

# Take A Byte



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GitHub Repository: <https://github.com/ZandileModise/PA5-214-Repo>

# Task 2: Design

System Requirements	3
Functional Requirements:	3
The Floor will have:	3
Customers:	3
Require a queue management system	3
Must be able to order	3
Tables	3
Seating arrangement	3
Waiters:	3
The waiter will	3
Serve a table	3
Take orders	3
Interact with the kitchen	3
Ordering System	4
Handles customer expectations Management	4
Menu	4
Build-your-own	4
The Kitchen will :	5
Process Orders	5
Have Chefs	5
Chefs should have different responsibilities	5
Activity Diagrams	6
Take order	6
Design Patterns	7
Complete UML diagram	8-9
Sequence and Communication Diagrams	10-12
State Diagram	13

## System Requirements:

- Our system should simulate the operation of a restaurant which includes managing tables, taking orders, and serving food.
- Customers must be able to make orders and specify preparation methods.
- Waiters should interact with customers, submit orders to the kitchen and serve prepared dishes.
- The kitchen staff i.e., the chefs should prepare food orders and should work at different stations.
- The system should handle customer expectations.
- Bill management should include splitting the bill and starting tabs.
- The restaurant may have a booking system or walk-in service.
- The restaurant may have a bar.

## Functional Requirements

### **Need two main interfaces:**

Floor and Kitchen

### **The floor consists of:**

Waiter and Table Management:

- Waiters should be assigned specific tables for which they are responsible for.
- Each table will be assigned a waiter.

Queue Management:

- A queue management system must be in place for customers waiting to enter the restaurant.
- Customers in the queue should be organized and seated based on availability.

Customer Seating and Management:

- There are 10 tables that seat four patrons each.
- The system must allow customers to request a table for seating.
- The table seat reserve system will allocate table for customers automatically.
- The system must be able to show customers to their assigned tables.
- Tables can be combined or split as needed to accommodate different party sizes.

#### Ordering and Serving:

- Customers should be able to place orders with a waiter.
- Customers may request the waiter to come back later if they are not ready to order.
- Waiters must pass customer orders to the kitchen staff.
- The kitchen must process orders as they come and delegate them to different chefs responsible for specific preparation tasks.
- Different stations in the kitchen should handle different parts of the dish preparation.
- Orders may be passed between stations and should be plated by the head chef before being served to customers.
- When an order is completed, the kitchen must notify the waiter for order pickup.
- The waiter will deliver the order to the customer's table.

#### Customer Expectations Management:

- The system should include mechanisms for managing customer expectations and feedback.
- It should allow for the tracking of customer satisfaction and the handling of customer complaints.

#### Build-Your-Own Ordering Menu:

- The system must provide a table of patrons a menu with a wide selection of available options, including appetisers, main courses, side dishes, and desserts.
- Customers should have the ability to create their orders by selecting items from the menu and customising them.

- The system displays real-time pricing information as customers build their orders, including the cost of individual items and any additional charges for customizations.

#### Waiter Actions Based on Table State:

- Waiters must be able to view the state of each table they are responsible for.
- The system should guide waiters in taking appropriate actions based on the table's state. For example, when a table is in the "Order Taken" state, the system may prompt the waiter to send the order to the kitchen.
- Waiters should have the capability to mark specific customer requests or table conditions, such as "Customer Not Ready to Order," for later review.

#### The kitchen consists of:

##### Order Processing:

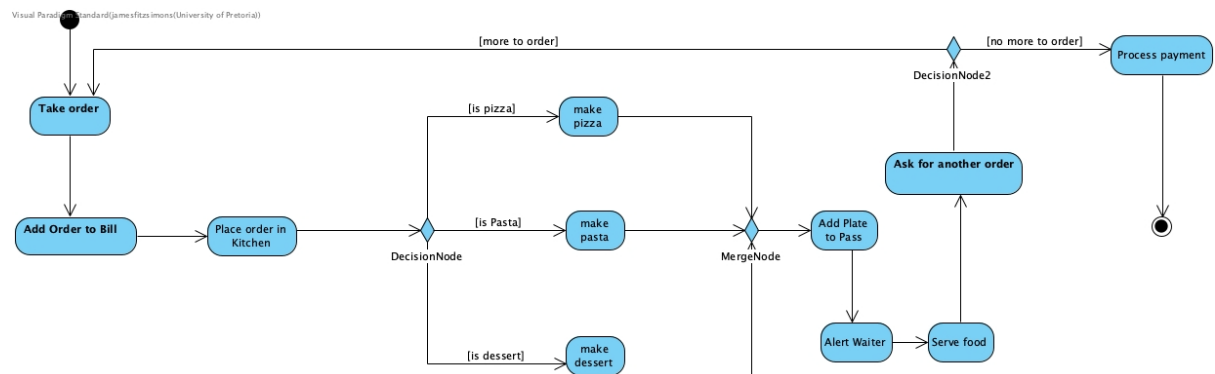
- The kitchen system must receive orders from the waitstaff, specifying the items and special requests.
- Orders must be processed in the order they are received, following the first-come, first-serve principle.
- The system must delegate orders to the appropriate chefs responsible for different parts of the preparation process.

##### Chefs' Responsibilities:

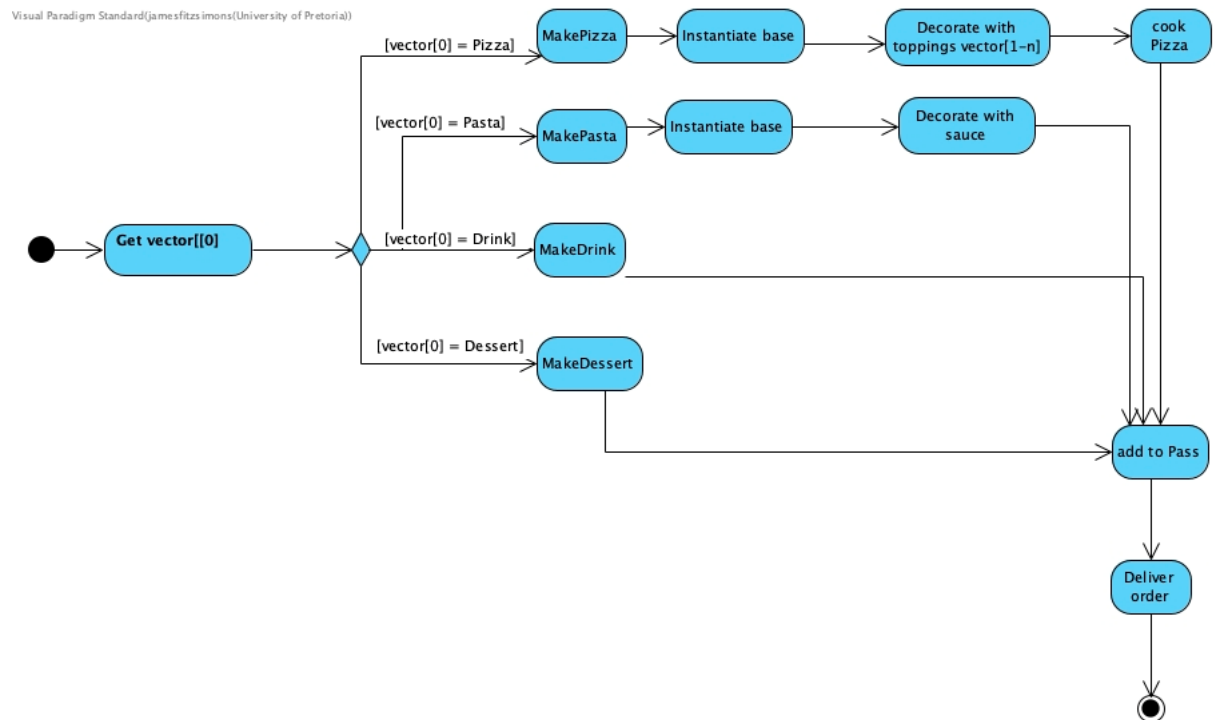
- Different chefs should be assigned specific tasks within the order preparation process (e.g., head chef for final plating, pasta chef for preparing pasta).
- Each chef should have access to the orders assigned to them and related details.

# Activity diagrams:

Process following order placement.



Building an order



# Design Patterns

## Floor

- Prototype
  - Clones the waiter objects.
- Memento
  - Saves and restores orders from clients.
- Singleton
  - The restaurant class serves as a singleton.
- Facade
- Flyweight
  - The kitchen class serves as a flyweight.
- State
  - Customer (waiting, order, served, eating, fed, complain ,exit)
  - Bill (paid, unpaid)
- Composite
- Iterator
  - Handles the customer queue.
- Factory
- Template

## Kitchen

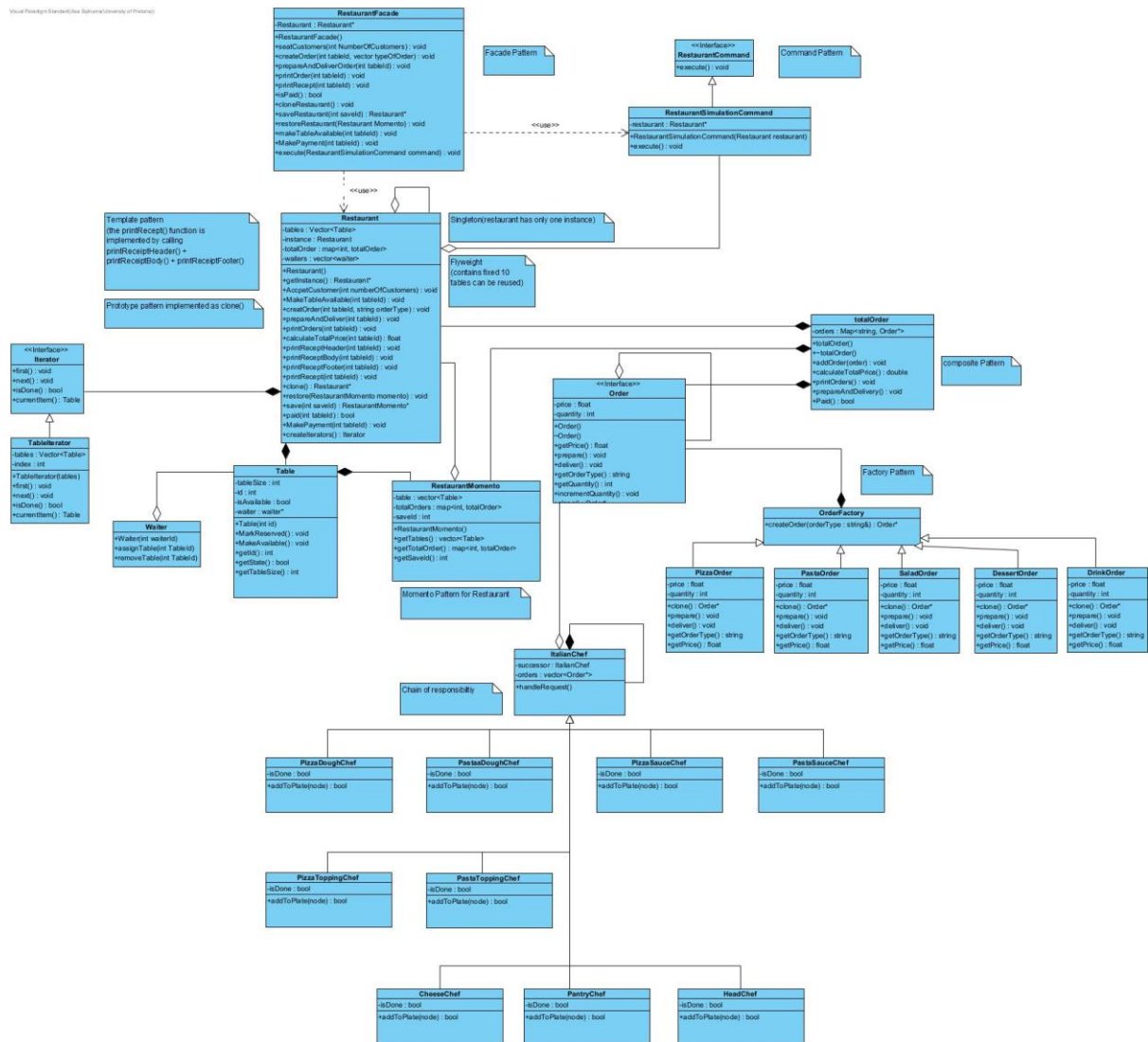
- Template
  -
- Decorator
  -
- Chain of Responsibility
  - Delegating the food to different chefs to prepare the dishes.  
(PizzaDoughChef ->PizzaSauceChef->PizzaToppingChef->CheeseChef)

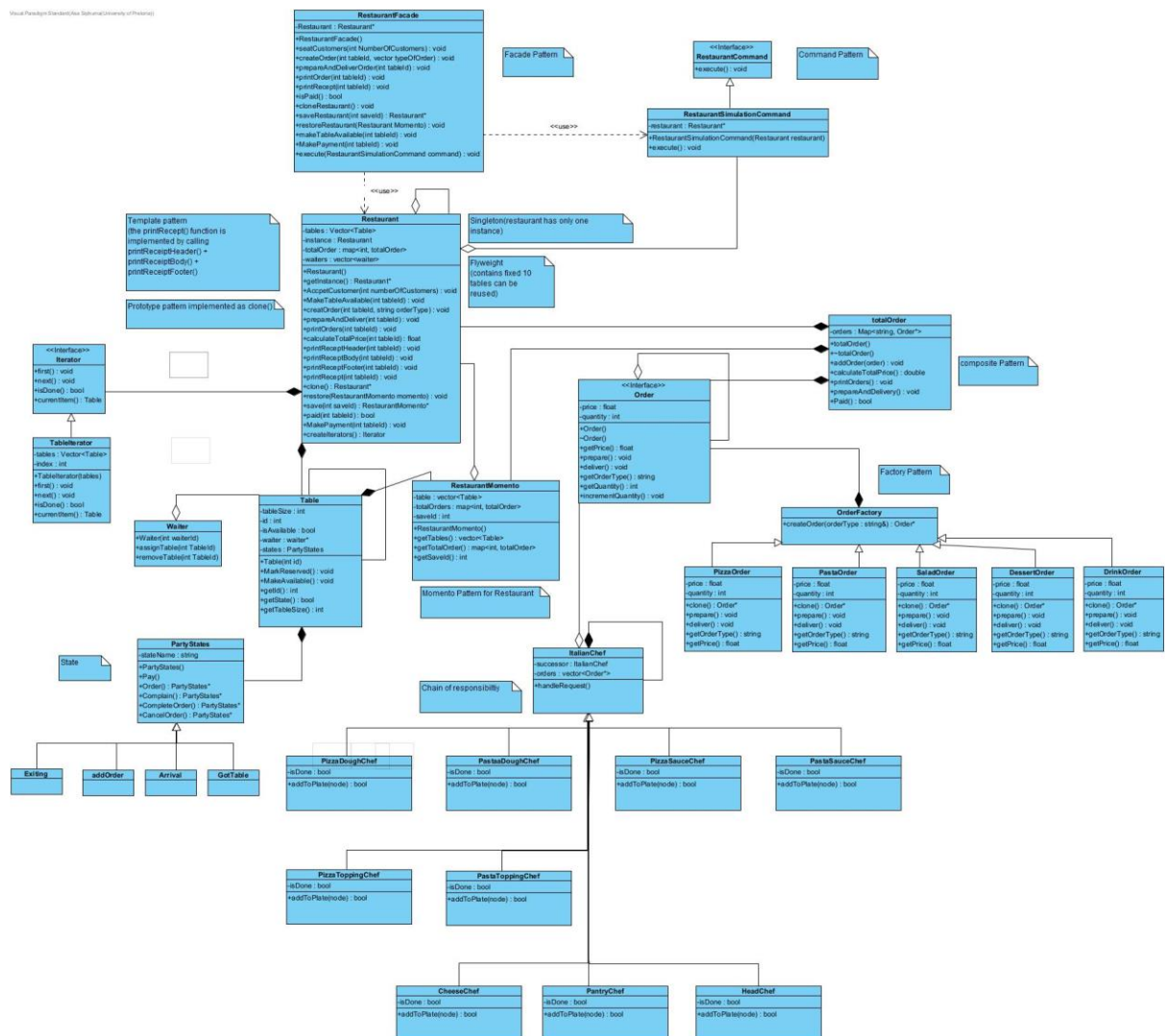
# Complete UML Diagram

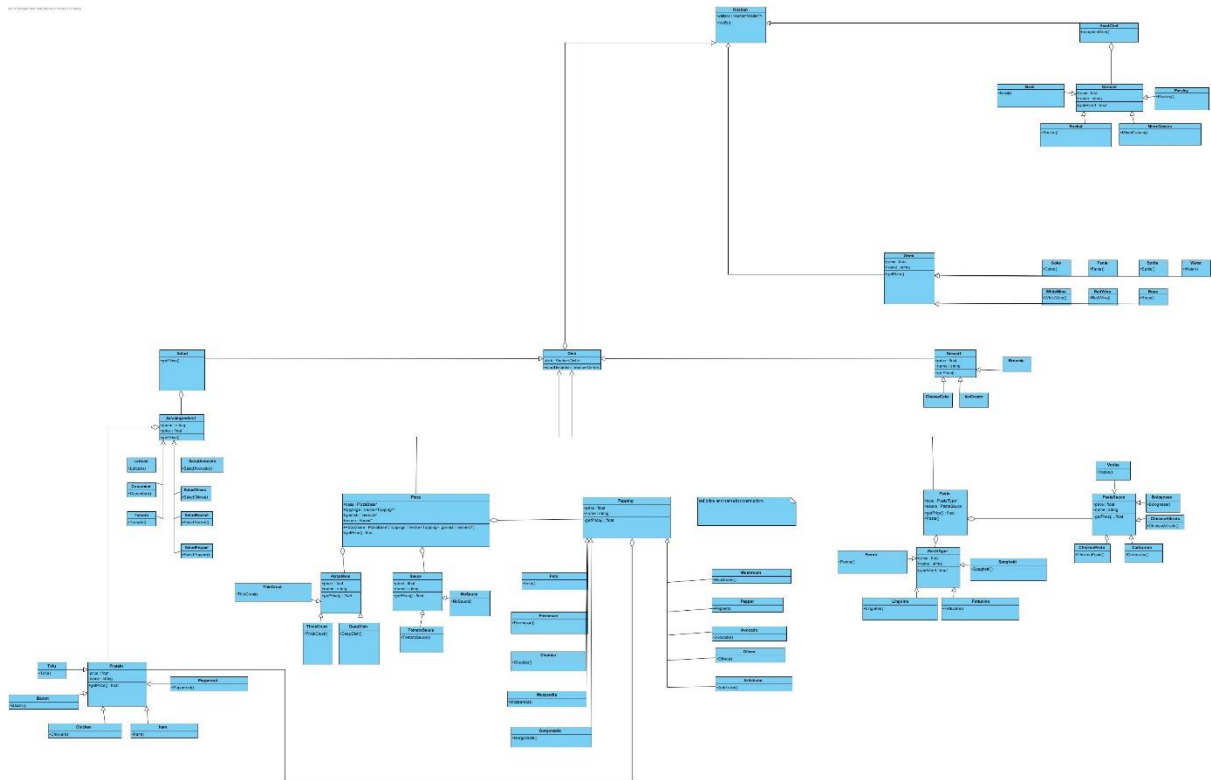
Initial floor UML





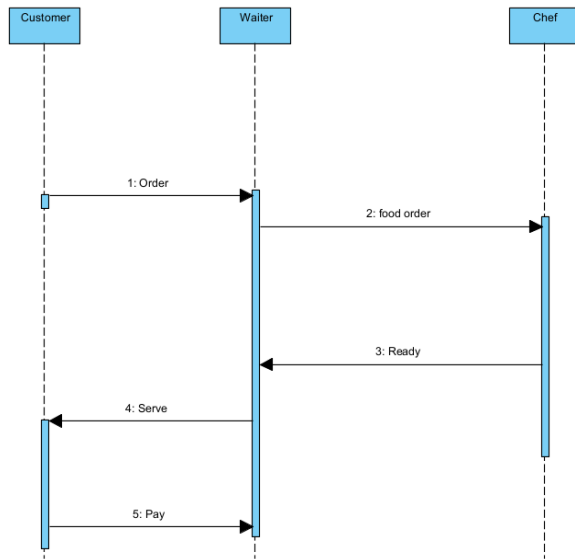




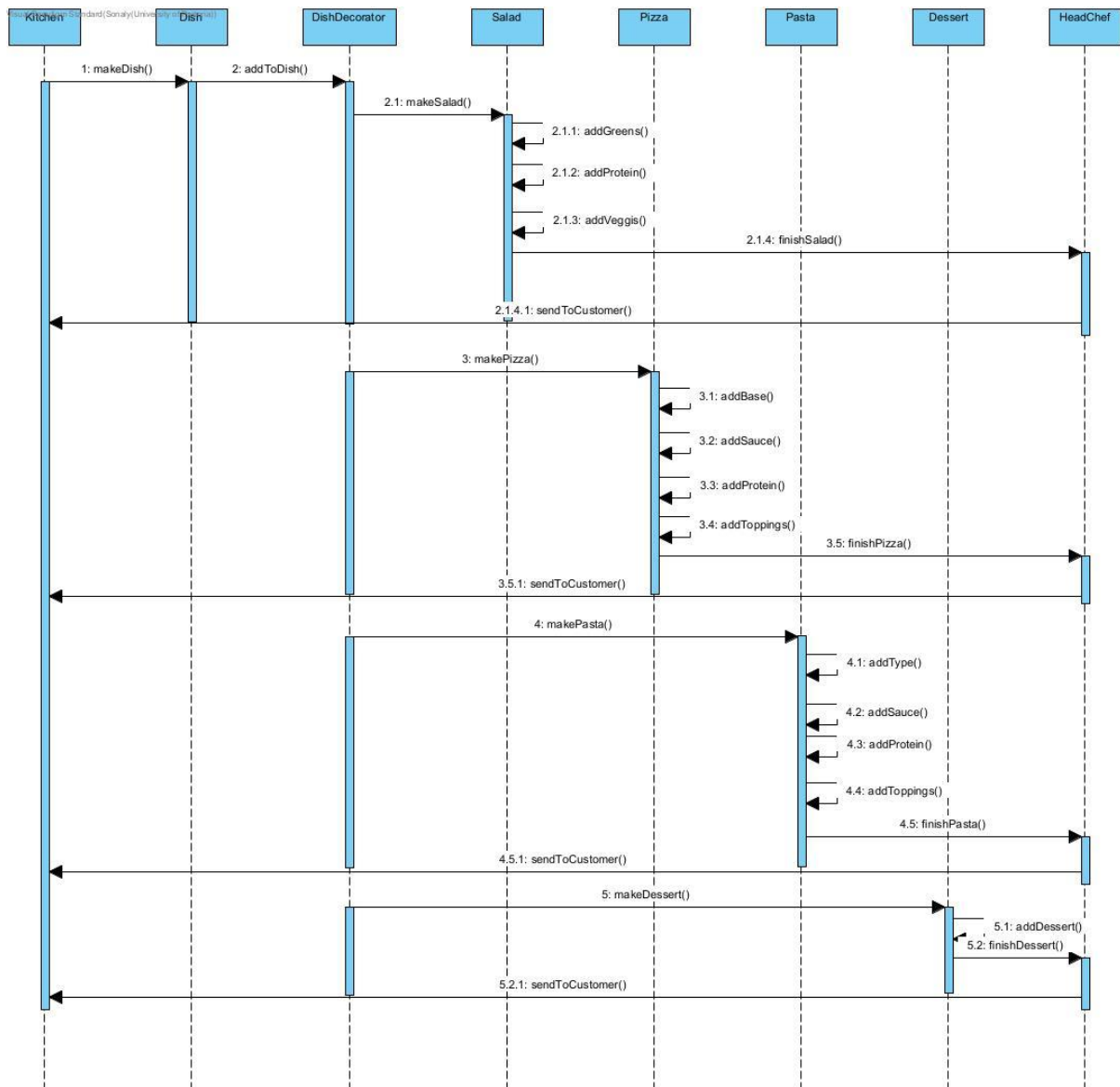


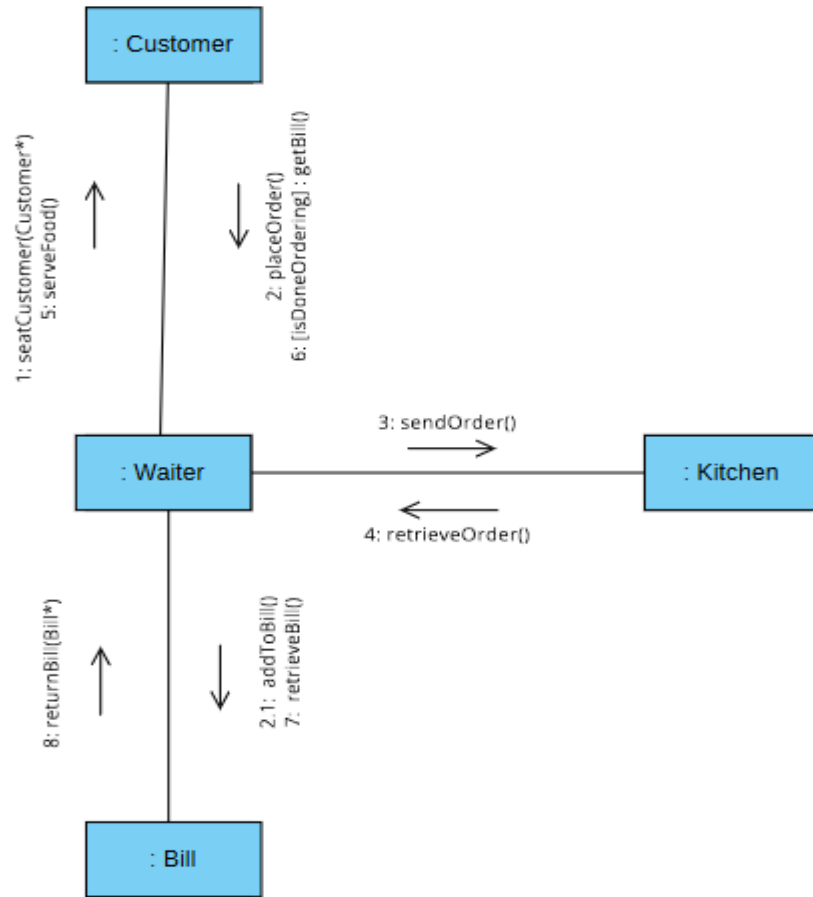
# Sequence and Communication Diagrams

sd (Place Order)

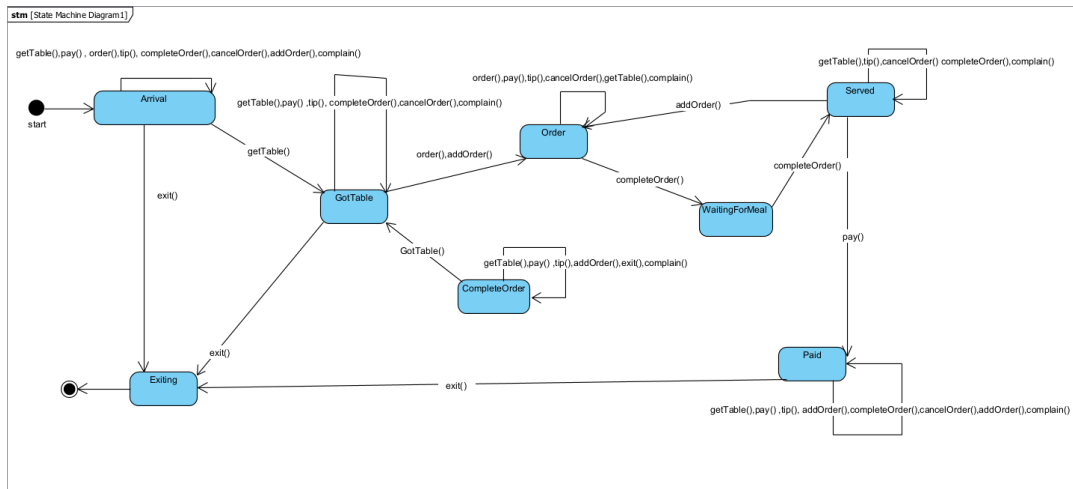


After Modification



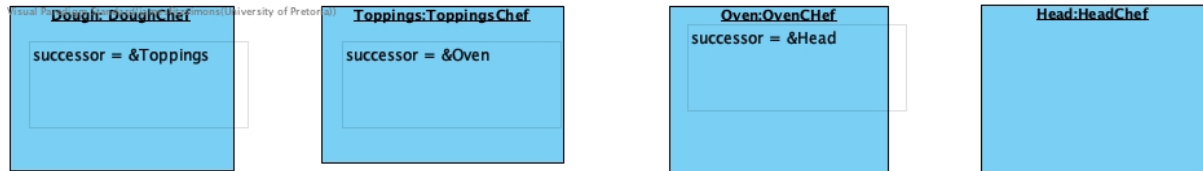


# State Diagram



# Object Diagram

## Chefs



## Restaurant

