# RESTAURANT MANAGEMENT SYSTEM

## Project Report

*Prepared By :*

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**2320226518 & 2320221072**

*Course Name :* **Visual Programming**

*Course Teacher :* **DR. Mahmoud Masoud Mohammed Ashour**

**27/8/2025**

## 1.Introduction

Brief Explanation of the Project

The restaurant management system project aims to develop an integrated software application that facilitates the efficient and organized management of various aspects of the restaurant.
The system includes meal, user, and order management, making it easier for staff and management to monitor daily operations smoothly.
The system provides an easy-to-use and simple user interface that allows users to add, edit, delete, and view meal and user data in a seamless and hassle-free manner.

### Importance of the Project :

This system plays a significant role in reducing errors resulting from traditional manual processes.

It automates various tasks related to restaurant management, such as updating inventory and tracking orders, saving time and effort.

It also contributes to improving the quality of service provided to customers by speeding up the ordering and delivery processes.

Additionally, the system enables management to analyze performance and make decisions based on accurate and reliable data.

## 2.Project Objectives

The restaurant management system aims to achieve a set of key objectives that contribute to improving restaurant performance and management. The most important of these objectives are:

Facilitating meal management processes: Enabling users to easily add, update, and delete meals, with the ability to upload images for each meal for attractive display.

Efficient order management: Tracking orders from the moment they are created until they are completed, ensuring speedy execution and reducing errors.

User management and controlling their permissions: Creating user accounts with different roles (such as administrator, employee) while controlling permissions to ensure system security.

Improving inventory accuracy: Automatically updating available meal quantities after each order to ensure product availability.

Providing an easy and intuitive user interface: Designing a simple user interface that helps all users interact with the system without the need for advanced technical expertise.

Decision support: Providing reports and statistics that help management understand restaurant performance and make decisions based on accurate data.

## 3. System Requirements

This section is divided into two types of requirements: hardware requirements and software requirements. The purpose of this section is to determine the appropriate environment for the smooth and efficient operation of the restaurant management system.

### 3.1 Software Requirements Operating System: Windows 10 or later

Development Environment: NetBeans IDE (preferably a version that supports JavaFX)

Programming Language: Java (with JavaFX support for creating the graphical interface)

Database: MySQL 8.0 or later (XAMPP was used to facilitate the setup of a local MySQL server)

Additional Tools:

Scene Builder (for designing FXML interfaces)

MySQL Workbench or phpMyAdmin (for database management)

### 3.2 Hardware Requirements Processor: Intel Core i3 or higher

RAM: At least 4 GB (8 GB recommended)

Storage Space: 500 MB for installing tools + additional space for saving data and images

Display: At least 1366x768 resolution for proper interface display

## 4. System Analysis

### 4.1 System Description

A restaurant management system is a software application that facilitates the process of managing food, orders, users, and inventory within a restaurant.

The system allows users (such as managers and employees) to add, edit, and delete meals, manage orders, and track inventory easily and efficiently.

### 4.2 Functional Requirements User Management:

Users log in with different permissions (manager, employee).

The ability to add, edit, and delete users (manager only).

Meal Management:

Add new meals with full details (name, description, price, photo, etc.).

Edit existing meal data.

Delete meals.

View each user's meal menu.

Order Management:

Add new orders.

Edit order status (completed, in preparation, canceled).

View current and previous orders.

Inventory Tracking:

Update available meal quantities.

Low-Supply Alert.

### 4.3 Non-Functional Requirements Security:

Protecting user data from unauthorized access. Storing passwords encrypted.

Ease of Use: A simple and clear user interface makes the system easy to navigate.

Performance: Quick response when performing various operations.

Scalability: The ability to add new features in the future without completely redesigning the system.

## 5.System Design

### 5.1 Architecture Design

The system is built on a multi-tier architecture model consisting of:

Presentation Layer: The interface that users interact with, built using Java Swing or any suitable user interface framework.

Business Logic Layer: Contains system logic, such as pricing calculations, user authorization verification, and order management.

Data Layer: Dealing with databases, performing insertion, modification, deletion, and query operations.

## 5.2 Database Design Main Tables:

Users Table:

id (Primary Key)

name

username

password

role

Meals Table:

meal_id (Primary Key)

name

description

price

currency

quantity

total

date_added

image_path

user_id (Foreign Key)

Orders Table: (If present in the project)

order_id (Primary Key)

meal_id (Foreign Key)

user_id (Foreign Key)

quantity

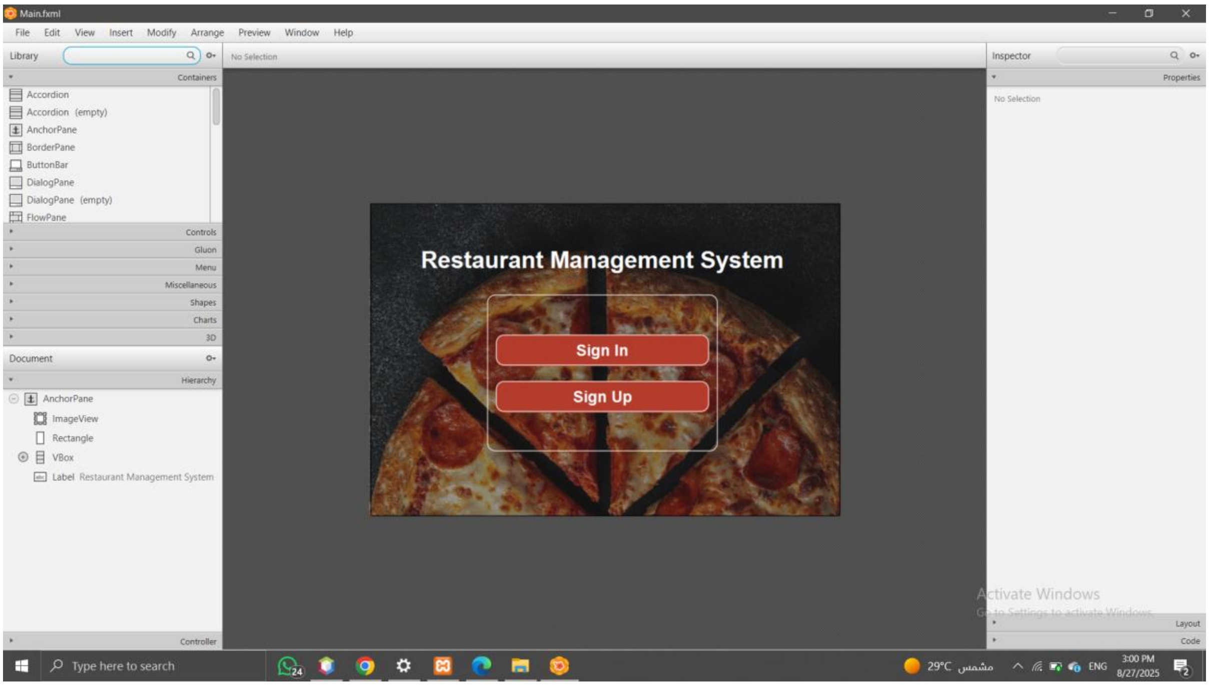
status

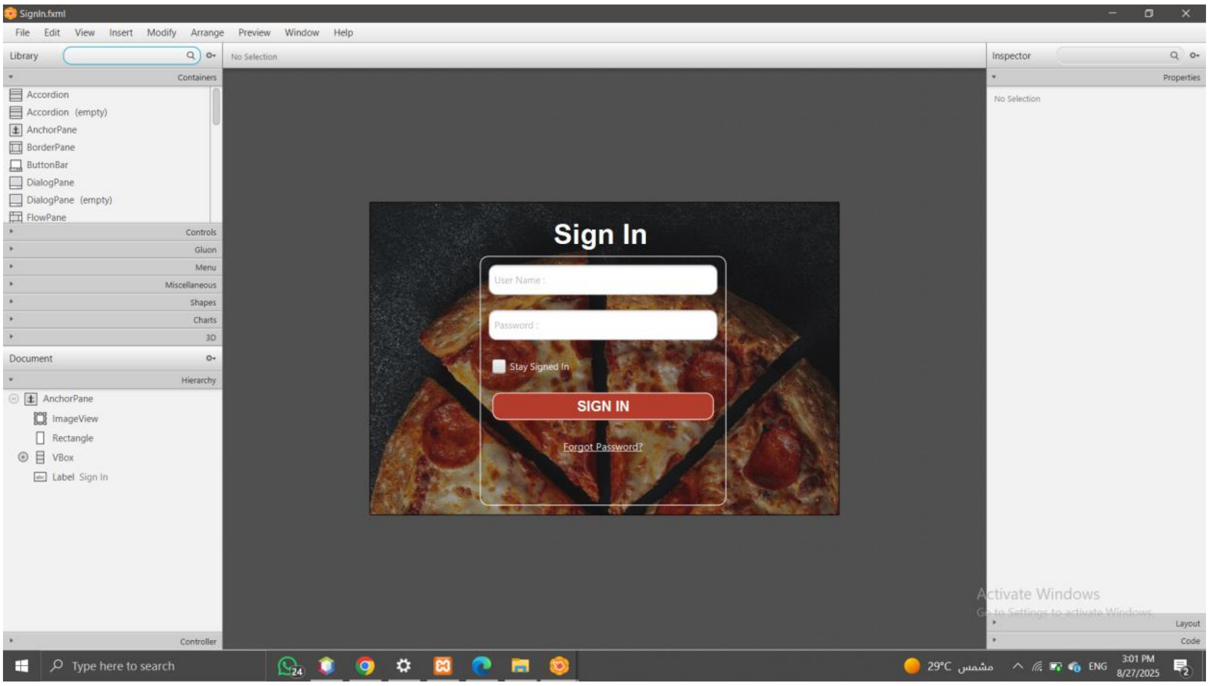
order_date

5.3 Design Diagrams Class Diagram: Illustrates the main classes such as User, Meal, and Order and the relationships between them.

Sequence Diagram: Illustrates the flow of processes when adding a new meal, logging in, or placing an order.

Database diagram (ER diagram): Demonstrates the relationships between the underlying tables.

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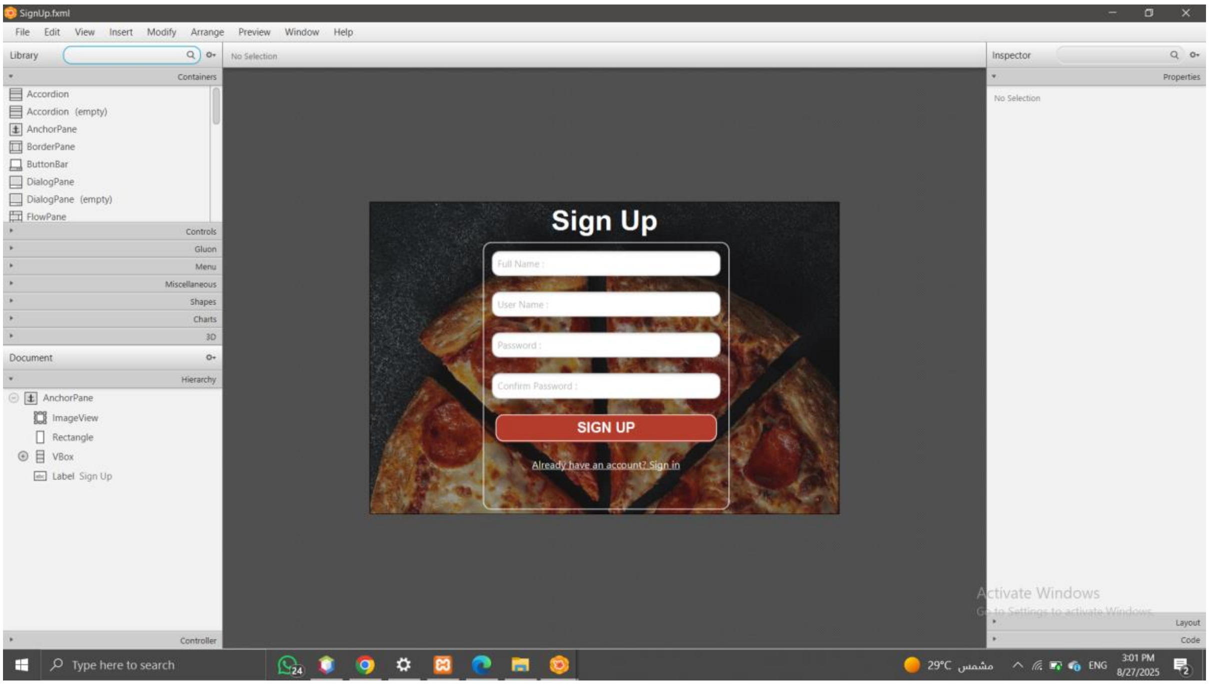
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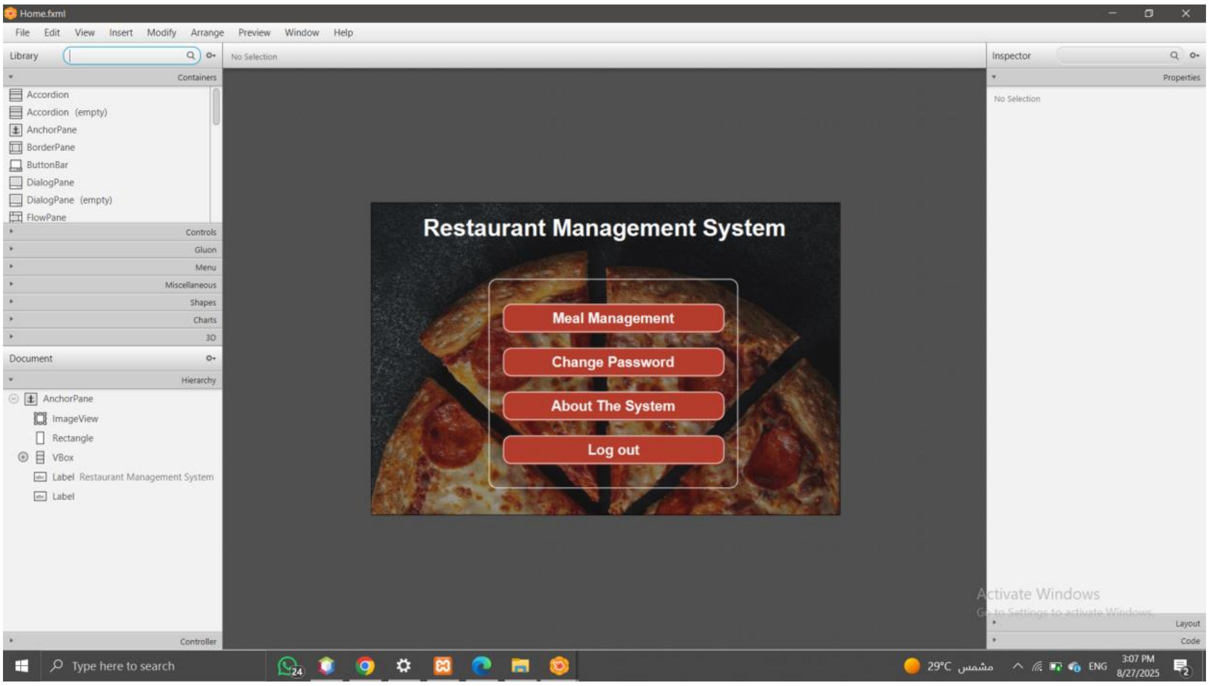
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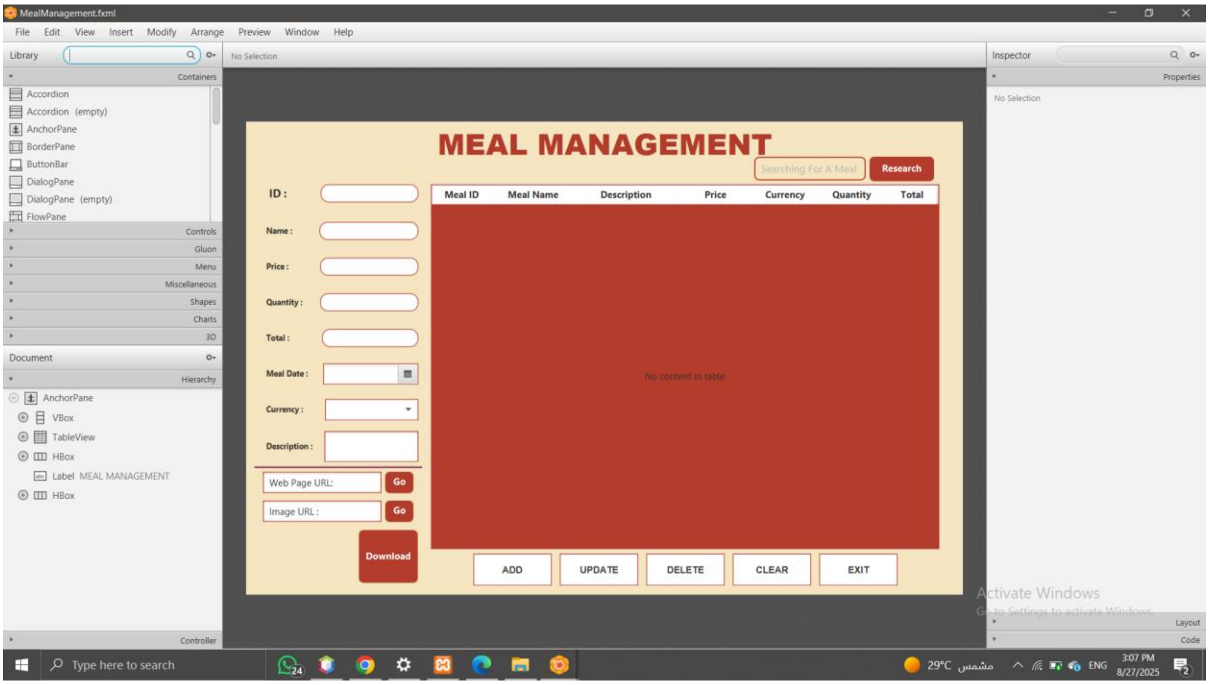
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Searching For A Meal
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Name :
Price :
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Total :
Meal Date :
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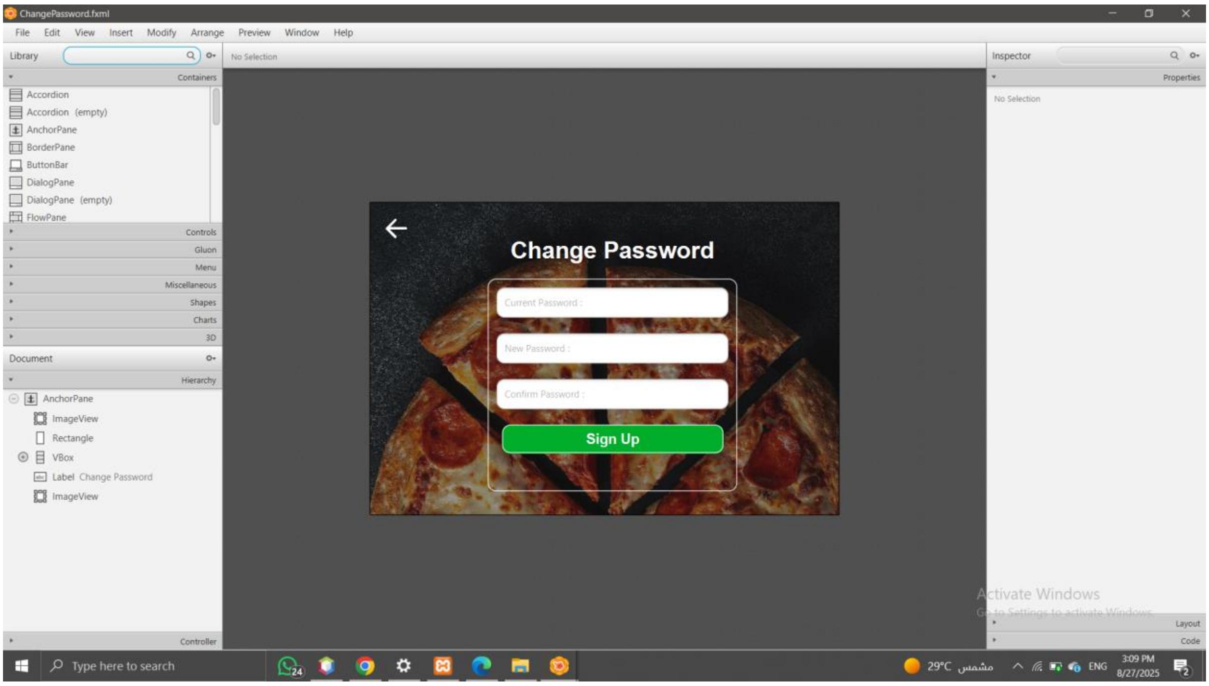


# 6.System Implementation

## 6.1 Development Environment Programming Language:

Java

IDE Used: NetBeans

Database: MySQL

Database Connection: JDBC (Java Database Connectivity)

Framework (if applicable): No external framework is used; the system is built using standard Java.

6.2 Implementation Details User Management: Login, logout, and user privileges (admin or regular user) are implemented.

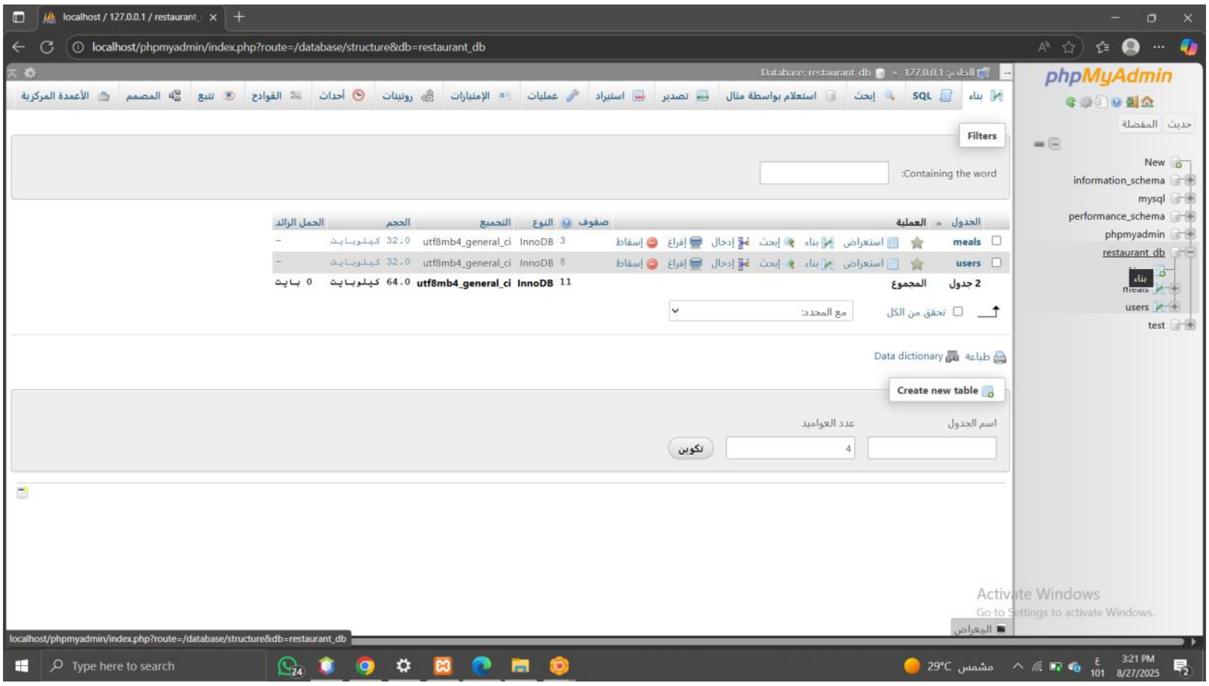
Meal Management: Add, edit, delete, and browse meals by user. Image uploading and storing image paths in the database is handled.

Database Connection: The DAO (Data Access Object) pattern is used to separate database logic from application logic.

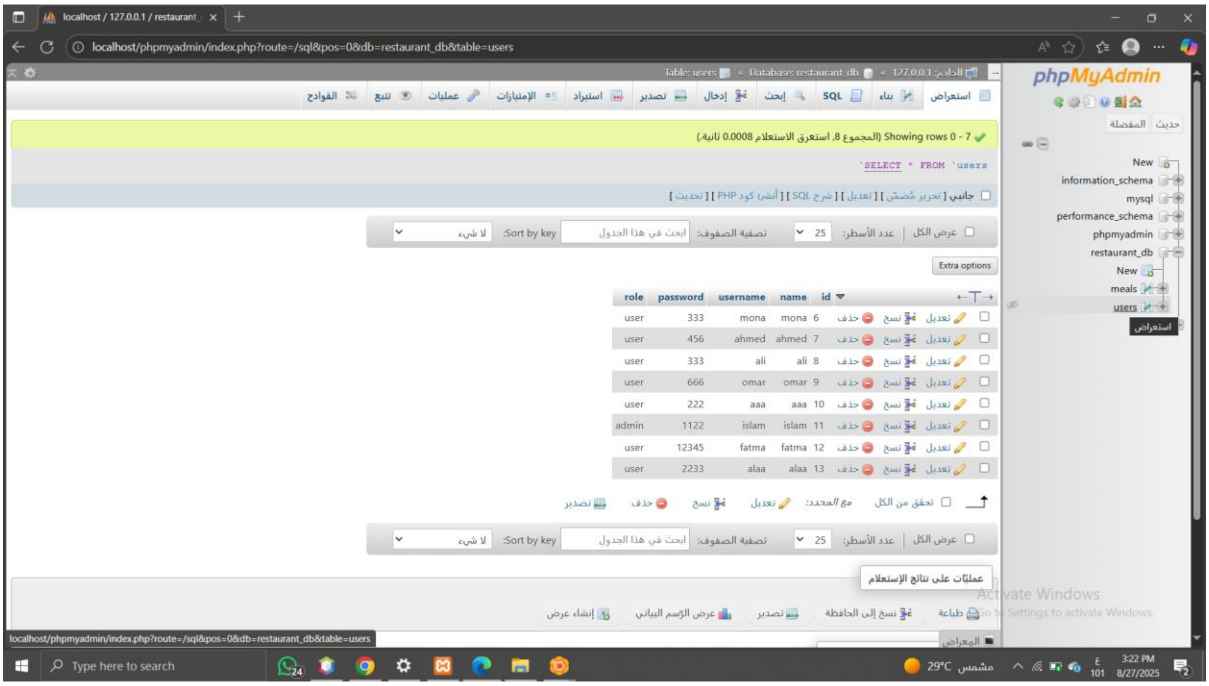
Date Handling: java.time.LocalDate is used to store and display meal addition dates.

6.3 Challenges and Solutions Image Handling: Only the image path is stored in the database to avoid large data storage issues.

Across-Layer Synchronization: A clear separation between the presentation layer, the business layer, and the data layer is implemented to improve maintainability.



| الجدول | العملية | صفوف | النوع | التجميع | الحجم | الحمل الزائد |
|---|---|---|---|---|---|---|
| meals | استعراض بناء إبحث إدخال إفراغ إسقاط | 3 | InnoDB | utf8mb4_general_ci | 32.0 كيلوبايت | - |
| users | استعراض بناء إبحث إدخال إفراغ إسقاط | 8 | InnoDB | utf8mb4_general_ci | 32.0 كيلوبايت | - |
| 2 جدول | المجموع | 11 | InnoDB | utf8mb4_general_ci | 64.0 كيلوبايت | 0 بايت |

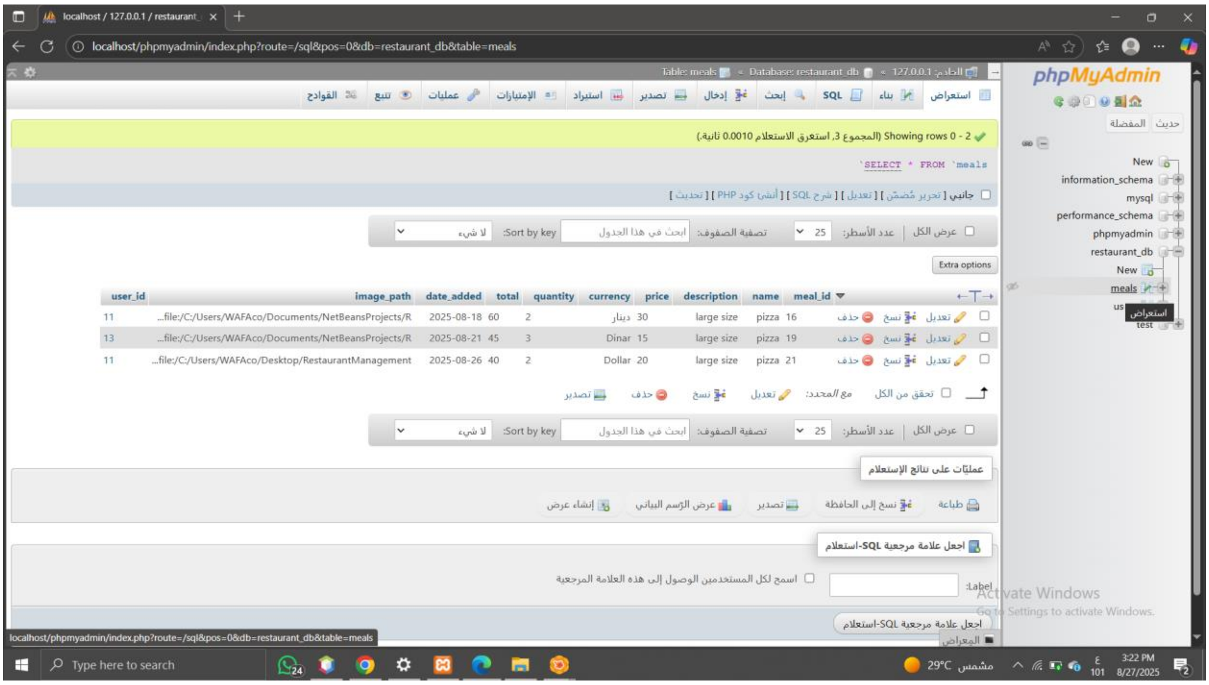


localhost/phpmyadmin/index.php?route=/sql&pos=0&db=restaurant_db&table=users

Showing rows 0 - 7 (المجموع 8, استغرق الاستعلام 0.0008 ثانية.)

```
SELECT * FROM `users`
```

| role | password | username | name | id |
|---|---|---|---|---|
| user | 333 | mona | mona | 6 |
| user | 456 | ahmed | ahmed | 7 |
| user | 333 | ali | ali | 8 |
| user | 666 | omar | omar | 9 |
| user | 222 | aaa | aaa | 10 |
| admin | 1122 | islam | islam | 11 |
| user | 12345 | fatma | fatma | 12 |
| user | 2233 | alaa | alaa | 13 |



localhost/phpmyadmin/index.php?route=/sql&pos=0&db=restaurant_db&table=meals

Showing rows 0 - 2 (المجموع 3, استغرق الاستعلام 0.0010 ثانية.)

```
SELECT * FROM `meals`
```

| user_id | image_path | date_added | total | quantity | currency | price | description | name | meal_id |
|---|---|---|---|---|---|---|---|---|---|
| 11 | ...file:/C:/Users/WAFAco/Documents/NetBeansProjects/R | 2025-08-18 | 60 | 2 | دينار | 30 | large size | pizza | 16 |
| 13 | ...file:/C:/Users/WAFAco/Documents/NetBeansProjects/R | 2025-08-21 | 45 | 3 | Dinar | 15 | large size | pizza | 19 |
| 11 | ...file:/C:/Users/WAFAco/Desktop/RestaurantManagement | 2025-08-26 | 40 | 2 | Dollar | 20 | large size | pizza | 21 |

# 7.System Testing

## 7.1 Testing Objectives

The objective of system testing is to ensure that all functions of the restaurant management system operate correctly and without errors, and that it meets user requirements and technical specifications.

## 7.2 Types of Tests Performed

Unit Testing: Each software module (such as MealDAO, UserDAO) was tested independently to ensure the validity of operations such as inserting, updating, deleting, and retrieving from the database.

Integration Testing: The integration of modules with each other was tested, particularly the interaction between the user interface, the business logic layer, and the data access layer.

System Testing: The system was fully tested through real-world usage scenarios, such as adding a new meal, modifying a meal, and logging in and out for users.

User Acceptance Testing: The system was demonstrated to potential users to test the system and ensure ease of use and functionality.

## 7.3 Results

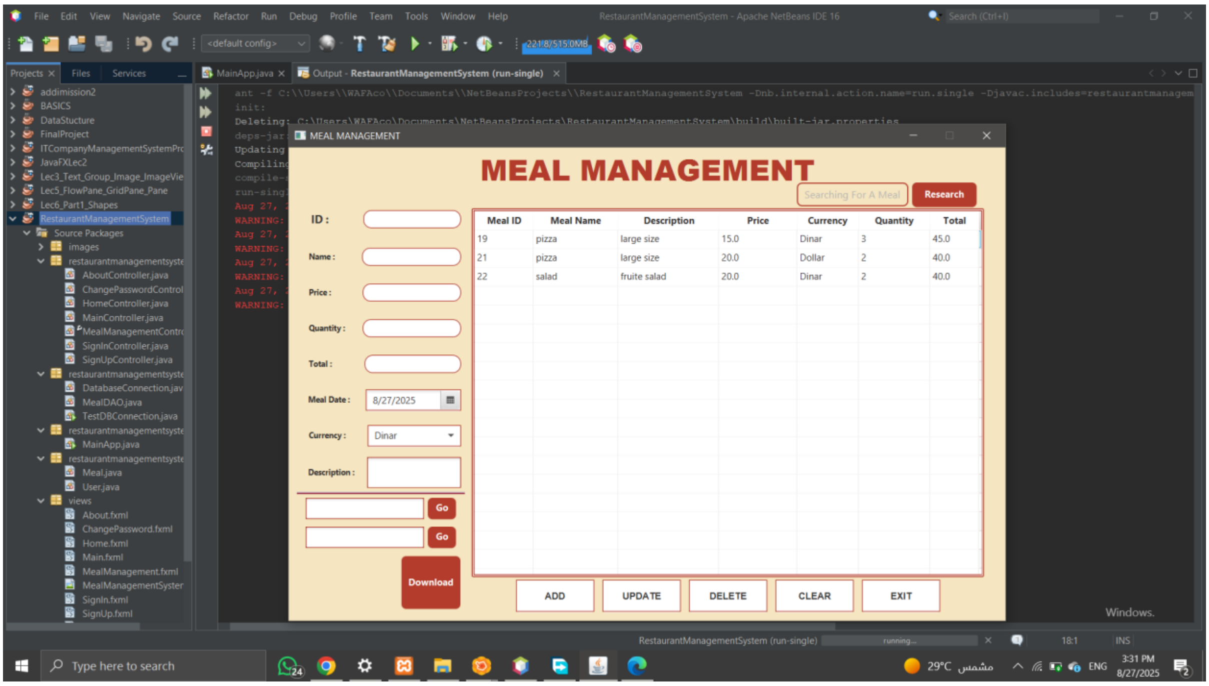
All tests were successfully completed, and some minor bugs that occurred during testing were corrected. The system demonstrated high stability and good performance in handling various operations.

## 7.4 Testing Tools Used

NetBeans Development Environment

MySQL Workbench for Database Monitoring

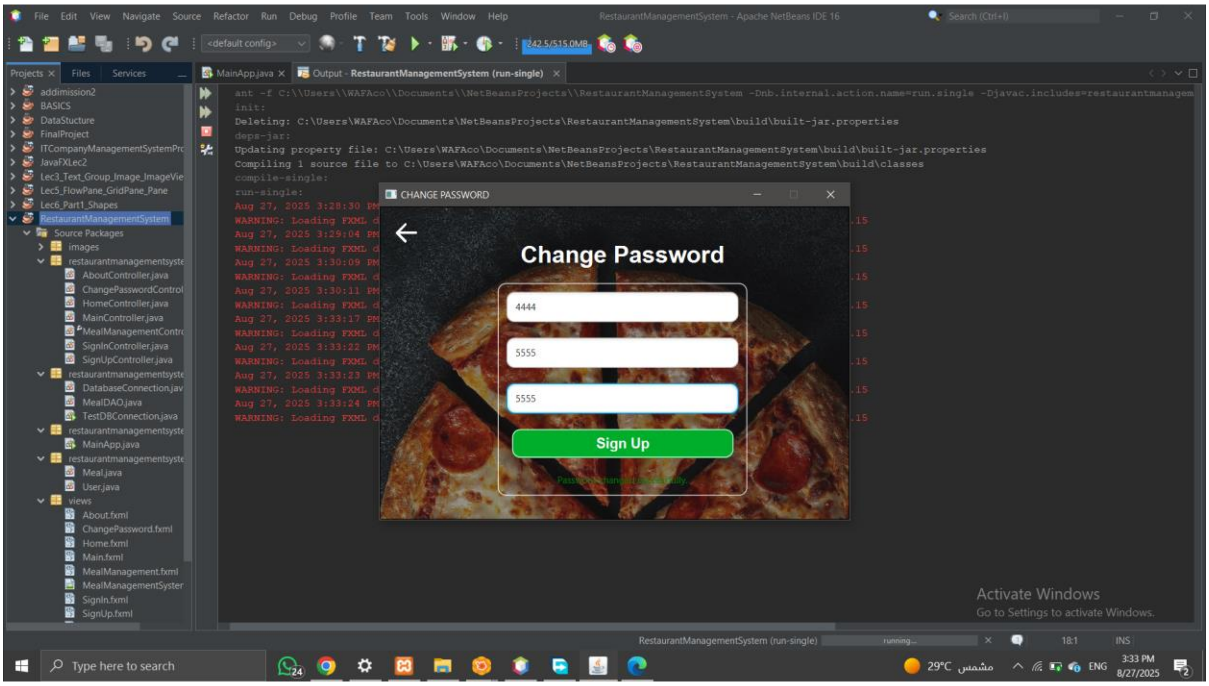
# Manual Testing Through the User Interface.



Meal Date: 8/27/2025

Currency: Dinar

| Meal ID | Meal Name | Description | Price | Currency | Quantity | Total |
|---|---|---|---|---|---|---|
| 19 | pizza | large size | 15.0 | Dinar | 3 | 45.0 |
| 21 | pizza | large size | 20.0 | Dollar | 2 | 40.0 |
| 22 | salad | fruite salad | 20.0 | Dinar | 2 | 40.0 |



```
ant -f C:\\Users\\WAFAco\\Documents\\NetBeansProjects\\RestaurantManagementSystem -Dnb.internal.action.name=run.single -Djavac.includes=restaurantmanagem
init:
Deleting: C:\Users\WAFAco\Documents\NetBeansProjects\RestaurantManagementSystem\build\built-jar.properties
deps-jar:
Updating property file: C:\Users\WAFAco\Documents\NetBeansProjects\RestaurantManagementSystem\build\built-jar.properties
Compiling 1 source file to C:\Users\WAFAco\Documents\NetBeansProjects\RestaurantManagementSystem\build\classes
compile-single:
run-single:
Aug 27, 2025 3:28:30 PM
WARNING: Loading FXML d                                                    .15
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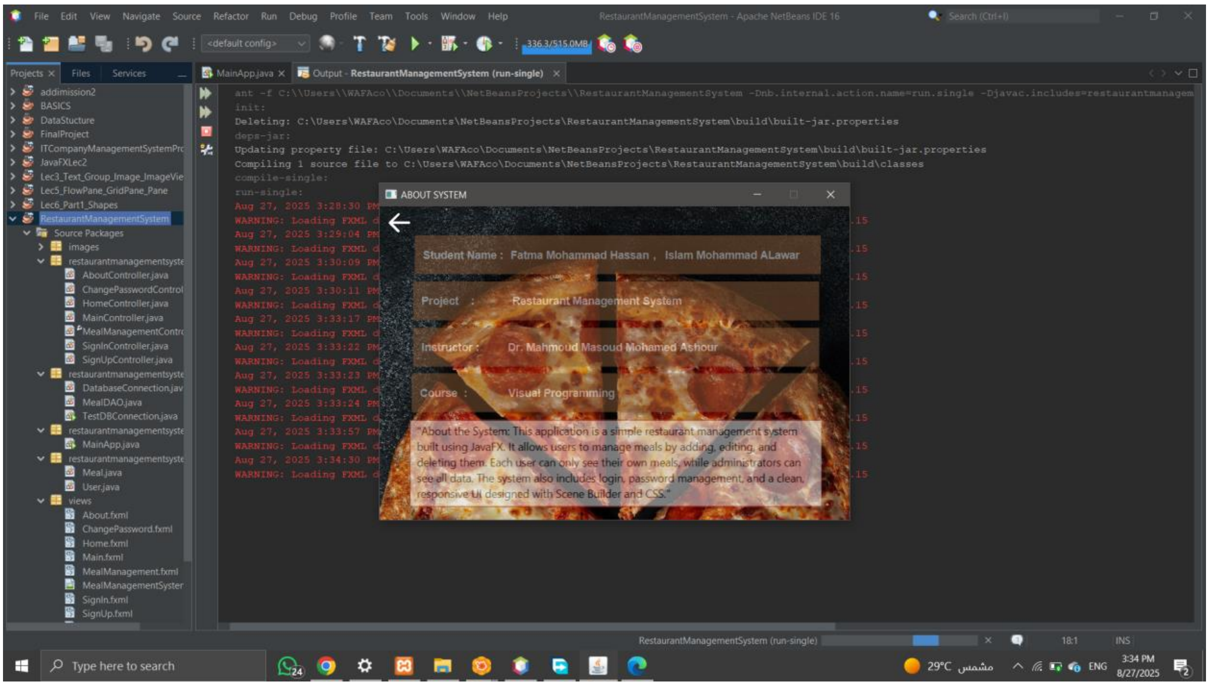
Password changed successfully.


RestaurantManagementSystem - Apache NetBeans IDE 16
File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help
Projects Files Services
MainApp.java
Output - RestaurantManagementSystem (run-single)
ABOUT SYSTEM

```
ant -f C:\\Users\\WAFAco\\Documents\\NetBeansProjects\\RestaurantManagementSystem -Dnb.internal.action.name=run.single -Djavac.includes=restaurantmanagem
init:
Deleting: C:\Users\WAFAco\Documents\NetBeansProjects\RestaurantManagementSystem\build\built-jar.properties
deps-jar:
Updating property file: C:\Users\WAFAco\Documents\NetBeansProjects\RestaurantManagementSystem\build\built-jar.properties
Compiling 1 source file to C:\Users\WAFAco\Documents\NetBeansProjects\RestaurantManagementSystem\build\classes
compile-single:
run-single:
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Aug 27, 2025 3:34:30 PM
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```

Student Name : Fatma Mohammad Hassan , Islam Mohammad ALawar

Project : Restaurant Management System

Instructor : Dr. Mahmoud Masoud Mohamed Ashour

Course : Visual Programming

"About the System: This application is a simple restaurant management system built using JavaFX. It allows users to manage meals by adding, editing, and deleting them. Each user can only see their own meals, while administrators can see all data. The system also includes login, password management, and a clean, responsive UI designed with Scene Builder and CSS."

# 8.Conclusion and Recommendations

## 8.1 Conclusion

The restaurant management system was successfully developed, achieving the desired goals of facilitating meal, order, and user management. The system helped improve data organization and reduce manual errors, in addition to providing an easy and efficient user interface. This project applied object-oriented programming principles and designed a suitable database to ensure the stability and performance of the system.

## 8.2 Recommendations

User Interface Development: The user interface can be improved to be more interactive and engaging using modern technologies such as JavaFX or web.

Adding advanced features: Such as detailed revenue reports, an inventory management system, and low-stock alerts.

Providing an advanced security system: Enhancing system security with better password protection and encryption of sensitive data.

System Expansion: The ability to support multiple restaurant branches with a centralized operations management system.

Integrating the system with electronic payment systems: To facilitate online ordering and payment.

## 9.References

This section documents all sources and references consulted during the project, whether books, articles, websites, or technical documentation.

Examples of references that can be included: Oracle website, JDBC documentation, available at: https://docs.oracle.com/javase/8/docs/technotes/guides/jdbc/

Book: "Java: The Complete Reference" - Herbert Schildt

Official MySQL website: https://dev.mysql.com/doc/

Tutorials and articles on sites such as Stack Overflow, GeeksforGeeks, and others.

References specific to programming tools used, such as NetBeans and MySQL Workbench.