**Full Project Code with Detailed Comments**

* All Java files have been updated with comments to explain each class, method, and variable used throughout the project.
* **Complete Java Files**
  + OrderEaseApp.java
  + Restaurant.java
  + Order.java
  + Table.java
  + Server.java
  + MenuItem.java

**What It Accomplishes**

The OrderEase application provides a streamlined, efficient restaurant management system. It enhances the guest experience by allowing direct interaction with the menu and order placement. It also facilitates server and admin management by providing role-specific interfaces and functionalities.

* **Guest Role**
  + Guests can view the menu, place orders, call the server, and request the check without needing to log in.
  + The interface is intuitive and easy to use, enhancing the dining experience.
* **Server Role**
  + Servers can manage their assigned tables, view order statuses, and check in with guests.
  + They receive real-time notifications for guest actions, improving service efficiency.
* **Admin Role**
  + Admins have full control over menu items and server assignments.
  + They can dynamically update the menu and manage server resources.

**Key Features**

* Guest Interface
  + View menu items with details such as name, description, price, and availability.
  + Place orders directly from the table.
  + Call the server or request the check without login.
* Role Switching
  + A small login button on the guest interface allows switching to server or admin roles.
  + Roles are switched using a username and password (admin/admin123, server1/server123).
* Server Management
  + View all assigned tables and order statuses.
  + Check in with guests and mark orders as served.
* Admin Management
  + Add, remove, or update menu items.
  + Assign or reassign servers to tables.

**Multiple Test Scenarios**

* **Test Scenario 1: Guest Interface Testing**
  + **View Menu**
    - Browse all available menu items.
    - Verify items are displayed with name, description, price, and availability.
  + **Place an Order**
    - Click the "Place Order" button.
    - Enter the name of an available menu item and confirm.
    - Ensure the item is added to the current order and the server is notified.
  + **Call Server**
    - Use the "Call Server" button.
    - Confirm that the server is notified of the request.
  + **Request Check**
    - Request the check and verify server notification.
* **Test Scenario 2: Role Switching and Server Interface Testing**
  + **Log in as Server**
    - Click the "Login as Server/Admin" button.
    - Enter server1 as the username and server123 as the password.
    - Verify that the server interface is displayed.
  + **View Assigned Tables**
    - Click the "View Tables" button.
    - Check that all tables assigned to the server are displayed with seating duration and order status.
  + **Check In with Guests**
    - Click the "Check In" button.
    - Enter a table number assigned to the server and confirm the check-in.
  + **Mark Order Served**
    - Click the "Mark Order Served" button.
    - Enter the table number and confirm the action.
    - Ensure the order for that table is cleared.
* **Test Scenario 3: Admin Interface Testing**
  + **Log in as Admin**
    - Click the "Login as Server/Admin" button.
    - Enter admin as the username and admin123 as the password.
    - Verify that the admin interface is displayed.
  + **Manage Menu Items**
    - Click the "Add Menu Item" button.
    - Enter the details for a new menu item and confirm.
    - Verify that the new item appears in the menu when viewed from the guest interface.
    - Update an existing item’s availability and price.
    - Remove an item from the menu and confirm it no longer appears.
  + **Server Assignment**
    - Click the "Assign Server to Table" button.
    - Enter a table number and the name of an available server.
    - Confirm that the server is assigned to the table.

**How to Run the Program**

* **Prerequisites** 
  + Install Java Development Kit (JDK).
  + An IDE such as VSCode, IntelliJ IDEA, or Eclipse.
  + The program source code files, including:
    - OrderEaseApp.java
    - Restaurant.java
    - Server.java
    - Table.java
    - Order.java
    - MenuItem.java
  + If using VSCode, install the "Extension Pack for Java" and ensure the Java runtime environment is set up.
* **Running the Program**
  + Open the project in your chosen IDE.
  + Compile and run the OrderEaseApp.java class.
  + Use the guest interface to simulate a table interaction.
  + Switch to the server or admin interfaces by selecting the "Login as Server/Admin" button.
* **Data Storage**
  + Data is stored in a file named restaurant\_data.dat.
  + The data is saved automatically when using the "Save Data" feature or manually via the application.
  + Data includes tables, orders, servers, and menu items, ensuring persistence across sessions.