

CS 157a Final Project Report: Cafe Dolphin

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CS 157a: Introduction to Database Management Systems

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There are many day to day issues and responsibilities to deal with as a small business owner. The Cafe Dolphin website was created in an effort to make a hypothetical cafe owner's life easier. The employees, owner, and managers of this cafe can use this website to organize and efficiently manage orders, inventory, transactions, employee data, and customer data. The website has a user-friendly interface and uses a MySQL database to allow any Cafe Dolphin worker to have a seamless experience.

Objective

As mentioned prior, this project is meant to make it easier for the owner of Cafe Dolphin to manage their company's orders, inventory, transactions, employee data, and customer data. Node.js and MySQL were the main tools used to accomplish this task, as it was required to have at least five MySQL tables included in the database of the project. Overall, the purpose of this project could be defined as developing a web application to manage operations for Cafe Dolphin.

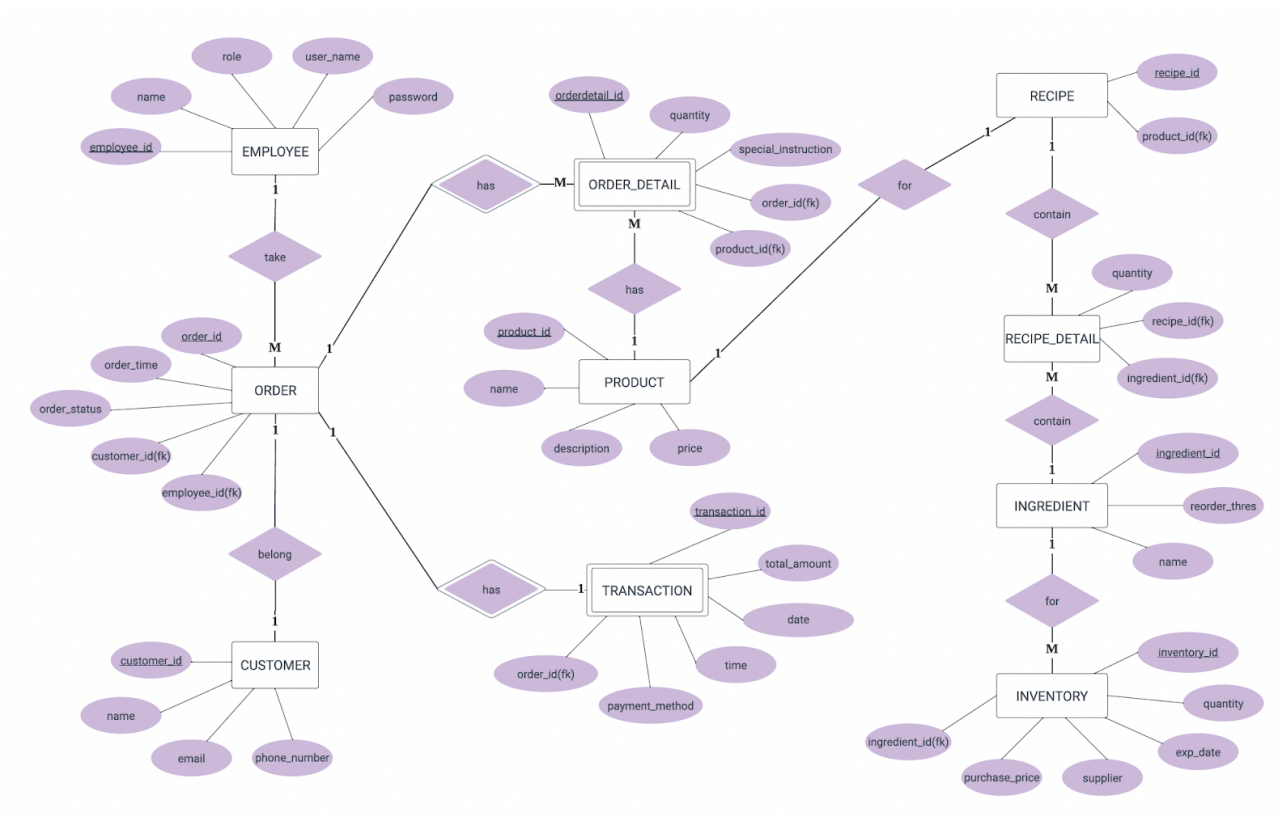
Project High-Level Design

The target users of the Cafe Dolphin website are the Cafe Dolphin staff, owner, managers, and other employees. For the frontend of the website the user interface was built using HTML, Javascript, and CSS1. The backend of the website was built using a Node.js server-side application to handle the business logic, API communication, and interactions with the MySQL database. The database uses MySQL hosted on AWS to store the data of the cafe like orders, inventory, transactions, employee data, and customer data.

User authentication and authorization as well as user roles and permissions were a key part of this project as not every user should have access to the same data as others. Employee's identification needs to be verified as well so only Cafe Dolphin employees can access the

website. Other than user management as a subsystem, there is also inventory management, menu management, order management, and reporting. Inventory management includes tracking the amount of ingredients and menu items are in stock. As well as the management of products with addition, deletion, and updating products. The menu management includes creating, editing, and deleting menu items and prices. Order/Customer management is to keep track of orders that have been made in-person to track order history and status. In addition, there will be reports and graphs included in the user interface to show sales and inventory.

Database Design (ER Diagram)



The database contains 10 entities, which are EMPLOYEE, CUSTOMER, ORDER, ORDER_DETAIL, PRODUCT, TRANSACTION, INVENTORY, RECIPE, RECIPE_DETAIL, and INGREDIENT. The relationships between each entity are shown below:

- Each employee can take many orders, and each order is taken by one employee
- Each order belongs to one customer, and each customer can have multiple orders
- Each order has multiple order details, and each order detail belongs to one order
- Each order has one transaction, and each transaction belongs to one order
- Each order detail has one product, and each product can be in many order details
- Each recipe is for one product, and each product has one recipe
- Each recipe contains many recipe details, and each recipe detail belongs to one recipe
- Each recipe detail contains one ingredient, and each ingredient belongs to many recipe details
- Each inventory is for one ingredient, and each ingredient have many inventories

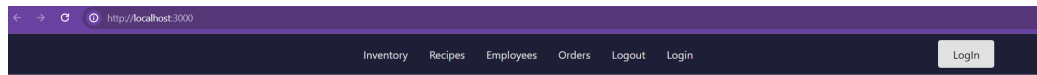
Normalization of Tables

The database satisfies 3NF, which means that each non-key attribute depends on the whole primary key and nothing but the primary key, in order to avoid any anomalies. The below is the functional dependencies of each table:

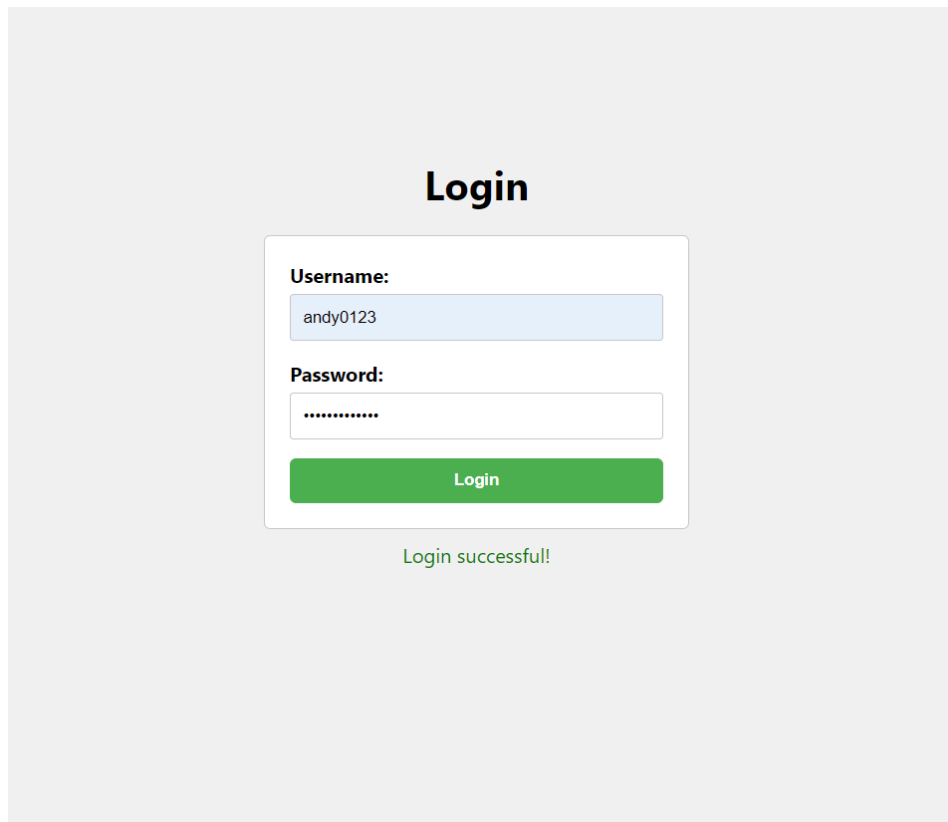
- EMPLOYEE: $\text{employee_id} \rightarrow \text{name, role, username, password}$
- CUSTOMER: $\text{customer_id} \rightarrow \text{name, email, phone number}$
- ORDER: $\text{order_id} \rightarrow \text{time, status, employee_id, customer_id}$
- ORDER_DETAIL: $\text{orderdetail_id} \rightarrow \text{quantity, special_instructions, order_id, product_id}$
- PRODUCT: $\text{product_id} \rightarrow \text{name, description, price}$
- TRANSACTION: $\text{transaction_id} \rightarrow \text{total, time, payment_method, order_id}$
- INGREDIENT: $\text{ingredient_id} \rightarrow \text{reorder_thres, name}$
- RECIPE: $\text{recipe_id} \rightarrow \text{product_id}$

- RECIPE_DETAIL: recipe_id, ingredient_id → quantity
- INVENTORY: inventory_id → quantity, exp_date, supplier, purchase_price, ingredeint_id

Results & Screenshots of the Application



Welcome to Cafe Dolphin POS



Inventory ID	IngredientID	Ingredient Name	Reorder	Threshold	quantity	Exp Date	Supplier	Purchase Price
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Inventory

1	7	cream	10	10	2024-05-15T07:00:00.000Z	Dairy	10
2	3	salt	10	10	2025-02-15T08:00:00.000Z	Superfood	5
3	8	coffee bean	20	30	2025-03-15T07:00:00.000Z	Roast	10
4	2	flour	10	10	2025-02-25T08:00:00.000Z	Buns	8
5	9	milk	2	10	2024-05-15T07:00:00.000Z	Dairy	5
6	1	sugar	2	10	2025-12-31T08:00:00.000Z	Sweetland	5
7	6	cream cheese	15	20	2024-05-30T07:00:00.000Z	Dairy	15
8	4	butter	20	10	2024-05-30T07:00:00.000Z	Dairy	10

Recipes

Add Recipe

RecipeID	Name	Description	Ingredients
1	Tiramisu		sugar: 1, butter: 2, egg: 1, cream: 1, coffee bean: 1
2	Cheesecake		sugar: 1, flour: 1, salt: 1, butter: 1, egg: 4, cream cheese: 1
3	Cookie		sugar: 1, flour: 1, egg: 1
4	Americano		coffee bean: 2
5	Latte		coffee bean: 1, milk: 1

Orders

OrderID	Order Time	Order Status	Customer Name	Quantity	Special Instructions	Product Name
6	2024-04-30T01:25:00.000Z Y		Nick	1		Tiramisu
8	2024-04-30T19:15:00.000Z Y		Cathy	1		Tiramisu
2	2024-04-29T20:58:00.000Z Y		Erin	1		Cheesecake
11	2024-04-30T20:00:00.000Z N		Kelly	1		Cheesecake
3	2024-04-30T00:05:00.000Z Y		Pamela	1		Cookie
1	2024-04-29T17:05:00.000Z Y		Jim	1	no sugar	Americano
2	2024-04-29T20:58:00.000Z Y		Erin	1	cream and sugar	Americano
5	2024-04-30T00:38:00.000Z Y		Angel	1	no cream	Americano
6	2024-04-30T01:25:00.000Z Y		Nick	1		Americano
9	2024-04-30T19:33:00.000Z Y		Neil	1		Americano
4	2024-04-30T00:12:00.000Z Y		Michael	1		Latte
7	2024-04-30T17:05:00.000Z Y		Angel	1	extra sugar	Latte

Member Contributions

- Hsin Ruei Lee - Database Design, AWS RDS setup
- Isiah - Backend Architecture, Sql queries, Helped connecting frontend to backend
- Cathy - Frontend design using ReactJS, HTML, and CSS, and report Objective and HLD