Defining the problem:

My client, Mr. Walker, is an entrepreneur who runs a restaurant. He says that his business is profitable and would like to expand. His original business uses pen and paper to record the company's data. This is very inconvenient for him to keep his records. It was originally fine as it was a very small restaurant, but as he expanded his business, it became more difficult to keep track of his records. In his new restaurant, he is thinking about a Subway franchise business which would give him a pre-established customer base and allow more potential for profit. He would like me to create an interface for him to propose to his franchisor that would allow him to record his data digitally.

He asked me to create a GUI application that could be used by various members of the staff and also be used by the customers. He wanted an application that could be used by the admin/ shareholders, manager, waiters, cooks, and the customers.

In order to analyze the problem, I took two interviews with my client to find out exactly what my client wanted, along with the exact features that should be implemented so that I could create a solution to the problem at hand.

After a discussing with my computer science teacher, Mr. Yadirgi, who is to be my supervisor, I agreed to program a solution to Mr. Walker's problem using Python.

Rationale:

According to the requirements set by my client, I have decided to create my solution on Python. This is because Python has libraries, such as Tkinter, that allows me to create GUI for the various user interactions. The GUI would help to improve the aesthetics and the usability of the product I aim to produce. Python also has features that would help to enhance the functionalities of the program such as database (sqlite3) which would help to store user information such as their name, gender, address, username, password, etc. Python also has file manipulation which allows for the solution to be split into separate files and programs (modular programming) and thus makes the solution more efficient and debugging easier. Python also has classes which allows me to use object-oriented programming and help structure this large project. Python also supports threading and multiprocessing which allows me to run many functions in parallel and hence, allow me to continuously check if specific variables change. Moreover, Python could be integrated into an app or a website with the use of libraries such as Flask, Django, etc. in the future which could increase the potential customers.

Functional Success Criteria:

- Login GUI Page which separates the customers, admin/ shareholders, manager, waiters, and cooks
- A layout of Sign-Up screen that changes according to the user being a staff member or customer.
    - The addition of salary, joining date, and bonus if the user is a staff member and hiding these fields for the customers.
- Validation to make sure the details entered/ edited in the Login screen, User Details Screen, Menu Details Screen, Order Details Screen does not have any human error.
    - Making sure none of the input fields are empty
    - Login Screen:

        - Checking if the username and password is in the database.
    - User Details Screen:
        - Checking if first and last name fields only include alphabets
        - Checking if the email field includes '@' and '.'
        - Checking if the address field has a maximum of 100 characters
        - Checking if the username and password fields have unique input
        - Checking if salary and bonus fields only include numbers
    - Menu Details Screen:
        - Checking if the item name field only includes alphabets
        - Checking if item price field only includes numbers
        - Checking if the ingredients listbox is empty
        - Adding ingredients:
            - Checking if no ingredient has been chosen.
            - Checking if ingredient quantity is empty
    - Order Details Screen:
        - Checking if all the item quantity entry boxes only include numbers
- A layout of Functional screen that changes according to the user being a staff member or customer.
    - Changing the functions that the users can perform according to them being an admin, manager, waiter, cook or customer.
- A layout of Menu screen that changes according to the number of menu items.
    - Adding, updating, deleting menu items would change the Menu screen.
- A layout of Order screen that changes as menu items are ordered.
    - Adding, updating, deleting menu items would change the Order screen.
- A layout of Bill screen that changes as more orders are placed.

Non-functional Success Criteria:

- Every screen with a textbox would have a label next to it and would state what that textbox is there for.
- The database would compromise of 4 tables: Users, Ingredients, Orders, Menu.
    - The Users database would have columns of id, first, last, gender, birthDay, birthMonth, birthYear, email, address, username, password, position, salary, joinDay, joinMonth, joinYear, bonus, image.
    - The Ingredients database would have columns of id, item, ingredientQuantity.
    - The Orders database would have columns of id, tables, item, itemQuantity.
    - The Menu database would have columns of id, item, price, ingredients, ingredientsQuantity, image.
- A Login screen with a title that says "Login" and has two text fields below it labelled "Username" and "Password", and also a button labelled "Sign in".
- A User Details screen with a title that says "Add", "Update" or "Delete" according to its usage and has 12 fields below it labelled "First Name", "Last Name", "Gender", "Date of Birth", "Email", "Address", "Username", "Password", "Salary", "Join Date", "Bonus", and "Position", and also a picture and 2 buttons labelled "Submit" and "Back".

- A Menu Details screen with a title that says “Add”, “Update” or “Delete” according to its usage and has 4 fields below it labelled “Item”, “Price”, “Ingredient”, “Ingredient Quantity”, and also a picture and 2 buttons labelled “Submit” and “Back”.
- An Order Details screen with a title that says “Add to Order” and has all the menu items below it and each item has an entry box next to it.