

DL Project Report

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(a) Redundant statements found:

- *VegitarianPizza*, *VegitarianPizzaEquivalent1* and *VegitarianPizzaEquivalent2*
All define the same pizzas in different ways
- *SpicyPizzaEquivalent* and *SpicyPizza*
All define the same pizzas in different ways
- *Caprina* has *SundriedTomatoTopping* which is a *TomatoTopping* and *TomatoTopping* as well.
Fix: Remove *TomatoTopping* requirement.
- *Giardiniera* has *SlicedTomatoTopping* which is a *TomatoTopping* and *TomatoTopping* as well.
Fix: Remove *TomatoTopping* requirement.
- *Pizza* has *Food* and *hasBase* as *PizzaBase* which is a subset of *Food*
Fix: Remove *Food* from definition of *Pizza*
- *CheesyPizza*, *InterestingPizza*, *SpicyPizza* and *MeatyPizza* have *Pizza* in their definition but as *hasTopping* has domain of *Pizza*, hence *Pizza* is redundant.
Fix: Remove *Pizza* from the definitions.
- *Hot*, *Medium* and *Mild* have *SubClassOf(AnonymousAncestor)* as "*Hot or Medium or Mild*" and also they have *Spiciness* as subclass of where both means the same.
Fix: Remove "*Hot or Medium or Mild*" from *SubClassOf(AnonymousAncestor)*

(b) Inconsistent Pizza \Rightarrow Consistent Pizza

Following are the reasons for the inconsistency and fixes we implemented to make the ontology consistent:

- Inconsistency: *IceCream* had the property *hasTopping* which had domain *Pizza*, which is disjoin with *IceCream*.
Fix: Removed *hasTopping*

- Inconsistency: *CheesyVegetableTopping* has top disjoint parents.
Fix: Deleted as the class is inconsistent and cannot exist.

After the above fixes the pizza ontology becomes consistent.

(c) Extending the ontology with redundant statements

Below are some obvious redundant statement added to the definition of classes and verified by generating the inferred subsumptions

- Add *Food* to the definition of *CheesyPizza*, *InterestingPizza* and *MeatyPizza* which doesn't change anything because it is the super-class/parent of *Pizza* which is already in the definition.
- Add *not VegetarianPizza* to the definition of *MeatyPizza*. This is redundant because *VegetarianPizza* has *not (hasTopping some MeatTopping)* in its definition and *MeatyPizza* has *(hasTopping some MeatTopping)* in its definition.
- Add *hasTopping some PepperTopping* to subclass of *AmericanHot*. It is redundant as *PepperTopping* is already implied by *AmericanHot* being a subclass of "*hasTopping some HotGreenPepperTopping and hasTopping some JalapenoPepperTopping*" which are all subclasses/children of *PepperTopping*
- Add *VegetarianTopping* to the definition of *MushroomTopping* and *OliveTopping*. This is redundant because *MushroomTopping* and *OliveTopping* are subclass of *VegetableTopping* which is in turn *VegetarianTopping*