

Project Title: Cafe Management System
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Class: BCS-2C
Subject: Object-Oriented Programming
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1. Introduction

The Cafe Management System is a C++ console-based application designed to streamline the management operations of a cafe. It incorporates essential functionalities such as menu management, order placement, billing, and table reservations. This project applies object-oriented programming (OOP) principles including classes, encapsulation, and file handling.

2. Objectives

- To understand and apply object-oriented programming concepts in a real-life scenario.
- To create a modular and extensible system for managing cafe operations.
- To implement basic file handling for data persistence.
- To enhance problem-solving and programming logic through system design.

3. Features Implemented

- **Menu Management:** The system can load and save a menu from a file. Items are categorized (e.g., Drinks, Snacks, Main Course) and displayed neatly.
- **Order Management:** Customers can place orders by selecting items and specifying quantities. Orders over \$50 receive a 10% discount.
- **Billing System:** Generates and saves a detailed receipt for each order.
- **Table Reservation:** Allows customers to reserve tables. Reservations are saved to and loaded from a file.
- **File Handling:** Supports loading and saving data to text files (Menu.txt and Reservations.txt).

4. Tools and Technologies Used

- **Programming Language:** C++
- **Compiler:** g++ / any C++11-compatible compiler
- **Platform:** Console-based (cross-platform)
- **File Format:** Plain text files for data persistence

5. Code Structure and Explanation

- **Item Class:** Represents a menu item with attributes like name, price, and category.
- **Menu Class:** Manages the list of items, including loading from and saving to files, and displaying categorized items.
- **Order Class:** Handles adding items, computing totals, applying discounts, and generating bills.
- **TableReservation Class:** Manages reservation statuses and saves/loads them to/from a file.
- **Main Function:** Provides a CLI for interaction, offering options to view menu, place orders, reserve tables, and view reservations.

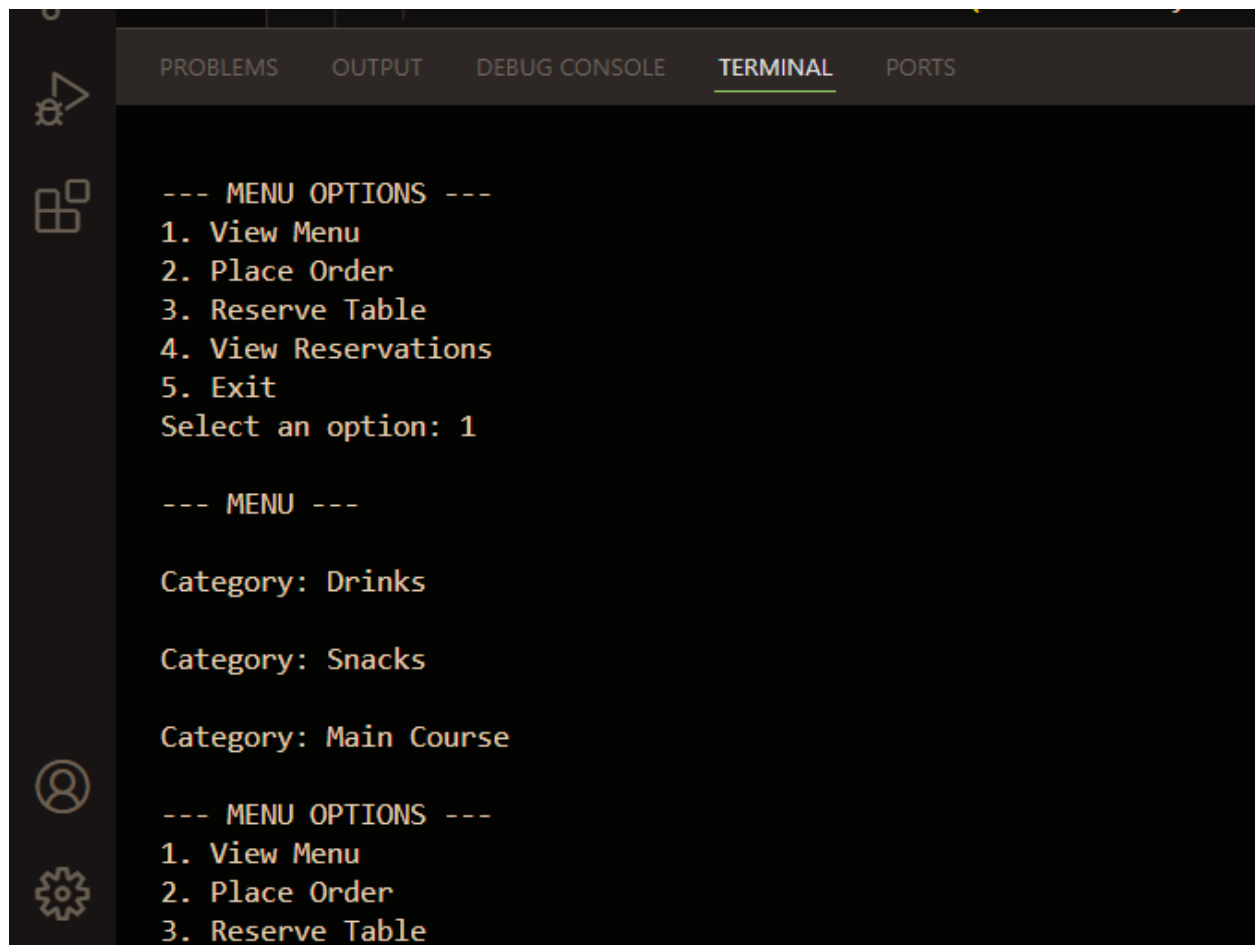
6. Challenges Faced

- Ensuring index validation for user inputs.
- Avoiding buffer overflows and handling invalid data gracefully.
- Maintaining readability and modularity of the code with increasing features.
- Implementing data persistence with file operations.

7. Conclusion

The Cafe Management System project provided hands-on experience with object-oriented programming concepts and reinforced understanding of file handling in C++. It demonstrated how modular and class-based design simplifies complex real-world problems. This system can be further extended to include admin controls, user authentication, and graphical interfaces.

8. Screenshots



The screenshot shows a VS Code interface with a terminal window open. The terminal displays the output of a program, which is a menu application. The application has a sidebar with icons for a magnifying glass, a grid, a person, and a gear. The terminal output is as follows:

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

--- MENU OPTIONS ---
1. View Menu
2. Place Order
3. Reserve Table
4. View Reservations
5. Exit
Select an option: 1

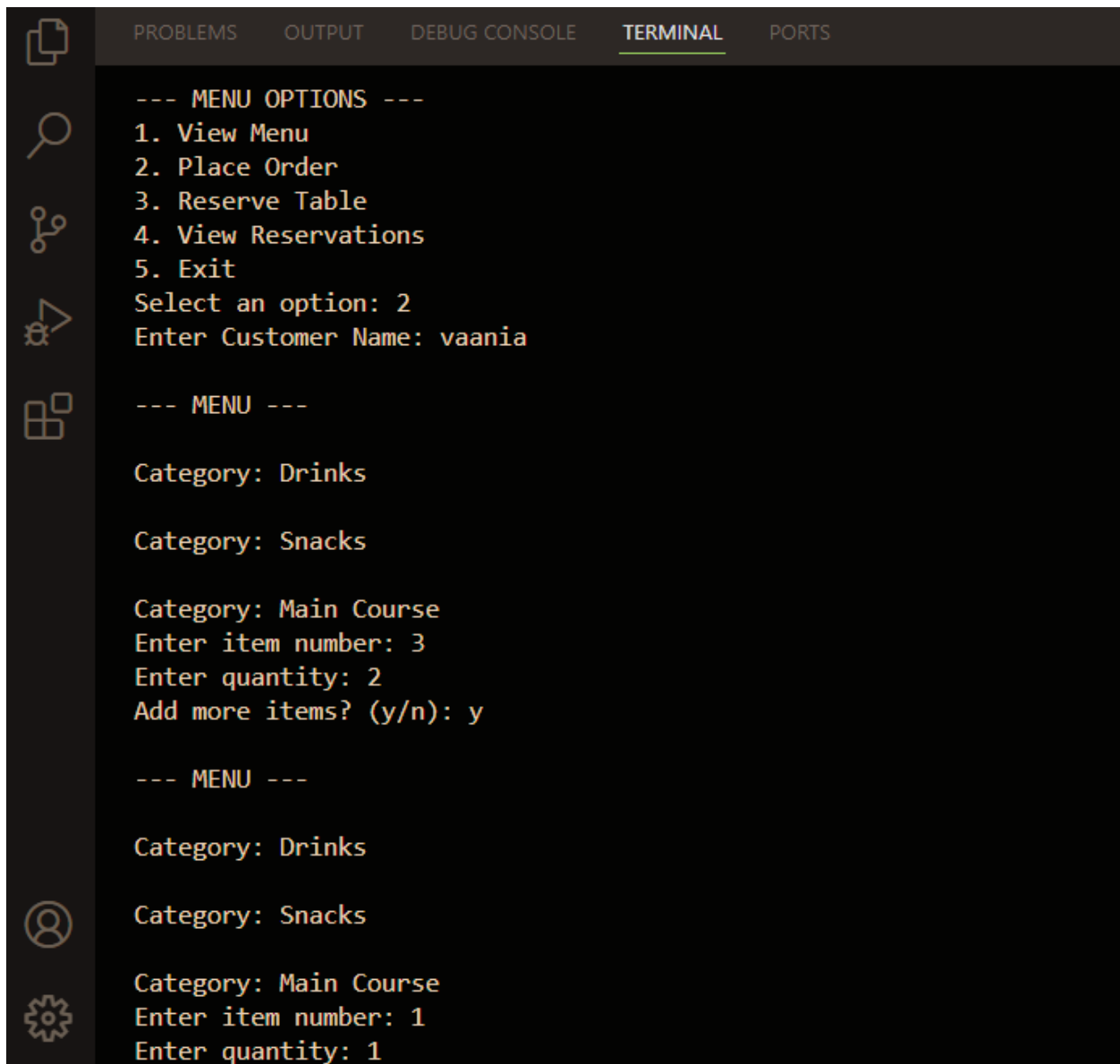
--- MENU ---

Category: Drinks

Category: Snacks

Category: Main Course

--- MENU OPTIONS ---
1. View Menu
2. Place Order
3. Reserve Table
```



PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
--- MENU OPTIONS ---  
1. View Menu  
2. Place Order  
3. Reserve Table  
4. View Reservations  
5. Exit  
Select an option: 2  
Enter Customer Name: vaania  
  
--- MENU ---  
  
Category: Drinks  
  
Category: Snacks  
  
Category: Main Course  
Enter item number: 3  
Enter quantity: 2  
Add more items? (y/n): y  
  
--- MENU ---  
  
Category: Drinks  
  
Category: Snacks  
  
Category: Main Course  
Enter item number: 1  
Enter quantity: 1
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

--- MENU OPTIONS ---
1. View Menu
2. Place Order
3. Reserve Table
4. View Reservations
5. Exit
Select an option: 3
Enter customer name: vaania
Enter table number (1-20): 3
Table 3 reserved for aania

--- MENU OPTIONS ---
1. View Menu
2. Place Order
3. Reserve Table
4. View Reservations
5. Exit
Select an option: 4

--- RESERVATIONS ---
Table 3: aania

--- MENU OPTIONS ---
1. View Menu
2. Place Order
3. Reserve Table
4. View Reservations
5. Exit
Select an option: |
```

9. References

- C++ Documentation - cplusplus.com
- Object-Oriented Programming Principles
- Online tutorials and classroom lectures