Project 1

Q1. Do any of your classes come out as inconsistent? (They will be show in red in the Class hierarchy (inferred) tab.) Explain why.

Ans: None of the classes become inconsistent while added as disjoint because they are all actually disjoint. In other words, none of the classes (Pizza, PizzaBase, PizzaTopping) have a subclass occurring in more than one of them.

Q2. Do any of your classes come out as inconsistent (equivalent to nothing)? Explain why and describe a way to resolve the inconsistency.

Ans: Yes. The following classes become inconsistent:

 MeatyVegetableTopping (subclass of MeatTopping and VegetableTopping) and CheesyVegetableTopping (subclass of CheeseTopping and VegetableTopping).

 This is because of the fact that the classes MeatTopping and VegetableTopping have a common subclass -> MeatyVegetableTopping. Similarly CheeseTopping and VegetableTopping have a common subclass -> CheesyVegetableTopping. So they are not disjoint.

As we do "Disjoint with" by holding Ctrl+all the class names, each class is marked disjoint with every other class. So we remove this and redo "Disjoint with" step by selecting classes one by one. While doing this, CheeseTopping-VegetableTopping are not marked as disjoint to resolve the inconsistency. Also the subclass MeatyVegetableTopping is deleted as it doesn't make any sense and no such topping can exist practically. Thus the other inconsistency is also resolved.

After executing the steps…

1)

1)   Add two more Pizzas
        FarmHousePizza, SpicyChickenPizza and PaneerMakhaniPizza.
2)   Add two more PizzaBases
        ThinCrustBase and StuffedCrustBase.
3)   Add two more PizzaToppings
        PaneerTopping, ChickenTopping, MuttonTopping, MushroomToppoing, OnionTopping, CapsicumTopping.
4)   Add atleast 4 more properties
        hasPlaceOfOrigin, hasDiscount, doesNotContain, hasSpiciness

Explanation:

FarmHousePizza has only Capsicum, Mushroom, Olive and Onion as ingredients and it comes in both thin and stuffed crusts.

SpicyChickenPizza has Chicken, Onion and Capsicum as ingredients and it comes in stuffed crust only.
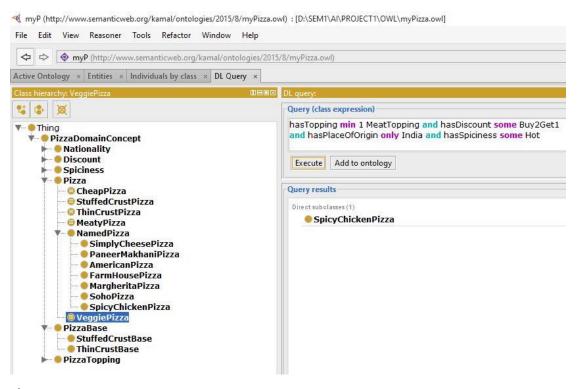
PaneerMakhaniPizza has only Paneer, Onion and Capsicum as ingredients and comes in stuffed crust only.

2) Add Nationality as a concept to the ontology and introduce necessary relations.
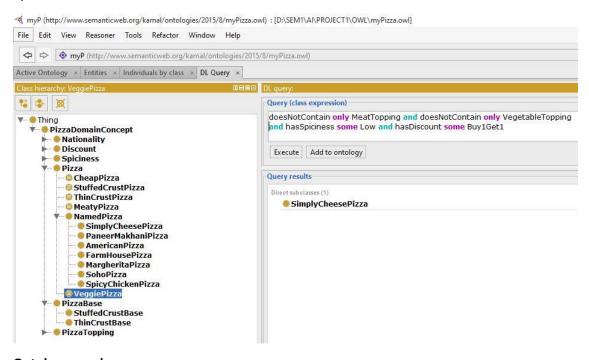
A new class 'Nationality' was added as a subclass of Thing and sibling of PizzaDomainConcept. A new property 'hasPlaceOfOrigin' was introduced. Each of the pizzas mapped to their country of origin using Universal (only) quantifier (ex: a Margherita pizza only has Italy as country of origin).
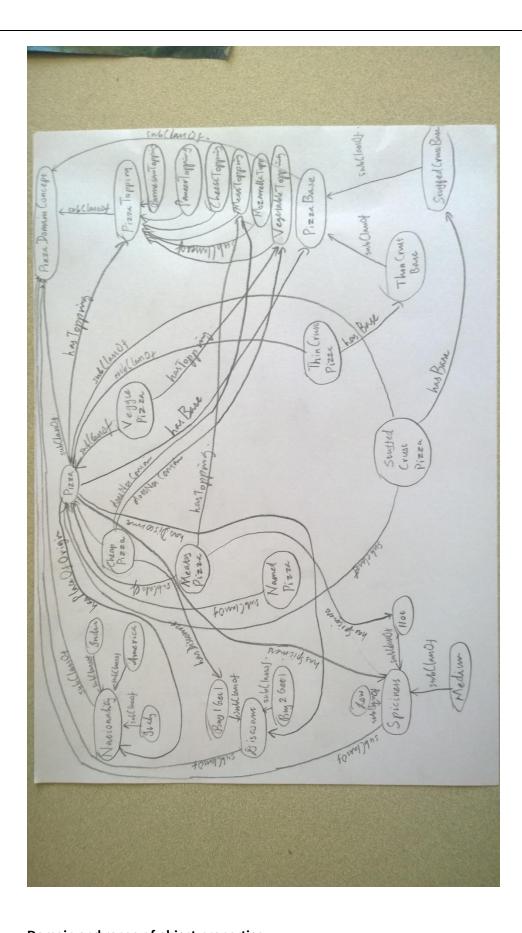
3) DL queries:

1)

2)

Ontology graph:

Domain and range of object properties:

Object Property

Domain

Range.

Pizza → has Topping → PizzaTopping

Simply Cheese Pizza → has Base → Pizza Base

→ does Not Contain → Meat Topping / Vegetable Topping

Pizza → has Discount → Discount

→ has PlaceOfOrigin → Nationality