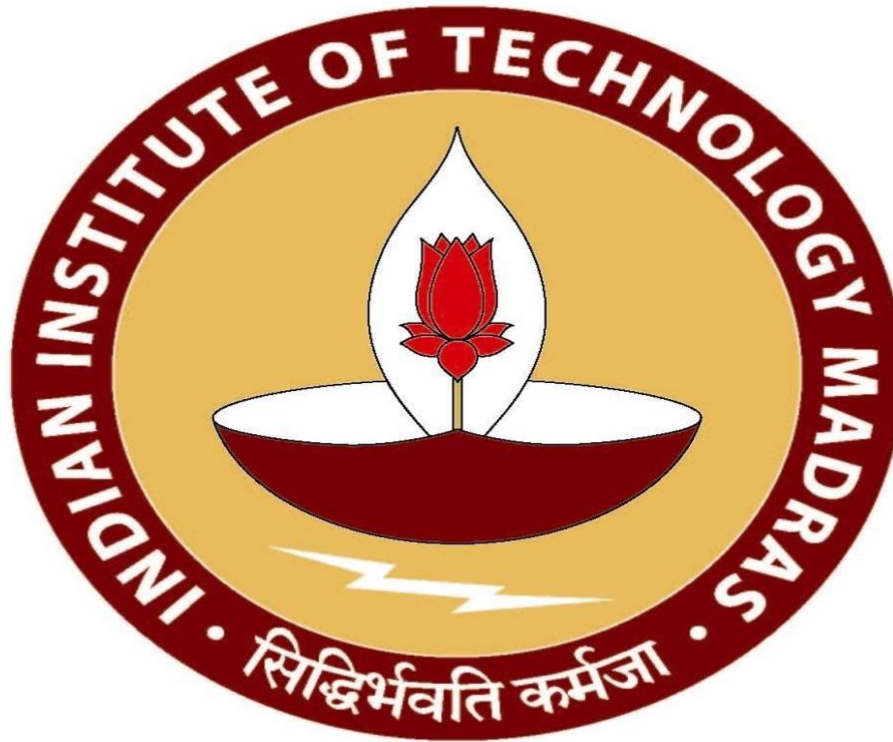


CS6852 : Assignment 3 - Ontology Development



Group – 05

Domain – Restaurant Management

Submitted To -

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Problem Statement - To produce an OWL Ontology using Protégé for the semantic model designed in Assignment 1 for our domain “Restaurant Management”.

Tools used for building OWL Ontology –

1. Protégé (5.5.0) -

- It is a free, open-source platform.
- It provides a suite of tools to construct domain models and knowledge-based applications with Ontologies.

Note - We have checked the consistency of our created OWL Ontology using Protégé using reasoner “HermiT 1.4.3.456”.

Slight modification/ addition to the earlier semantic model –

1. We have eliminated ComboPack as this is less significant to our semantic model.
2. Modification in Supervisor Definition –

$\text{Supervisor} \equiv \text{Staff} \sqcap \forall \text{managesActively}.\text{Staff}$

The above definition of Supervisor is not appropriate as \forall may also contain the staff who managesActively no one. Thus, \exists is more appropriate to use instead of \forall . Below is the corrected definition of Supervisor -

$\text{Supervisor} \equiv \text{Staff} \sqcap \exists \text{managesActively}.\text{Staff}$

3. Modification in Chef Definition –

$\text{Chef} \equiv \text{Staff} \sqcap \forall \text{cooks}.\text{Food} \sqcap \exists \text{plans}.\text{MenuCard} \sqcap \exists \text{uses}.\text{Kitchen}$

The above definition of Chef is incomplete as the Range of cooks role is only limited to Food excluding Beverage. Below is the corrected definition which includes Beverage also.

$\text{Chef} \equiv \text{Staff} \sqcap \forall \text{cooks} . (\text{Food} \sqcup \text{Beverage}) \sqcap \exists \text{plans}.\text{MenuCard} \sqcap \exists \text{uses}.\text{Kitchen}$

4. We have made Cashier, Chef, Manager, Supervisor, Valet, and Waiter disjoint from each other so as to ensure staff can only be one of them.

Problems Faced –

Initially, we used *Webprotege* for producing an OWL Ontology but we couldn't visualize the created OWL Ontology. Also, we were not able to check the consistency of the Ontology.

Solution –

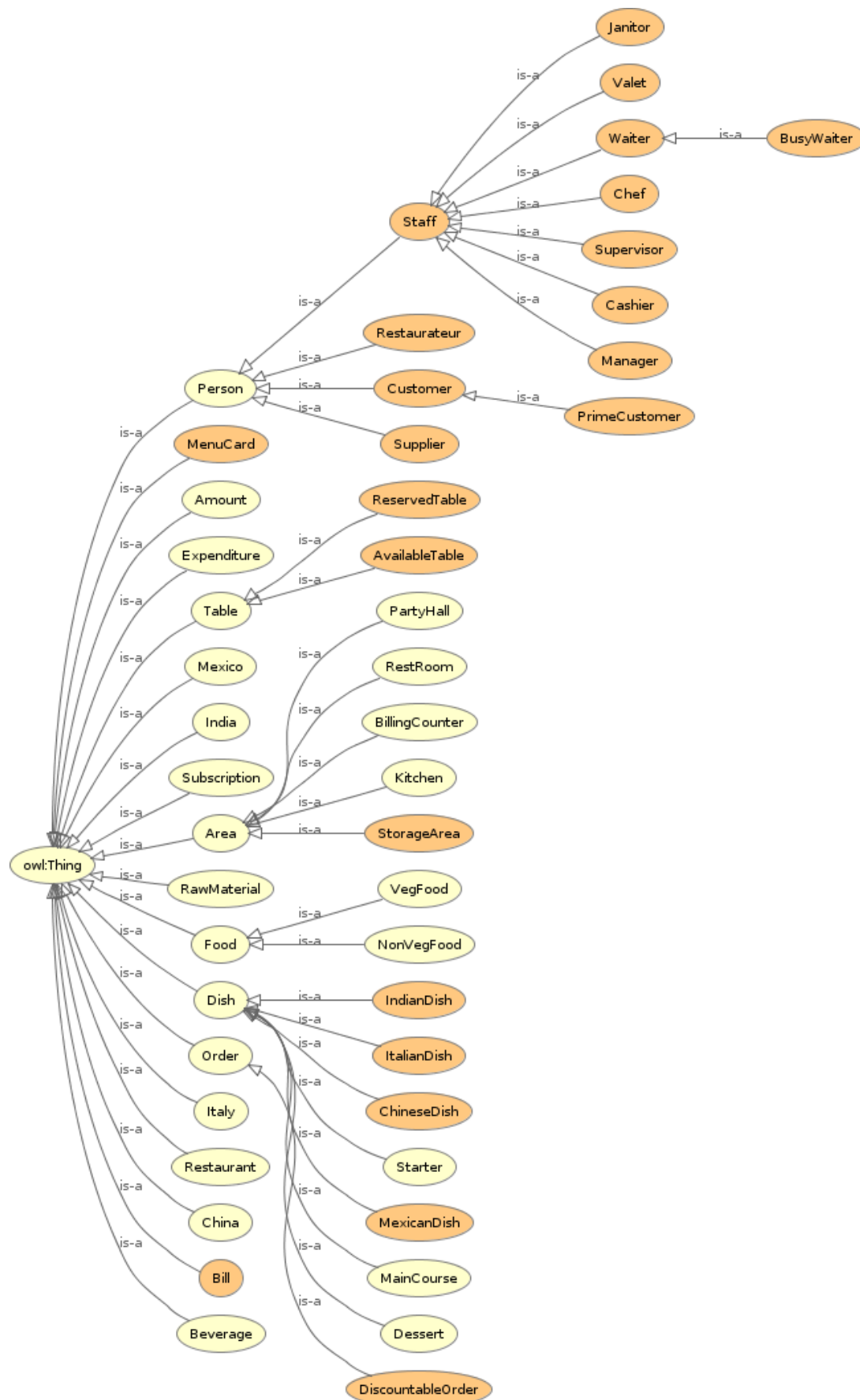
We downloaded the same version (5.5.0) of the Desktop Protégé editor. This solves our problems and we were able to create, visualize and check the consistency of the Ontology.

- With the help of the **OWL Viz** tool, we generated the visual representation of the class hierarchy.
- With the help of the **OntoGraf** tool, we generated the graphical representation of the ontology.
- With the help of a visualization tool **WebVOWL** we have created a visual representation of the complete Ontology. We were able to get the interactive visualization of the created ontology.

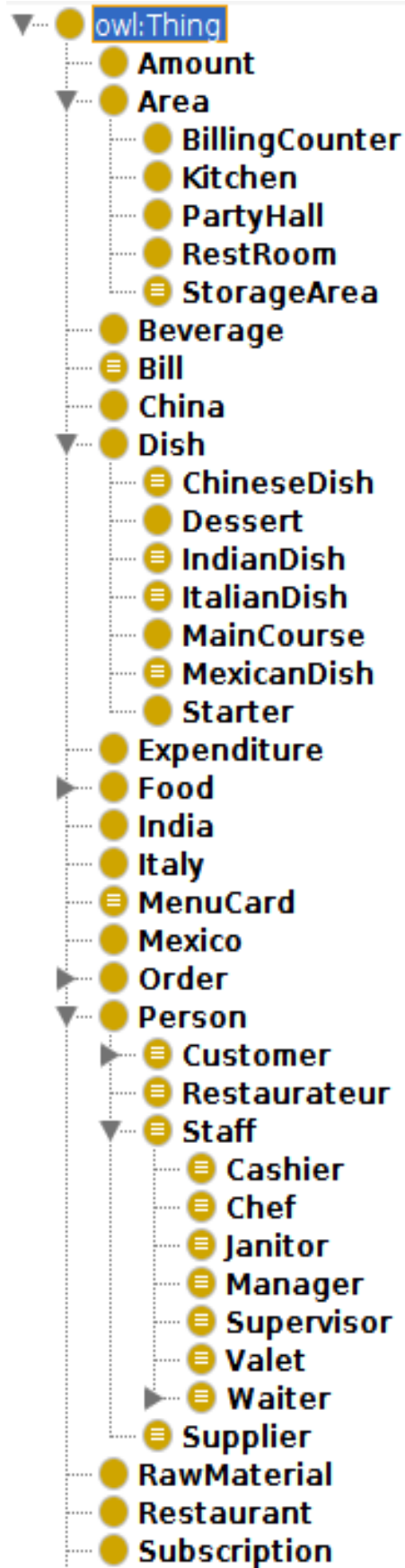
The final ontology is consistent and coherent.



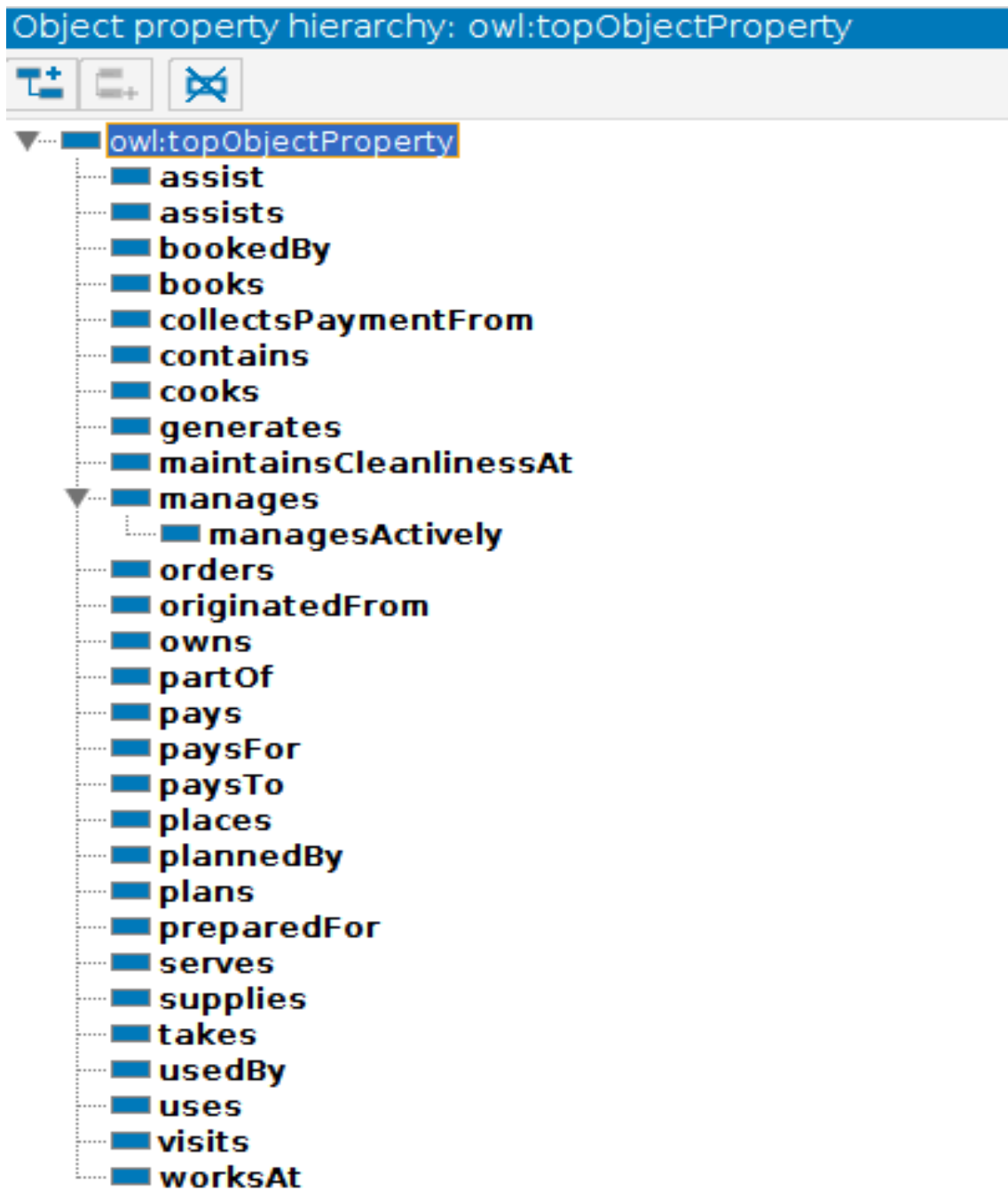
Class Hierarchy obtained from “*OWL Viz*” Tool –



Class Hierarchy



Object Property Hierarchy



Data Property Hierarchy

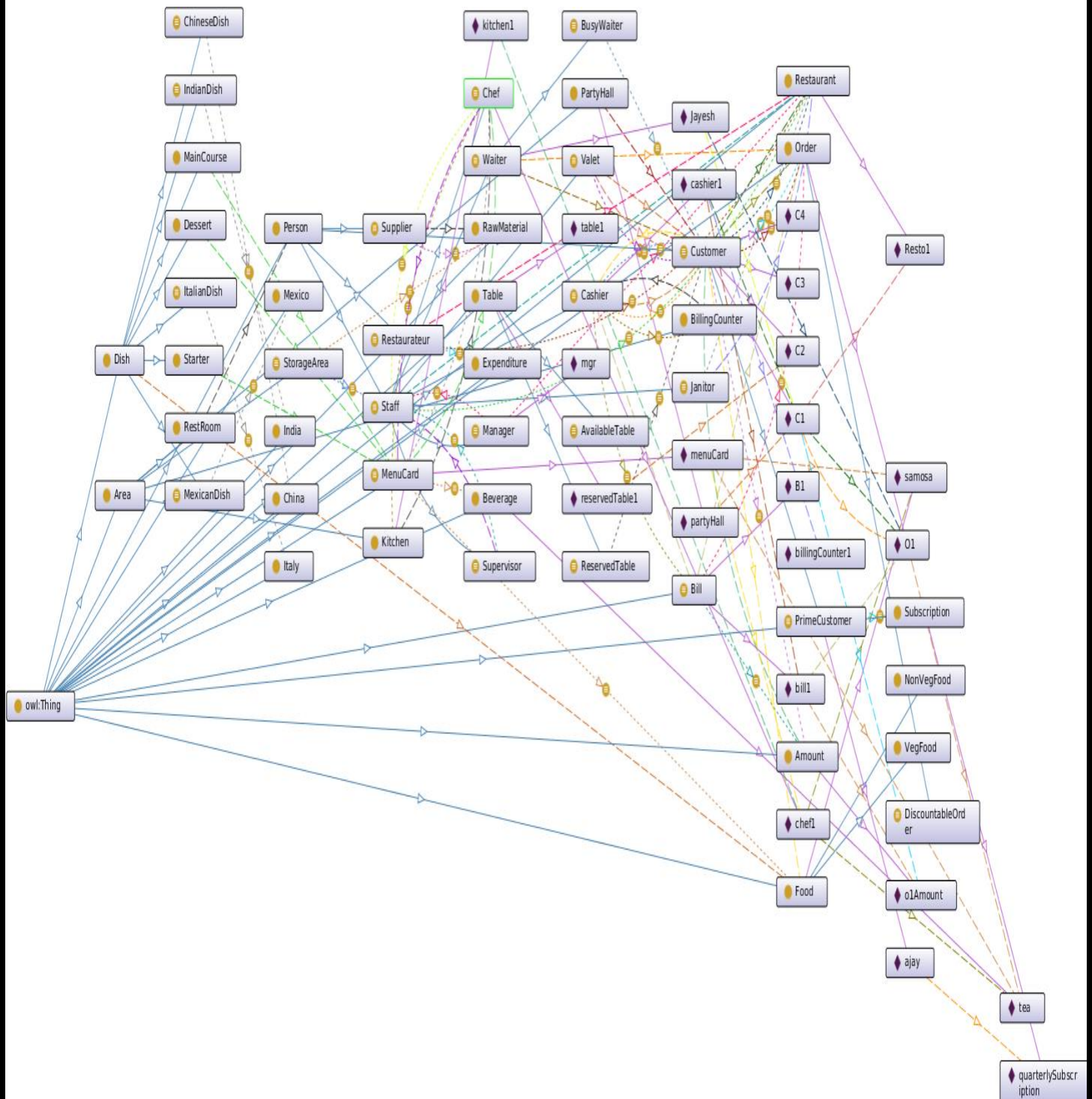
Data property hierarchy: owl:topDataProperty



owl:topDataProperty

- address
- consistsOf
- contact
- cost
- date
- details
- duration
- id
- name
- price
- reportsTo
- salary
- surfaceArea

Ontology Visualization obtained from “*OntoGraf*” Tool –



Visual representation of “Restaurant Management” Ontology using WebVOWL tool-

