



UNIVERSITI
TEKNOLOGI
PETRONAS

OBJECT ORIENTED PROGRAMMING

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DOCUMENTATION

BAKERY MANAGEMENT SYSTEM

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1.0 DESCRIPTION

The Bakery Management System aims to resolve operational inefficiencies faced by local bakeries that rely on manual processes or outdated tools. Issues such as stock mismatches, order errors, slow service, and the absence of real-time inventory tracking can lead to poor customer experience and lost revenue. This project addresses those challenges by providing a centralized and digital platform that helps streamline inventory handling, customer order management, and product tracking. By automating routine tasks and organizing data flow, the system supports better operational accuracy and enhances the overall customer service experience for small or independent bakeries.

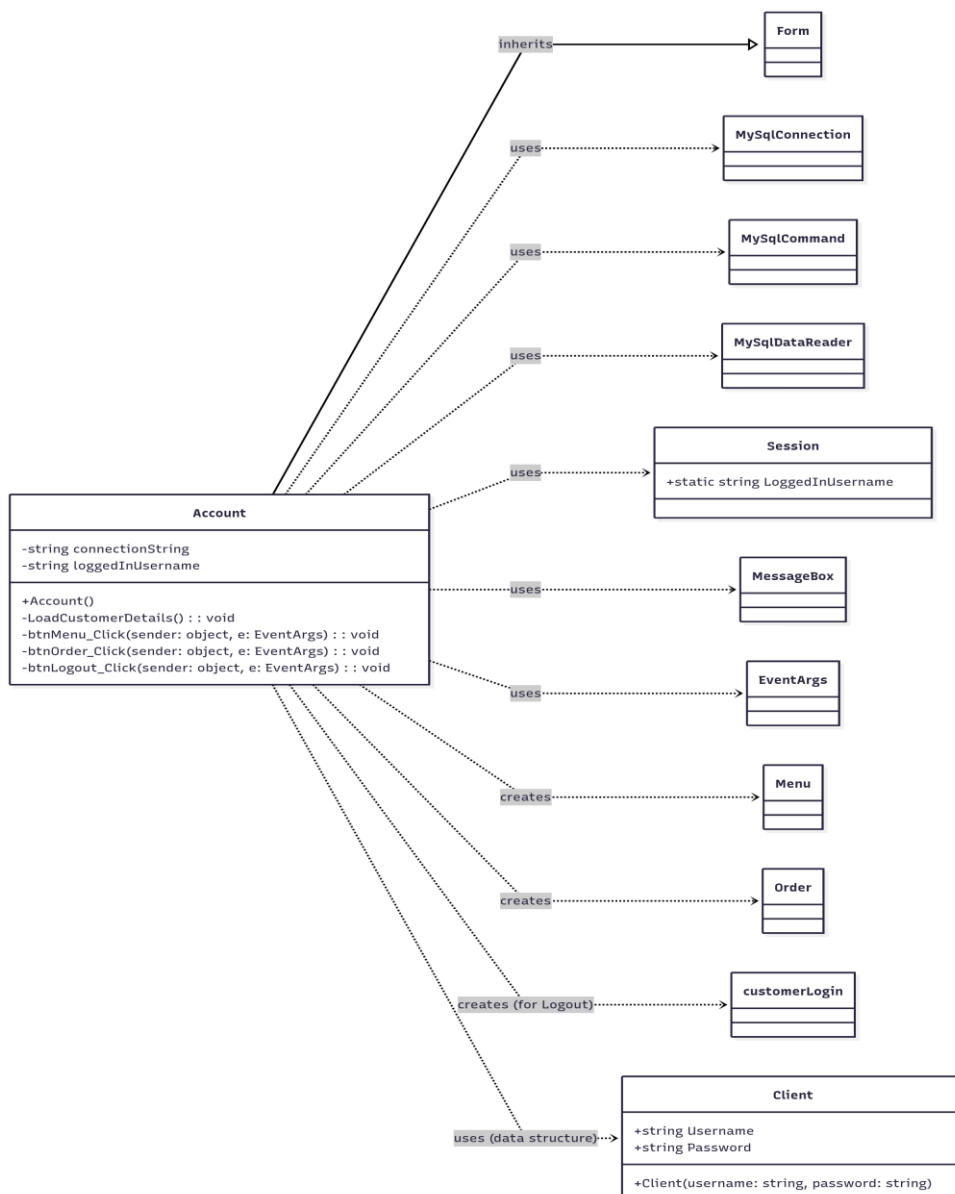
This system provides a range of core functionalities designed to streamline daily operations within a bakery. It features user authentication for both customers and staff, enabling secure login and access control through MySQL-connected forms. Customers can log in to view available products, place orders, and manage their profiles, while staff members have administrative access to manage orders, product listings, and inventory. The system uses session handling to track user activity during login sessions. Product management is a central feature, with each item represented by a Product class containing properties like product ID, name, price, quantity, and image. Admin users can add, edit, or remove products as needed, ensuring that stock availability is always up to date. Orders are handled through a dedicated form that allows staff to process customer purchases, view summaries, and store order data efficiently.

In addition to product and order handling, the system supports inventory management through an Ingredient class that tracks ingredient names, quantities, and units. This enables the bakery to monitor its internal stock levels and update ingredient quantities accordingly. Staff and customer data are handled by the Staff and Customer classes, allowing for registration, login validation, and linking customer information to order history. All user interactions are done through a graphical user interface built with Windows Forms, with components such as buttons, text fields, and data grids tied to specific functions through event handlers. A main dashboard (Menu form) allows users to navigate easily between different modules like product, order, and customer management, making the system not only functional but also intuitive to use for both technical and non-technical users.

2.0 UML

UML Diagram (Customer)

Account class



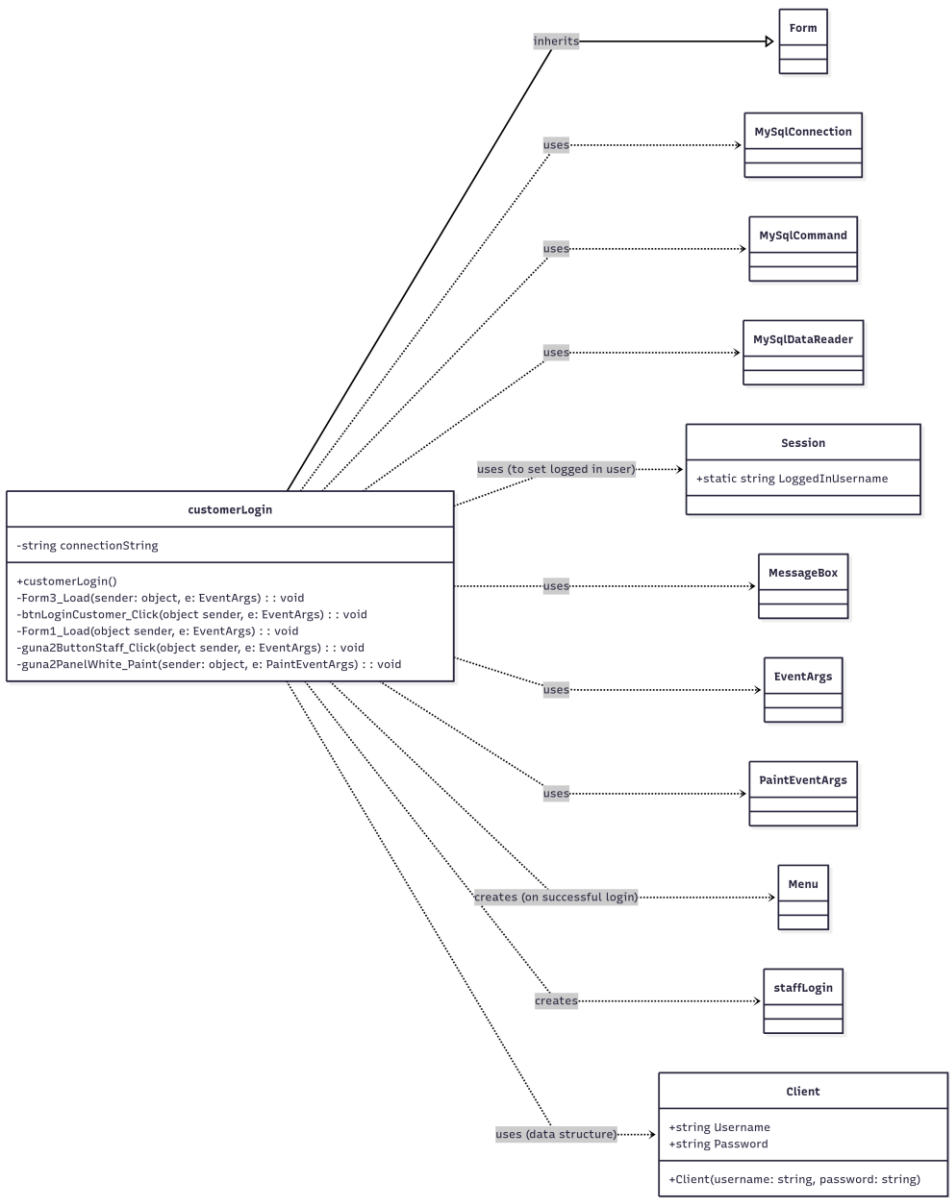
Client class

Client
+string Username +string Password
+Client(username: string, password: string)

Global State Class

GlobalState
+static int CurrentOrderId

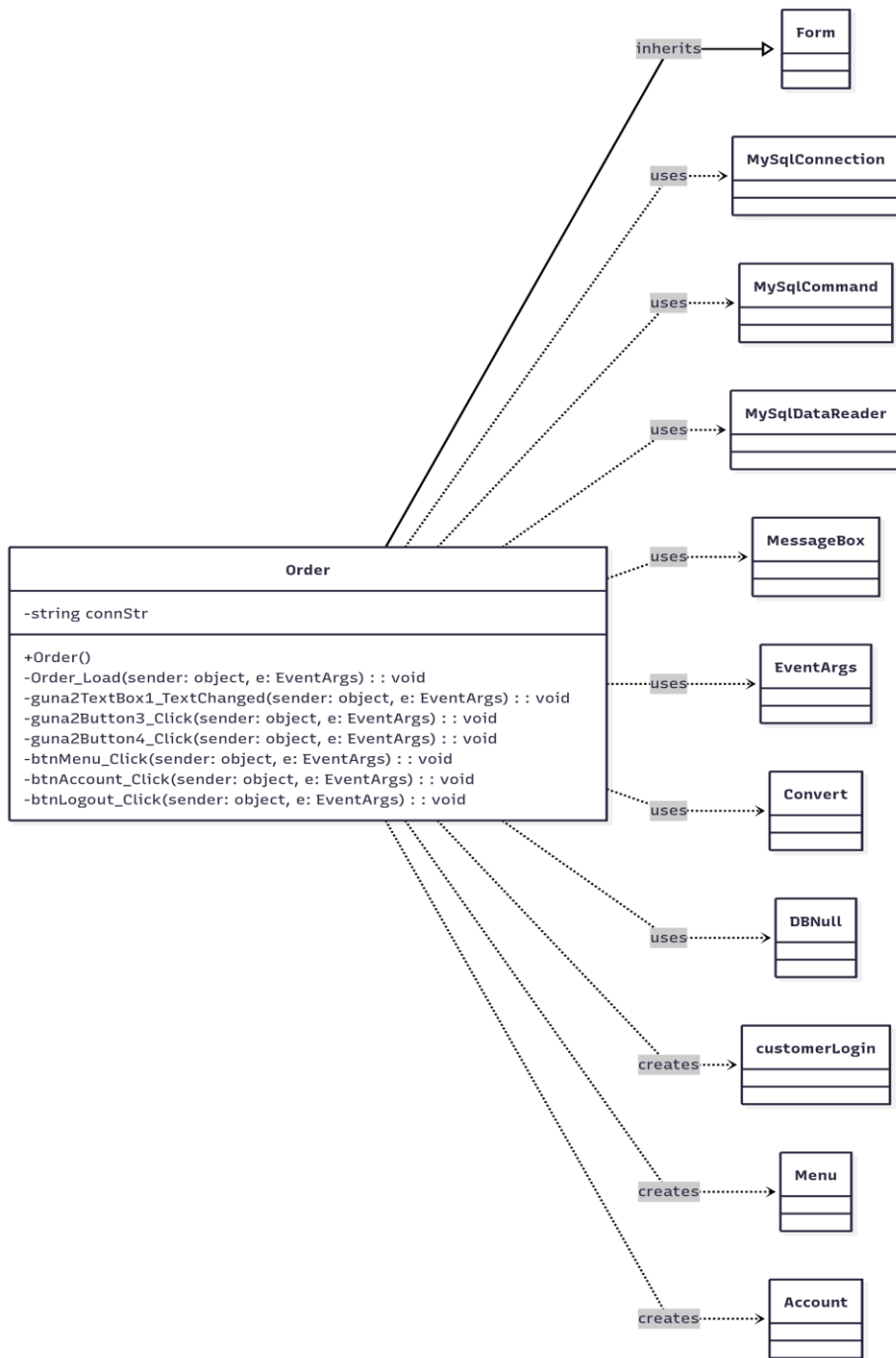
Customer Class



Ingredient Class

Ingredient
+int IngredientID +string IngredientName +int Quantity +string Unit
+Ingredient(ingredientId: int, name: string, quantity: int, unit: string) +AddQuantity(amount: int) : : void +UseQuantity(amount: int) : : bool +ToString() : : string

Order Class



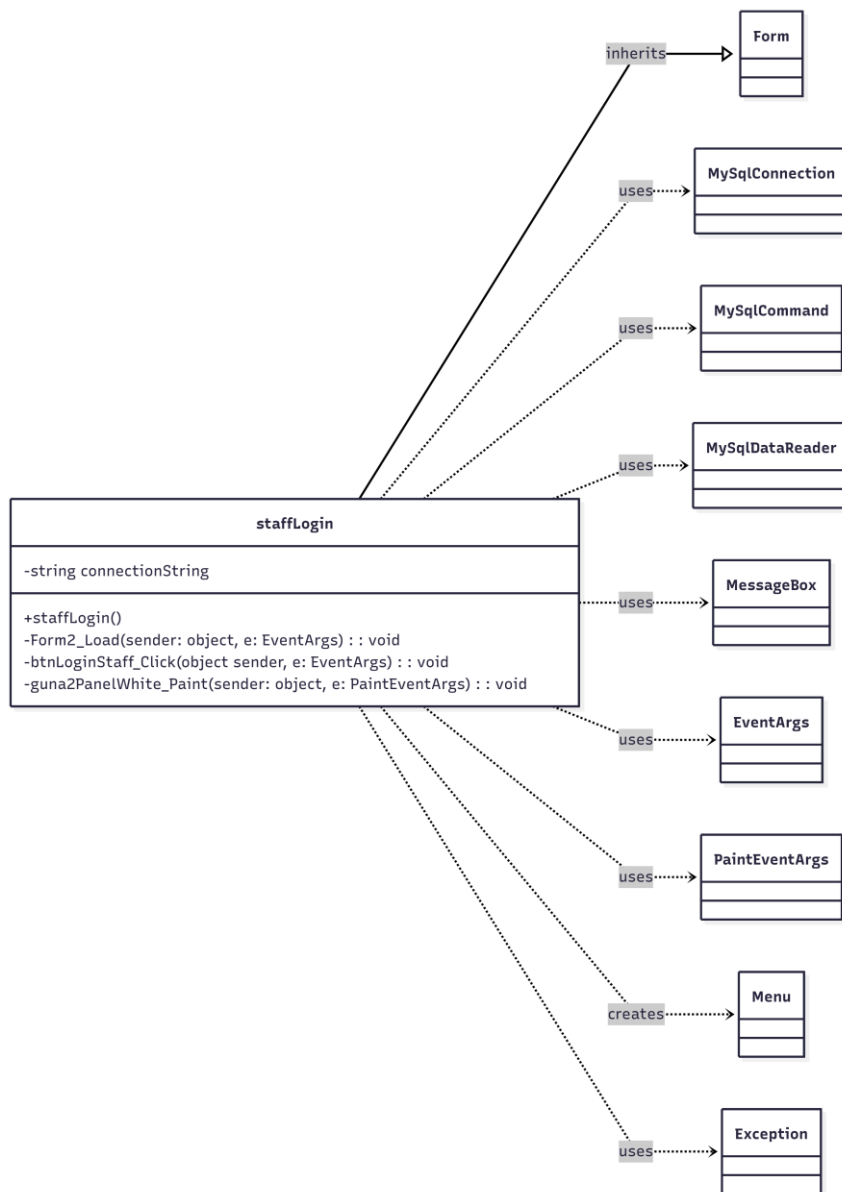
Product Class

Product
+int ProductID +string ProductName +decimal Price +int Quantity +byte[] ProductImage
+Product(productId: int, productName: string, price: decimal, quantity: int, productImage: byte[]) +AddStock(amount: int) : : void +Purchase(amount: int) : : bool +ToString() : : string

Session Class

Session
+static string LoggedInUsername

Staff Class




3.0 TEAM ORGANISATION AND CONTRIBUTIONS

<p>Name: Thurga Anjali A/P Nagappan</p> <p>StudentID: 24000041</p> <p>Programme: Information Technology</p> <p>Contributions: Developed the graphical user interface, implemented the application code, and fixed errors.</p>	<p>Name: Farah Nur Farzana bt Mohd Salleh</p> <p>StudentID: 24000057</p> <p>Programme: Information Technology</p> <p>Contributions: I led my team members by providing ideas for the project, distributing tasks among them, and designing the GUI interface for the customer section first. I organized multiple meetings to discuss project progress, coded the entire customer module for the bakery system, supervised my team's work, and kept track of their individual responsibilities.</p>
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<p>Name: Muhammad Bintang Samudra</p> <p>StudentID: 22912079</p> <p>Programme: Information Technology</p> <p>Contributions: I coded the staff section for the bakery system and created the database for it, fixing the errors, and improving the previous staff design</p>	<p>Name: Nur Najahtul Akma Binti Radzuan</p> <p>StudentID: 24000153</p> <p>Programme: Information Technology</p> <p>Contributions: Prepared project video, fixed code errors, writing and improving the application's code.</p>
<p>Name:Aisyah Sofea Binti Mohd Sallehuddin</p> <p>StudentID:22011342</p> <p>Programme: Computer Engineering</p> <p>Contributions: documentation and writing application code</p>	<p>Name: Dhurgesh A/L M Palani</p> <p>StudentID: 2400044</p> <p>Programme: Information Technology</p> <p>Contributions: Created and finalized UML diagrams specifically for all classes under the Customer module.</p>

4.0 SCREENSHOT



Please sign in

username

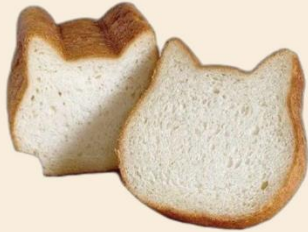
username

password

password

staff ? click here

staff sign in



BAKERY

Menu


Account

Order

Log

Menu

Only 2 orders are allowed




Strawberry Donut Cake

RM 30

2

Add to Cart




Strawberry Sugar Cake

RM 45

1

Add to Cart




Strawberry Frosting Cake

RM 40

0

Add to Cart



Strawberry Classic Cake

RM 50

0

Add to Cart

CART

choose your method

☒ Dine in ☐ Take Away

Strawberry Sugar Cake

RM 45.00

Quantity: 1

Remove

Strawberry Donut Cake

RM 60.00

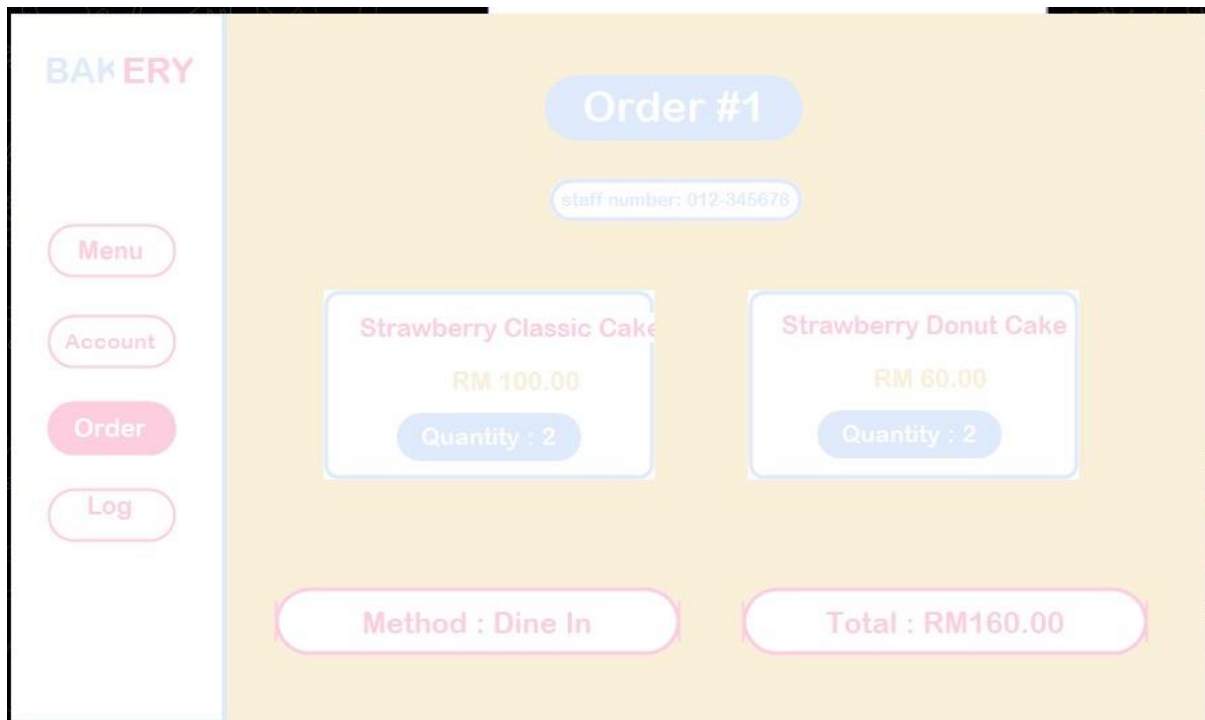
Quantity: 2

Remove


Total

RM 105.00

Place an Order



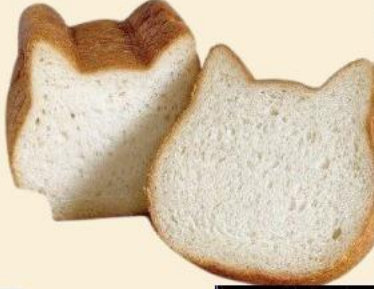
Staff Interface



Staff

username

password



Form5

BAKERY

Product

Stock

Order

Log

Product Name :

Dough

Category :

Wet Ingredient


Price :

30

Add

Clear

ID	NAME	CATEGORY	PRICE
1	Dough	Dry Ingredient	30.00



Form6

BAKERY

Product

Stock

Order

Log

Select Product :

Dough

Quantity :

3


Restock Date :

Thursday, July 31, 2025

Restock

Clear

StockID	ProductName	Quantity	LastUpdate
4	Dough	5	8/1/2025 10:47 PM
5	Chocolate	3	8/1/2025 10:47 PM



Form8

BAKERY

Product

Stock

Order

Log

Cart Panel

Product Name	Quantity
Dough	1
Chocolate	1

RM 65.00

Place Order

Delete Order

Marked As Completed

Select Product:


Chocolate

Add to Cart

Clear the Cart

Order History

Order ID	Items	Total	Date	Status
5	2	65.00	8/1/2025	Completed



5.0 LINK VIDEO

https://drive.google.com/file/d/1pWjPFD7QZ_6StEt8xbZ_tvfcPdtLa8Jt/view?usp=sharing