RECIPE GENERATOR

A MINI-PROJECT BY:

AISHWARYA A 230701015

AKSHITHAA H 230701025

in partial fulfilment of the award of the degree

OF

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING

RAJALAKSHMI ENGINEERING COLLEGE, CHENNAI

An Autonomous Institute

CHENNAI

NOVEMBER 2024

BONAFIDE CERTIFICATE

It is hereby certified that the project titled **“Recipe Generator”** is a genuine work carried out by **Aishwarya A (230701015)** and **Akshithaa H (230701025)**,2nd-year students of the **Department of Computer Science and Engineering** for **CS23333-Object Oriented Programming using JAVA** in the year **2024- 2025**.

This project was undertaken as part of the academic requirements under theguidance and supervision of the undersigned.

Academic Year : 2024-2025 **Semester:** IIIrd sem **Branch :** CSE

FACULTY SIGNATURE

MRS B.DEEPA

ABSTRACT

This project focuses on the development of an interactive and user-friendly graphical user interface (GUI) application built using Java Swing. The core functionality of the application is to enable users to input, store, and retrieve data efficiently. The application uses a combo box as the primary component for user interaction, where users can dynamically add new items. These items are not only displayed in the combo box for immediate selection but are also stored persistently in a backend SQL database.

The integration of Java Swing with SQL forms the foundation of this project, ensuring that the user inputs are handled seamlessly and stored for long-term accessibility. By leveraging Java Swing, the application delivers a visually appealing and intuitive interface, making it easy for users to navigate and interact with the system. Features like button-based operations, input validation, and a clean layout enhance the usability of the application, catering to both beginners and experienced users.

On the backend, SQL plays a critical role in managing the data lifecycle. The database stores user inputs entered through the application, ensuring that the data persists even after the application is closed. This persistence feature eliminates the need for users to re-enter data and provides a reliable way to retrieve previously stored information. The database design is optimized for performance, allowing for real-time data storage and retrieval with minimal latency.

The application's functionality is designed with scalability and robustness in mind. For instance, users can repeatedly add new items to the combo box without encountering performance bottlenecks. The system also includes safeguards to prevent duplicate entries, ensuring data consistency and accuracy. Additionally, the application supports error handling mechanisms to address issues such as database connectivity failures or invalid inputs, thereby enhancing reliability.

TABLE OF CONTENTS

1.1 Introduction

The project focuses on creating a simple user interaction system that allows users to enter text into a combo box. This data is stored in a database and retrieved when necessary. The project aims to demonstrate how a GUI-based system can be integrated with a database for real-time data storage and retrieval.

1.2 Objectives

The objectives of the project are as follows:

- Design and develop a user-friendly GUI using Java Swing components.

- Enable real-time data entry and storage via combo boxes.

- Integrate an SQL database to store user inputs persistently.

- Provide a simple interface for displaying and interacting with stored data.

1.3 Modules

The project is divided into the following modules:

- GUI Module: Responsible for displaying the user interface, including combo boxes and labels.

- Database Integration Module: Manages the interaction between the Java application and the SQL database, including data storage and retrieval.

- Event Handling Module: Manages user actions like input, selection, and data saving.

2. SURVEY OF TECHNOLOGIES

2.1 Software Description

This project utilizes Java Swing for the development of the GUI, allowing users to interact with combo boxes. Java Swing provides a set of tools for building windows-based applications with various GUI components. The project also integrates an SQL database (MySQL) for storing data entered by users.

2.2 Languages

This section describes the programming languages and technologies used to develop the project

2.2.1 SQL

SQL (Structured Query Language) is used for managing and querying data in relational databases. The project uses SQL commands to store, retrieve, and delete data from the database.

2.2.2 Java Swing

Java Swing is part of the Java Foundation Classes (JFC) used for building graphical user interfaces. In this project, Java Swing components like `JComboBox`, `JLabel`, and `JButton` are used to create the interface where users can input and view data.

3. REQUIREMENTS AND ANALYSIS

3.1 Requirement Specification

The following are the system requirements:

- Functional Requirements:
  - The user should be able to input data into a combo box.
  - The combo box should be editable.
  - The input data should be saved to a database immediately after entry.
  - The user interface should be responsive and user-friendly.

- Non-Functional Requirements:

  - The system should be able to handle at least 1000 records in the combo box.

  - The application should have minimal load time when accessing data from the database.

3.2 Hardware and Software Requirements

- Hardware Requirements:

  - A computer with at least 2 GB of RAM.

  - A display resolution of 1024x768 or higher.

- Software Requirements:

  - Java Development Kit (JDK) 8 or above.

  - MySQL database for storing and managing data.

  - A text editor or Integrated Development Environment (IDE) such as Eclipse or IntelliJ IDEA.

3.3 Architectural Diagram

The architecture of the system follows a layered structure:

- Presentation Layer: Handles the user interface using Java Swing.

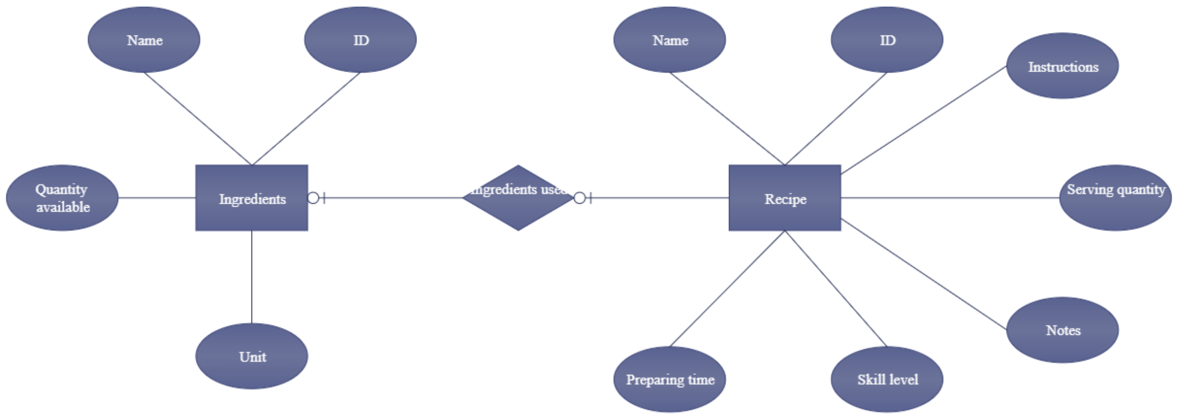
- Business Logic Layer: Handles the logic for input validation, interaction, and data storage.

- Data Layer: Interacts with the SQL database for storing and retrieving data.

3.4 ER Diagram

The Entity-Relationship (ER) diagram defines the data structure for storing input items in the database. It includes relationships between various entities like `User`, `Item`, and `Transaction`.

ER diagram of Recipe database

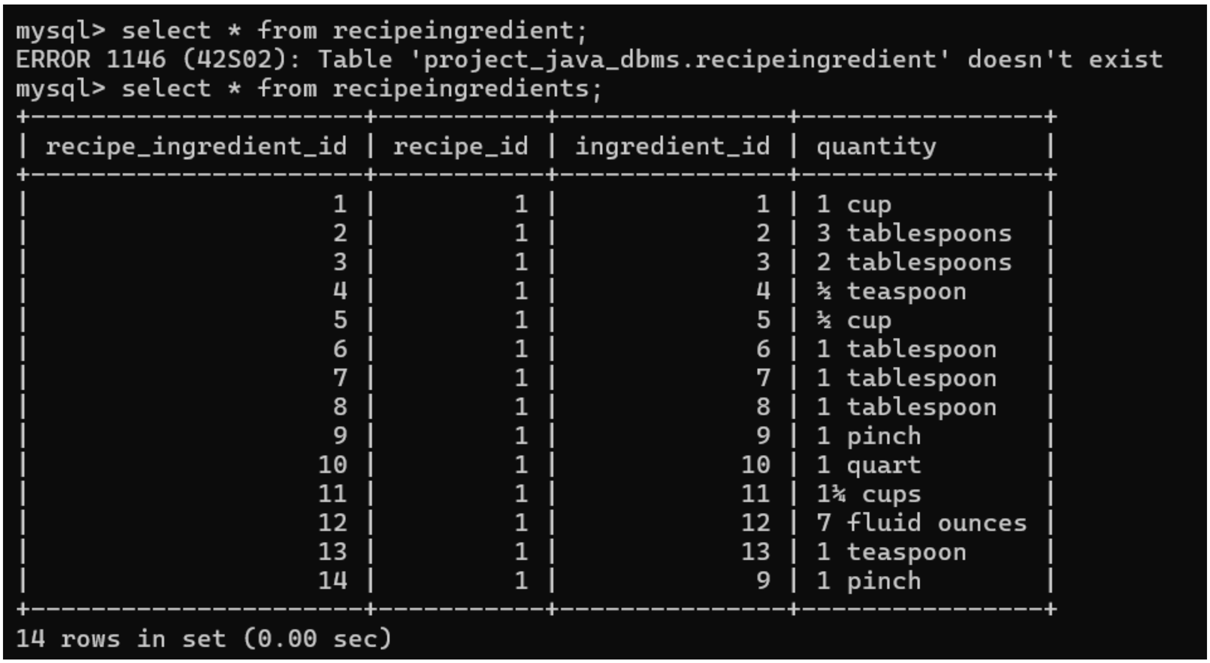


3.5 Normalization

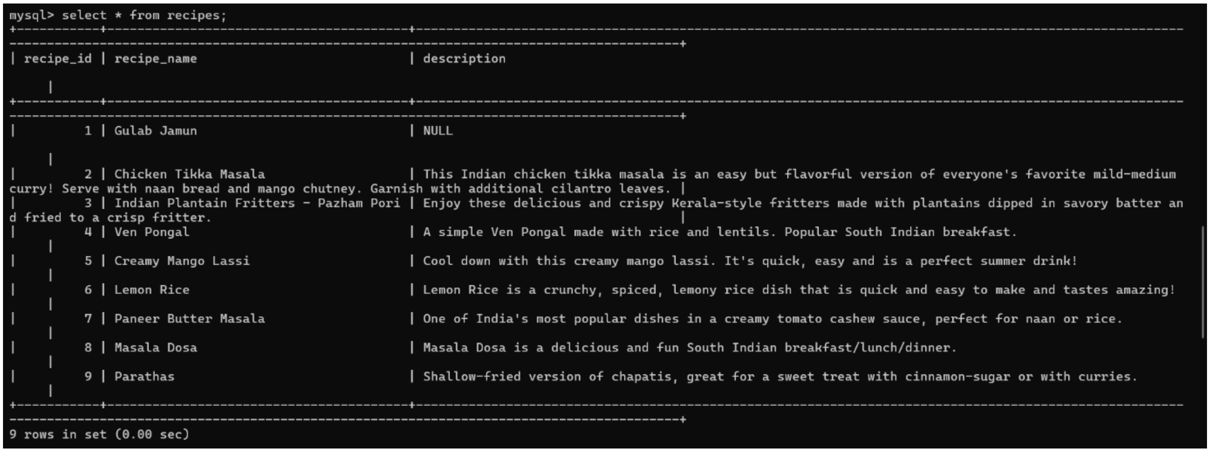
Normalization is the process of organizing the data in the database to reduce redundancy. The project ensures that the data is normalized to the third normal form (3NF), ensuring minimal duplication of data and efficient storage.

4. PROGRAM CODE

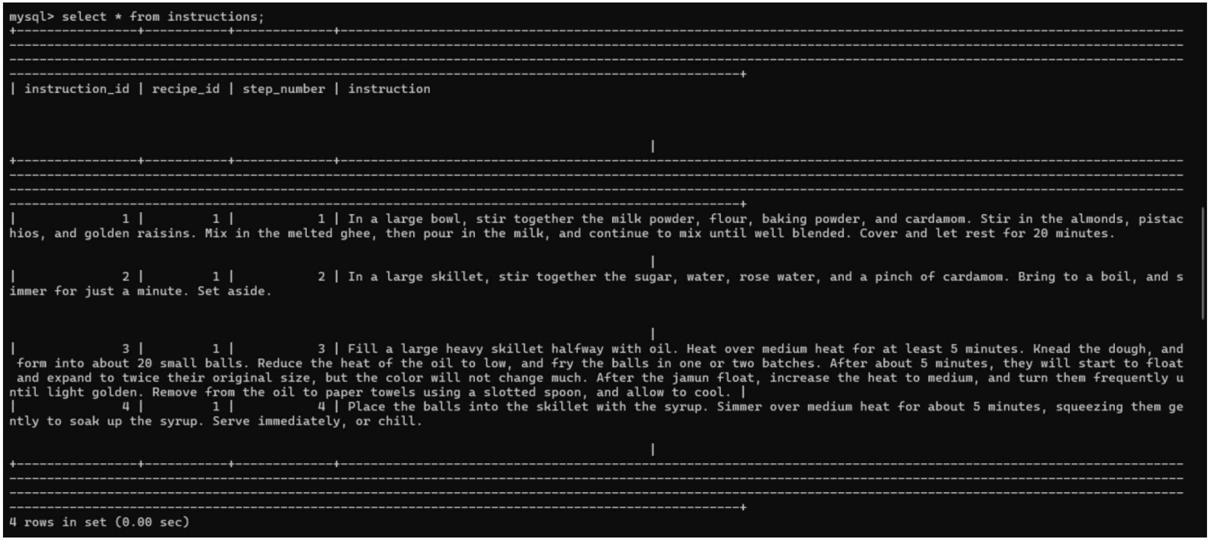
This section contains the Java code used for developing the project. The code includes all the components required for creating the graphical user interface, adding functionality to the combo box, and interacting with the SQL database for storing and retrieving data. The code is organized into multiple classes and modules to make it easier to understand and maintain.



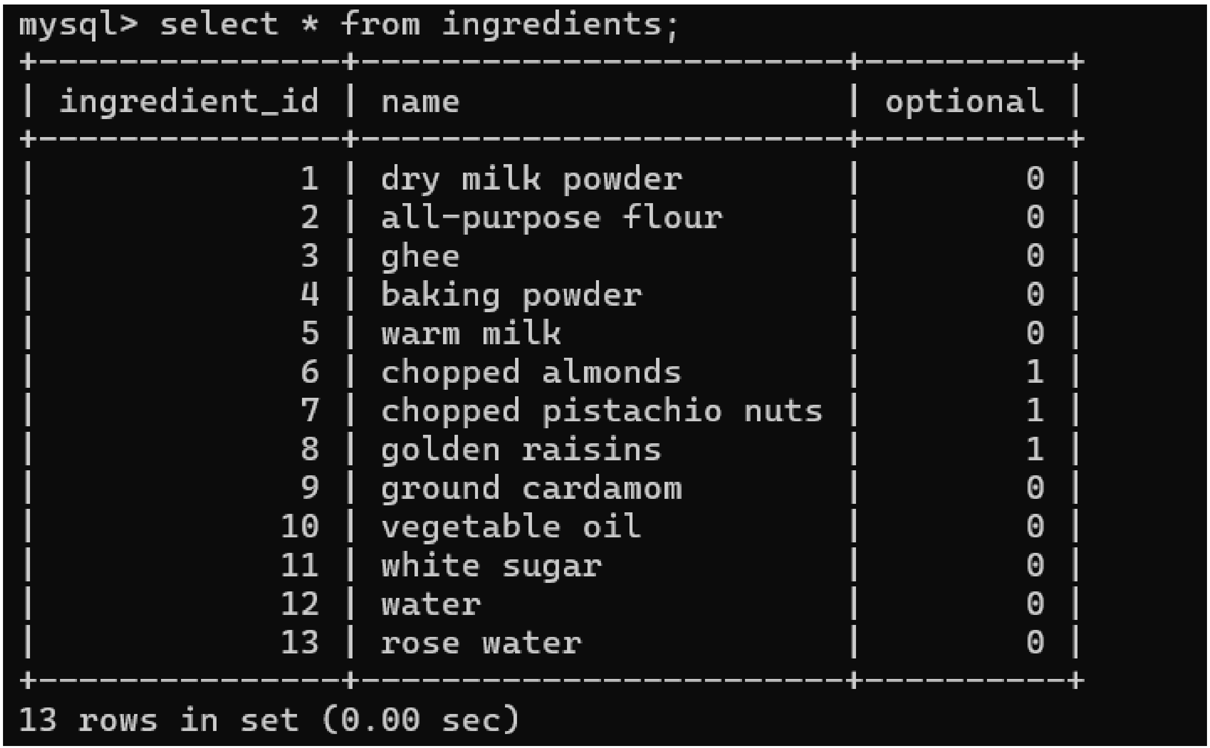
```
mysql> select * from recipeingredient;
ERROR 1146 (42S02): Table 'project_java_dbms.recipeingredient' doesn't exist
mysql> select * from recipeingredients;
+----------------------+-----------+---------------+-----------------+
| recipe_ingredient_id | recipe_id | ingredient_id | quantity        |
+----------------------+-----------+---------------+-----------------+
|                    1 |         1 |             1 | 1 cup           |
|                    2 |         1 |             2 | 3 tablespoons   |
|                    3 |         1 |             3 | 2 tablespoons   |
|                    4 |         1 |             4 | ½ teaspoon      |
|                    5 |         1 |             5 | ½ cup           |
|                    6 |         1 |             6 | 1 tablespoon    |
|                    7 |         1 |             7 | 1 tablespoon    |
|                    8 |         1 |             8 | 1 tablespoon    |
|                    9 |         1 |             9 | 1 pinch         |
|                   10 |         1 |            10 | 1 quart         |
|                   11 |         1 |            11 | 1¾ cups         |
|                   12 |         1 |            12 | 7 fluid ounces  |
|                   13 |         1 |            13 | 1 teaspoon      |
|                   14 |         1 |             9 | 1 pinch         |
+----------------------+-----------+---------------+-----------------+
14 rows in set (0.00 sec)
```



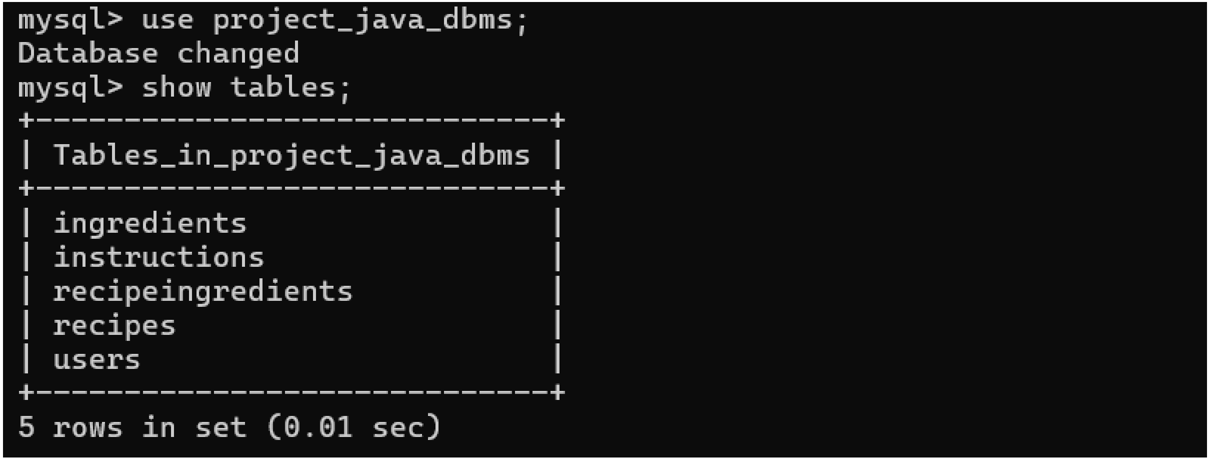
```
mysql> select * from recipes;
+-----------+----------------------------------------+------------------------------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------+
| recipe_id | recipe_name                            | description

    |
+-----------+----------------------------------------+------------------------------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------+
|         1 | Gulab Jamun                            | NULL

    |
|         2 | Chicken Tikka Masala                   | This Indian chicken tikka masala is an easy but flavorful version of everyone's favorite mild-medium
curry! Serve with naan bread and mango chutney. Garnish with additional cilantro leaves. |
|         3 | Indian Plantain Fritters - Pazham Pori | Enjoy these delicious and crispy Kerala-style fritters made with plantains dipped in savory batter an
d fried to a crisp fritter.                                                                |
|         4 | Ven Pongal                             | A simple Ven Pongal made with rice and lentils. Popular South Indian breakfast.
    |
|         5 | Creamy Mango Lassi                     | Cool down with this creamy mango lassi. It's quick, easy and is a perfect summer drink!
    |
|         6 | Lemon Rice                             | Lemon Rice is a crunchy, spiced, lemony rice dish that is quick and easy to make and tastes amazing!
    |
|         7 | Paneer Butter Masala                   | One of India's most popular dishes in a creamy tomato cashew sauce, perfect for naan or rice.
    |
|         8 | Masala Dosa                            | Masala Dosa is a delicious and fun South Indian breakfast/lunch/dinner.
    |
|         9 | Parathas                               | Shallow-fried version of chapatis, great for a sweet treat with cinnamon-sugar or with curries.
    |
+-----------+----------------------------------------+------------------------------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------+
9 rows in set (0.00 sec)
```



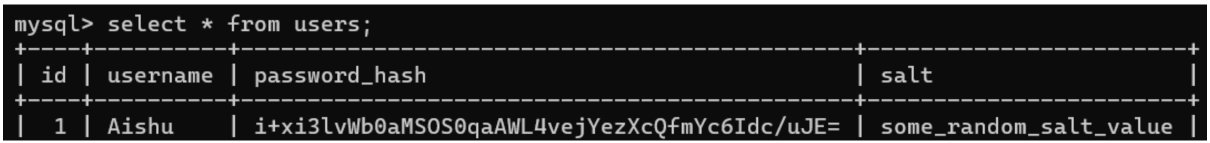
```
mysql> select * from instructions;
+----------------+-----------+-------------+--------------------------------------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------
---------------------------------------------------------------------------------------------------+
| instruction_id | recipe_id | step_number | instruction



                                                                                   |
+----------------+-----------+-------------+--------------------------------------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------
---------------------------------------------------------------------------------------------------+
|              1 |         1 |           1 | In a large bowl, stir together the milk powder, flour, baking powder, and cardamom. Stir in the almonds, pistac
hios, and golden raisins. Mix in the melted ghee, then pour in the milk, and continue to mix until well blended. Cover and let rest for 20 minutes.

                                                                                   |
|              2 |         1 |           2 | In a large skillet, stir together the sugar, water, rose water, and a pinch of cardamom. Bring to a boil, and s
immer for just a minute. Set aside.


                                                                                   |
|              3 |         1 |           3 | Fill a large heavy skillet halfway with oil. Heat over medium heat for at least 5 minutes. Knead the dough, and
 form into about 20 small balls. Reduce the heat of the oil to low, and fry the balls in one or two batches. After about 5 minutes, they will start to float
 and expand to twice their original size, but the color will not change much. After the jamun float, increase the heat to medium, and turn them frequently u
ntil light golden. Remove from the oil to paper towels using a slotted spoon, and allow to cool. |
|              4 |         1 |           4 | Place the balls into the skillet with the syrup. Simmer over medium heat for about 5 minutes, squeezing them ge
ntly to soak up the syrup. Serve immediately, or chill.

                                                                                   |
+----------------+-----------+-------------+--------------------------------------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------
---------------------------------------------------------------------------------------------------+
4 rows in set (0.00 sec)
```



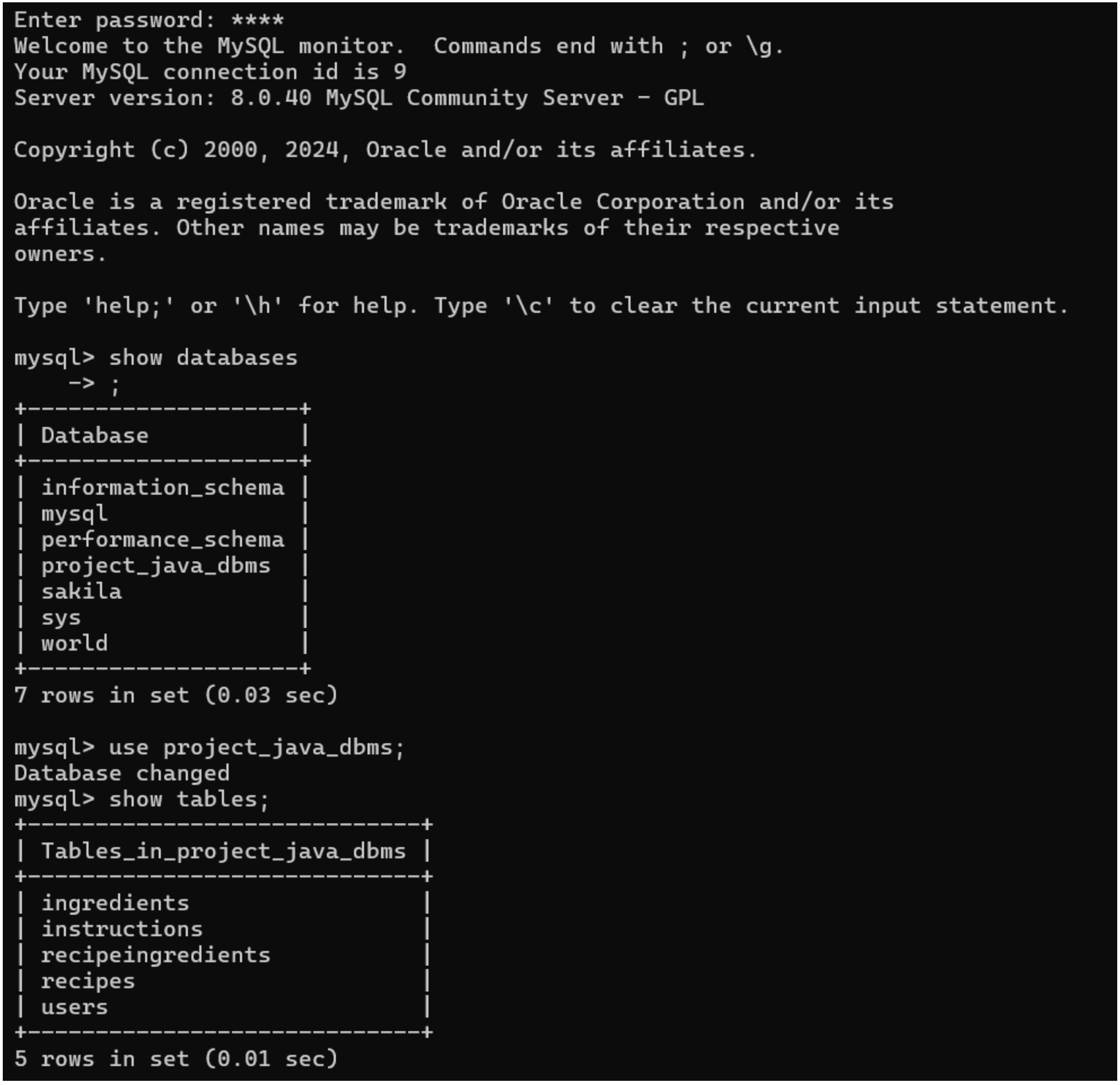
```
mysql> select * from ingredients;
+---------------+------------------------+----------+
| ingredient_id | name                   | optional |
+---------------+------------------------+----------+
|             1 | dry milk powder        |        0 |
|             2 | all-purpose flour      |        0 |
|             3 | ghee                   |        0 |
|             4 | baking powder          |        0 |
|             5 | warm milk              |        0 |
|             6 | chopped almonds        |        1 |
|             7 | chopped pistachio nuts |        1 |
|             8 | golden raisins         |        1 |
|             9 | ground cardamom        |        0 |
|            10 | vegetable oil          |        0 |
|            11 | white sugar            |        0 |
|            12 | water                  |        0 |
|            13 | rose water             |        0 |
+---------------+------------------------+----------+
13 rows in set (0.00 sec)
```



```
mysql> use project_java_dbms;
Database changed
mysql> show tables;
+-----------------------------+
| Tables_in_project_java_dbms |
+-----------------------------+
| ingredients                 |
| instructions                |
| recipeingredients           |
| recipes                     |
| users                       |
+-----------------------------+
5 rows in set (0.01 sec)
```



```
mysql> select * from users;
+----+----------+----------------------------------------------+------------------------+
| id | username | password_hash                                | salt                   |
+----+----------+----------------------------------------------+------------------------+
|  1 | Aishu    | i+xi3lvWb0aMSOS0qaAWL4vejYezXcQfmYc6Idc/uJE= | some_random_salt_value |
```

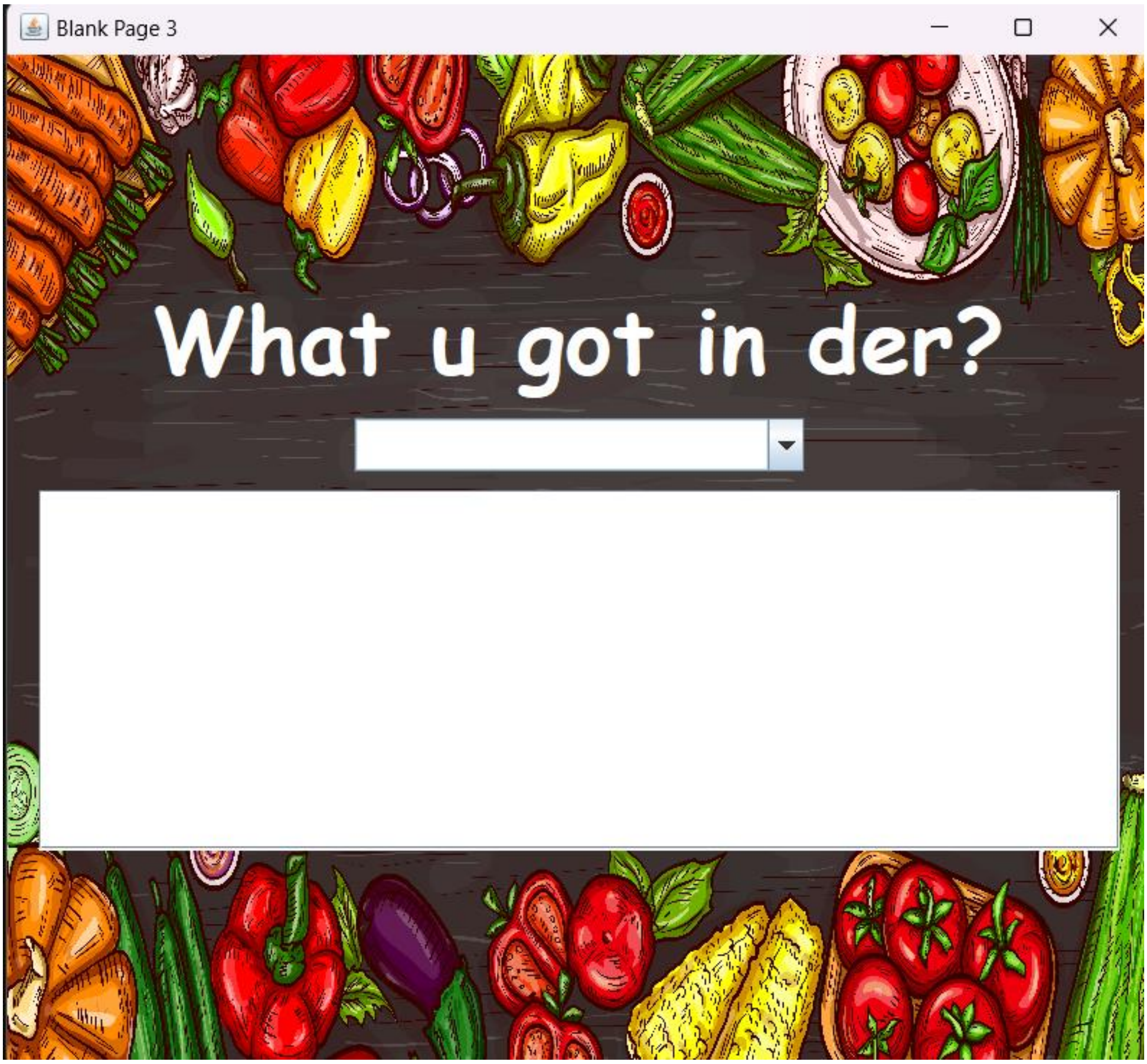


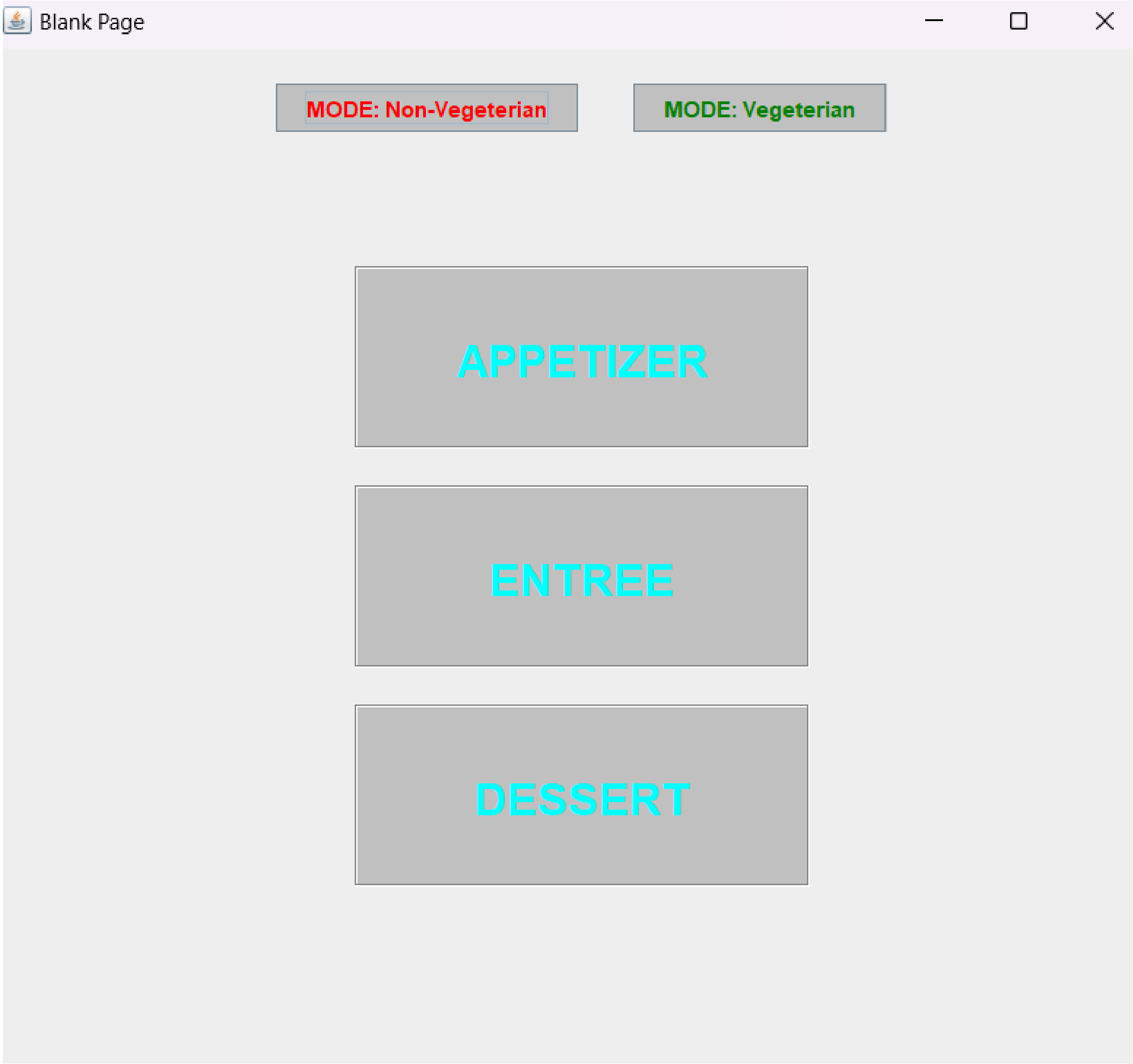
```
Enter password: ****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 9
Server version: 8.0.40 MySQL Community Server - GPL

Copyright (c) 2000, 2024, Oracle and/or its affiliates.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases
    -> ;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| project_java_dbms  |
| sakila             |
| sys                |
| world              |
+--------------------+
7 rows in set (0.03 sec)

mysql> use project_java_dbms;
Database changed
mysql> show tables;
+-----------------------------+
| Tables_in_project_java_dbms |
+-----------------------------+
| ingredients                 |
| instructions                |
| recipeingredients           |
| recipes                     |
| users                       |
+-----------------------------+
5 rows in set (0.01 sec)
```

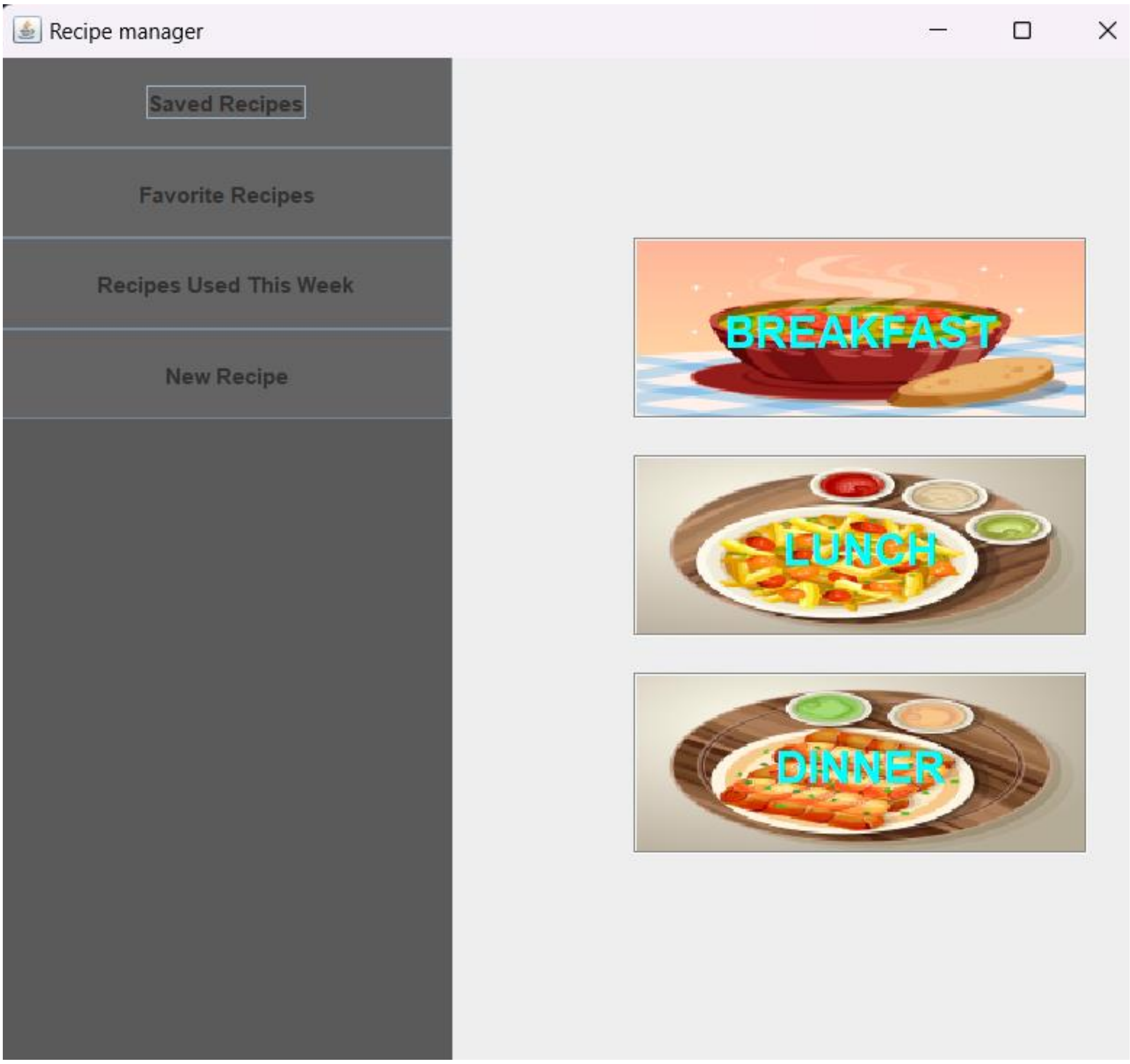
5. RESULTS AND DISCUSSION

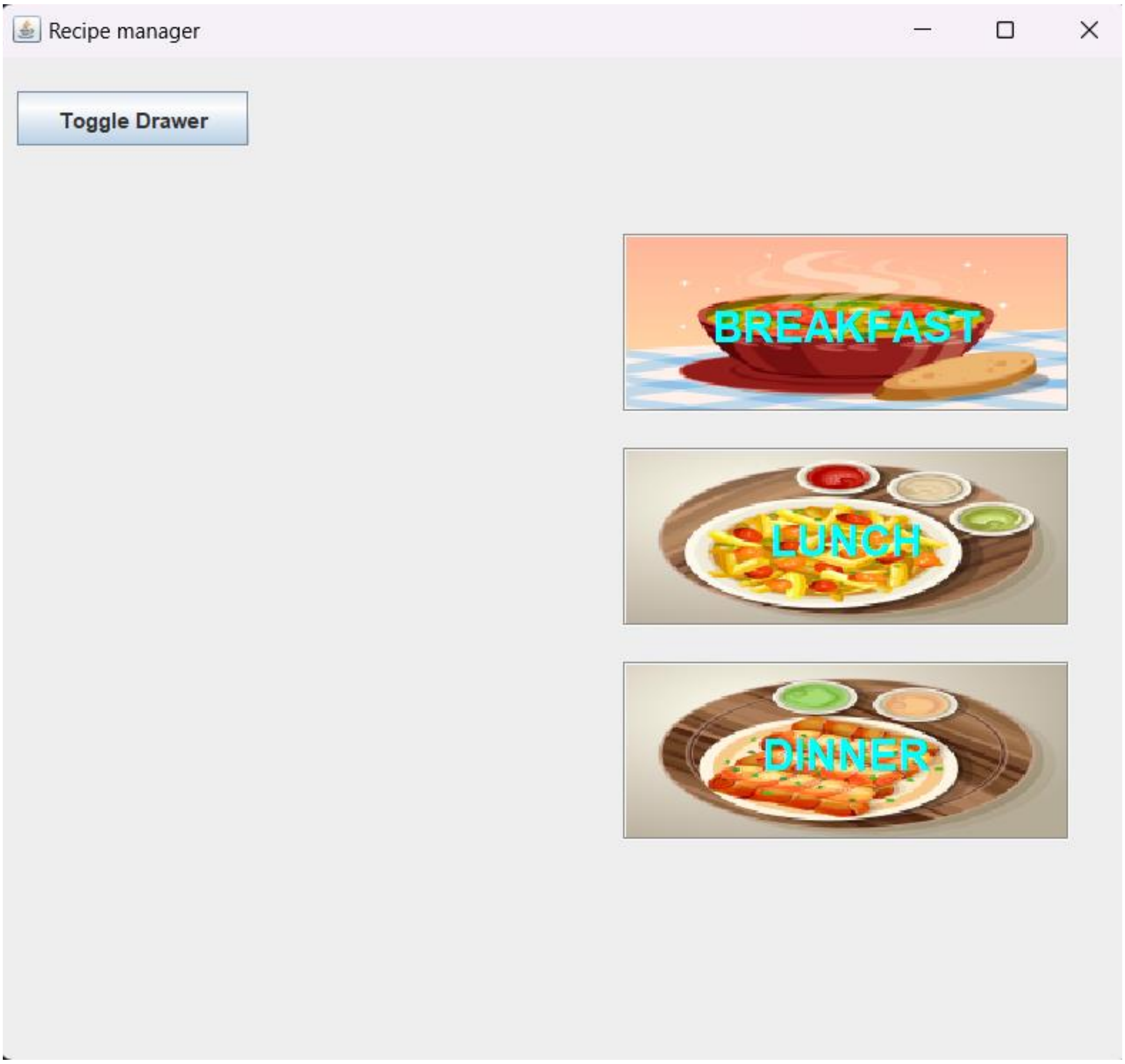
5.1 System Performance

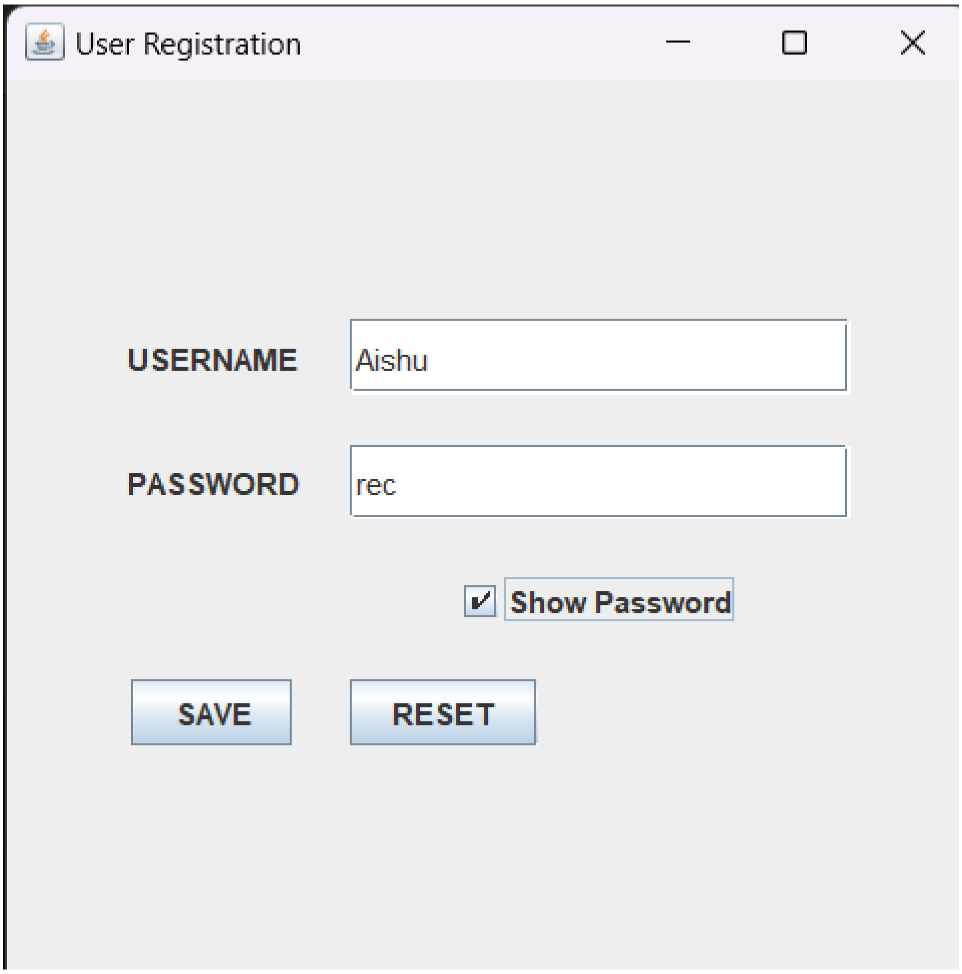
The system was able to handle the input and retrieval of data efficiently. The combo box updated with new entries in real-time and communicated seamlessly with the database. The database operations were executed with minimal delay, ensuring a smooth user experience.




Blank Page
MODE: Non-Vegeterian
MODE: Vegeterian
APPETIZER
ENTREE
DESSERT


Recipe manager
Saved Recipes
Favorite Recipes
Recipes Used This Week
New Recipe
BREAKFAST
LUNCH
DINNER


Recipe manager
Toggle Drawer
BREAKFAST
LUNCH
DINNER

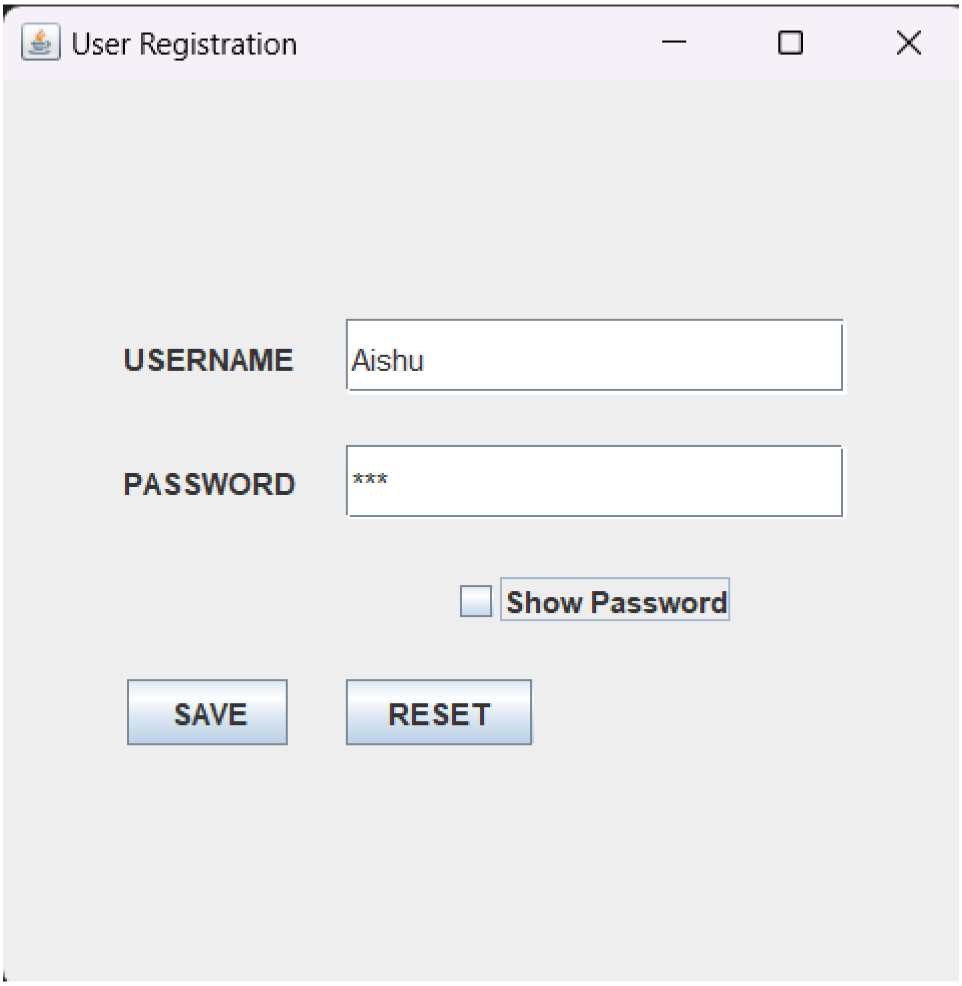


User Registration

USERNAME Aishu

PASSWORD rec

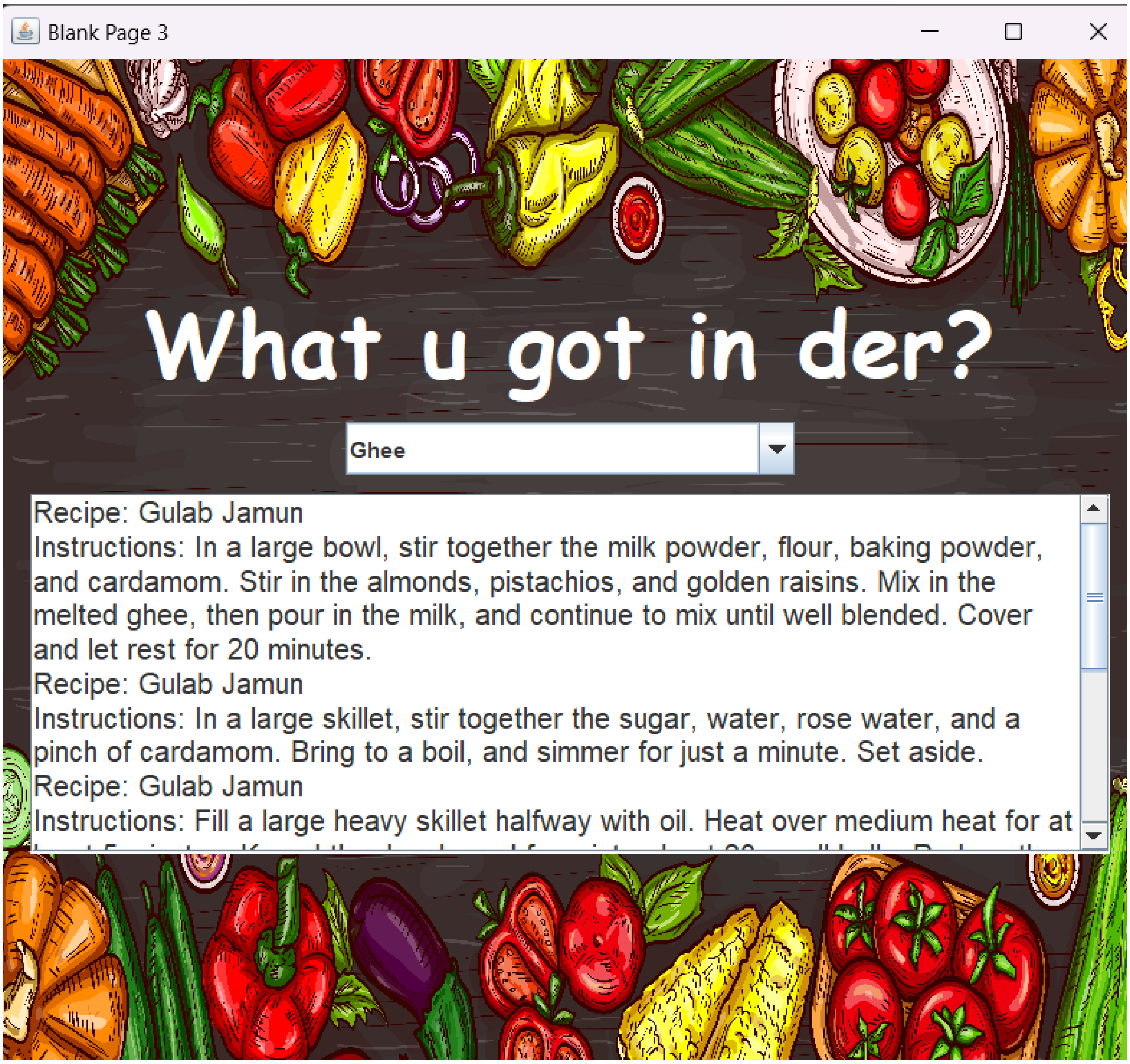
☑ Show Password



USERNAME: Aishu

PASSWORD: ***

□ Show Password



Ghee

Recipe: Gulab Jamun
Instructions: In a large bowl, stir together the milk powder, flour, baking powder, and cardamom. Stir in the almonds, pistachios, and golden raisins. Mix in the melted ghee, then pour in the milk, and continue to mix until well blended. Cover and let rest for 20 minutes.
Recipe: Gulab Jamun
Instructions: In a large skillet, stir together the sugar, water, rose water, and a pinch of cardamom. Bring to a boil, and simmer for just a minute. Set aside.
Recipe: Gulab Jamun
Instructions: Fill a large heavy skillet halfway with oil. Heat over medium heat for at

6. CONCLUSION

The project successfully demonstrated how a simple Java Swing-based GUI can be integrated with an SQL database to allow real-time data entry and retrieval. The system was able to handle user inputs efficiently and store them persistently in the database. This project can be extended further to handle more complex data structures and interactions.

7. REFERENCES

1. https://docs.oracle.com/javase/8/docs/api/
2. https://dev.mysql.com/doc/
3. https://docs.oracle.com/javase/tutorial/uiswing/
4. https://www.tutorialspoint.com/jdbc/index.htm
5. https://www.geeksforgeeks.org/java-swing/
6. https://www.w3schools.com/sql/
7. https://www.javatpoint.com/java-jdbc
8. https://www.mysqltutorial.org/
9. https://docs.oracle.com/javase/tutorial/collections/interfaces/index.html
10. https://www.baeldung.com/java-jdbc