Introduction:

I run an online shoe shop and have developed a Microsoft Access database with three tables (as detailed in the Database section). Additionally, I use Excel VBA to streamline several processes, such as loading data from Access tables, updating new customer information into the Access tables, colouring the status of completed orders, displaying customer information based on the order status, and updating the database in the Excel sheet and sending it back to the Access tables.

Database

Customer Table: This table contains a record for each customer who purchases shoes. It includes the following fields:

-CustomerID: The primary key for the table. (Data Type: Number)

-FirstName: The first name of the buyer. (Data Type: Short Text)

-Surname: The surname of the buyer. (Data Type: Short Text)

-Item: The type of shoes purchased by the buyer. (Data Type: Long Text)

Delivery Table: This table records delivery information for each order made by the shop owner and sold to buyers. It contains the following fields:

OrderID: The primary key for the table. . (Data Type: Date)

SoldDate: The date when the shoes were sold. (Data Type: Date)

ShipDate: The date when the shoes were shipped to the buyer. Shipping typically occurs 1 or 2 days after the SoldDate. (Data Type: Date)

DeliveryDate: The date when the shoes were delivered to the buyer. Delivery usually occurs 2 days after the ShipDate. (Data Type: Date)

Orders table: This table is a junction table that specifies the profits, retail prices, and the status of each sales transaction. The table includes the following fields:

OrderID: The primary key for the table, uniquely identifying each order. (Data Type: Date)

CustomerID: The ID of the customer associated with the order. (Data Type: Date)

Wholesale: the price at which the shoes were sold to the buyer. This reflects the retail price for the customer. (Data Type: Number)

CostPrice: The price at which the owner purchased the shoes from the producers or suppliers. (Data Type: Number)

Profit: The profit made by the shop owner from the sale. This is typically calculated as: Profit = Wholesale – CostPrice (Data Type: Number)

CompletedOrder: The status of the order can be one of three options. "Completed" means the order has been successfully processed, the shoes were delivered, and the transaction is complete. "Returns" indicates that the shoes were returned by the buyer within the 1-month free return policy. "Pending" refers to an order that is still in progress, such as being shipped or awaiting completion. Any status after the sold date is considered pending. (Data Type: Short Text)

Also, I have created 3 queries in the access tables. It shows all the sales are returned, the sales are made between 31/05/2024 and 01/01/2024, and sum of profits for different types of shoes to see which shoes are best seller.

Front-end:

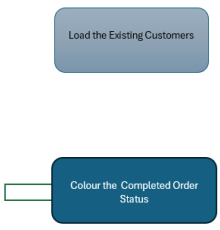
In second tab of excel, I have created a Pivot table shows the Sum of profits for each item in my sales months during 2024 and 2025.

Sum of Profit	Column Labels							
Row Labels	Jordan 1	Jordan 11	Jordan 2	Jordan 3	Jordan 4	Jordan 4	Jordan 5	Grand Total
⊟2024	75	30	20	80	50		15	270
⊞Qtr1	25		20	0	10		15	70
⊟Qtr2	0	30			20			50
Apr	0							0
May		30						30
Jun					20			20
⊟Qtr3		0		40	0			40
Jul					0			0
Aug				40				40
Sep		0						0
⊟Qtr4	50			40	20			110
Oct	25				20			45
Nov	25							25
Dec				40	0			40
⊟2025		30			40	60		130
⊞Qtr1		30			40	60		130
Grand Total	75	60	20	80	90	60	15	400

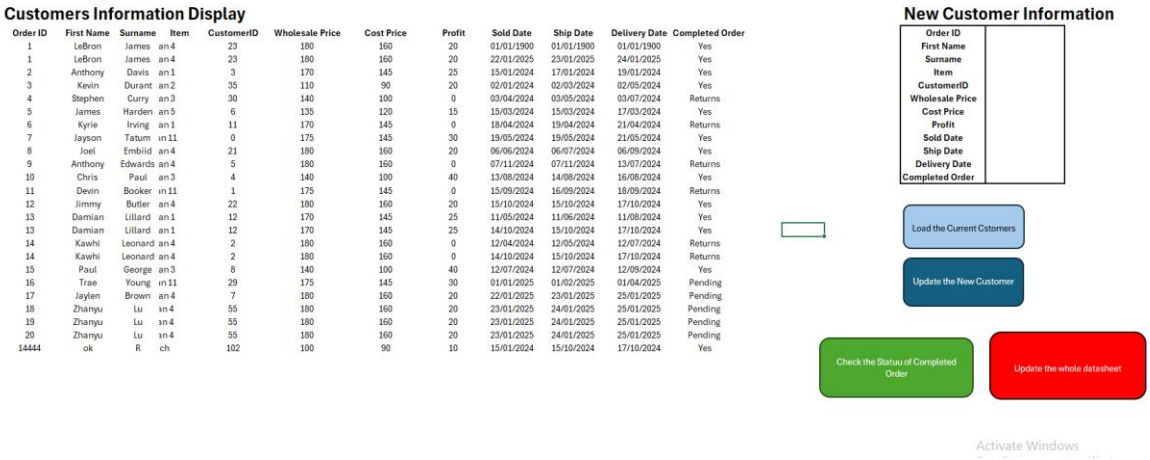
VBA Middleware:

Existing Customers in Access

Order ID	First Name	Surname	Item	CustomerID	Wholesale Price	Cost Price	Profit	Sold Date	Ship Date	Delivery Date	Completed Order
1	LeBron	James	Jordan 4	23	180	160	20	22/01/2025	23/01/2025	24/01/2025	Yes
2	Anthony	Davis	Jordan 1	3	170	145	25	15/01/2024	17/01/2024	19/01/2024	Yes
3	Kevin	Durant	Jordan 2	35	110	90	20	01/02/2024	03/02/2024	05/02/2024	Yes
4	Stephen	Curry	Jordan 3	30	140	100	0	04/03/2024	05/03/2024	07/03/2024	Returns
5	James	Harden	Jordan 5	6	135	120	15	15/03/2024	15/03/2024	17/03/2024	Yes
6	Kyrie	Irving	Jordan 1	11	170	145	0	18/04/2024	19/04/2024	21/04/2024	Returns
7	Jayson	Tatum	Jordan 11	0	175	145	30	19/05/2024	19/05/2024	21/05/2024	Yes
8	Joel	Embiid	Jordan 4	21	180	160	20	06/06/2024	07/06/2024	09/06/2024	Yes
9	Anthony	Edwards	Jordan 4	5	180	160	0	11/07/2024	11/07/2024	13/07/2024	Returns
10	Chris	Paul	Jordan 3	4	140	100	40	13/08/2024	14/08/2024	16/08/2024	Yes
11	Devin	Booker	Jordan 11	1	175	145	0	15/09/2024	16/09/2024	18/09/2024	Returns
12	Jimmy	Butler	Jordan 4	22	180	160	20	15/10/2024	15/10/2024	17/10/2024	Yes
13	Damian	Lillard	Jordan 1	12	170	145	25	14/10/2024	15/10/2024	17/10/2024	Yes
13	Damian	Lillard	Jordan 1	12	170	145	25	05/11/2024	06/11/2024	08/11/2024	Yes
14	Kawhi	Leonard	Jordan 4	2	180	160	0	14/10/2024	15/10/2024	17/10/2024	Returns
14	Kawhi	Leonard	Jordan 4	2	180	160	0	04/12/2024	05/12/2024	07/12/2024	Returns
15	Paul	George	Jordan 3	8	140	100	40	07/12/2024	07/12/2024	09/12/2024	Yes
16	Trae	Young	Jordan 11	29	175	145	30	01/01/2025	02/01/2025	04/01/2025	Pending
17	Jaylen	Brown	Jordan 4	7	180	160	20	22/01/2025	23/01/2025	25/01/2025	Pending
18	Zhanyu	Lu	Jordan 4	55	180	160	20	23/01/2025	00/01/1900	00/01/1900	Pending
19	Zhanyu	Lu	Jordan 4	55	180	160	20	23/01/2025	00/01/1900	00/01/1900	Pending
20	Zhanyu	Lu	Jordan 4	55	180	160	20	23/01/2025	00/01/1900	00/01/1900	Pending
14444	ok	R	peach	102	100	90	10	15/01/2024	15/10/2024	17/10/2024	Yes



The first tab in the Excel workbook is named Customer Orders and includes two buttons. The Load Existing Customers button (Grey button) allows the owner to retrieve customer data directly from the Access database tables. The Colour the Completed Order Status button(Blue Button) shows the status of completed orders using colour codes: green indicates that the sale is finalized and complete, yellow signifies that the buyer has returned the shoes, and red shows that the sale is still within the 1-month return period, during which the buyer can choose to return the shoes.



Customers Information Display

Order ID	First Name	Surname	Item	CustomerID	Wholesale Price	Cost Price	Profit	Sold Date	Ship Date	Delivery Date	Completed Order
1	LeBron	James	an 4	23	180	160	20	01/01/1900	01/01/1900	01/01/1900	Yes
1	LeBron	James	an 4	23	180	160	20	22/01/2025	23/01/2025	24/01/2025	Yes
2	Anthony	Davis	an 1	3	170	145	25	15/01/2024	17/01/2024	19/01/2024	Yes
3	Kevin	Durant	an 2	35	110	90	20	02/01/2024	02/03/2024	02/05/2024	Yes
4	Stephen	Curry	an 3	30	140	100	0	03/04/2024	03/05/2024	03/07/2024	Returns
5	James	Harden	an 5	6	135	120	15	15/03/2024	15/03/2024	17/03/2024	Yes
6	Kyrie	Irving	an 1	11	170	145	0	18/04/2024	19/04/2024	21/04/2024	Returns
7	Jayson	Tatum	ın 11	0	175	145	30	19/05/2024	19/05/2024	21/05/2024	Yes
8	Joel	Embiid	an 4	21	180	160	20	06/06/2024	06/07/2024	06/09/2024	Yes
9	Anthony	Edwards	an 4	5	180	160	0	07/11/2024	07/11/2024	13/07/2024	Returns
10	Chris	Paul	an 3	4	140	100	40	13/08/2024	14/08/2024	16/08/2024	Yes
11	Devin	Booker	ın 11	1	175	145	0	15/09/2024	16/09/2024	18/09/2024	Returns
12	Jimmy	Butler	an 4	22	180	160	20	15/10/2024	15/10/2024	17/10/2024	Yes
13	Damian	Lillard	an 1	12	170	145	25	11/05/2024	11/06/2024	11/08/2024	Yes
13	Damian	Lillard	an 1	12	170	145	25	14/10/2024	15/10/2024	17/10/2024	Yes
14	Kawhi	Leonard	an 4	2	180	160	0	12/04/2024	12/05/2024	12/07/2024	Returns
14	Kawhi	Leonard	an 4	2	180	160	0	14/10/2024	15/10/2024	17/10/2024	Returns
15	Paul	George	an 3	8	140	100	40	12/07/2024	12/07/2024	12/09/2024	Yes
16	Trae	Young	ın 11	29	175	145	30	01/01/2025	01/02/2025	01/04/2025	Pending
17	Jaylen	Brown	an 4	7	180	160	20	22/01/2025	23/01/2025	25/01/2025	Pending
18	Zhanyu	Lu	ın 4	55	180	160	20	23/01/2025	24/01/2025	25/01/2025	Pending
19	Zhanyu	Lu	ın 4	55	180	160	20	23/01/2025	24/01/2025	25/01/2025	Pending
20	Zhanyu	Lu	ın 4	55	180	160	20	23/01/2025	24/01/2025	25/01/2025	Pending
14444	ok	R	ch	102	100	90	10	15/01/2024	15/10/2024	17/10/2024	Yes

New Customer Information

Order ID	
First Name	
Surname	
Item	
CustomerID	
Wholesale Price	
Cost Price	
Profit	
Sold Date	
Ship Date	
Delivery Date	
Completed Order	

In the third tab of excel , it is called Update Customers. It has 4 buttons .

First Button is called Load the current customers (Light blue Button) ,its same as load the existing customers , it takes the data from access tables and display it under customer information display.

The second button is called Update New Customer (Dark Blue Button). It allows me to type new customer information under New Customer Information table and add into the Access database. The newly added customer will then be displayed under the Customer Information Display section with the existing customer information. After clicking the button, the values in the New Customer Information table will be cleared.

The third button is called Check the Status of Completed Order (Green Buton). It will display an input box prompting the owner to check the status of a completed order. The user is only allowed to input Yes, Returns, or Pending to check the completed order. If an invalid input is provided, VBA will repeatedly prompt the user to enter a correct input. Once the user enters the correct input, the customer information with the completed order status will be displayed under the Customers Information Display table.

The fourth button is called "Update the Whole Datasheet" and is marked in red to signify its critical importance. This is due to the shoe shop's 1-month return policy, which necessitates updating the data once sales are completed.

I have created a subroutine that enables the owner to update the data displayed in the Customers Information Display Table. When the user clicks the Load the Current Customers button, the entire database will be shown, the user can update any information as needed .

Afterwards, the user clicks the Update the Whole Datasheet button, the VBA script will delete all data in the Access tables and reinsert the updated data from the Excel sheet back into the Access tables.

Conclusion

For my application , it should be good for business already. Some of the small details need to be better like graphics design or need to provide warming message if user did not add any value and click the buttons. Also, as the business grows, the need for handling larger volumes of data and more complex processes will arise, it requests more information from customers. So, the quantity of the database is needed.

The GitHub page is https://github.com/zhangyulu1994/CW2

Some codes are provided. To check all please check the Excel VBA section.

```
Sub LoadFromDatabase()
    ' establish connection
    Dim Connection As ADODB.Connection
    Set Connection = New ADODB.Connection
    Dim Provider As String
    Dim DatabaseFile As String
    Provider = "Provider=Microsoft.ACE.OLEDB.12.0;"
    DatabaseFile = "Data Source=Database3.accdb;"
    Connection.Open Provider & DatabaseFile
    ' Run SQL
    Dim SQLInstruction As String
    'select data from Access table
    SQLInstruction = "SELECT DISTINCT Orders.OrderID,Customer.FirstName, Customer.Surname, Customer.Item ,Customer.CustomerID ," & _
                "Orders.Wholesale, Orders.CostPrice, Orders.Profit, Delivery.SoldDate, Delivery.ShipDate, Delivery.DeliveryDate, Orders.CompletedOrder " & _
                "FROM (Orders " & _
                "INNER JOIN Customer ON Customer.CustomerID = Orders.CustomerID)" & _
                "INNER JOIN Delivery ON Orders.OrderID = Delivery.OrderID"
    ' Create Results object
    Dim Results As ADODB.Recordset
    Set Results = New ADODB.Recordset
    ' Run the SQL Query
    Set Results = Connection.Execute(SQLInstruction)
    ' Write results to sheet B5
    Range("B5").CopyFromRecordset Results
    ' Close and clean everything
    Set Results = Nothing
    Connection.Close
    Set Connection = Nothing
End Sub
```

```
Sub UpdateCellColors()
    Dim rng As Range
    Dim cell As Range
    Set rng = Range("M5:M" & Cells(Rows.Count, "M").End(xlUp).Row)
    For Each cell In rng
    Debug.Print (cell)
    Debug.Print (cell.Value)
    ' If the cell is not empty
    If Not IsEmpty(cell.Value) Then
     ' If the cell is Yes
        If Trim(cell.Value) = "Yes" Then
                cell.Interior.Color = RGB(144, 238, 144) ' Light green
            ElseIf Trim(cell.Value) = "Returns" Then
                ' Set color to yellow if value is between 51 and 100
                cell.Interior.Color = RGB(255, 255, 102) ' Yellow

            ElseIf Trim(cell.Value) = "Pending" Then
                cell.Interior.Color = RGB(255, 102, 102) ' Yellow
            Else
                ' Set color to red if value is 50 or less
                cell.Interior.Color = xlNone ' Light red
            End If
        Else
            ' Clear color if the cell is empty
            cell.Interior.Color = xlNone
        End If
    Next cell
    MsgBox "Cell colors updated successfully!"
End Sub
```