SEHH2240 Database Systems

CC Food Delivery Platform

Prepared by Class 201 Group B4

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1. Idea of Creating a Food Delivery Platform

People are increasingly seeking convenience in their daily lives. Due to the COVID-19 epidemic, people try to avoid going out. However, eating is a must for the public. When people do not want to go out and cook, they must use food delivery services. We anticipated that the demand for food delivery services will increase, so we decided to open a food delivery platform.

2. Introduction of Food Delivery Platform

Food delivery platform is a database system which aims at storing different data that will be used during food delivery. Via searching this database system, our staff will be able to acknowledge the detail of the order. They will be able to meet customer’s requirements and deliver the food correctly Also, customers can track which staff is responsible for their order. Customers can contact the staff with the phone number provided in the UI.

3. Background Description of Business

Relationships Between Users

For this system, managers of CCFood and business partners of CCFood will be the user. The end-users of CCFood system will be clients, staff and restaurants.

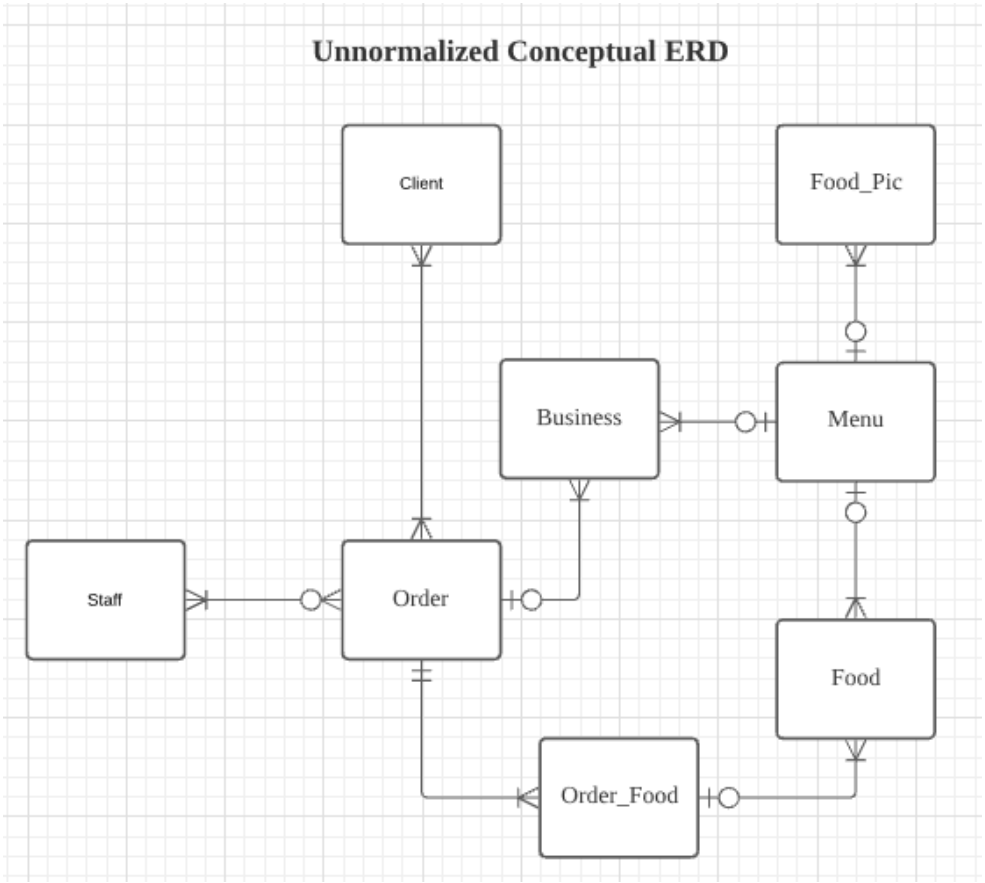
For the client of CCFood. They can choose and order food from our platform. We provide many kinds of food. Different food will provide by different restaurant. If client have any special requirement with the food, they can point out and let our stuff to fulfill.

For the staff of CCFood, they can check the order from the platform. Customers' address can be checked from the database and they can deliver food to the right location.

For food, customer can choose and order the food by our food rank.

For the order, each order contain one or many foods ordered by customer, each order will be delivered by one of the staff of CCFood.

For the business partners, they can check how many orders they have taken from our platform and check their turnover. Let them know how many order and sales they gain from our platform.



As this is only the concept of delivery system, more function will be changed on and database will be normalized thought 3NF in the future.

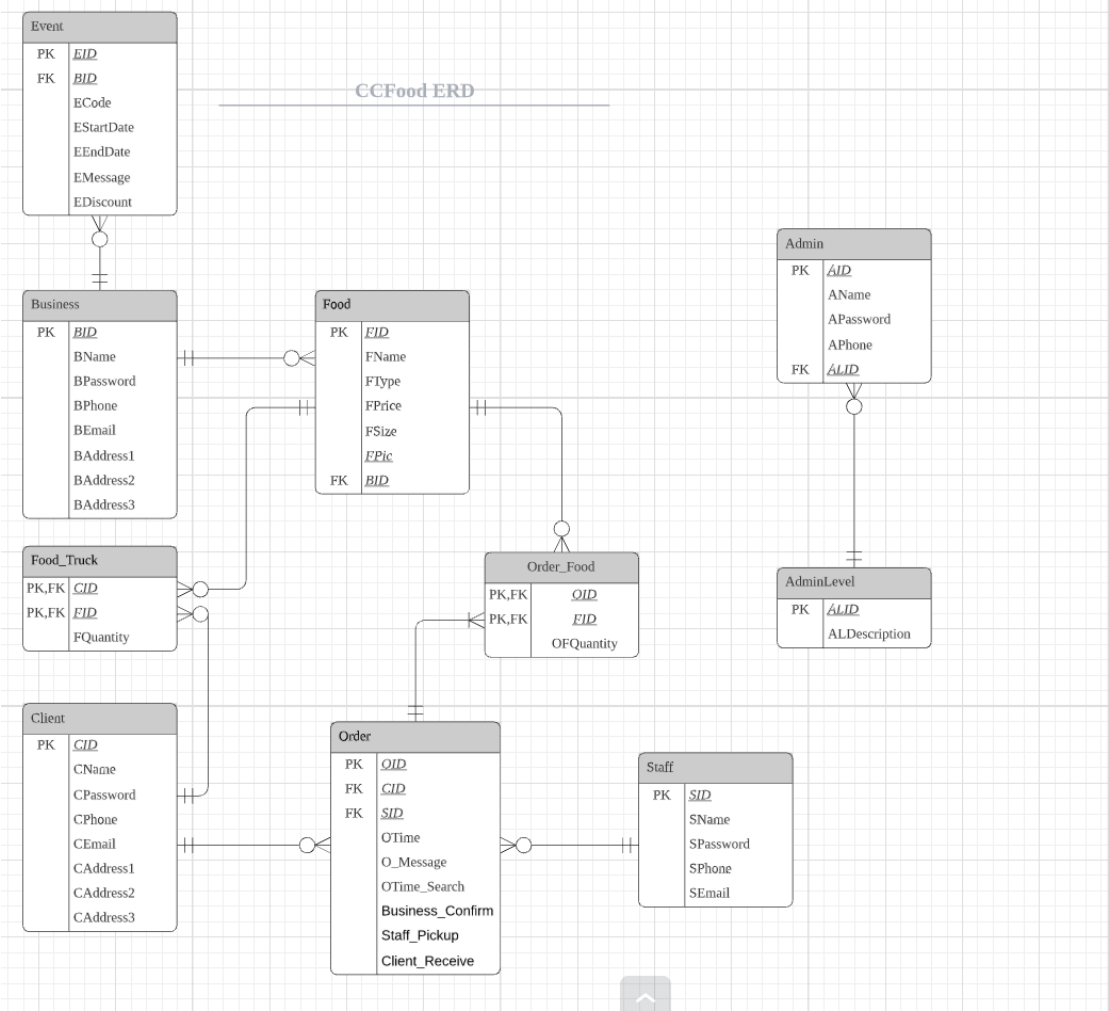
4. Data dictionary

Business (BID, BName, BPassword, BPhone, BEmail, BAddress1, BAddress2, BAddress3)
Client (CID, CName, CPassword, CPhone, CEmail, CAddress1, CAddress2, CAddress3)
Event (EID, BID, ECode, EStartDate, EEndDate, EMessage, EDiscount)
Food (FID, FName, FType, FPrice, FSize, FPic, BID)
Food_Truck (CID, FID, FQuantity)
Order (OID, CID, SID, OTime, OTime_Search, O_Message)
Order_Food (OID, FID, OFQuantity)
Staff (SID, SName, SPassword, SPhone, SEmail)
Admin (AID, AName, APassword, APhone, ALID)
AdminLevel (ALID, ALDescription)

5. Conceptual design

Entity Relationship Modeling and Normalization

Base on the background description of business relationships between Users relationship above. we design a more complete ERD and add more function in it.



In this ERD, some of the function are added and many M:N relationships are broken down in 1:M and M:1 relationship.

For the entity Food and Order, a composite entity order food are added to resolve the M:N relationship between Food and Order. For this table, O_ID and F_ID are used as a composite key. Since each order may have many or one Order_Food only, Order and Order_Food are in 1:M relationship Food and Order_Food are in 1 to 0-or-many relationship since the food are popular and order by many clients or may not order by

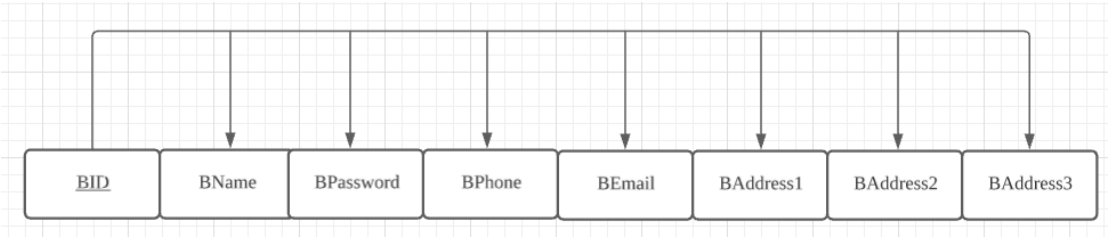
any clients.

For the entity Client and Food, a composite entity Food_Truck are added to resolve the M:N relationship between Food and Client. For this table. C_ID and F_ID are used as a Composite key. Food and Food_Truck are in 1 to 0-or-many relationship since Food_Truck can store many or none of specific kind of food. Food_Truck and Client are in 0-or-many to 1 relationship since there can be no food truck or many food trucks to provide food to a client.

For the entity Business, since our company will held different events to attract more customers, the entity Event are added to record the different event at specific date. Such as we will have 50% off at 20/4.

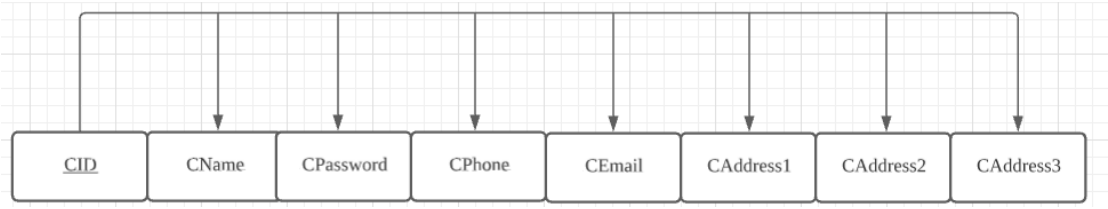
6. Dependency Diagram

a. Business



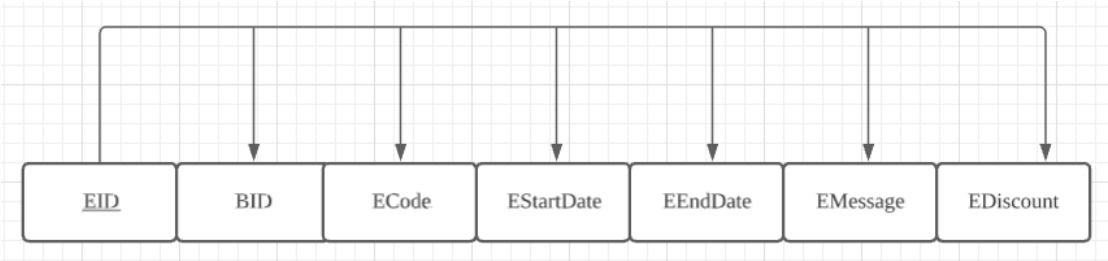
Relational Schema: Business (BID, BName, BPassword, BPhone, BEmail, BAddress1, BAddress2, BAddress3)

b. Client



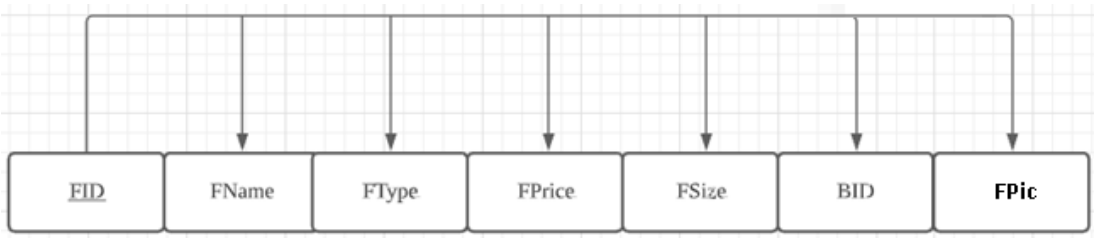
Relational Schema: Client (CID, CName, CPassword, CPhone, CEmail, CAddress1, CAddress2, CAddress3)

c. Event



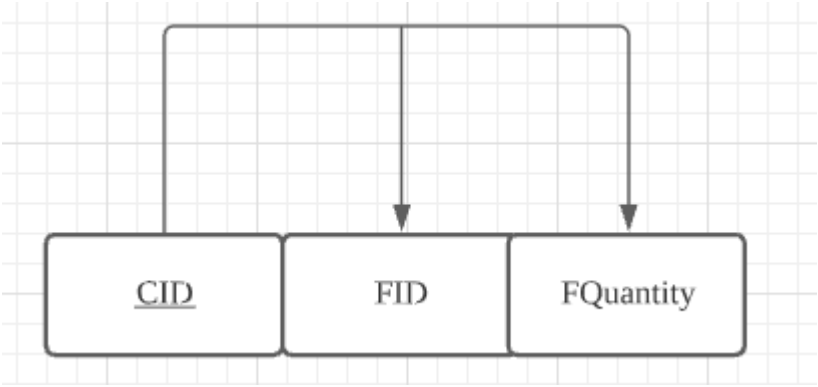
Relational Schema: Event (EID, BID#, ECode, EStartDate, EEndDate, EMassage, EDiscount)

d. Food



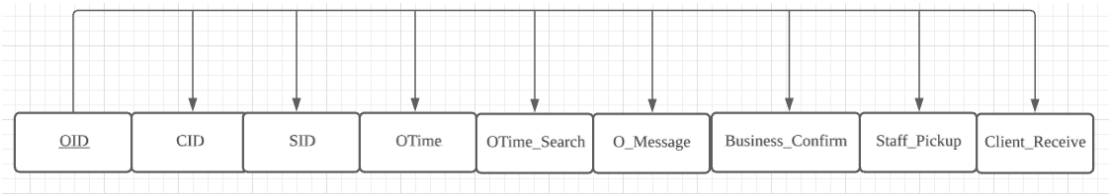
Relational Schema: Food (FID, FName, FType , FPrice, FSize, BID#, FPic)

e. Food Truck



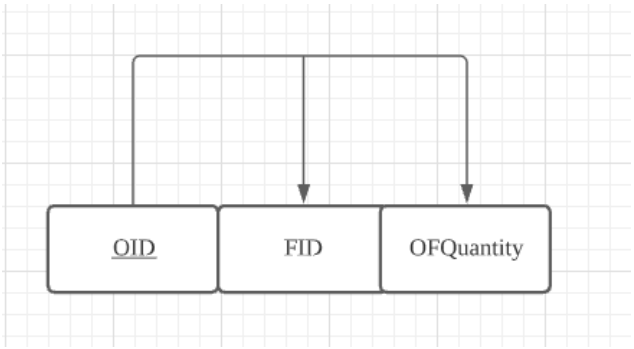
Relational Schema: Food_Truck (CID, FID#, FQuantity)

f. Order



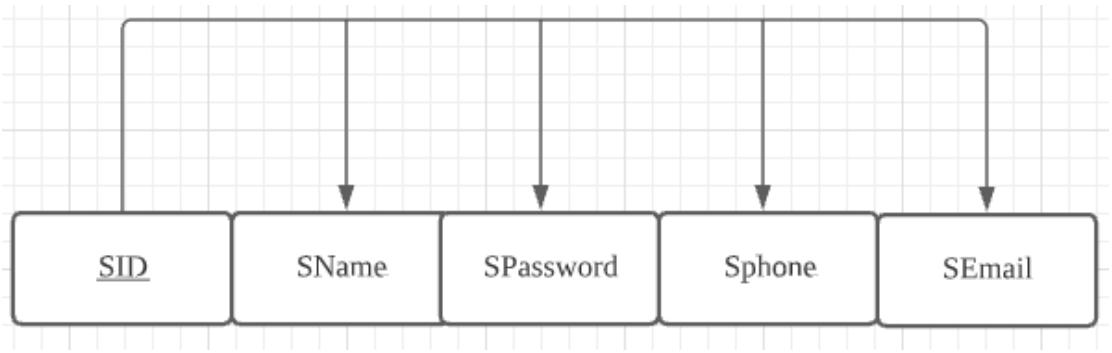
Relational Schema: Order (OID, CID#, SID#, OTime, OTime_Search, O_Message, Business_Confirm, Staff_Pickup, Client_Receive)

g. Order_Food



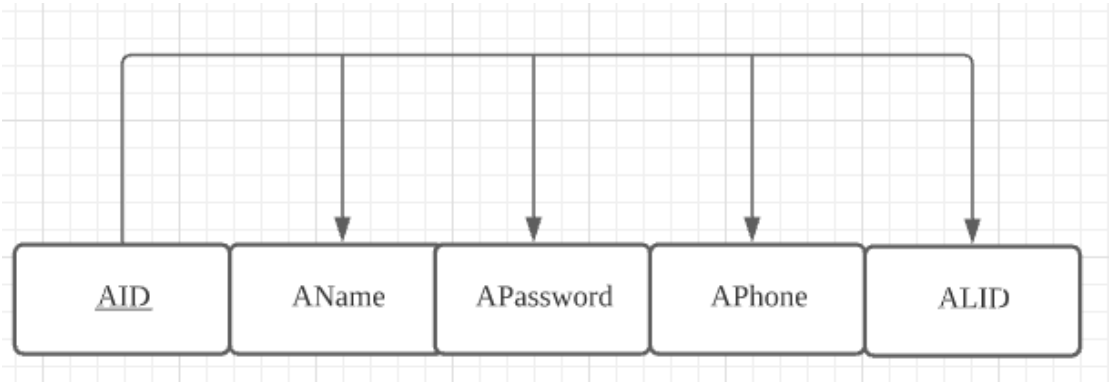
Relational Scheme: Order_Food (OID, FID#, OFQuantity)

h. Staff



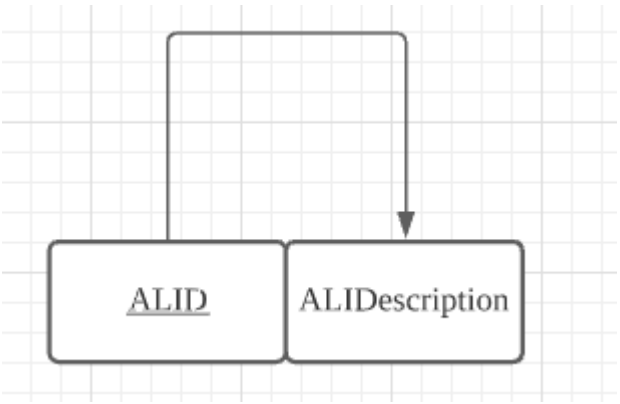
Relational Scheme: Staff (SID, SName, SPassword, Sphone, SEmail)

i. Admin



Relational Scheme: Admin (AID, AName, APassword, APhone, ALID#)

j. AdminLevel



Relational Scheme: AdminLevel (ALID, ALIDescription)

7. Logic design

The following tables and attributes are all implemented within the environment of Microsoft Access.

a. Business

This table stores the information of our business partners for registration.

Business					
	Attribute	Data Type	Description	Size	Rule
PK	BID	AutoNumber	Business ID		
	BName	Short Text	Business Name		Not Null
	BPassword	Long Text	Business Password	576	Not Null
	BPhone	Number	Business Phone	8	*
	BEmail	Long Text	Business Email	50	
	BAddress1	Long Text	Business Address Area		Not Null
	BAddress2	Long Text	Business Address Street		
	BAddress3	Long Text	Business Address Room		

b. Client

This table stores the personal information of our customers for registration.

Client					
	Attribute	Data Type	Description	Size	Rule
PK	CID	AutoNumber	Client ID		
	CName	Short Text	Client Name		Not Null
	CPassword	Long Text	Client Password	576	Not Null
	CPhone	Number	Client Phone	8	*
	CEmail	Long Text	Client Email	50	
	CAddress1	Long Text	Client Address Area		
	CAddress2	Long Text	Client Address Street		
	CAddress3	Long Text	Client Address Room		

c. Event

This table stores the details of events hold by different business partners.

Event					
	Attribute	Data Type	Description	Size	Rule
PK	EID	AutoNumber	Event ID		
FK	BID	AutoNumber	Business ID		

	ECode	Long Text	Event Code		Not Null
	EStartDate	Number	Event Start Date		
	EEndDate	Long Text	Event End Date		
	EMessage	Long Text	Event Description		
	EDiscount	Long Text	Event Discount		

d. Food

This table stores the details of different foods.

Food					
	Attribute	Data Type	Description	Size	Rule
PK	FID	AutoNumber	Food ID		
	FName	Long Text	Food Name		Not Null
	FType	Long Text	Food Type		
	FPrice	Number	Food Price		
	FSize	Long Text	Food Size		
FK	BID	AutoNumber	Business ID		
	FPic	Attachment	Food Picture		

e. Food_Truck

This table stores the food items that customers selected temporarily.

Food_Truck					
	Attribute	Data Type	Description	Size	Rule
PK	CID	Number	Client ID		
FK	FID	Number	Food ID		
	FQuantity	Number	Food Number		

f. Order

This table acts as a receipt which mainly stores the date and time of the order being processed successfully, types, quantity and the price of food, total cost and an order ID.

Order					
	Attribute	Data Type	Description	Size	Rule
PK	OID	AutoNumber	Order ID		
FK	CID	Number	Client ID		
FK	SID	Number	Staff ID		
	OTime	Date/Time	Order Time in hour		
	OTime_Search	Date/Time	Order Time in day		

	O_Message	Long Text	Order Message		
	Business_Confirm	Yes/No	Confirm finished making by Restaurant		
	Staff_Pickup	Yes/No	Confirm Picked up by Staff		
	Client_Receive	Yes/No	Confirm received by Client		

g. Order_Food

This Table acts as a receipt for the restaurants to know what their customers have ordered. The order ID is for verifying with our staff by confirming the same order ID received by both business partners and our staff.

Order_Food					
	Attribute	Data Type	Description	Size	Rule
PK	OID	Number	Order ID		
FK	FID	Number	Food ID		
	OFQuantity	Number	Quantity		

h. Staff

This table stores the personal information of our staff.

Staff					
	Attribute	Data Type	Description	Size	Rule
PK	SID	AutoNumber	Staff ID		
	SName	Short Text	Staff Name		Not Null
	SPassword	Long Text	Staff Password	576	Not Null
	SPhone	Number	Staff Phone number	8	*
	SEmail	Long Text	Staff E-mail	50	

i. Admin

This table stores the personal information of the database administrators.

Admin					
	Attribute	Data Type	Description	Size	Rule
PK	AID	AutoNumber	Admin ID		
	AName	Long Text	Admin Name		Not Null
	APassword	Long Text	Admin Password	576	Not Null
	APhone	Number	Admin Phone number	8	*
FK	ALID	AutoNumber	Admin Level ID		Not Null

j. AdminLevel

This table lists out the level of the administrators with descriptions.

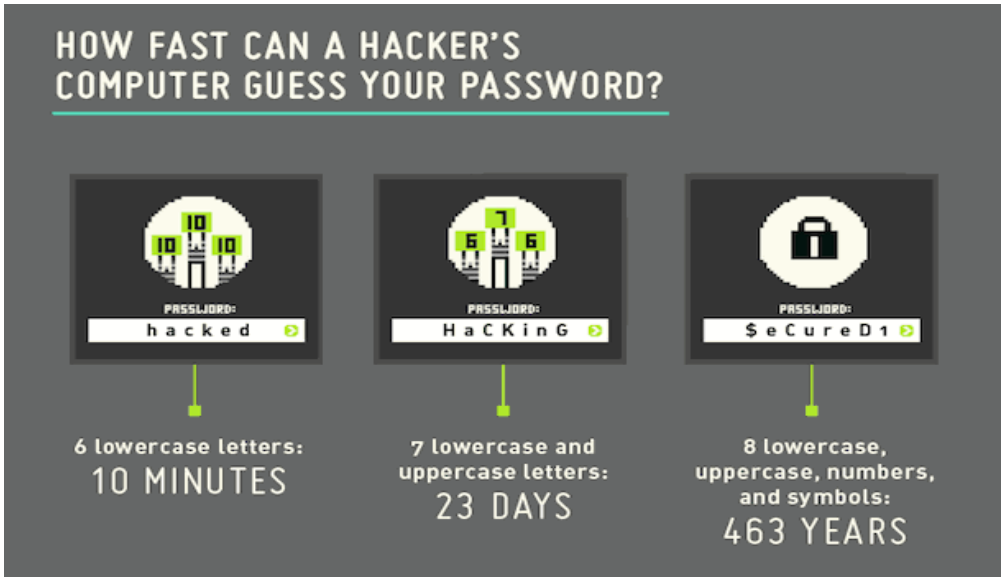
AdminLevel					
	Attribute	Data Type	Description	Size	Rule
PK	ALID	AutoNumber	Admin Level ID		
	ALDescription	Long Text	Admin Level description		Not Null

*:Number have be inside the range 20000000-39999999,50000000-69999999,90000000-99999999 due to Hong Kong's phone number starts at 2,3,5,6,9.

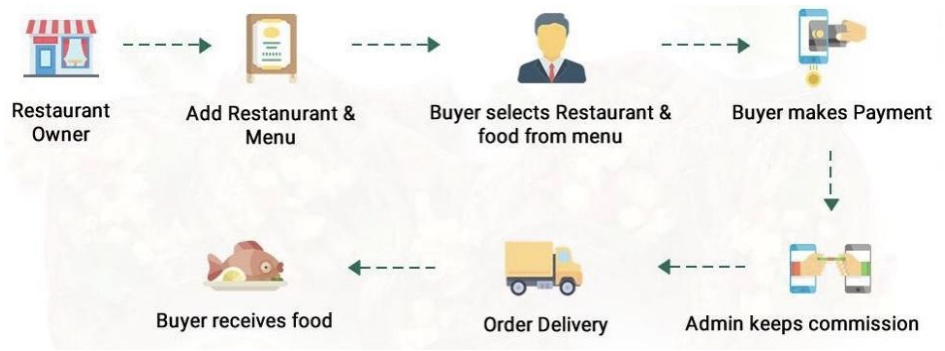
8. Data Security Control

a. Password Security

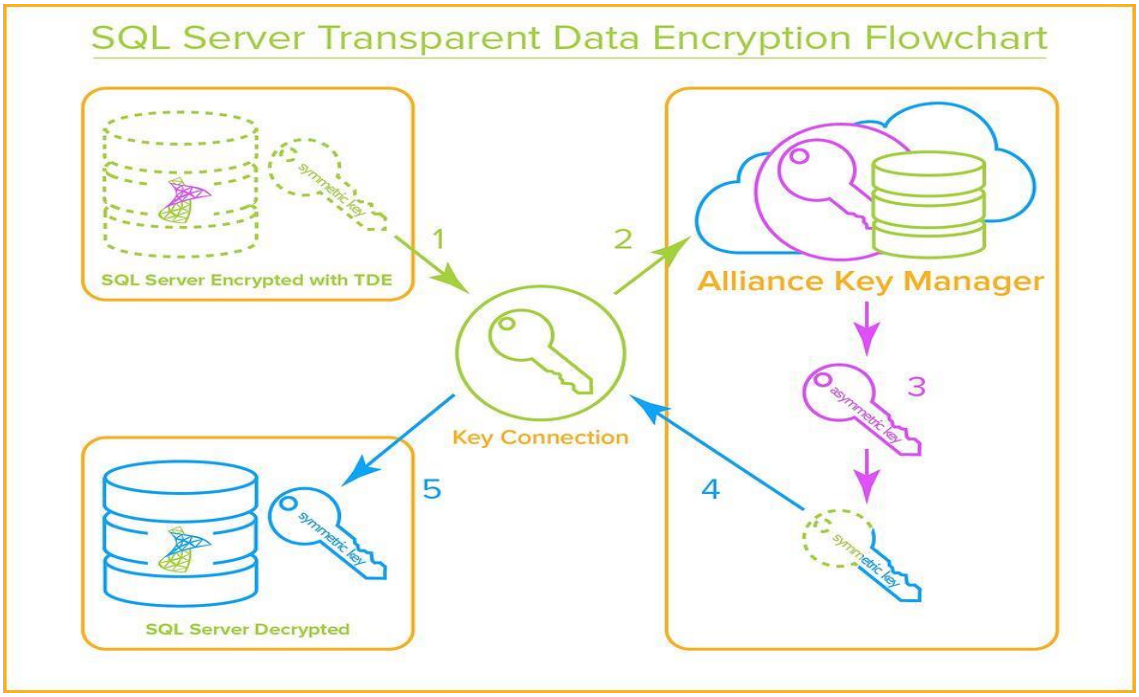
Uppercase and lowercase letters, numbers and symbols are required to be included in password to increase the security level. Besides, we use type check, length check or field check instead of some simple checking to ensure the security as well.



However, if the password is stored in an insecure way, these restrictions would be invalid. In SQL, a password is usually stored in the database, so we need to be very careful when storing the password. But the password is stored in the table in plain text which is vulnerable to attacks. If an attacker accesses the database, he can steal the password of clients or even the administrators. Therefore, the password in the database should be encrypted well and made as complicated as possible to avoid being illegally decrypted.

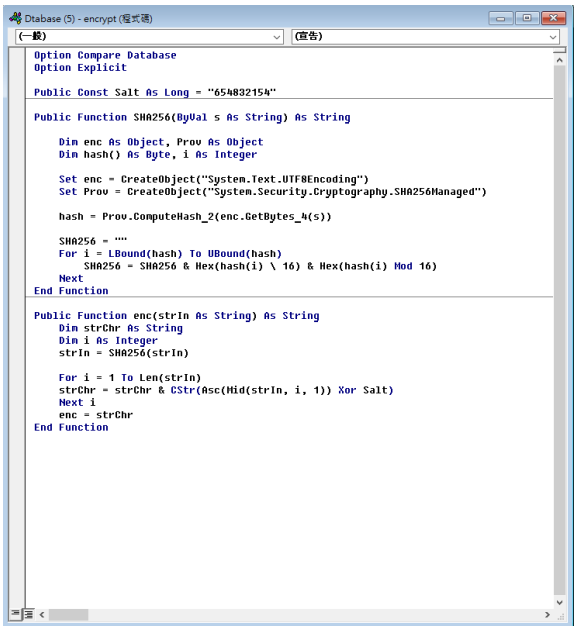


Users are required to input password during the making payment process in which password is necessary to be encrypted.



1. The SQL server requests the Data Encryption Key (DEK) to be decrypted by the Key Encryption Key (KEK).
2. The key connection sends a decryption request to Alliance Key Manager (AKM).
3. AKM decryption and KEK's DEK.
4. AKM sends the decrypted DEK to the Key connection.
5.Key connection sends the decrypted DEK to SQL Server so that the database can be decrypted.

This Process can significantly ensure the security by using SHA1(SHA-256 XOR Salt) method to encrypt.



```
Option Compare Database
Option Explicit

Public Const Salt As Long = "65483215A"

Public Function SHA256(ByVal s As String) As String

    Dim enc As Object, Prov As Object
    Dim hash() As Byte, i As Integer

    Set enc = CreateObject("System.Text.UTF8Encoding")
    Set Prov = CreateObject("System.Security.Cryptography.SHA256Managed")

    hash = Prov.ComputeHash_2(enc.GetBytes_4(s))

    SHA256 = ""
    For i = LBound(hash) To UBound(hash)
        SHA256 = SHA256 & Hex(hash(i) \ 16) & Hex(hash(i) Mod 16)
    Next
End Function

Public Function enc(strIn As String) As String
    Dim strChr As String
    Dim i As Integer
    strIn = SHA256(strIn)

    For i = 1 To Len(strIn)
    strChr = strChr & CStr(Asc(Mid(strIn, i, 1)) Xor Salt)
    Next i
    enc = strChr
End Function
```

Screenshot for password encryption.

9. Implementation Details

Flowcharts of the Program

i. Flowcharts for customers

Program Procedures	Description
1	Customers would register by filling their personal information through a program.
2	Personal information of customers will be validated and stored in the database system.
3	Customers can select their wanted items from different registered shops by using different functions (food rank, types of food).
4	The selected items will be stored in the Food truck temporarily such that customers can double check what they have selected.
5	Customers can pay the bill through online payment.
6	Customers will receive a digital receipt with customers' name, time and date, items ordered, price of each item and total cost.
7	Customers can wait for their ordered food.

ii. Flowcharts for business partners

Program Procedures	Description
1	Business partners would register by filling their personal information through a program.
2	Information of business partners will be validated and stored in the database system.
3	Business partners can input their products with pictures to the program for customers to select.
4	Once there is an order on their own restaurant, they will receive a receipt showing the name and quantity of food with the order ID.
5	Business partners can verify our staff by confirming the same order ID received by both business partners and our staff.

Queries Design

Target	Query Name	SQL	Description
Business partner	1.Business rank in total	SELECT b.BName, SUM(of.OFQuantity) AS Quantity FROM Food AS f, Order_Food AS [of], Business AS b WHERE of.FID = f.FID AND f.BID = b.BID GROUP BY b.BName ORDER BY SUM(of.OFQuantity) DESC;	Show out which Business partner are most popular and the quantity of food ordered.
	2.Business rank in total (Top5)	SELECT TOP 5 b.BName, SUM(of.OFQuantity) AS Quantity FROM Food AS f, Order_Food AS [of], Business AS b WHERE of.FID = f.FID AND f.BID = b.BID GROUP BY b.BName ORDER BY SUM(of.OFQuantity) DESC;	Show out top 5 Business partner which are most popular and the quantity of food ordered.
Client	1.Food rank for hamburger	SELECT b.BName, f.FName AS Name, f.FPrice AS Price, SUM(of.OFQuantity) AS Quantity FROM Food AS f, Order_Food AS [of], Business AS b WHERE of.FID = f.FID AND f.BID = b.BID AND f.FType = "Hamburger" GROUP BY b.BName, f.FName, f.FSize, f.FPrice, f.FSize ORDER BY SUM(of.OFQuantity) DESC;	Show out which business partner having highest number of sales of hamburger so client can refer this rank to order.
	2.Food rank for noodles	SELECT b.BName, f.FName AS Name, f.FPrice AS Price, SUM(of.OFQuantity) AS Quantity	Show out which business partner having highest number

		FROM Food AS f, Order_Food AS [of], Business AS b WHERE of.FID = f.FID AND f.BID = b.BID AND f.FType = "Noodles" GROUP BY b.BName, f.FName, f.FSize, f.FPrice, f.FSize ORDER BY SUM(of.OFQuantity) DESC;	of sales of noodles so client can refer this rank to order.
	3.Food rank for rice	SELECT b.BName, f.FName AS Name, f.FPrice AS Price, SUM(of.OFQuantity) AS Quantity FROM Food AS f, Order_Food AS [of], Business AS b WHERE of.FID = f.FID AND f.BID = b.BID AND f.FType = "Rice" GROUP BY b.BName, f.FName, f.FSize, f.FPrice, f.FSize ORDER BY SUM(of.OFQuantity) DESC;	Show out which business partner having highest amount of sales of rice so client can refer this rank to order.
	4.Food rank for snacks	SELECT b.BName, f.FName AS Name, f.FPrice AS Price, SUM(of.OFQuantity) AS Quantity FROM Food AS f, Order_Food AS [of], Business AS b WHERE of.FID = f.FID AND f.BID = b.BID AND f.FType = "Snacks" GROUP BY b.BName, f.FName, f.FSize, f.FPrice, f.FSize ORDER BY SUM(of.OFQuantity) DESC;	Show out which business partner having highest amount of sales of snacks so client can refer this rank to order.
	5.Food rank for spaghetti	SELECT b.BName, f.FName AS Name, f.FPrice AS Price, SUM(of.OFQuantity) AS Quantity FROM Food AS f, Order_Food AS [of], Business AS b	Show out which business partner having highest amount of sales of spaghetti so client can refer this

		WHERE of.FID = f.FID AND f.BID = b.BID AND f.FType = "Spaghetti" GROUP BY b.BName, f.FName, f.FSize, f.FPrice, f.FSize ORDER BY SUM(of.OFQuantity) DESC;	rank to order.
	6.Food rank in last year(2021)	SELECT b.BName, f.FName AS Name, f.FPrice AS Price, SUM(of.OFQuantity) AS Quantity FROM Food AS f, Order_Food AS [of], Business AS b, [Order] AS o WHERE of.FID = f.FID AND f.BID = b.BID AND of.OID=[o].[OID] AND Year([o].[OTime_Search])=2021 GROUP BY b.BName, f.FName, f.FSize, f.FPrice, f.FSize ORDER BY SUM(of.OFQuantity) DESC;	Display the data of highest sales of food sold out last year,such as BName, name,price,and quantity for client reference.
	7.Food rank in total	SELECT b.BName, SUM(of.OFQuantity) AS Quantity FROM Food AS f, Order_Food AS [of], Business AS b WHERE of.FID = f.FID AND f.BID = b.BID GROUP BY b.BName ORDER BY SUM(of.OFQuantity) DESC;	Display the data of highest sales of food sold out,such as BName, name,price,and quantity for client reference.
	8.Food rank in total (TOP5)	SELECT TOP 5 b.BName, f.FName AS Name, f.FPrice AS Price, SUM(of.OFQuantity) AS Quantity FROM Food AS f, Order_Food AS [of], Business AS b WHERE of.FID = f.FID AND f.BID = b.BID GROUP BY b.BName, f.FName, f.FSize, f.FPrice, f.FSize	Display the data of TOP 5 sales of food sold out,such as BName, name,price,and quantity for client reference.

		ORDER BY SUM(of.OFQuantity) DESC;	
CCFood	1.Food Truck	SELECT Food.FName, Food.FSize, Food.FPrice, SUM(Food_truck.FQuantity) AS Quantity FROM Client, Food_Truck, Food WHERE Client.CID = Food_truck.CID AND Food_Truck.FID = Food.FID GROUP BY Food.FName, Food.FSize, Food.FPrice ORDER BY SUM(Food_truck.FQuantity) DESC;	Display the data of food in food truck such as foodname,foodsize(the place that food consuming),food price and the quantity.
	2.Money flow in last month	SELECT f.FName AS Name, SUM(of.OFQuantity) AS Quantity, SUM(of.OFQuantity* f.FPrice) AS [Total Flow] FROM Food AS f, Order_Food AS [of], [Order] AS o WHERE of.FID = f.FID AND of.OID = o.OID AND year(o.OTime_Search) = 2021 AND month(o.OTime_Search) = 4 GROUP BY f.FName, f.FSize, f.FPrice, f.FSize ORDER BY SUM(of.OFQuantity) DESC;	Display the amount of food sold and the money gain last month.
	3.Money flow in last month	SELECT f.FName AS Name, Sum(of.OFQuantity) AS Quantity, Sum(of.OFQuantity*f.FPrice) AS [Total Flow] FROM Food AS f, Order_Food AS [of], [Order] AS o WHERE (((of.FID)=[f].[FID]) AND ((of.OID)=[o].[OID]) AND ((Year([o].[OTime_Search]))=2021)) GROUP BY f.FName, f.FSize,	Display the amount of food sold and the money gain in last month.

		f.FPrice, f.FSize ORDER BY Sum(of.OFQuantity) DESC;	
	4.Money flow in total	SELECT f.FName AS Name, SUM(of.OFQuantity) AS Quantity, SUM(of.OFQuantity* f.FPrice) AS [Total Flow] FROM Food AS f, Order_Food AS [of] WHERE of.FID = f.FID GROUP BY f.FName, f.FSize, f.FPrice, f.FSize ORDER BY SUM(of.OFQuantity) DESC;	Display the amount of food sold and the money gain.

10. Security measure of our database

a. Filter

For our database, the password should have security. Therefore, we added some restrictions when users enter passwords, such as using special characters, mixing letters and numbers, not using simple words, and using type check, length check and field integrity check for restrictions.

In our SQL, all passwords are stored in database. However, storing passwords in plain text form in a table is very vulnerable to attacks, because if an attacker accesses the database, he can steal the passwords of users and even administrators. So, the passwords in the database should be encrypted and made as secure as possible from illegal decryption.

For example,
"SELECT * FROM Client
WHERE (name = ' " & username & " ') "
and (password = ' " & password & " '); "
Are the SQL of login

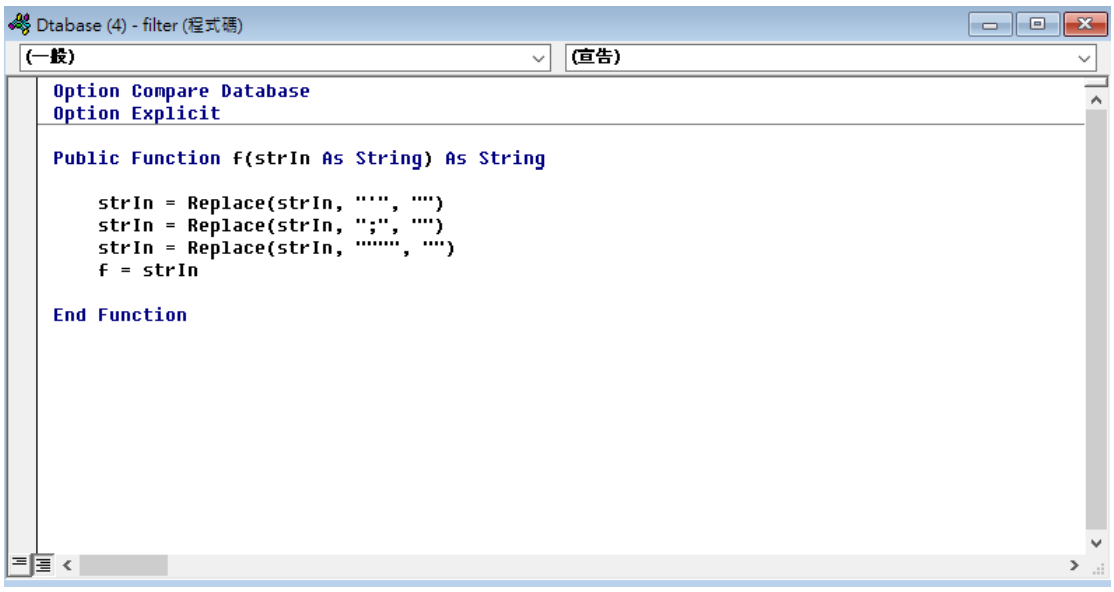
when the password and username was fill in maliciously:
username = " 1' OR '1'='1 "
password = " 1' OR '1'='1 "
The SQL became to:

SELECT * FROM Client
WHERE (name = '1' OR '1'='1')
and (password = '1' OR '1'='1') ;

Thus, the actual SQL command will be executed as:

SELECT * FROM Client;

Which cause everyone can login with no username and password.
It might cause data leakage, such as confidential corporate and personal information, account information, passwords, etc., or hacking of data structures.
Therefore, some limitations was added for username and password as follow:


Dtabase (4) - filter (程式碼)
(一般)
(宣告)
Option Compare Database
Option Explicit
Public Function f(strIn As String) As String
strIn = Replace(strIn, "'", "")
strIn = Replace(strIn, ";", "")
strIn = Replace(strIn, """", "")
f = strIn
End Function

11. User interface and Form design

The user interface and the form designs shown as above:

a. For Business Partners

i. The user interface for business partners.

ii. The login screen for business partners

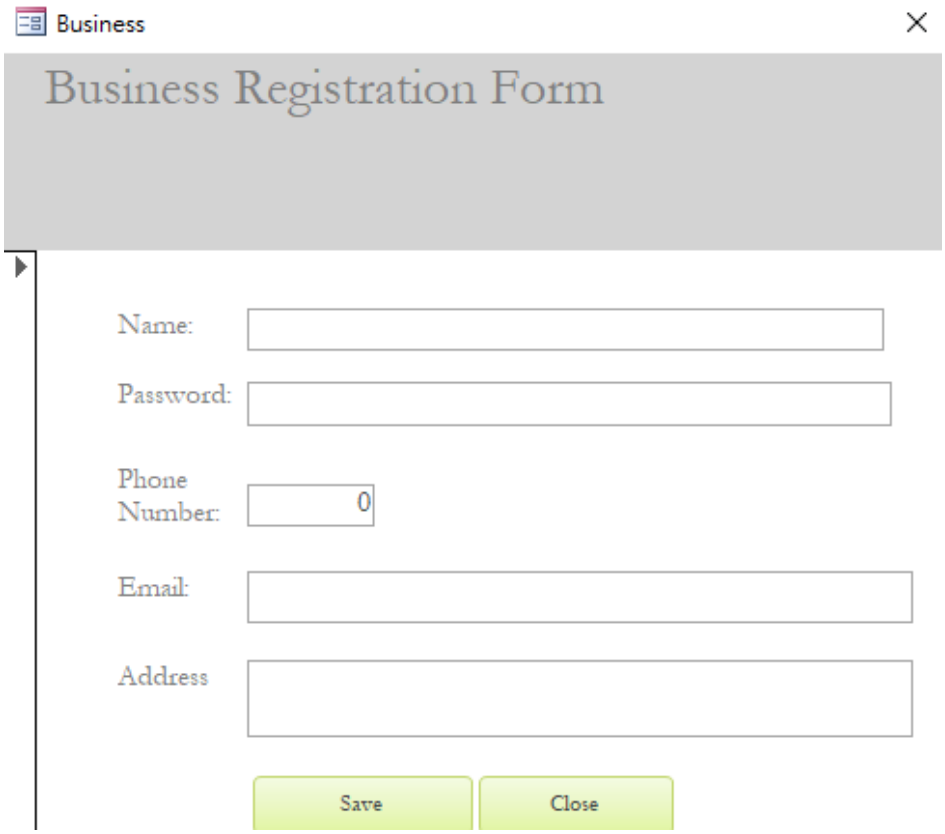
If the Login button are selected, the login form will be shown.

After user input their user name and password, they can click the Login button to login.

The close button is for user to close the form.

iii. The Business Registration Form

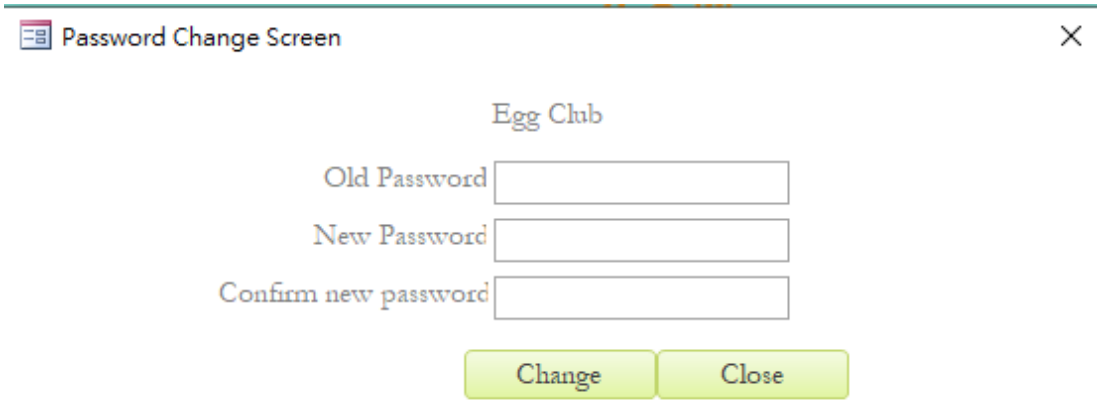
If the Register button are clicked, the business registration from will be shown.



This form is or business registrant, input the Name, Password, Phone Number, Email, Address and click the save button to save their information to our database.

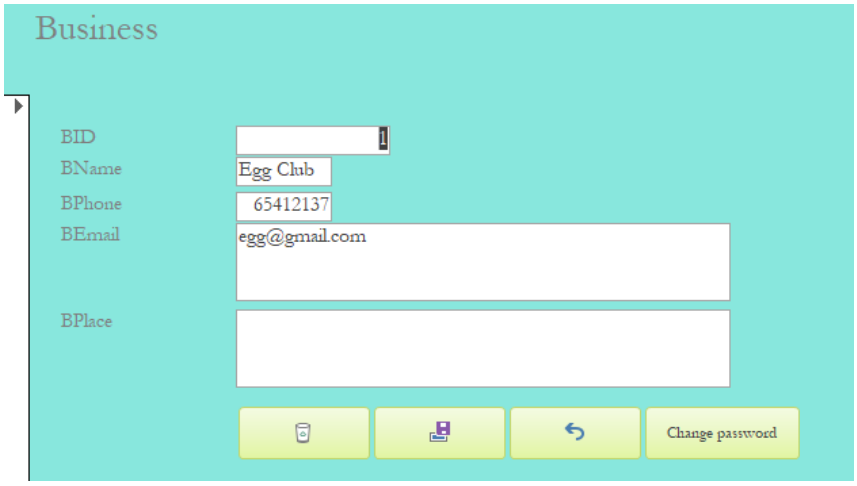
For changing the password, users only need to input their old password and new password. To prevent users from entering the wrong password, user need to input the password twice.

iv. Password Change Screen



v. Interface for Business modify record

This is the interface for Business modify their record, there are four buttons below, user can delete, save change password or redo by selecting these buttons.



vi. Interface after login

This is the user interface for Business Partners after login:

There three button in this user interface: Edit your record, Food record and Exit.

When Edit your record button are clicked,the form of modify record for business partner will be shown.

When Food record button are clicked,the food record of that business partner will be shown.

When the exit record are clicked, user will return to the previous screen

After exit button clicked:

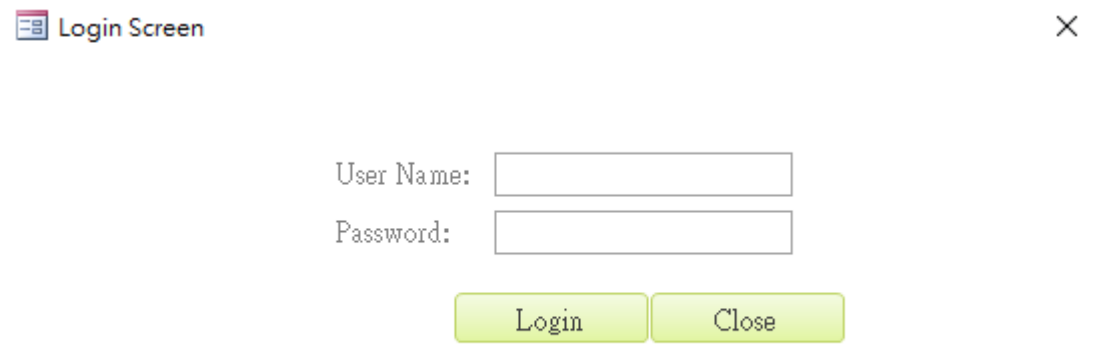
b. For Clients

i. Interface for clients

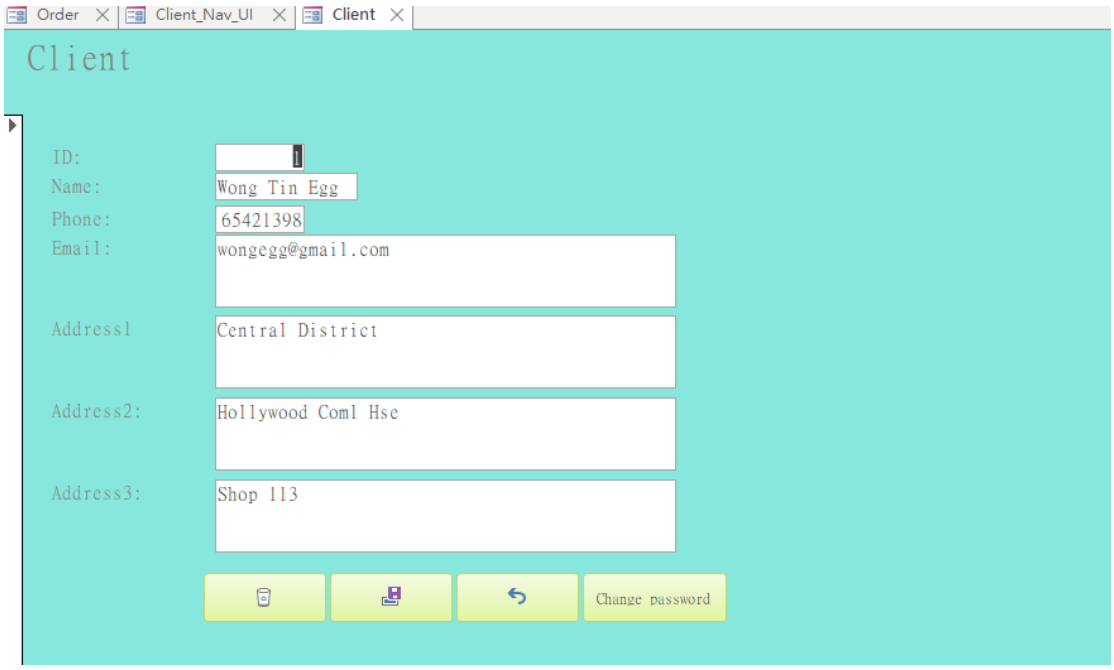
The interface look like as same as the interface of business.

The button Login and Close‘s function are same with the button in the login screen of business partner, but the data of client will be stored at database of client.

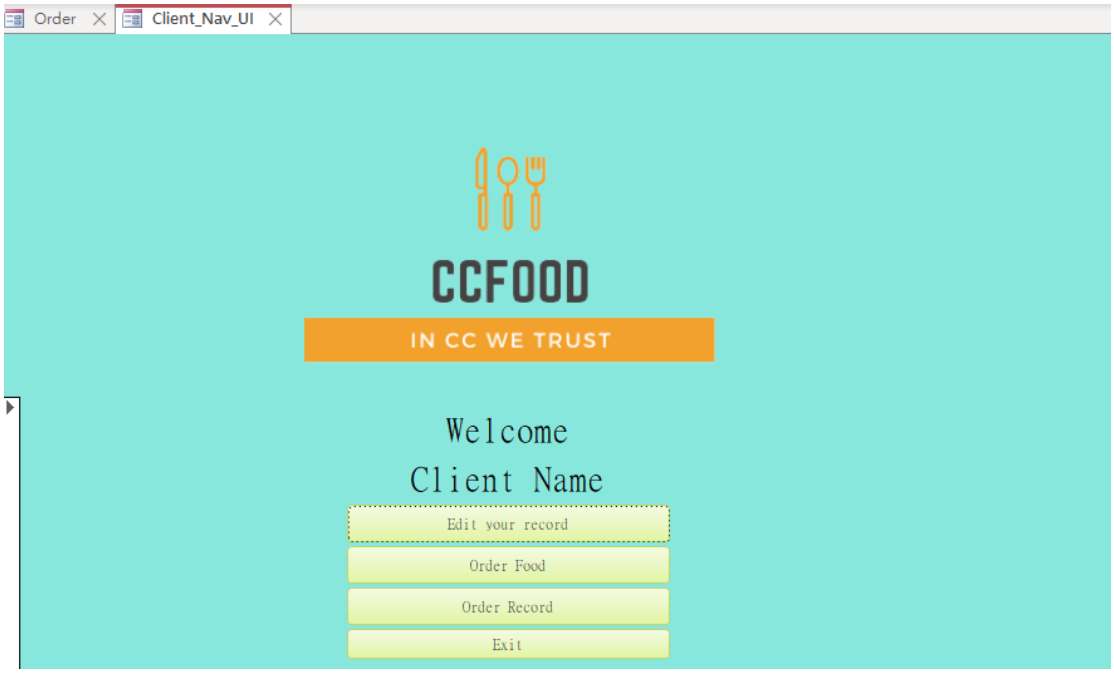
ii. Login screen for client



iii. Form for client edit data

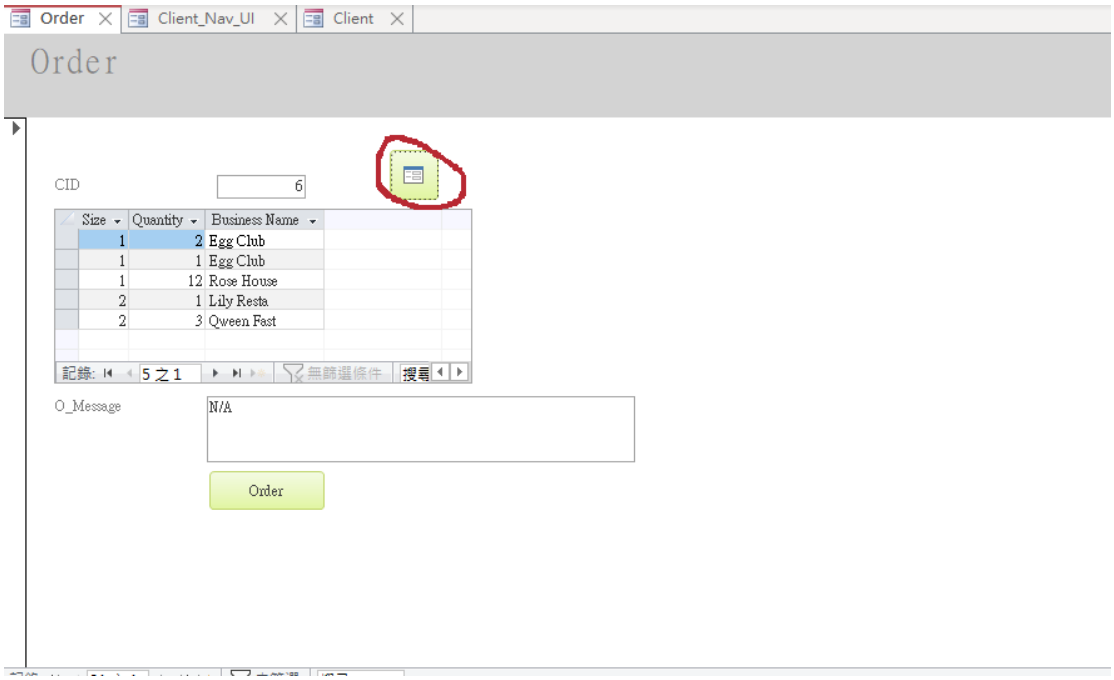


This is the interface for client modify their record, there are four buttons below, user can delete, save change password or redo by selecting these buttons. As same as the Form for business partner edit their data.



iv. Form for order food

This is the form for client to order food. Clients can click the button clicked to choose food they want.



After the button are clicked, the menu are shown(shown in the picture below)client can see the data of different food such as Food Name, Type,Size,Price,taurant Name and the picture of food in the form. These data are locked to avoid that client change these data mistakenly. User can input the quantity and click add to car to order food.

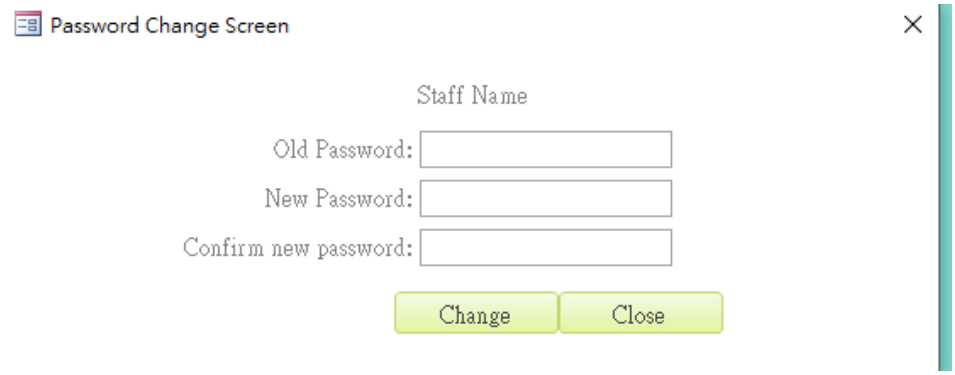
c. For Staff

i. Basic UI for Staff

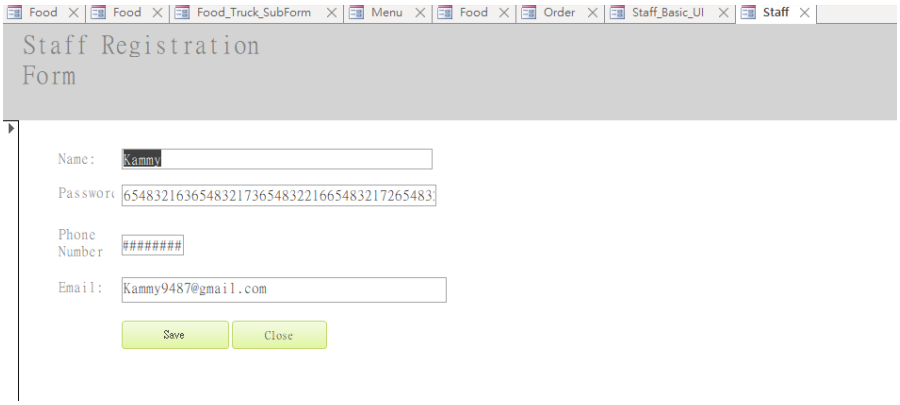
This is the basic user interface for staff, after login button are clicked, the login screen will be shown, just like the business and client interface.
The button Login and Close‘s function are same with the button in the login screen of business partner, but the data of staff will be stored at database of staff.

ii. Login Screen For Staff

iii. Password Changing Form

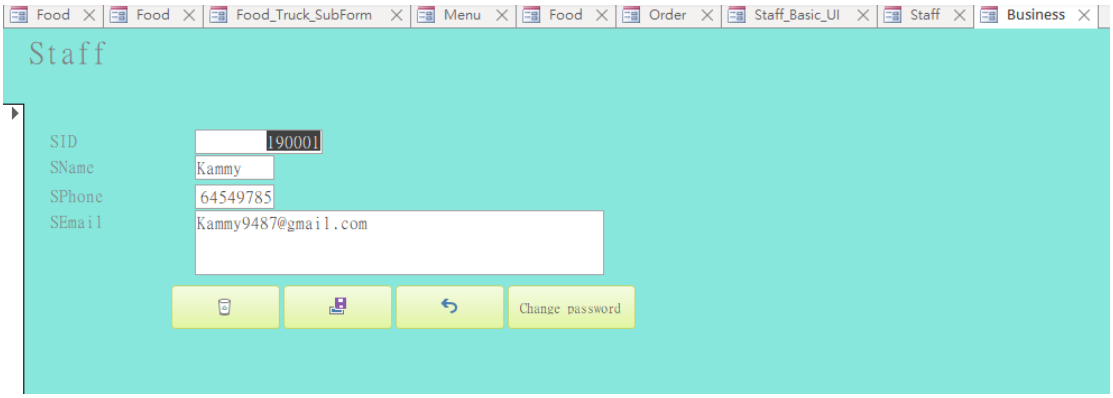


iv. Staff Registration Form



v. Interface for staff after login

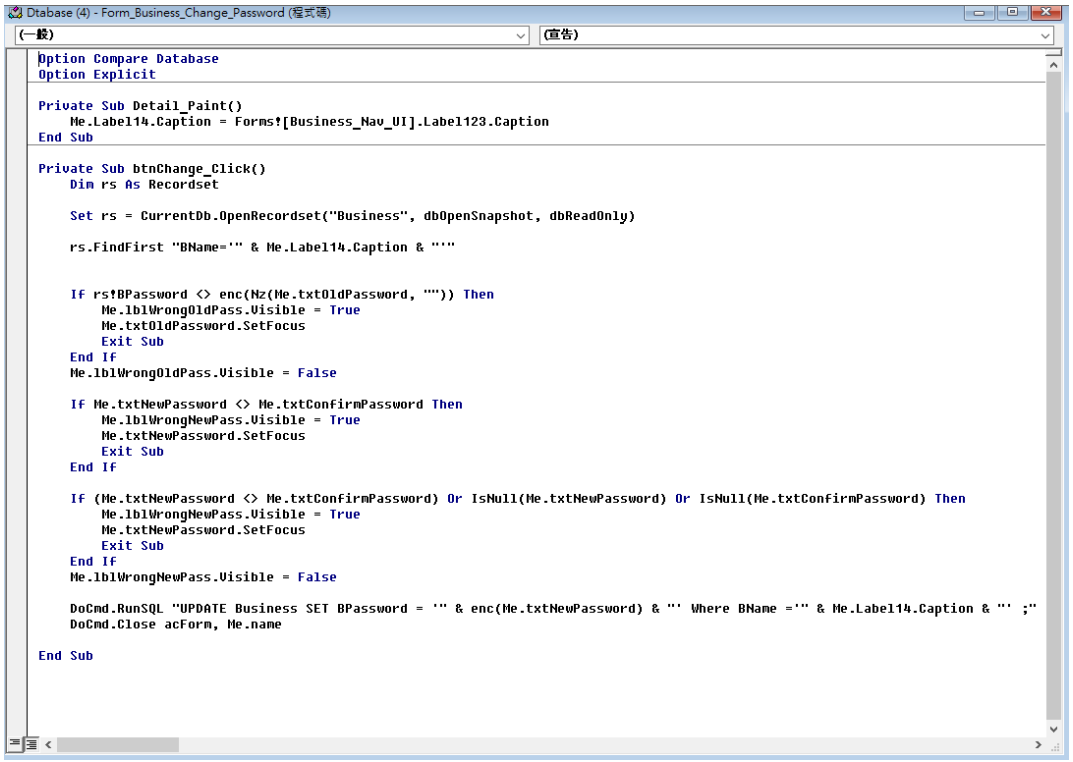
vi. Form for staff to edit their data



12. VBA

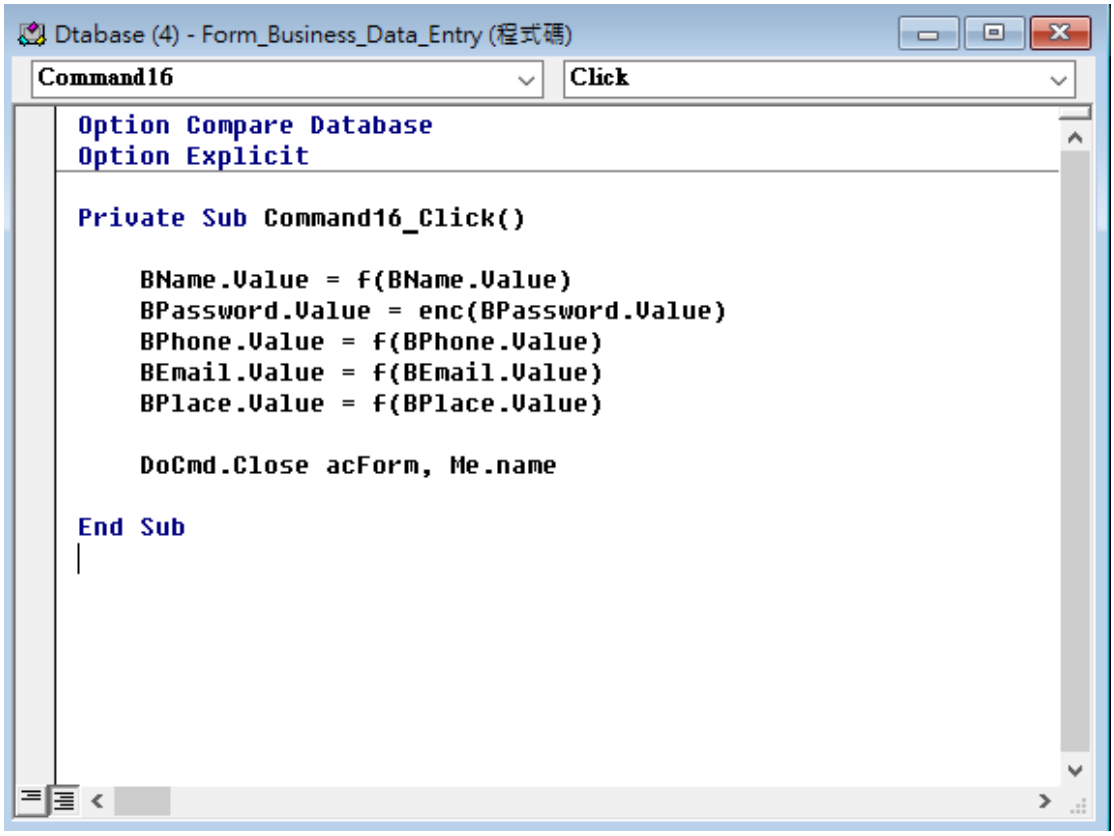
a. VBA for Business

This VBA is for Business users to change their password by alter database record after checking is the input value match system record or not.

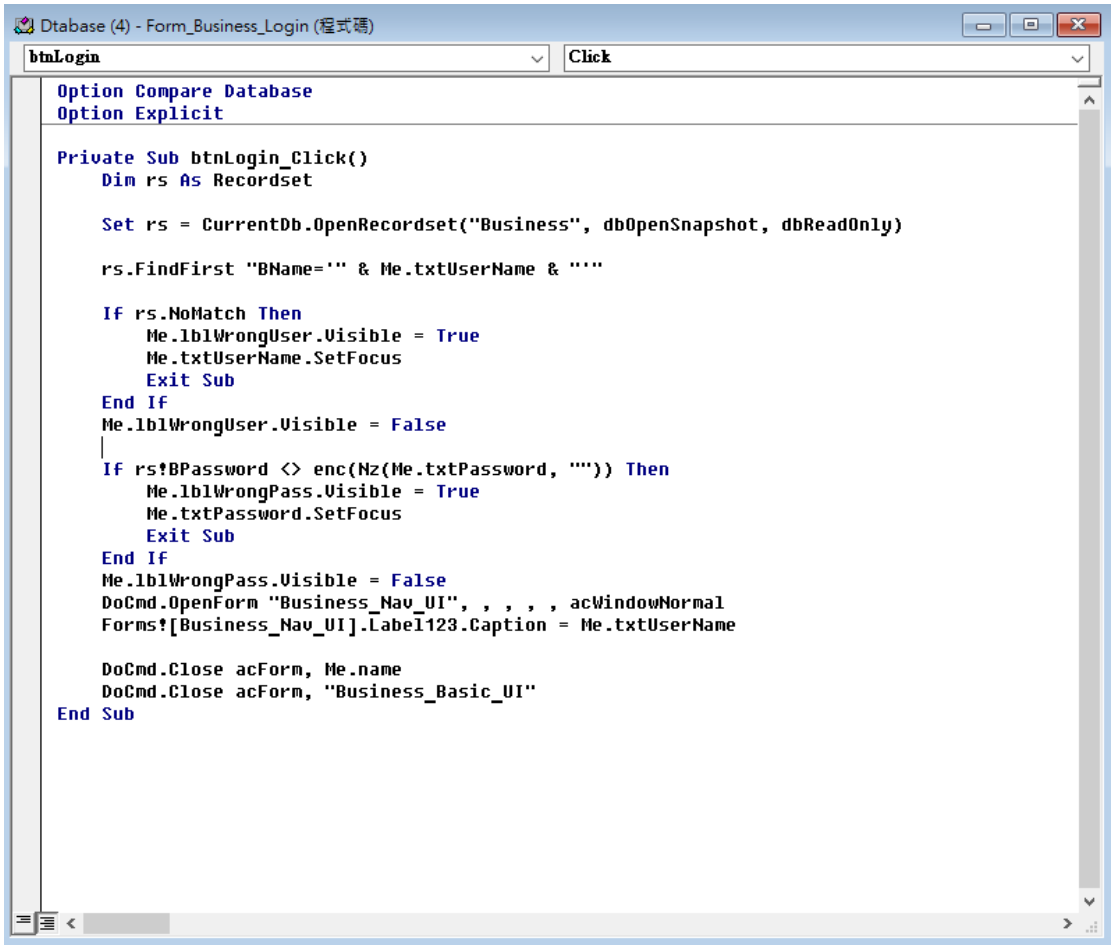



```
Option Compare Database
Option Explicit

Private Sub Detail_Paint()
    Me.Label14.Caption = Forms![Business_Nav_UI].Label123.Caption
End Sub

Private Sub btnChange_Click()
    Dim rs As Recordset

    Set rs = CurrentDb.OpenRecordset("Business", dbOpenSnapshot, dbReadOnly)

    rs.FindFirst "BName='" & Me.Label14.Caption & "'"


    If rs!BPassword <> enc(Nz(Me.txtOldPassword, "")) Then
        Me.lblWrongOldPass.Visible = True
        Me.txtOldPassword.SetFocus
        Exit Sub
    End If
    Me.lblWrongOldPass.Visible = False

    If Me.txtNewPassword <> Me.txtConfirmPassword Then
        Me.lblWrongNewPass.Visible = True
        Me.txtNewPassword.SetFocus
        Exit Sub
    End If

    If (Me.txtNewPassword <> Me.txtConfirmPassword) Or IsNull(Me.txtNewPassword) Or IsNull(Me.txtConfirmPassword) Then
        Me.lblWrongNewPass.Visible = True
        Me.txtNewPassword.SetFocus
        Exit Sub
    End If
    Me.lblWrongNewPass.Visible = False

    DoCmd.RunSQL "UPDATE Business SET BPassword = '" & enc(Me.txtNewPassword) & "' Where BName ='" & Me.Label14.Caption & "' ;"
    DoCmd.Close acForm, Me.name

End Sub
```

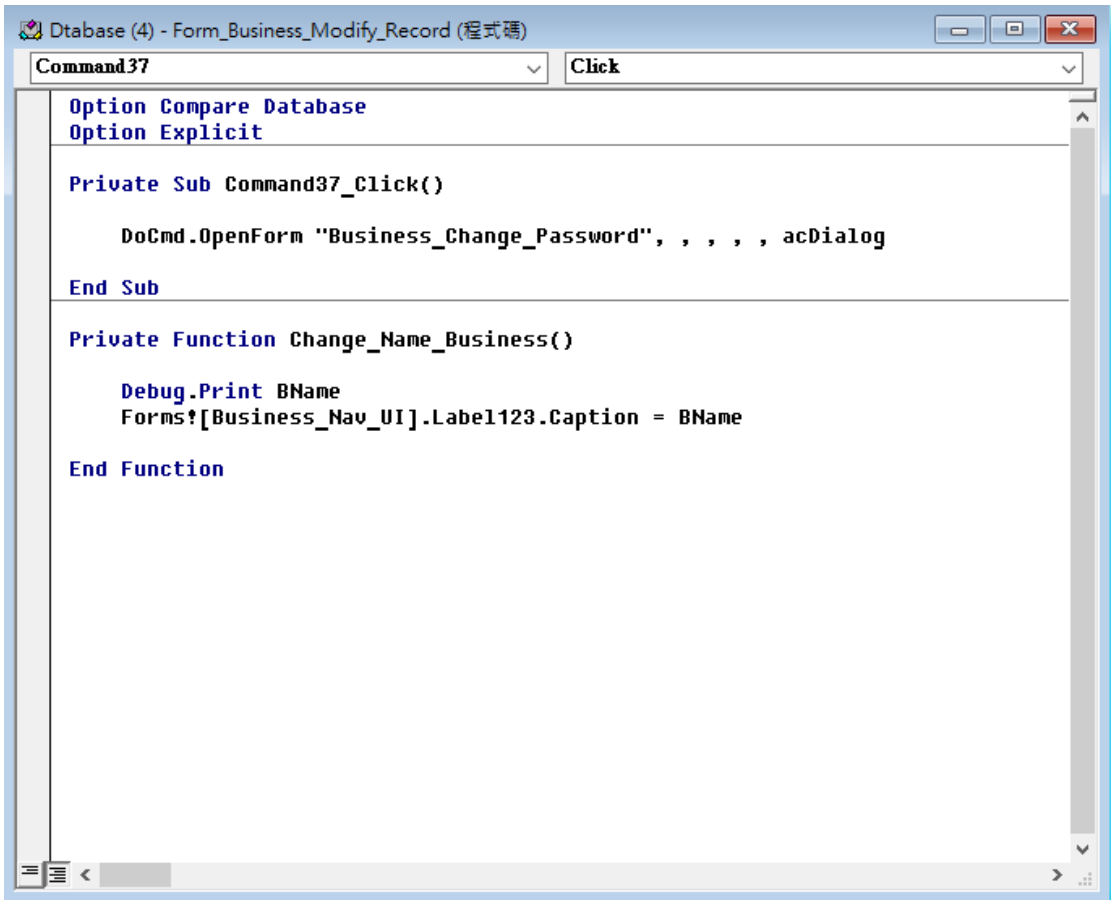
This VBA is for Business users to input the data into the database after filtering bad words.



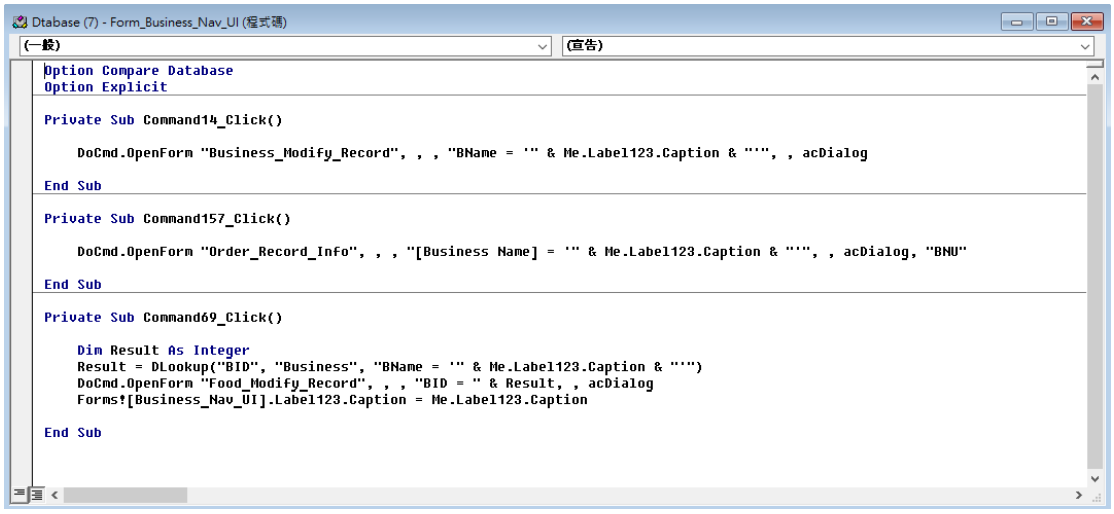
This VBA is for Business users to login after checking is the input value match system record or not.



This VBA is for Business users to modify their record.

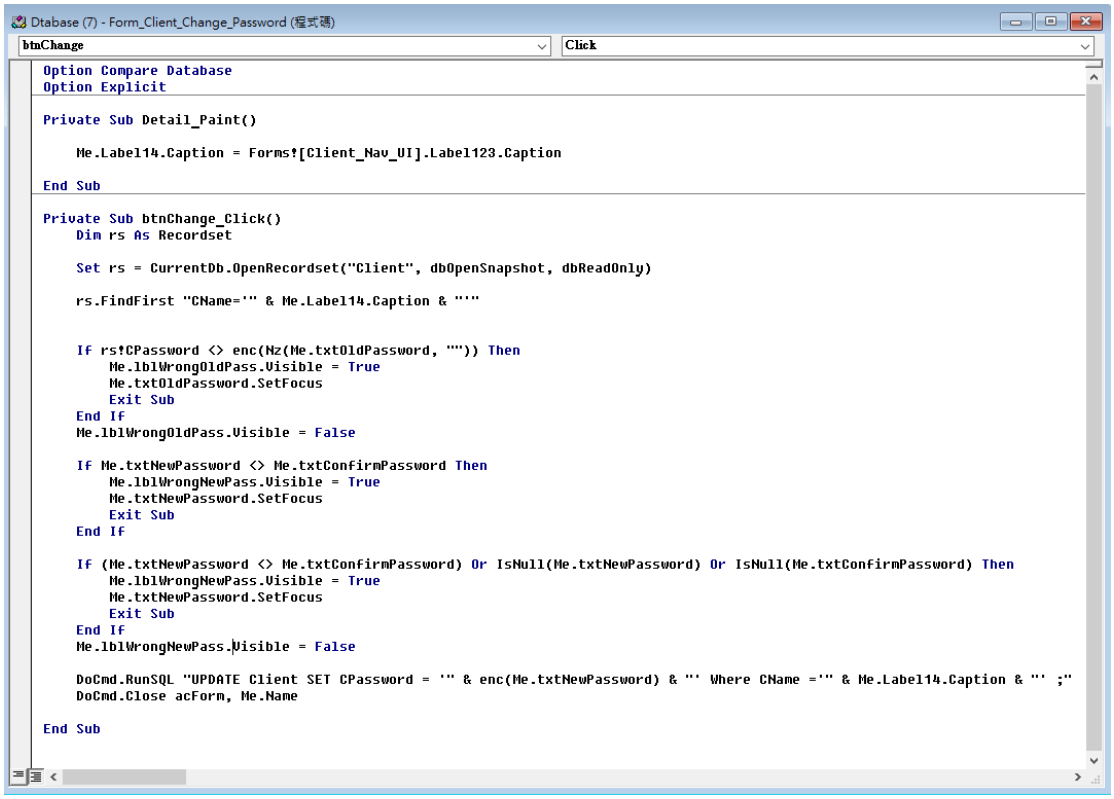


This VBA is for navigating Business users to their own interface after login.

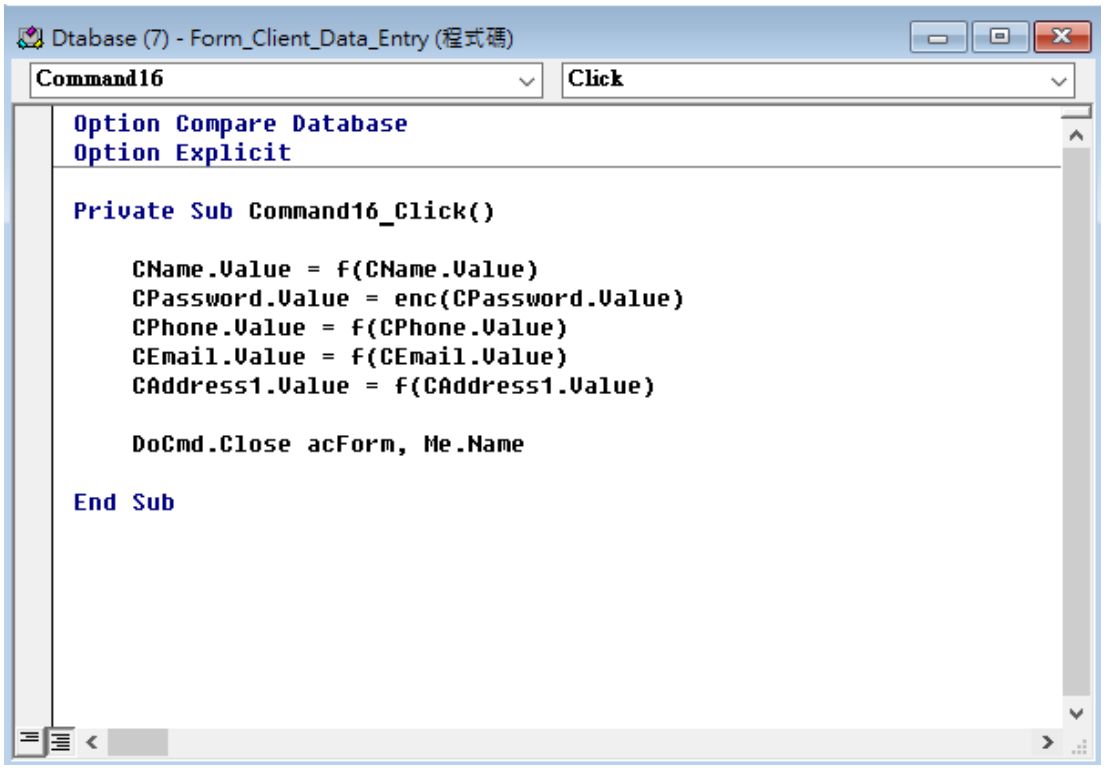


b. VBA for Client

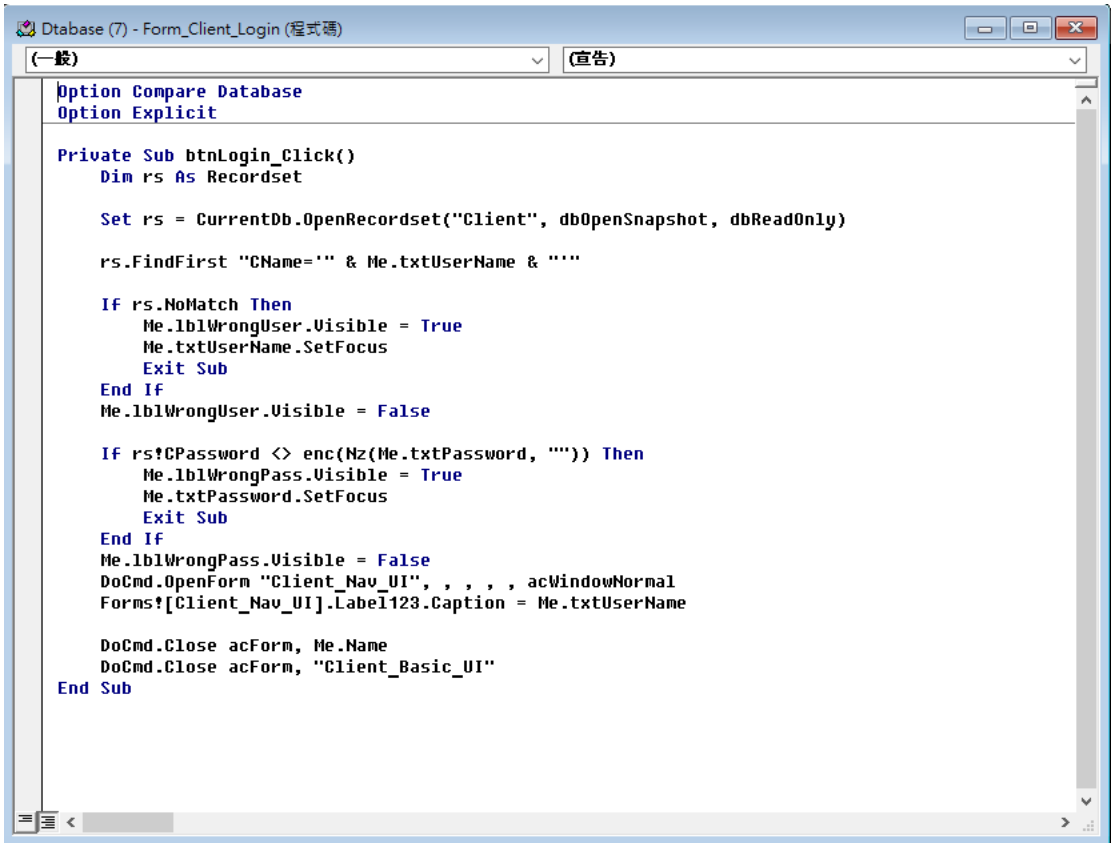
This VBA is for Client to change their password by alter database record after checking is the input value match system record or not.



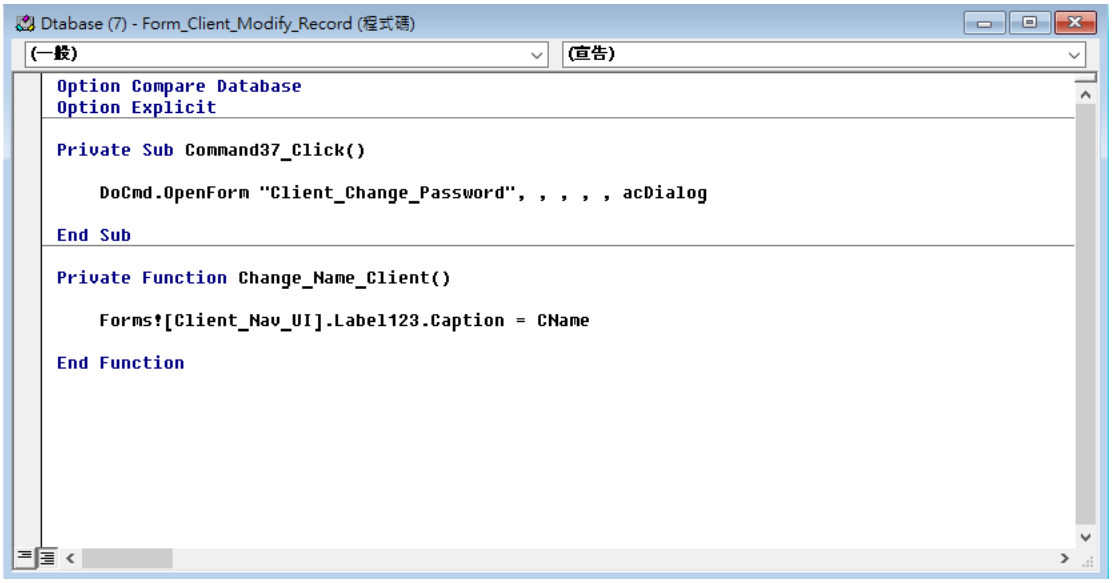
This VBA is for Client users to input the data into the database after filtering bad words. same as the VBA for Business users to entry data, but this is for Client.



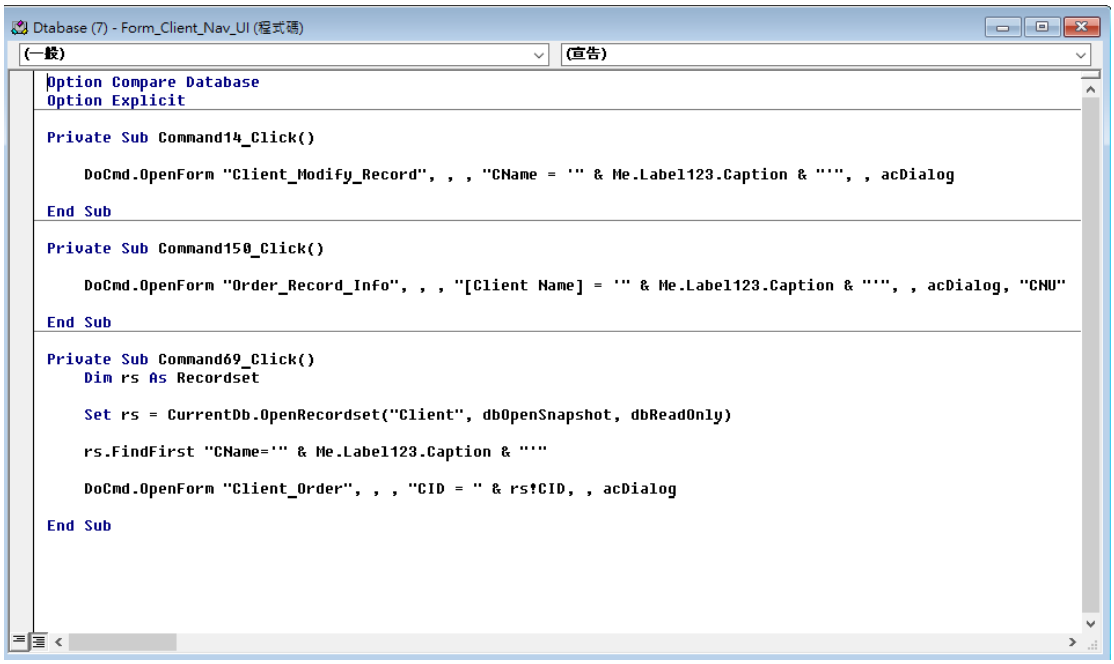
This VBA is for Client to login after checking is the input value match system record or not.



This VBA is for Client users to modify their record.

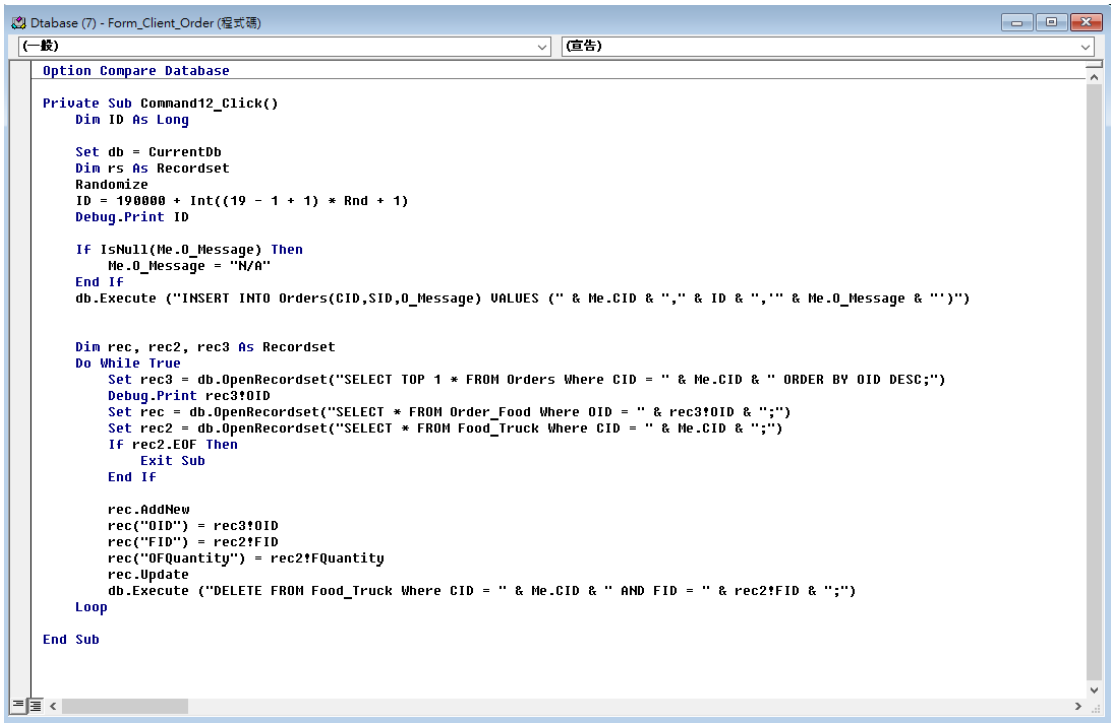


This VBA is for navigating Client users to their own interface after login.



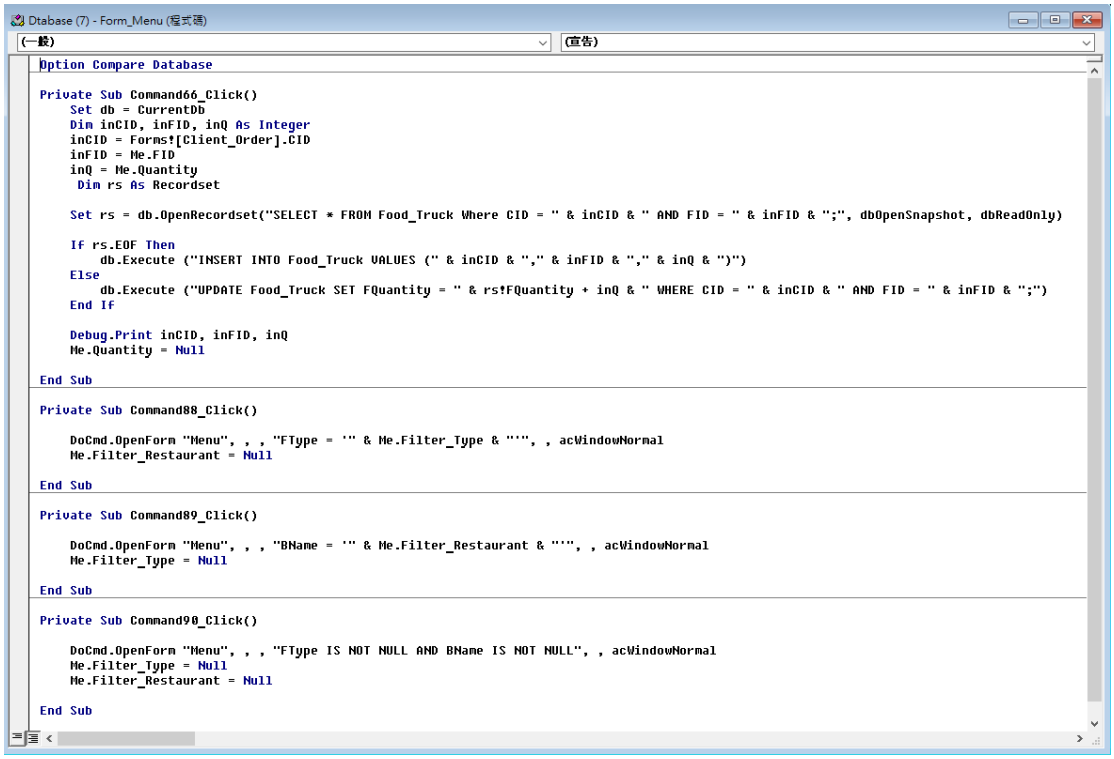
```
Option Compare Database
Option Explicit

Private Sub Command14_Click()

    DoCmd.OpenForm "Client_Modify_Record", , , "CName = '" & Me.Label123.Caption & "'", , acDialog

End Sub

Private Sub Command150_Click()

    DoCmd.OpenForm "Order_Record_Info", , , "[Client Name] = '" & Me.Label123.Caption & "'", , acDialog, "CNU"

End Sub

Private Sub Command69_Click()
    Dim rs As Recordset

    Set rs = CurrentDb.OpenRecordset("Client", dbOpenSnapshot, dbReadOnly)

    rs.FindFirst "CName='" & Me.Label123.Caption & "'"

    DoCmd.OpenForm "Client_Order", , , "CID = " & rs!CID, , acDialog

End Sub
```

This VBA is for Client users to input their order. After clients order their food, it will find the matches record of order and move it from Food_Truck to Order_Food.



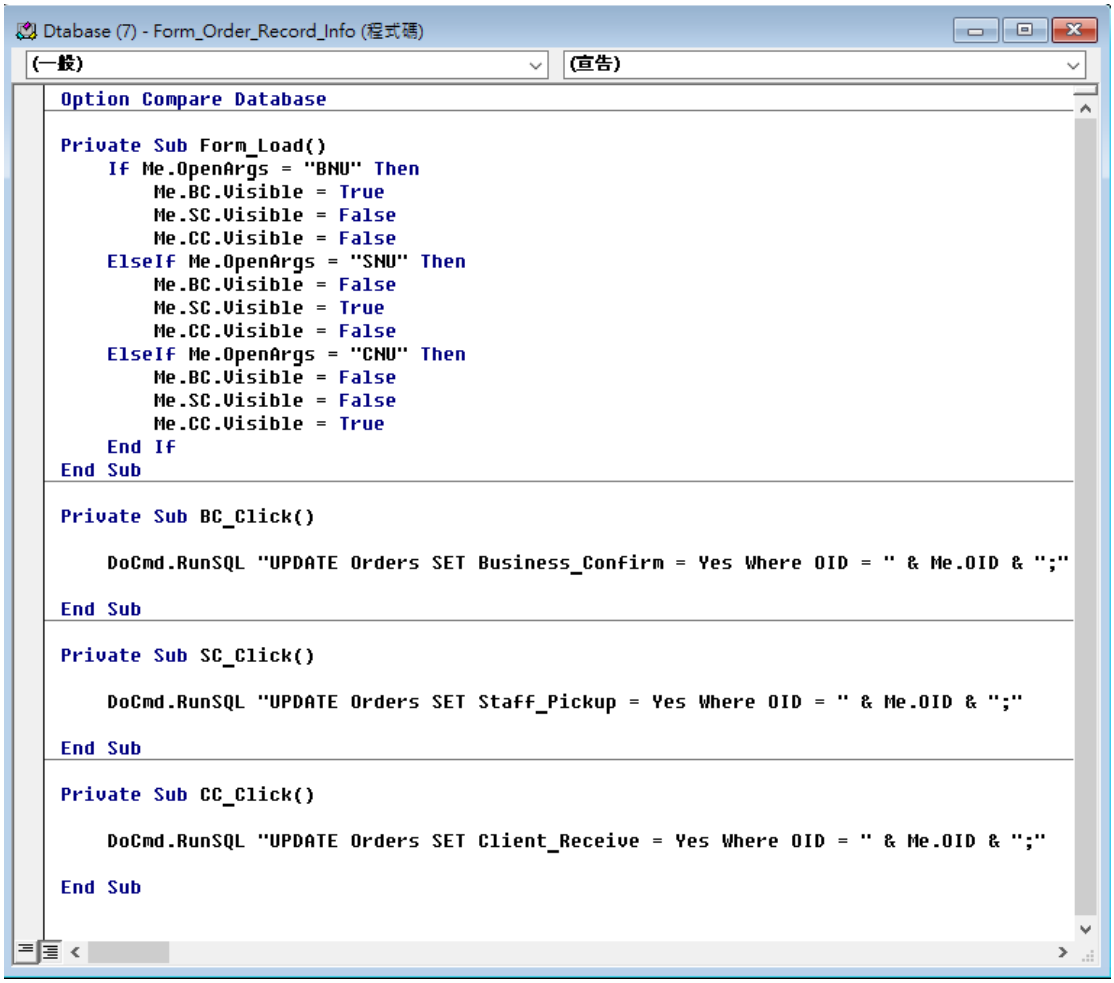
```
Option Compare Database

Private Sub Command12_Click()
    Dim ID As Long

    Set db = CurrentDb
    Dim rs As Recordset
    Randomize
    ID = 190000 + Int((19 - 1 + 1) * Rnd + 1)
    Debug.Print ID

    If IsNull(Me.O_Message) Then
        Me.O_Message = "N/A"
    End If
    db.Execute ("INSERT INTO Orders(CID,SID,O_Message) VALUES (" & Me.CID & "," & ID & ",'" & Me.O_Message & "')")


    Dim rec, rec2, rec3 As Recordset
    Do While True
        Set rec3 = db.OpenRecordset("SELECT TOP 1 * FROM Orders Where CID = " & Me.CID & " ORDER BY OID DESC;")
        Debug.Print rec3!OID
        Set rec = db.OpenRecordset("SELECT * FROM Order_Food Where OID = " & rec3!OID & ";")
        Set rec2 = db.OpenRecordset("SELECT * FROM Food_Truck Where CID = " & Me.CID & ";")
        If rec2.EOF Then
            Exit Sub
        End If

        rec.AddNew
        rec("OID") = rec3!OID
        rec("FID") = rec2!FID
        rec("OFQuantity") = rec2!FQuantity
        rec.Update
        db.Execute ("DELETE FROM Food_Truck Where CID = " & Me.CID & " AND FID = " & rec2!FID & ";")
    Loop

End Sub
```

This VBA is for the menu. It provides a user interface for Client User to select the foods to order, provides two search functions filtering by Food Type of Restaurant Name, and also provides a clear function to clear the filter.



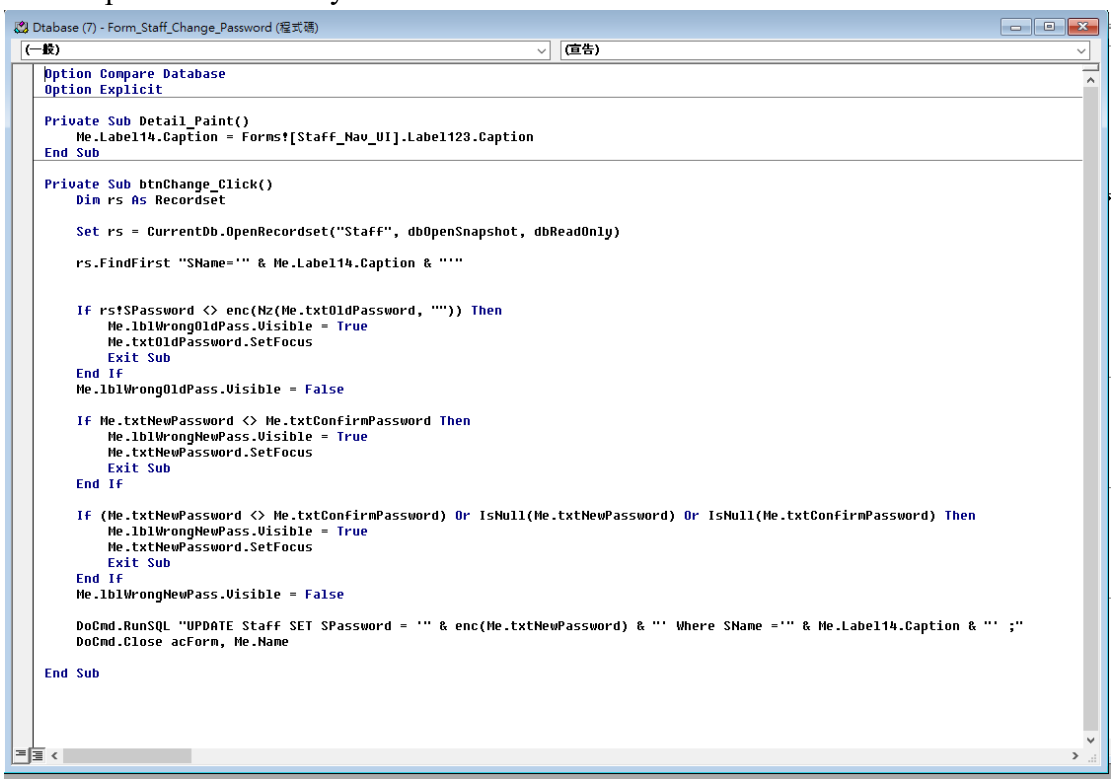

```
Option Compare Database

Private Sub Command66_Click()
    Set db = CurrentDb
    Dim inCID, inFID, inQ As Integer
    inCID = Forms![Client_Order].CID
    inFID = Me.FID
    inQ = Me.Quantity
     Dim rs As Recordset

    Set rs = db.OpenRecordset("SELECT * FROM Food_Truck Where CID = " & inCID & " AND FID = " & inFID & ";", dbOpenSnapshot, dbReadOnly)

    If rs.EOF Then
        db.Execute ("INSERT INTO Food_Truck VALUES (" & inCID & "," & inFID & "," & inQ & ")")
    Else
        db.Execute ("UPDATE Food_Truck SET FQuantity = " & rs!FQuantity + inQ & " WHERE CID = " & inCID & " AND FID = " & inFID & ";")
    End If

    Debug.Print inCID, inFID, inQ
    Me.Quantity = Null

End Sub

Private Sub Command88_Click()

    DoCmd.OpenForm "Menu", , , "FType = '" & Me.Filter_Type & "'", , acWindowNormal
    Me.Filter_Restaurant = Null

End Sub

Private Sub Command89_Click()

    DoCmd.OpenForm "Menu", , , "BName = '" & Me.Filter_Restaurant & "'", , acWindowNormal
    Me.Filter_Type = Null

End Sub

Private Sub Command90_Click()

    DoCmd.OpenForm "Menu", , , "FType IS NOT NULL AND BName IS NOT NULL", , acWindowNormal
    Me.Filter_Type = Null
    Me.Filter_Restaurant = Null

End Sub
```

This VBA is for the form Order_Record_Info, each type of user (business, staff, client) can tick different boxes by the confirm button to confirm the process of the takeaway.

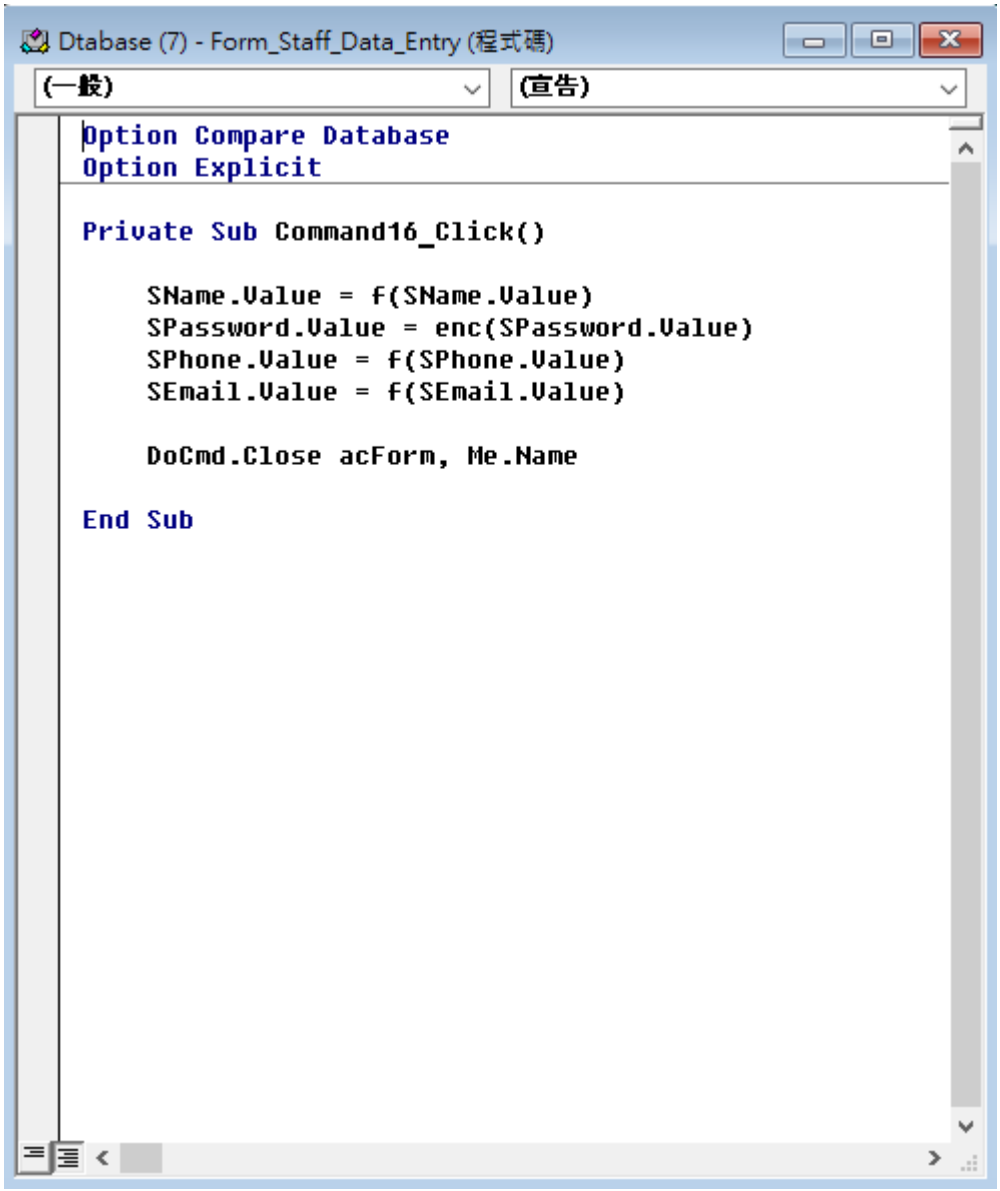



```
Option Compare Database

Private Sub Form_Load()
    If Me.OpenArgs = "BNU" Then
        Me.BC.Visible = True
        Me.SC.Visible = False
        Me.CC.Visible = False
    ElseIf Me.OpenArgs = "SNU" Then
        Me.BC.Visible = False
        Me.SC.Visible = True
        Me.CC.Visible = False
    ElseIf Me.OpenArgs = "CNU" Then
        Me.BC.Visible = False
        Me.SC.Visible = False
        Me.CC.Visible = True
    End If
End Sub

Private Sub BC_Click()

    DoCmd.RunSQL "UPDATE Orders SET Business_Confirm = Yes Where OID = " & Me.OID & ";"

End Sub

Private Sub SC_Click()

    DoCmd.RunSQL "UPDATE Orders SET Staff_Pickup = Yes Where OID = " & Me.OID & ";"

End Sub

Private Sub CC_Click()

    DoCmd.RunSQL "UPDATE Orders SET Client_Receive = Yes Where OID = " & Me.OID & ";"

End Sub
```

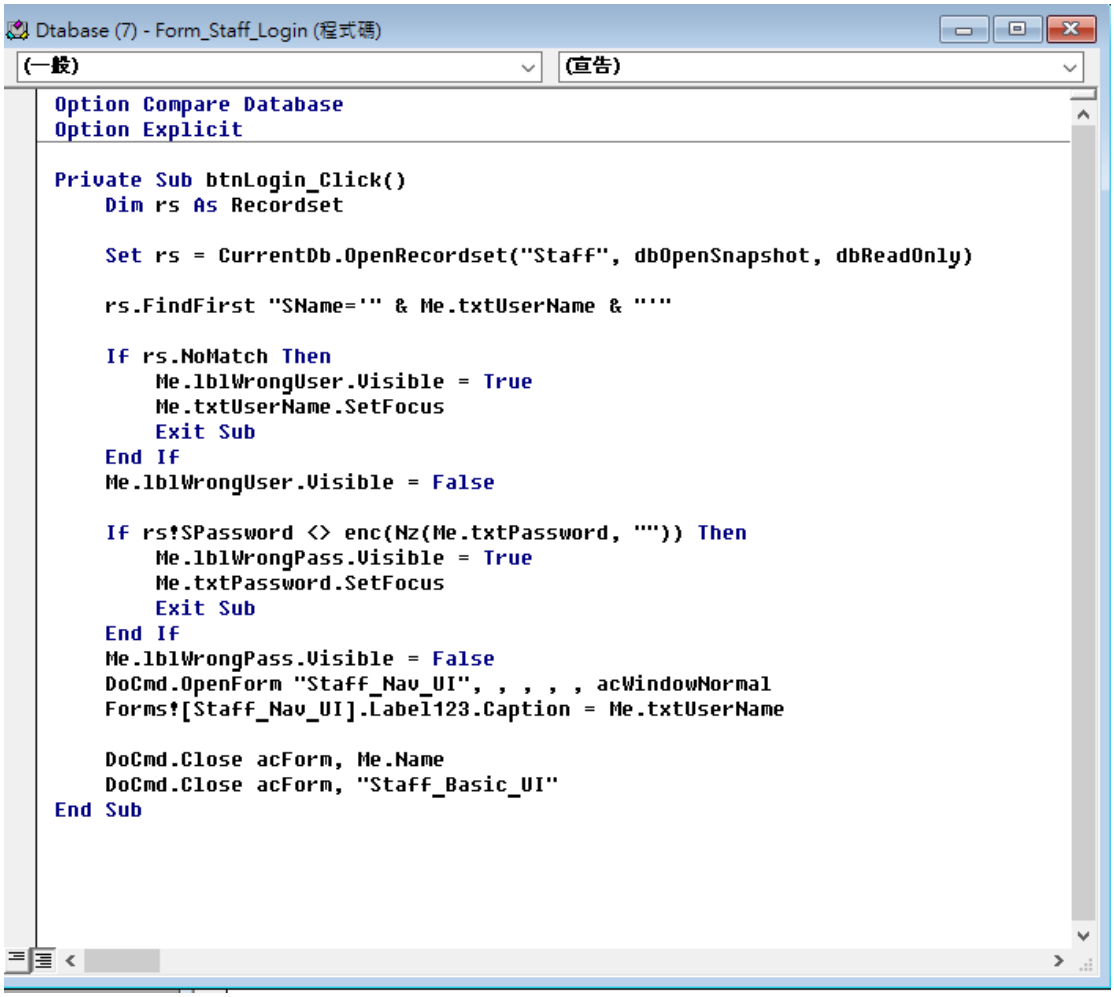
This VBA is for staff to change their password by alter database record after checking is the input value match system record or not.



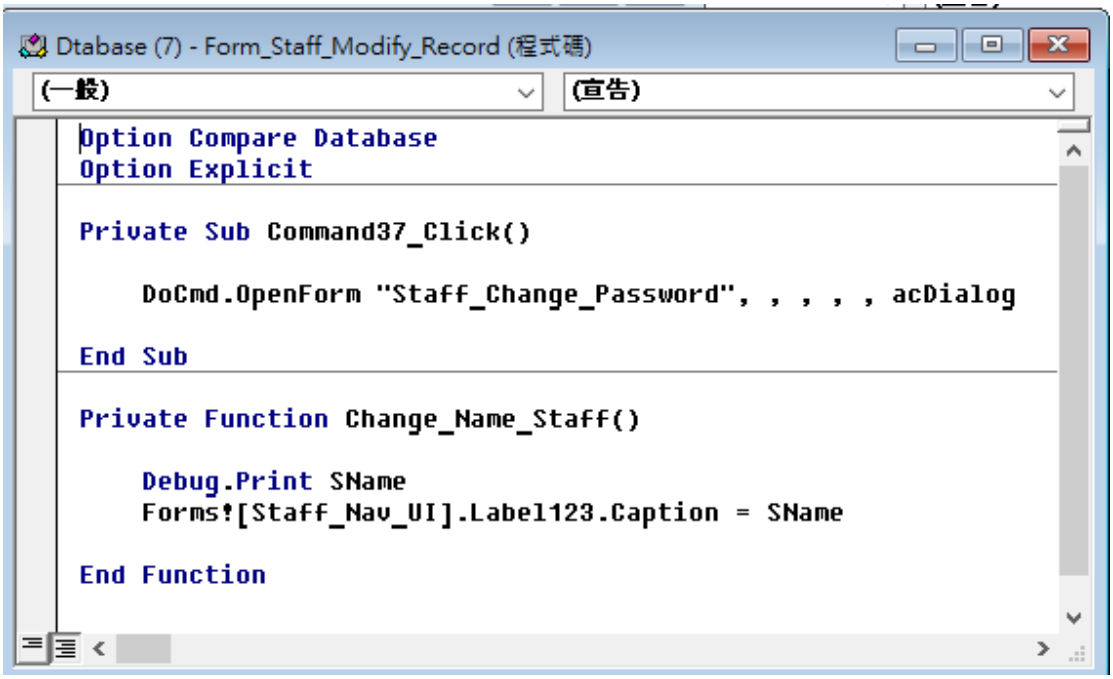
This VBA is for staff entry their data.



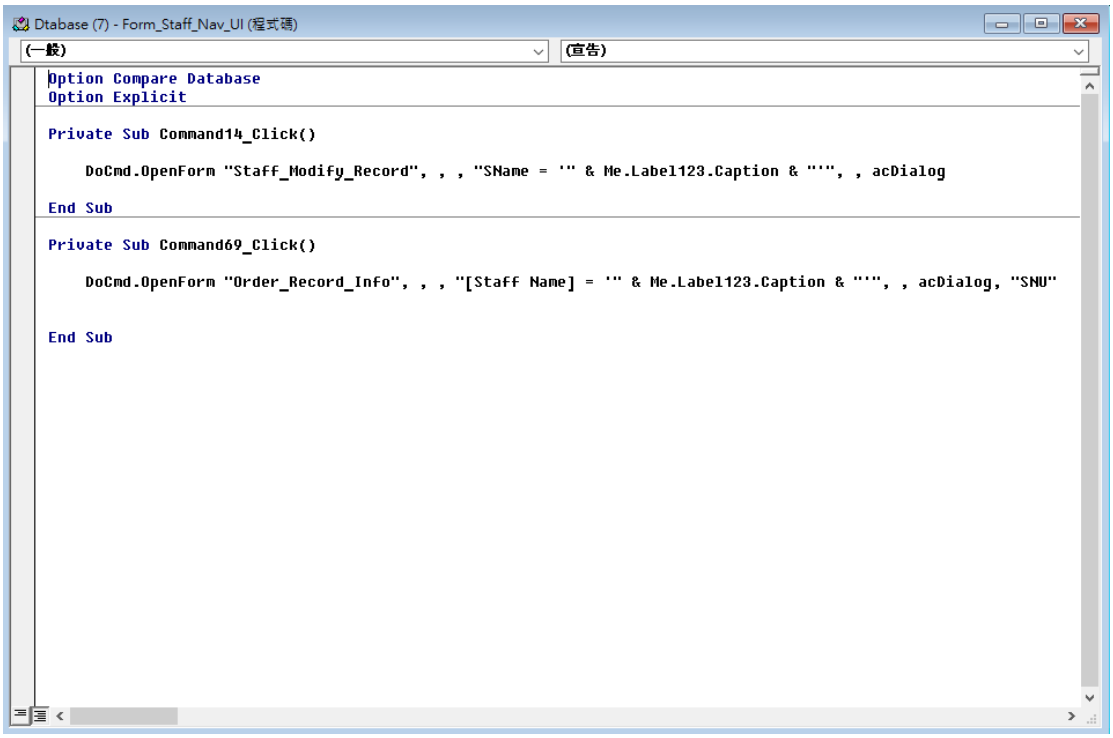
This VBA is for staff to login after checking is the input value match system record or not.



This VBA is for staff to modify their record.

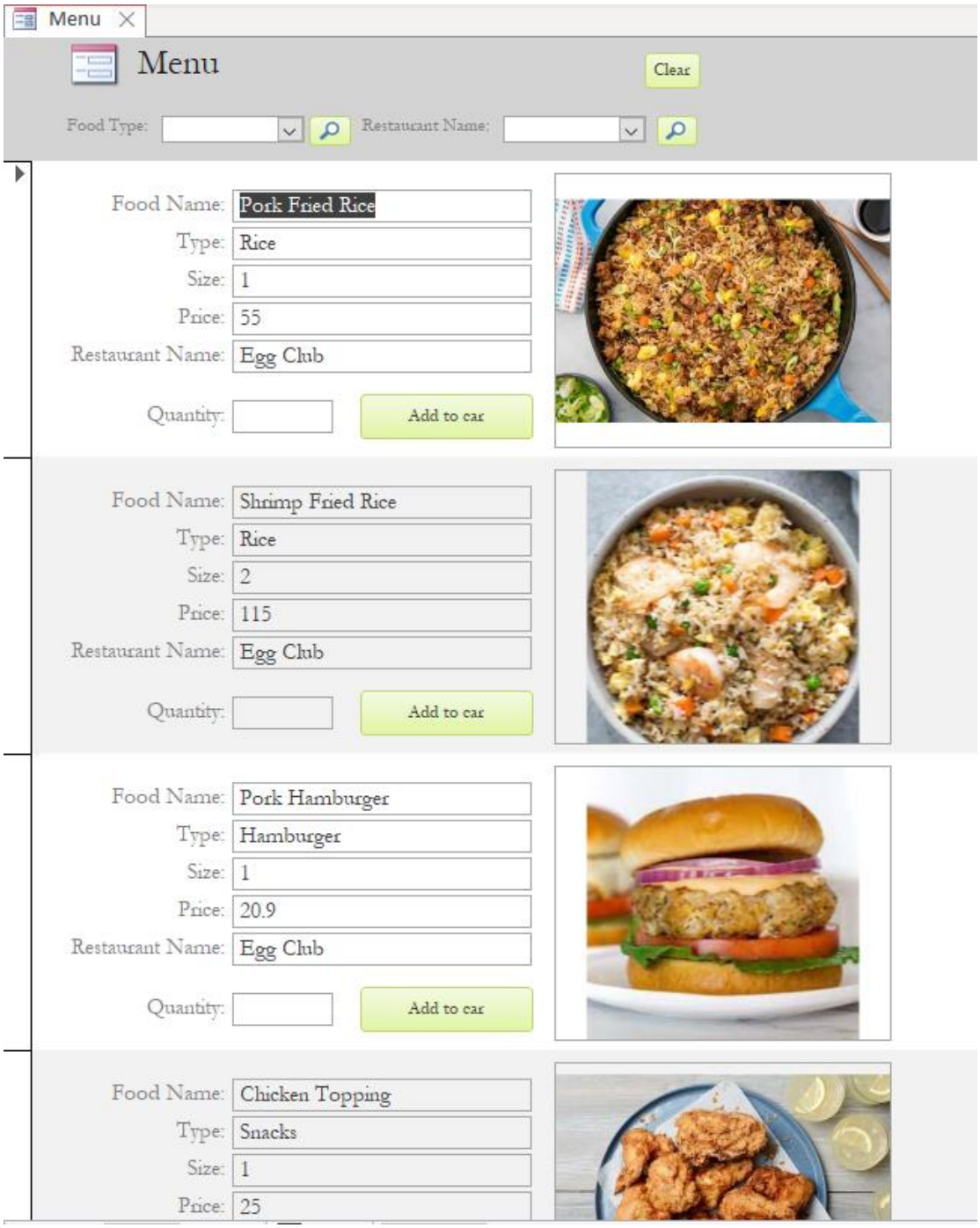


This VBA is for navigating Staff to their own interface after login.

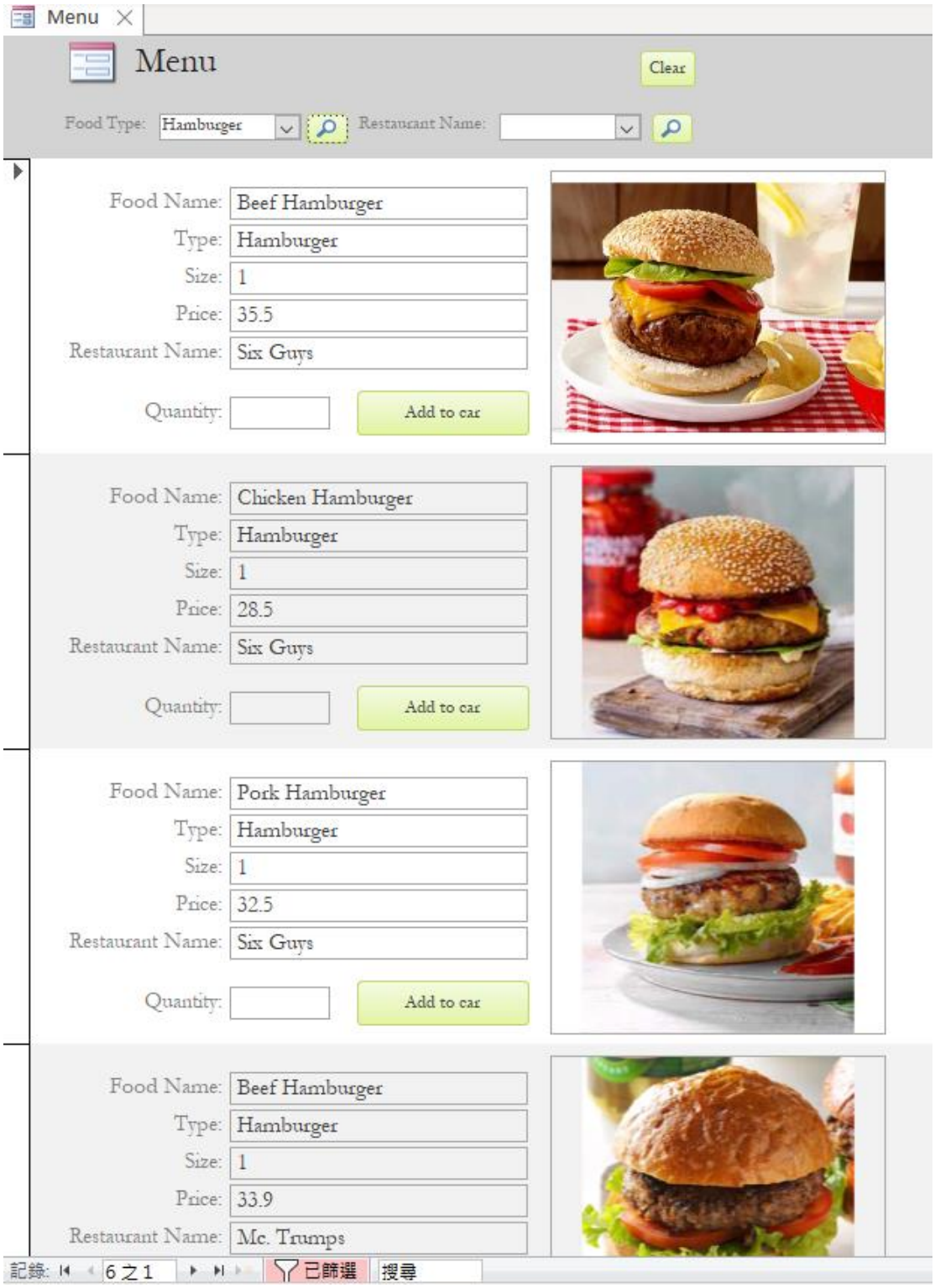


c. For all of the users

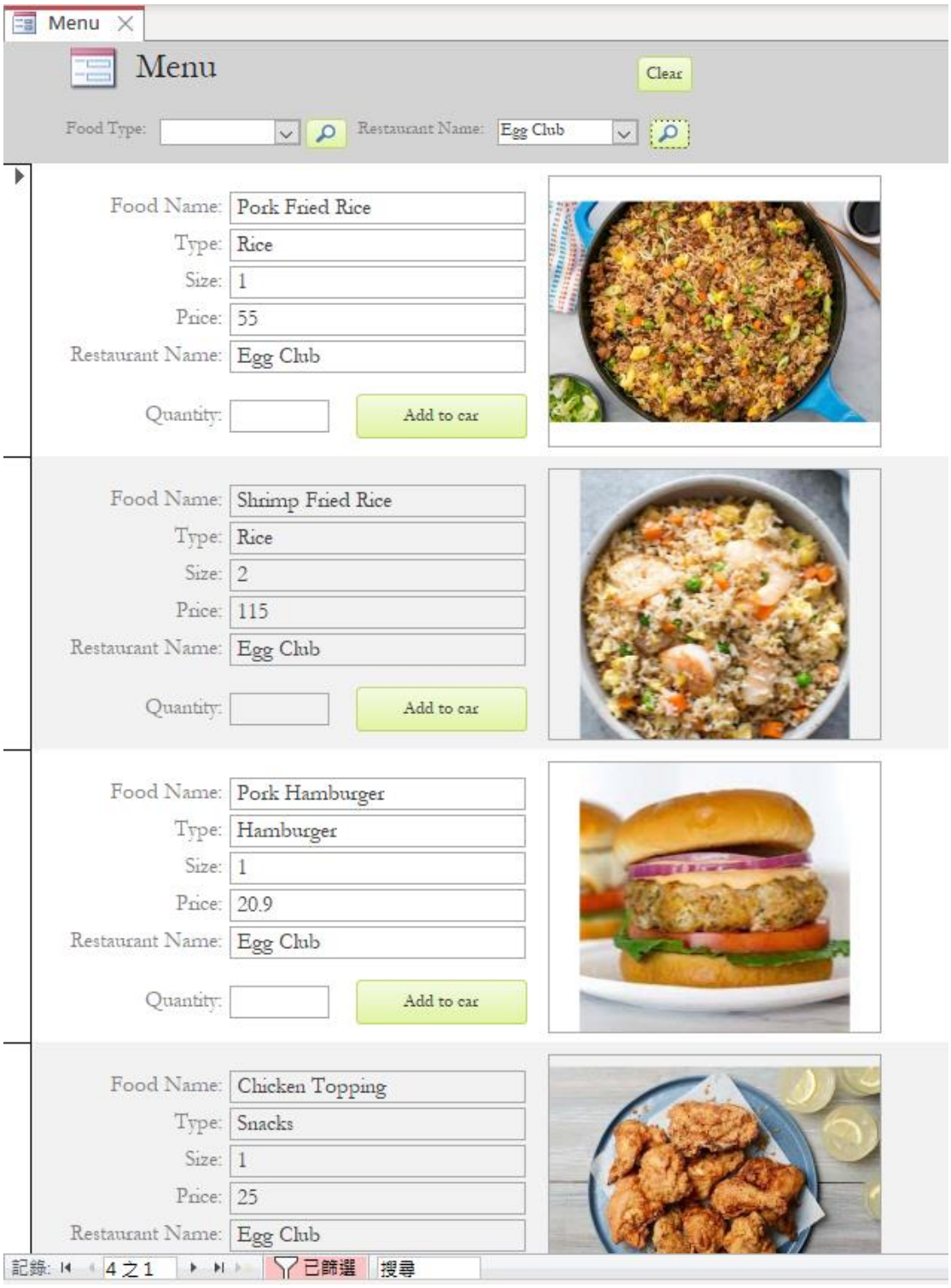
vii. Menu



Also, our platform has so many kinds of food. or the convenience of our customers, we add a search function. Y can select the food type you want by clicking the arrow next to Food Type. for example, user can select a specific type of food such as hamburger. After the button with magnifying glass clicked, the form will only show the food of hamburger.

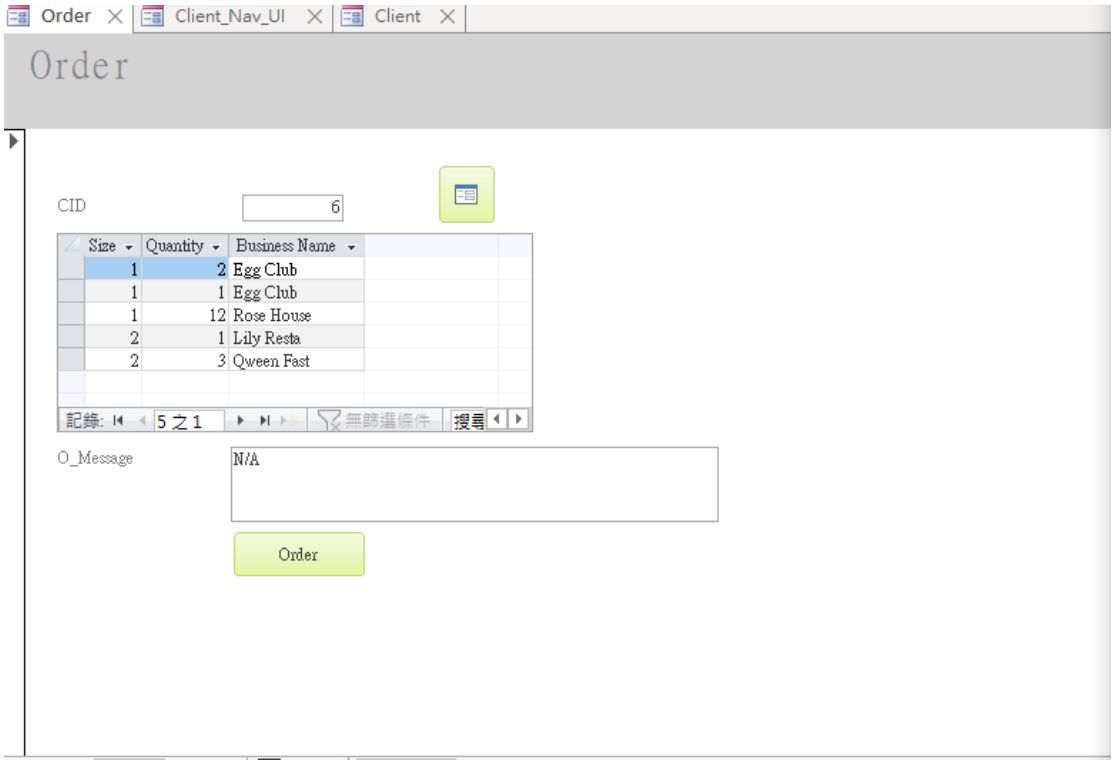


Also, user can search their favorite restaurant too. for example, our user only wants to eat the food from egg club (or other restaurant), they can select and the food from that restaurant will only be shown in menu.

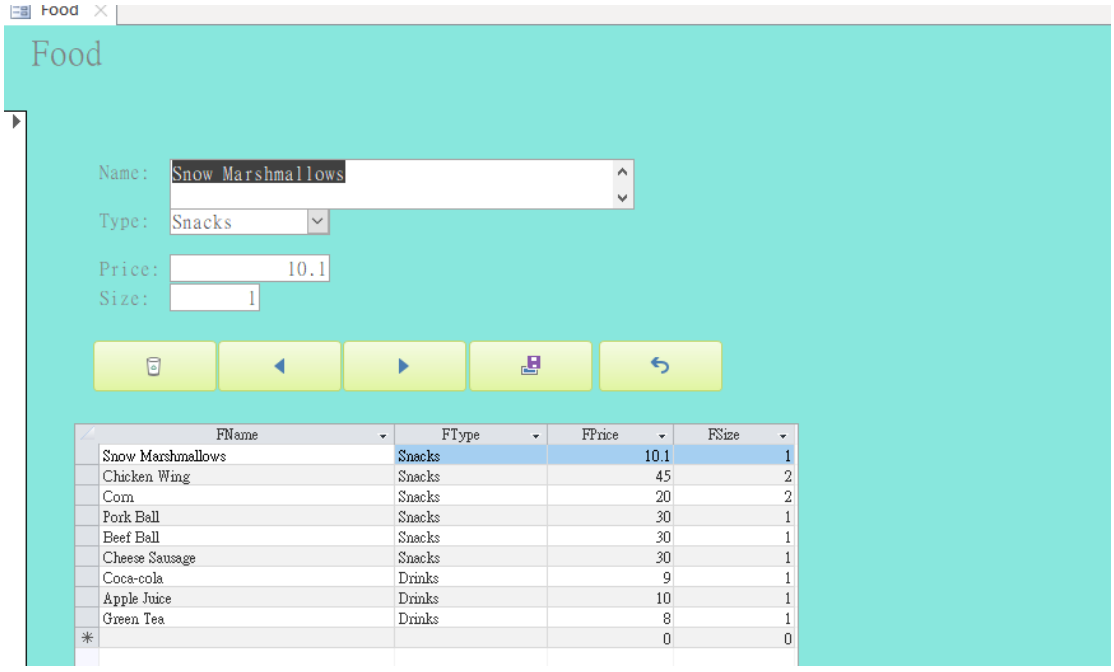


After the food are selected, Order Form will record the food you ordered let you have a chance to change your mind or check that is there any food you misclicked. Also, you can type any specific requirement you want (such as less sugar, no salt, extra tissue, etc) in the box of O_Message. After client check that there no mistake, they can click the order button.

1. Order



2. Food



3. Food record

Food | Food

FName	FType	FPrice	FSize
Snow Marshmallows	Snacks	10.1	1
Pork Fried Rice	Rice	55	1
Beef Fried Rice	Rice	130	2
Shrimp Fried Rice	Rice	115	2
Chicken Noodles	Noodles	70	1
Beef Noodles	Noodles	95	1
Vegetable Noodles	Noodles	80	1
Juicy Steak	Steak	85	1
Borscht	Soup	20	1
Chicken Soup	Soup	15	1
Lobster Soup	Soup	50	1
Chicken Wing	Snacks	45	2
Beef Hamburger	Hamburger	35.5	1
Chicken Hamburger	Hamburger	28.5	1
Pork Hamburger	Hamburger	32.5	1
French Fries	Snacks	15	1
Corn	Snacks	20	2
Beef Hamburger	Hamburger	33.9	1
Chicken Hamburger	Hamburger	22.9	1
Pork Hamburger	Hamburger	20.9	1
Ice Cream	Snacks	10	1
Chicken Set	Snacks	40	1
Chicken Topping	Snacks	25	1
Chicken Spleen	Snacks	25	1
White Sauce Chicken King Rice	Rice	30	1
Mushroom Rice	Rice	30	1
Spicy Chicken Rice	Rice	32	1
Beef Rice	Rice	34	1
Curry Beef Rice	Rice	35	1
Mushroom Spaghetti	Spaghetti	42	1
Spaghetti Bolognese	Spaghetti	45	1
Spaghetti Carbone	Spaghetti	45	1
Yangzhou Fried Rice	Rice	30	1
Western Fried Rice	Rice	30	1
Satay Beef Noodle	Noodles	32	1
Pork Ball	Snacks	30	1
Beef Ball	Snacks	30	1
Cheese Sausage	Snacks	30	1
Coca-cola	Drinks	9	1
Apple Juice	Drinks	10	1
Green Tea	Drinks	8	1
		0	0

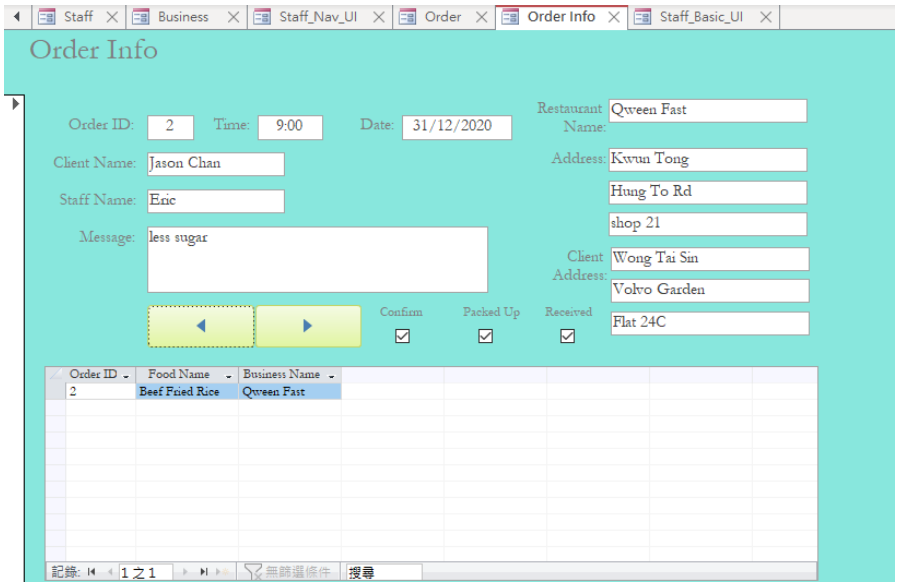
Food | Food | Food_Truck_SubForm

FName	Size	Quantity	Business Name
Snow Marshmallows	1	2	Egg Club
Snow Marshmallows	1	1	Egg Club
Pork Fried Rice	1	12	Rose House
Beef Fried Rice	2	1	Lily Resta
Shrimp Fried Rice	2	3	Qween Fast

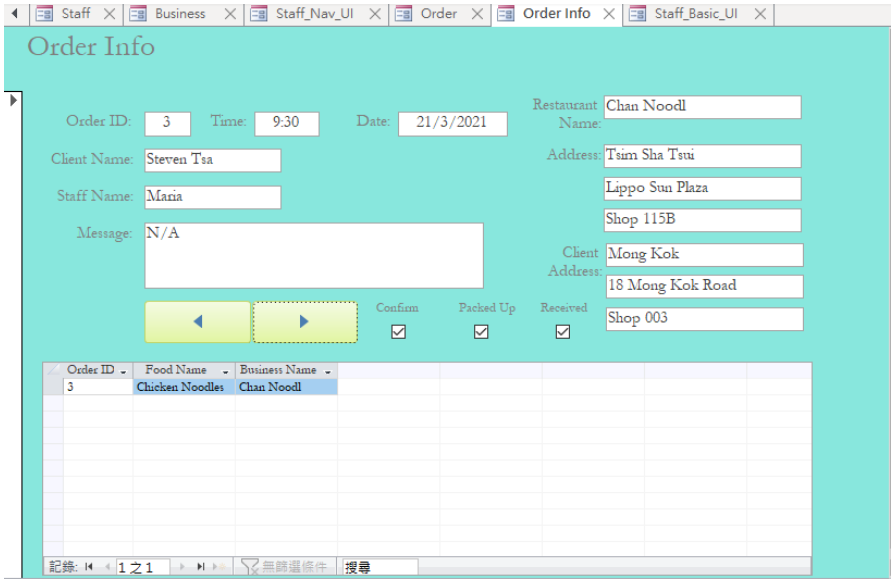
4. Order info

This is the form for record the order info, such as client name, food ordered, order message, the amount of food,restaurant and client's address.our staff can delivery the right food to the right place by following this form's data. By clicking the 2 button under order message, staff can change the data shown to the previous or next order.

Before



After



It clearly shows that when the right arrow button are clicked, the order id changed and the data of the form became another order.

This is the form of order that record the order of each staff deliver.

Food | Food | Food_Truck_SubForm | Menu | Food | Order

Order ID	Food Name	Message	Business Name	Business_Confi	Staff Name	Staff_Pickup	Client_Receive
1	Beef Fried Rice	N/A	Qween Fast	☑	Kevin	☑	☑
1	Beef Noodles	N/A	Chan Noodl	☑	Kevin	☑	☑
1	Shrimp Fried Rice	N/A	Egg Club	☑	Kevin	☑	☑
2	Beef Fried Rice	less sugar	Qween Fast	☑	Eric	☑	☑
3	Chicken Noodles	N/A	Chan Noodl	☑	Maria	☑	☑
4	Chicken Set	don't put salt	Qween Fast	☑	Kammy	☑	☑
4	Pork Hamburger	don't put salt	Six Guys	☑	Kammy	☑	☑
5	Beef Hamburger	N/A	Six Guys	☑	Jacob	☑	☑
6	Chicken Set	help me buy some point card at circle k	Qween Fast	☑	Peach	☑	☑
6	Chicken Spleen	help me buy some point card at circle k	Qween Fast	☑	Peach	☑	☑
6	Chicken Topping	help me buy some point card at circle k	Egg Club	☑	Peach	☑	☑
7	Beef Hamburger	no need tableware	Mc. Trumps	☑	Jacob	☑	☑
8	Cheese Sausage	N/A	Ben BBQ	☑	Egg	☑	☑
8	Snow Marshmallow	N/A	Ben BBQ	☑	Egg	☑	☑
9	Juicy Steak	deliver at 11:00	Ray Steak	☑	Katherine	☑	☑
11	Pork Fried Rice	N/A	Egg Club	☑	Jacob	☑	☑
11	Shrimp Fried Rice	N/A	Egg Club	☑	Jacob	☑	☑
11	Vegetable Noodles	N/A	Chan Noodl	☑	Jacob	☑	☑
12	Chicken Noodles	N/A	Chan Noodl	☑	Egg	☑	☑
13	Vegetable Noodles	N/A	Chan Noodl	☑	Peach	☑	☑
14	Corn	N/A	Ben BBQ	☑	Christine	☑	☑
14	Mushroom Rice	N/A	Qween Fast	☑	Christine	☑	☑
16	Juicy Steak	N/A	Ray Steak	☑	Katherine	☑	☑
15	Vegetable Noodles	N/A	Chan Noodl	☑	Jacob	☑	☑
17	Spicy Chicken Rice	N/A	Qween Fast	☑	Egg	☑	☑
18	Spaghetti Carbone	N/A	Lily Resta	☑	Peach	☑	☑
19	Yangzhou Fried Ri	N/A	Liu Fried	☑	Christine	☑	☑
20	Ice Cream	N/A	Mc. Trumps	☑	Katherine	☑	☐
21	Chicken Noodles	N/A	Chan Noodl	☑	Eric	☐	☐
22	Chicken Wing	N/A	Ben BBQ	☐	Eric	☐	☐

13. Report design

a. Food_Rank_In_Total_Report:

This report shows the quantity of each food and there price and ordered by the quantity.

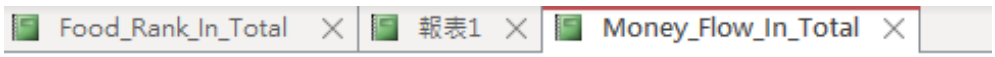
Food_Rank_In_Total

Quantity	Name	Price
8	Vegetable Noodles	80
7	Chicken Noodles	70
5	Corn	20
4	Beef Fried Rice	130
3	Shrimp Fried Rice	115
3	Juicy Steak	85
3	Chicken Set	40
2	Spaghetti Carbone	45
2	Chicken Spleen	25
1	Ice Cream	10
1	Beef Hamburger	33.9
1	Pork Hamburger	32.5
1	Cheese Sausage	30
1	Pork Fried Rice	55
1	Chicken Topping	25
1	Mushroom Rice	30
1	Spicy Chicken Rice	32
1	Beef Noodles	95
1	Snow Marshmallows	10.1
1	Beef Hamburger	35.5
1	Chicken Wing	45
1	Yangzhou Fried Rice	30

2021年4月16日 第 1 頁，共 1 頁

b. Money_Flow_In_Total_Report

This report displays the amount each food sold and the money flow.
The two boxes under the column Quantity and Total Flow show out the amount of food sold out and the total flow specifically.



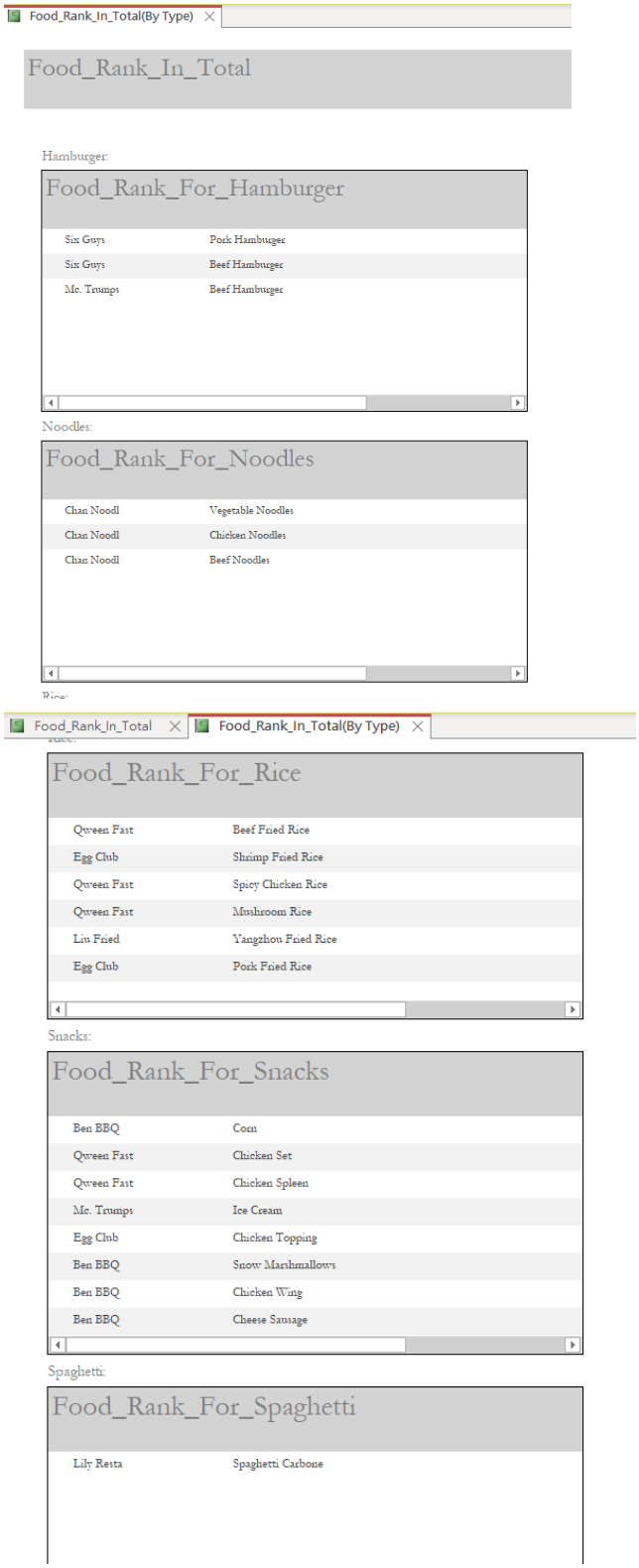
Money_Flow_In_Total

2021年4月15日
21:34:58

Name	Quantity	Total Flow
Beef Fried Rice	4	520
Beef Hamburger	1	33.9
Beef Hamburger	1	35.5
Beef Noodles	1	95
Cheese Sausage	1	30
Chicken Noodles	7	490
Chicken Set	3	120
Chicken Spleen	2	50
Chicken Topping	1	25
Chicken Wing	1	45
Corn	5	100
Ice Cream	1	10
Juicy Steak	3	255
Mushroom Rice	1	30
Pork Fried Rice	1	55
Pork Hamburger	1	32.5
Shrimp Fried Rice	3	345
Snow Marshmallows	1	10.1
Spaghetti Carbone	2	90
Spicy Chicken Rice	1	32
Vegetable Noodles	8	640
Yangzhou Fried Rice	1	30
	50	3074

第 1 頁，共 1 頁

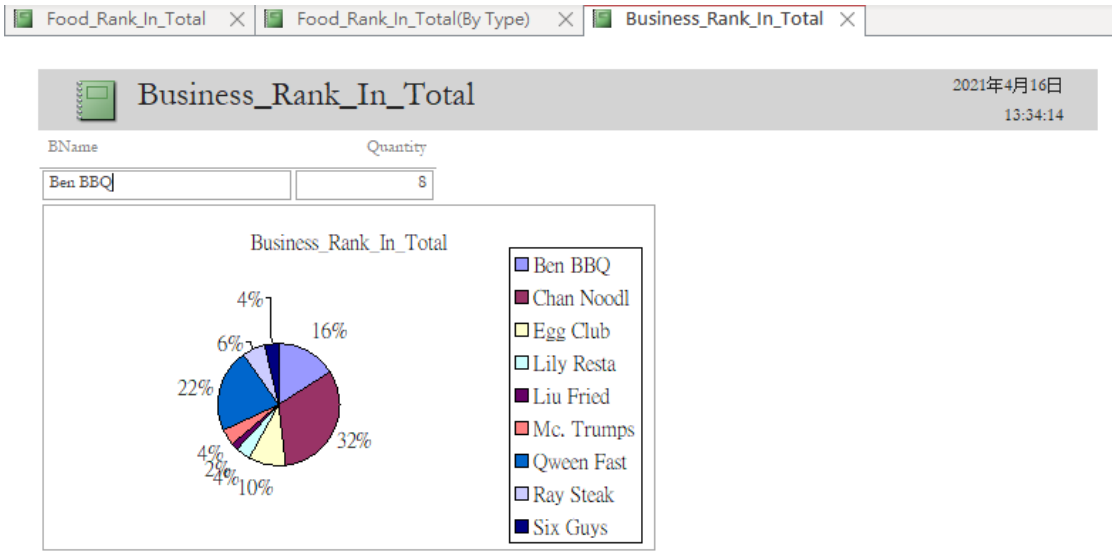
c. Food_Rank_In_Total Report (By Type)



This report shows out the food rank and classification by species,Business partner can use this table to determine their market share of a food item on our platform.

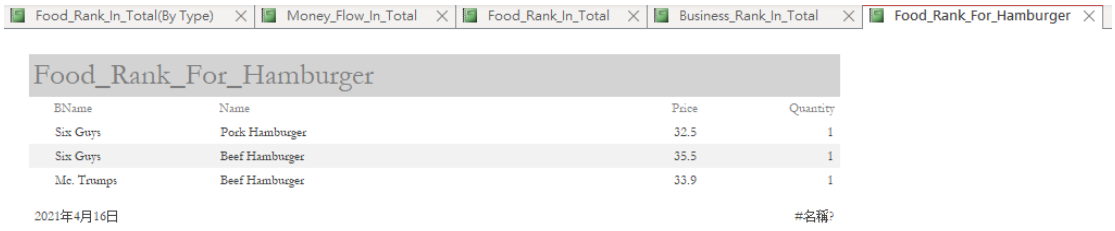
d. Business_Rank_In_Total

This report shows out the business rank in total.Business partner can see this report after then login our platform as a business partner.For different BuninessName,they can see how many percentage he have in out platform.

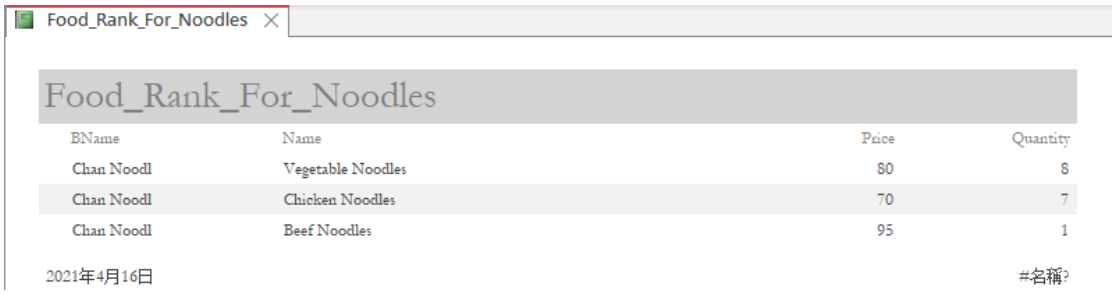


e. Food_Rank_For_Specific_Food

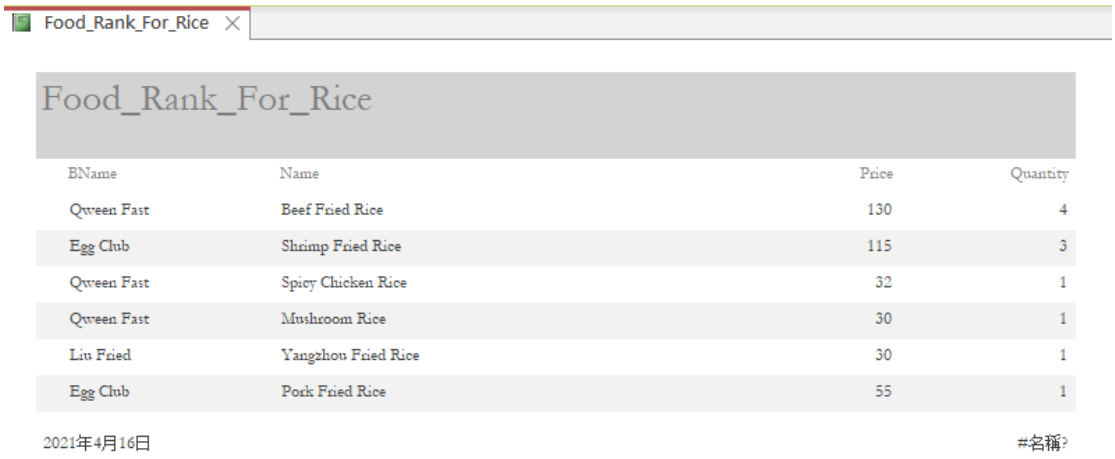
This is the report of food rank of hamburger.



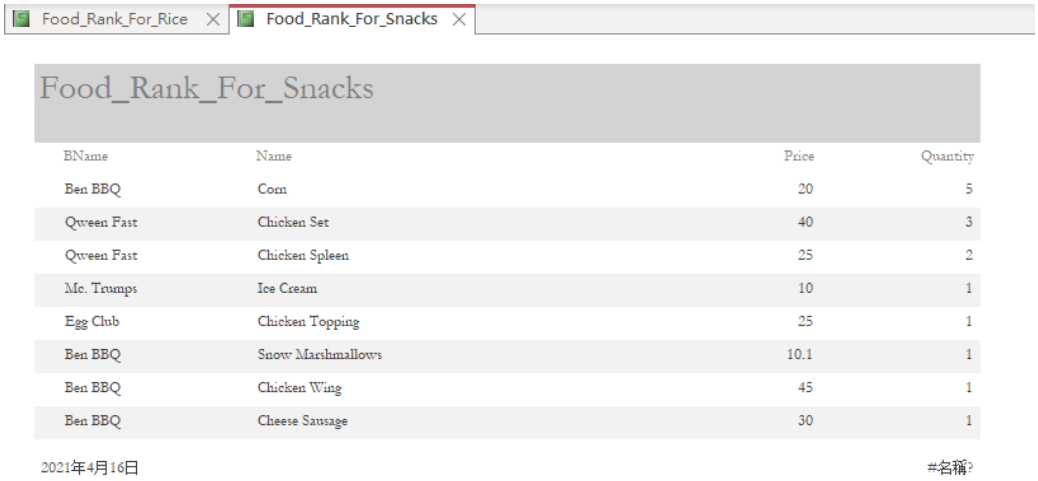
This is the report of food rank of noodle.



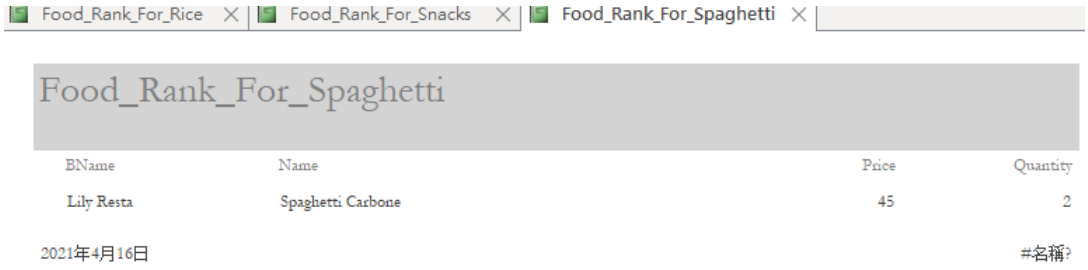
This is the report of food rank of rice.



This is the report of food rank of snacks.



This is the report of food rank of spaghetti.



14. Work Distribution List

Task	Start Date	Finish Date	Responsible
Outline	10/03/2021	11/03/2021	All
Adding Data	01/04/2021	10/04/2021	All
Design Form	08/04/2021	11/04/2021	Wong Tin Yau
Design Query	08/04/2021	11/04/2021	Wong Tin Yau
Making SQL	08/04/2021	11/04/2021	Kwok Chun Wing Wong Tin Yau
Word Report	01/04/2021	13/04/2021	Cho Shing Yin Kwok Chun Wing Wong Cho Hin
PowerPoint	01/04/2021	14/04/2021	Cho Shing Yin Wong Cho Hin
Debug	09/04/2021	15/04/2021	All

15. Conclusion

During designing this database, we encountered many difficulties, such as the normalization, resolve M: N relationship. We put lots of effort and research to solve the problem. Finally, we use energy and persistence to conquer all things. We also learnt that building a small database also consume a lot of time. We need to think how to design tables and how to make a report or a query to present the data clearly.

While designing the database, we gained a better understanding of how a food delivery platform works. We need to care the needs of business partners, customers and our staffs. We have to think about their actual use when designing the UI, forms and queries.

All in all, we gained a lot while making this platform. Although there are still spaces for improvement, it is hoped that this food delivery platform can really provide convenience for users in daily life.

16. Reference

https://www.foodnetwork.com/ (Food Photos)

https://stackoverflow.com/

https://www.youtube.com/