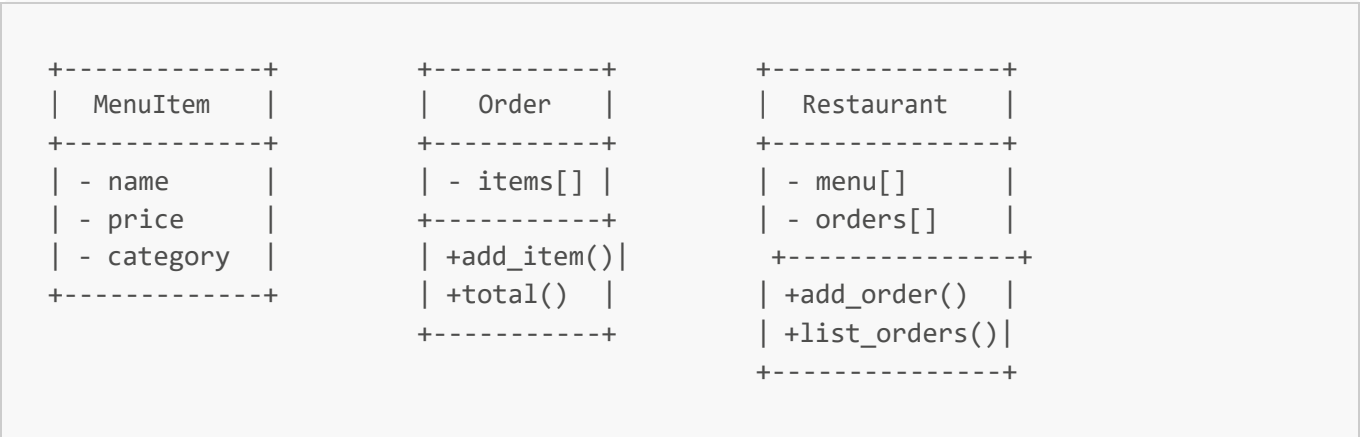


Assignment: Design and Implement a Restaurant Management System

You are required to design an object-oriented system for managing a restaurant. Your system should include at least the following classes:

- **MenuItem**: representing an individual menu item with a name, price, and category.
- **Order**: representing a customer's order with a list of items and a method to calculate the total.
- **Restaurant**: representing the restaurant with a menu and a record of placed orders.

UML Sketch:



Task: Based on the UML, implement the classes in Python using the principles of class definition, constructors, data members, instance methods, encapsulation, and optionally static methods.

Additionally, create a separate **main** class or script that will serve as the entry point of your program. This script should:

1. **Instantiate** a **Restaurant** object.
2. **Interact with the user** through the command line to perform the following:
 - Add new menu items (prompt the user for name, price, and category).
 - Display the current menu.
 - Create a new order (allow the user to select items by name).
 - Place the order into the restaurant's order list.
 - List all orders with total amounts.

Structure your code cleanly with comments explaining the logic and how it connects back to the concepts of object-oriented programming.

Example Run:

Welcome to the Restaurant Management System!

Choose an option:

1. Add menu item
2. View menu
3. Create new order
4. List all orders
5. Exit

> 1

Enter item name: Margherita Pizza

Enter item price: 8.5

Enter item category: Pizza

Menu item added successfully.

Welcome to the Restaurant Management System!

Choose an option:

1. Add menu item
2. View menu
3. Create new order
4. List all orders
5. Exit

> 1

Enter item name: Caesar Salad

Enter item price: 6.0

Enter item category: Salad

Menu item added successfully.

Welcome to the Restaurant Management System!

Choose an option:

1. Add menu item
2. View menu
3. Create new order
4. List all orders
5. Exit

> 2

Menu:

1. Margherita Pizza (\$8.5) [Pizza]
2. Caesar Salad (\$6.0) [Salad]

Welcome to the Restaurant Management System!

Choose an option:

1. Add menu item
2. View menu
3. Create new order
4. List all orders
5. Exit

> 3

Enter item numbers for the order separated by commas (e.g., 1,2): 1,2

Order created and added successfully.

Welcome to the Restaurant Management System!

Choose an option:

1. Add menu item
2. View menu
3. Create new order
4. List all orders
5. Exit

> 4

Orders:

Order 1:

- Margherita Pizza (\$8.5)
- Caesar Salad (\$6.0)

Total: \$14.5

Welcome to the Restaurant Management System!

Choose an option:

1. Add menu item
2. View menu
3. Create new order
4. List all orders
5. Exit

> 5

Thank you for using the Restaurant Management System!