. Screenshot of the First query.**

**Ans:**

The screenshot displays the myPizza ontology editor interface. On the left, a class hierarchy tree shows the structure of the ontology, with 'NamedPizza' selected. The main panel shows a DL query: 'NamedPizza and hasNationality some Indian and hasTopping some TomatoTopping'. The query results are displayed in a table, showing the following classes:

Category	Classes
Equivalent classes (0 of 0)	
Superclasses (3 of 4)	NamedPizza, Pizza, PizzaDomainConcept
Direct superclasses (1 of 1)	NamedPizza
Direct subclasses (2 of 2)	IndianClassicPizza, VegFarmhousePizza
Subclasses (2 of 3)	IndianClassicPizza, VegFarmhousePizza
Instances (0 of 0)	

The right sidebar contains options for 'Query for' (Direct superclasses, Superclasses, Equivalent classes, Direct subclasses, Subclasses, Instances) and 'Result filters' (Name contains, Display owl:Thing, Display owl:Nothing).

## Q7. Second query of your own choice.

Ans: NamedPizza and hasCrust some GarlicHerbCrust and hasTopping some MozzarellaTopping

### Q7-1. Explanation of the Second query.

Ans: This query finds all the NamedPizza types which have GarlicHerbCrust as crust, and only those which have MozzarellaTopping.

### Q7-2. Screenshot of the Second query.

Ans:

The screenshot displays the myPizza ontology editor interface. The top menu bar includes File, Edit, View, Reasoner, Tools, Refactor, Window, and Help. The address bar shows the URL: <http://www.semanticweb.org/nnale/ontologies/2023/3/myPizza.owl>. The main window is divided into several panes:

- Class hierarchy:** A tree view on the left showing the ontology structure. The 'Pizza' class is expanded, showing subclasses like 'NamedPizza', 'IndianClassicPizza', 'ItalianFeastPizza', 'MargheritaPizza', 'SohoPizza', and 'VegFarmhousePizza'. The 'PizzaBase' class is also expanded, showing subclasses like 'NaanBase', 'ParathaBase', 'PizzaTopping', 'CheeseTopping', 'MeatTopping', 'MozzarellaTopping', 'TomatoTopping', 'VegetableTopping', 'Sauce', 'Seasoning', and 'Size'.
- DL Query:** A central pane showing the query: `NamedPizza and hasCrust some GarlicHerbCrust and hasTopping some MozzarellaTopping`. Below the query are buttons for 'Execute' and 'Add to ontology'.
- Query results:** A pane on the right showing the results of the query. It lists equivalent classes (0 of 0), superclasses (3 of 4), direct superclasses (1 of 1), direct subclasses (3 of 3), subclasses (3 of 4), and instances (0 of 0). The results are as follows:

Category	Count	Items
Equivalent classes	0 of 0	
Superclasses	3 of 4	NamedPizza, Pizza, PizzaDomainConcept
Direct superclasses	1 of 1	NamedPizza
Direct subclasses	3 of 3	IndianClassicPizza, ItalianFeastPizza, MargheritaPizza
Subclasses	3 of 4	IndianClassicPizza, ItalianFeastPizza, MargheritaPizza
Instances	0 of 0	

On the far right, there are sections for 'Query for' (with checkboxes for Direct superclasses, Superclasses, Equivalent classes, Direct subclasses, Subclasses, and Instances) and 'Result filters' (with a 'Name contains' text box and checkboxes for 'Display owl:Thing' and 'Display owl:Nothing').