Highline College

Busn 216: Computer Applications for Business

M365 Video #13: Create Database, Import Excel, Create Tables & Forms, Build Relationships

This handout will illustrate the steps of building an Access Database for a toy shop. The name of the toy shop is Stuffed Animals. You will create a database that stores the product data, supplier store data and customer list data.

The steps that we will use in this video to build the Stuffed Animal Database are listed here:

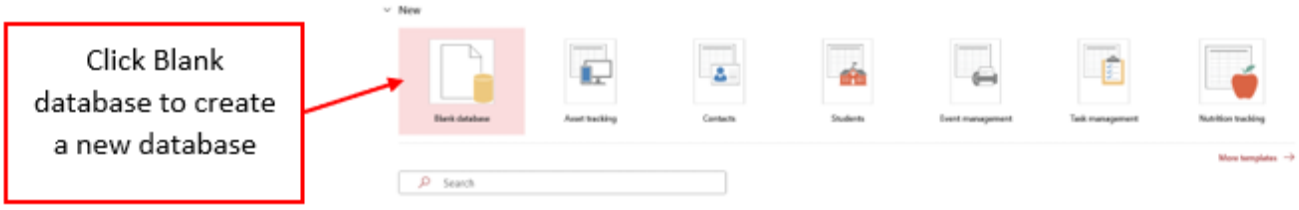
A. Create new database.
B. Import Supplier List Data Table and Customer List Data Table into the Database from Excel workbooks
C. Add Data Types to each of these two tables
D. Create a product table and add data types and field properties to it.
E. Use Data Type Lookup Wizard to connect the Products table with the other two tables with One-To-Many Relationship. Use Lookup Wizard to create Wholesale Retail field.
F. Use Relationship Window to add Referential Integrity to One-To-Many Relationship between the three tables.
G. Create a Form for all the three tables
H. Add data to the Products table using the Product Form.

To start Access:

On the Windows taskbar, click the start button to open the Start menu, scroll down the list of Apps and click Access or on the Windows taskbar, click on the search bar and type Access to search the Access Application and Access App shows on your Start menu, click on Access. Access opens and displays in Backstage view.

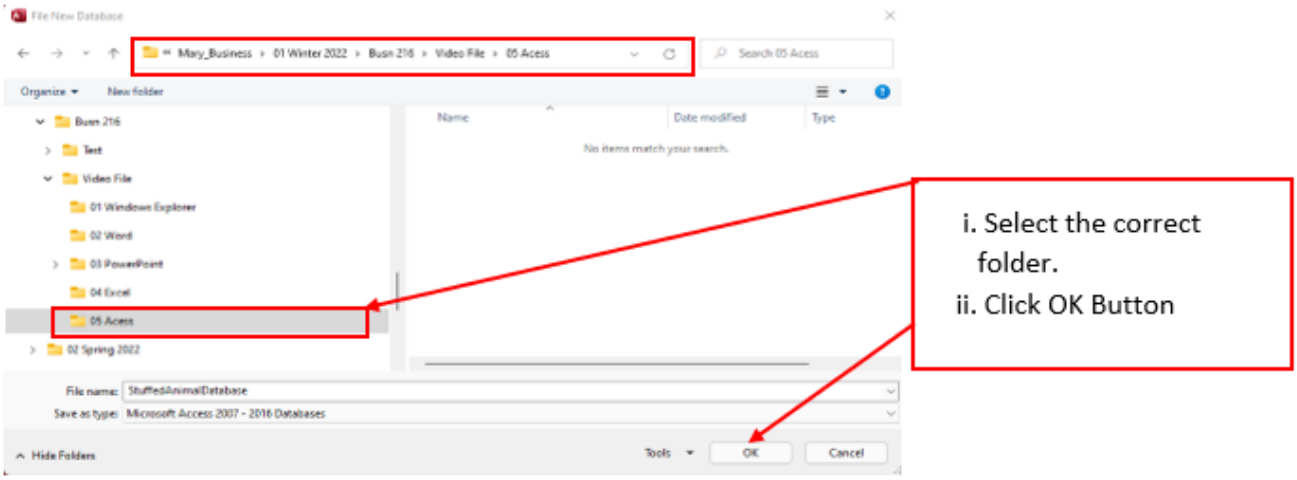
To create the new Stuffed Animal database:

1. After opening Access click on Blank database as seen in the picture below.

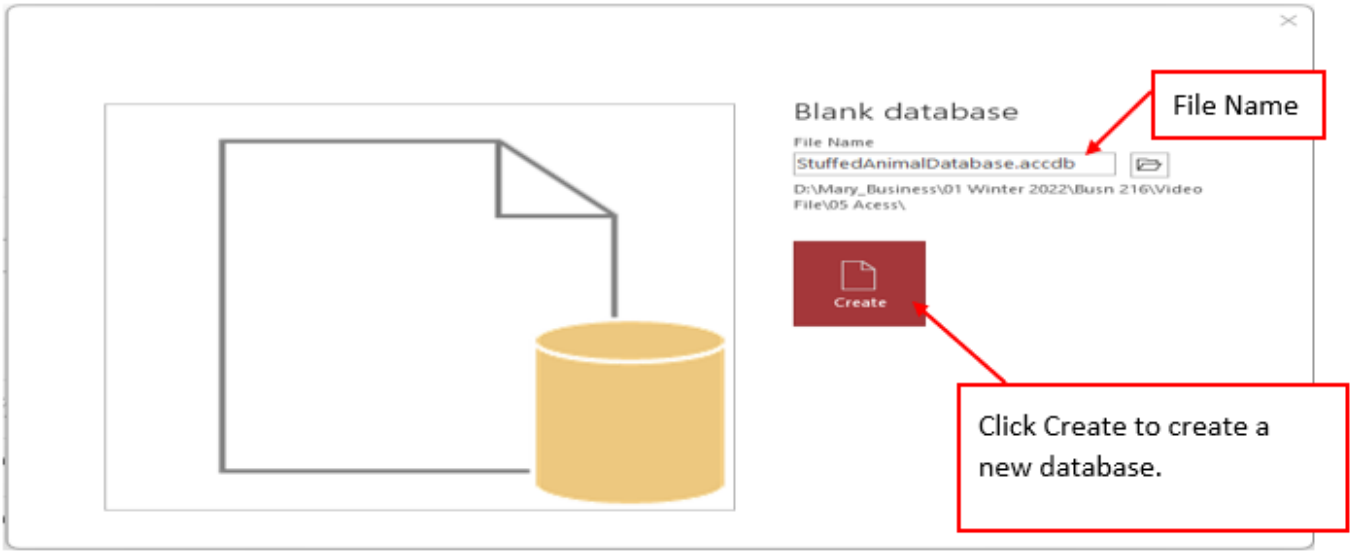


2. In the File Name box, type **StuffedAnimalDatabase** to replace the selected Database1 name provided by Access.

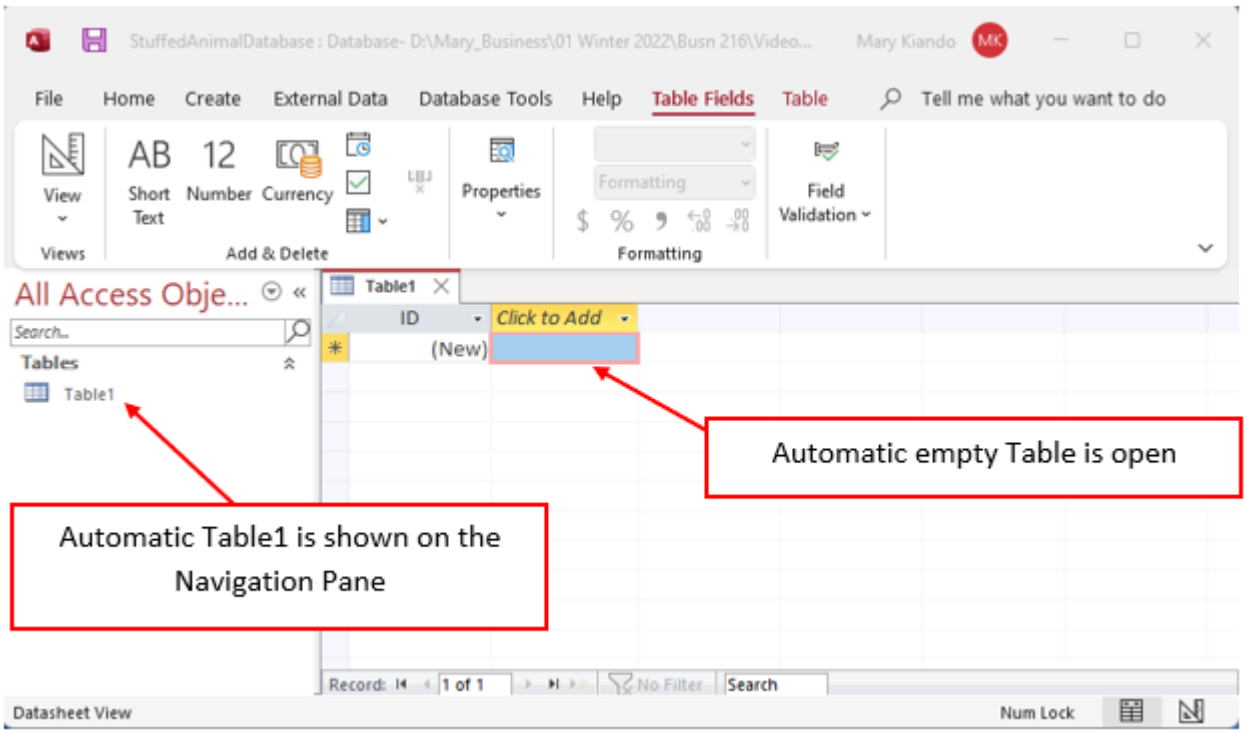
3. In the File New Database window, navigate to the drive and folder where you are saving your files as seen below, make sure the Save as type box displays “Microsoft Access 2007 – 2016 Databases” and then click ok to return to the Blank database screen



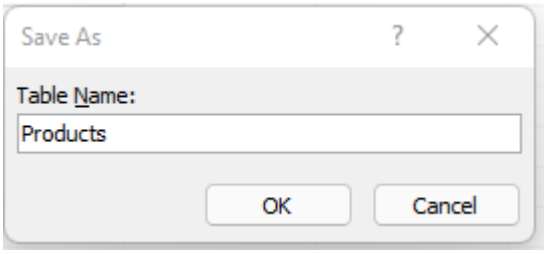
4. On the Blank database screen the File Name box now shows StuffedAnimalDatabase.accdb. The file name extension “accdb” identifies this file as an Access 2007 – 2016 Database. Now click Create.



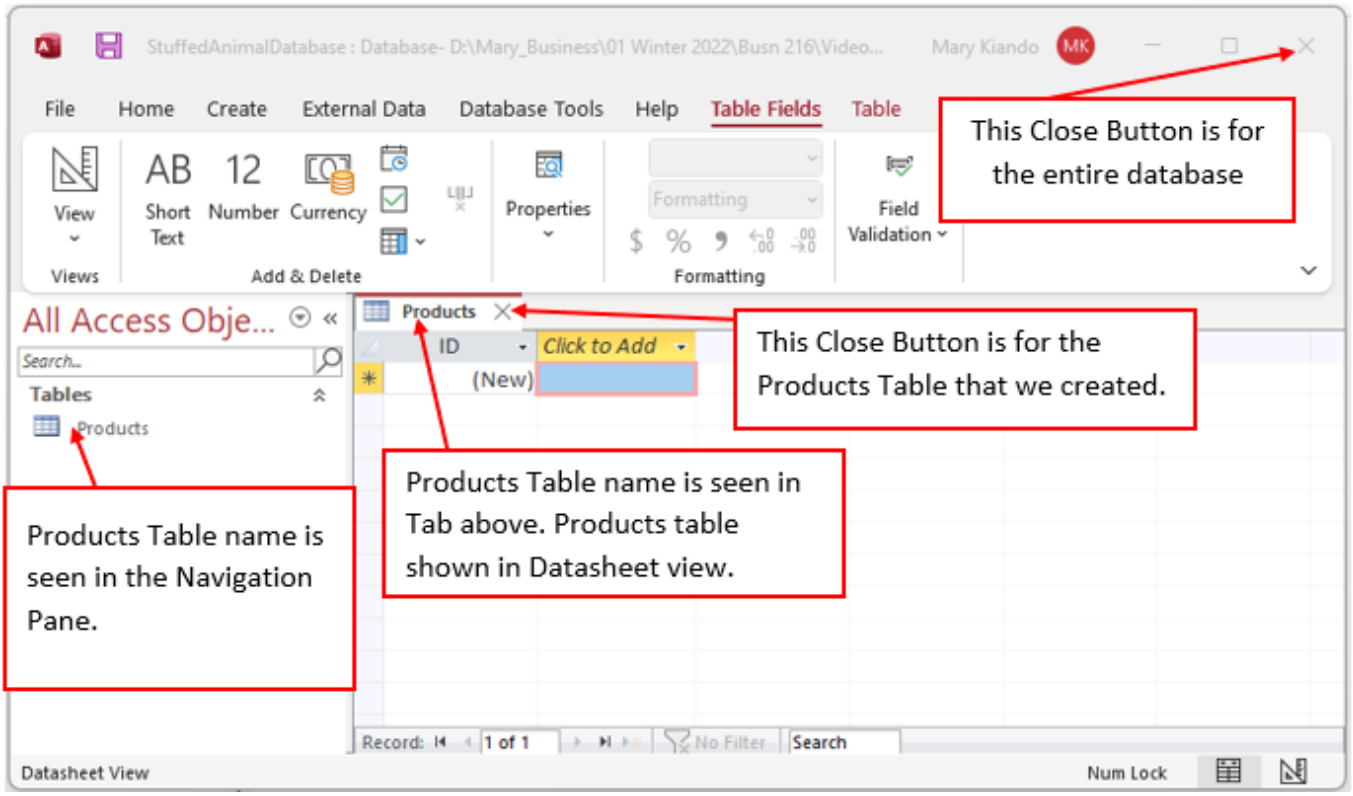
5. Access creates the new database, saved in the specified location, and opens an empty table named Table1.



i. Using Ctrl + S, name the table “Products”, then click OK. Table1 is now named as Products.

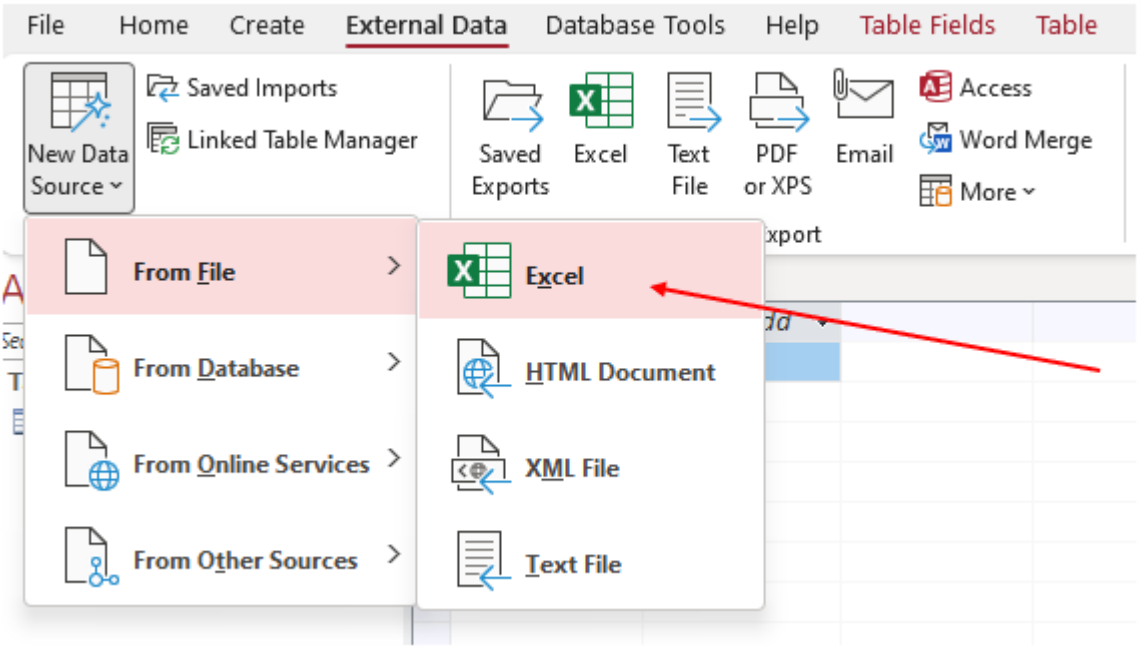


ii. Here is the view of the database with the Products Table. Use the Close Button for the Products Table. Do not close the database. See picture below.

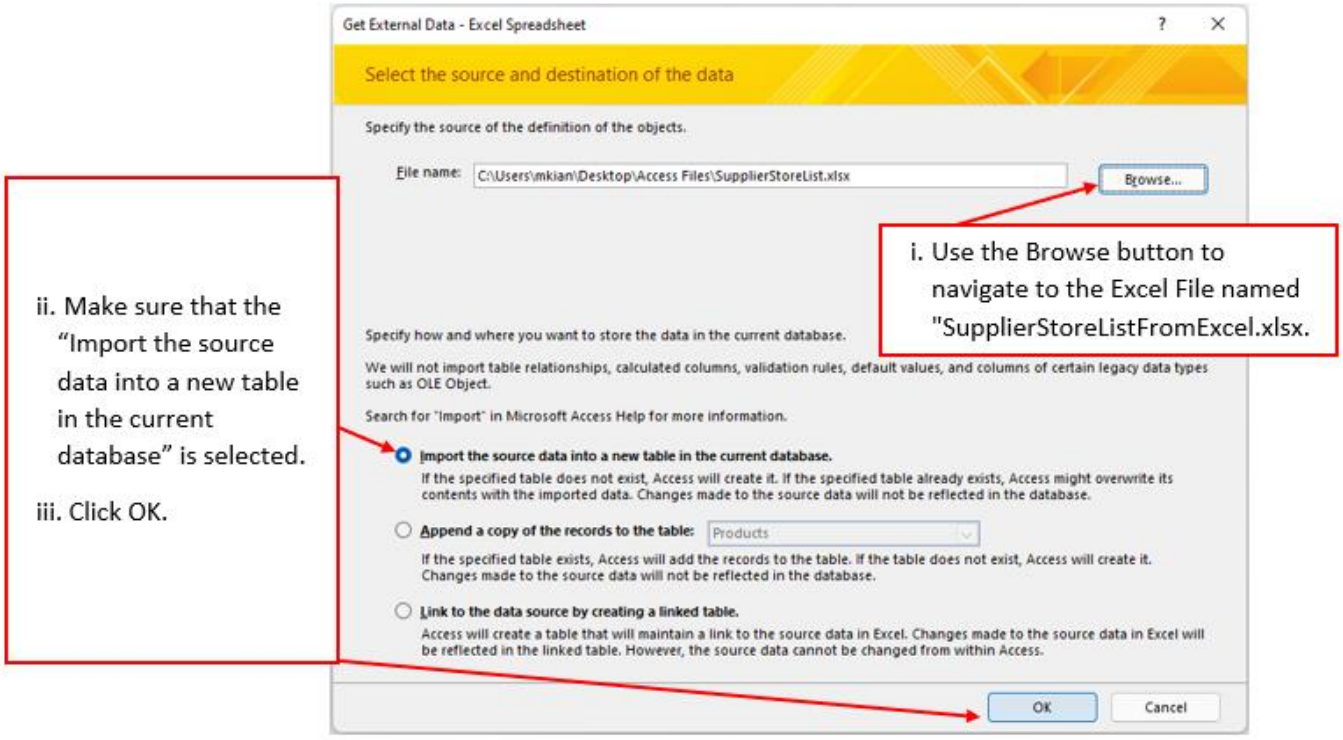


Next, we need to import the Customer List Table and Supplier List Table from Excel Files named: "SupplierStoreListFromExcel.xlsx" and "CustomerListFromExcel.xlsx". (you download these files from our class web page).

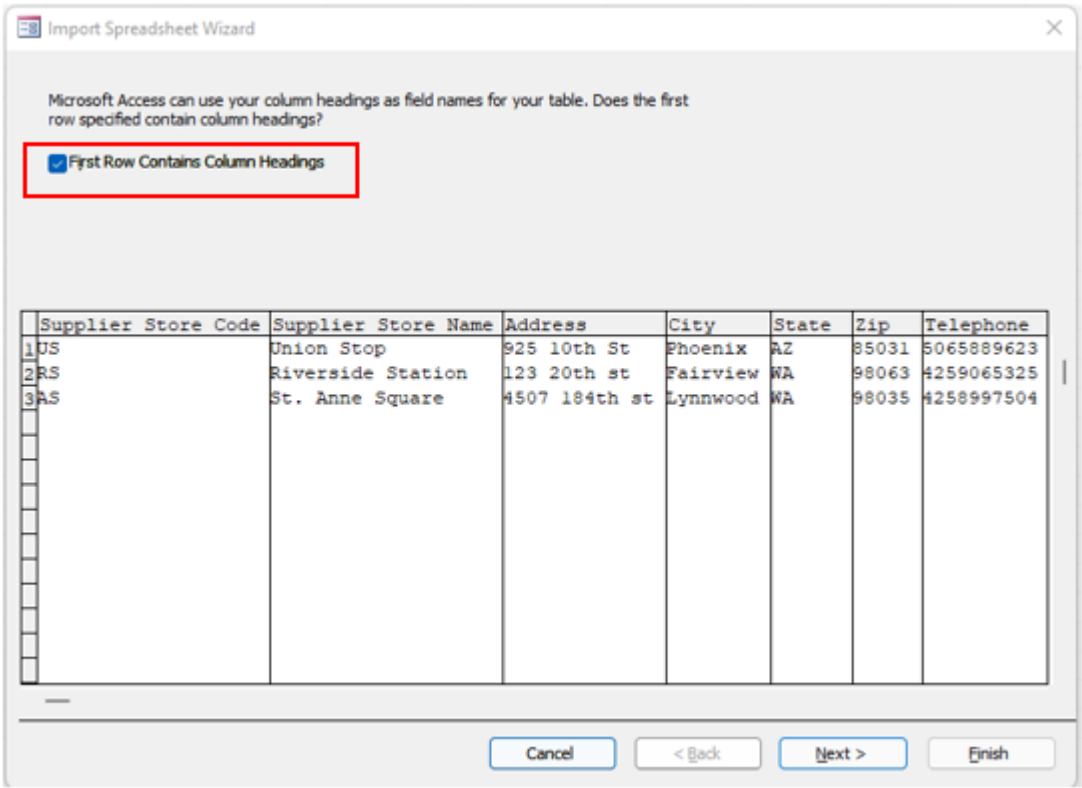
6. From your Ribbon, click on the External Data Tab, click the New Data Source dropdown, click From File, then click Excel.



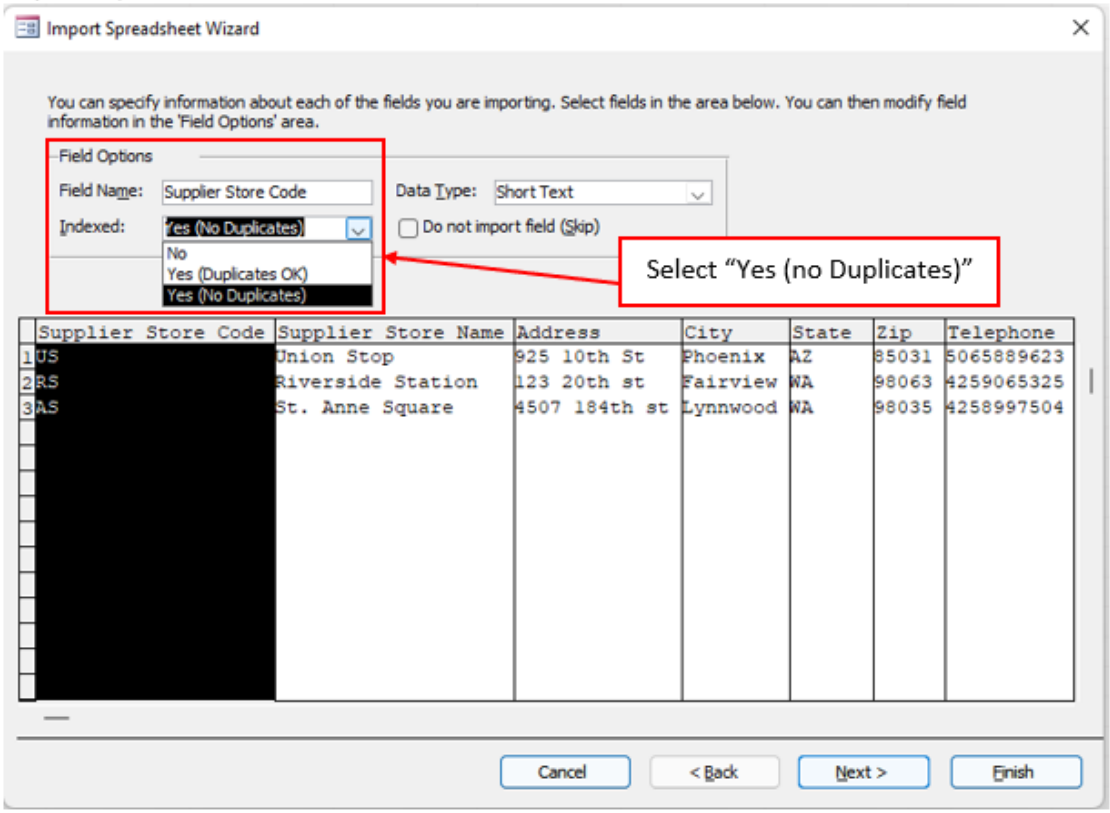
a. In the “Get External Data – Excel Spreadsheet” dialog box:
   i. Use the Browse button to navigate to the Excel File named “SupplierStoreListFromExcel.xlsx”.
   ii. Make sure that the “Import the source data into a new table in the current database” dialog button is selected.
   iii. Click OK.



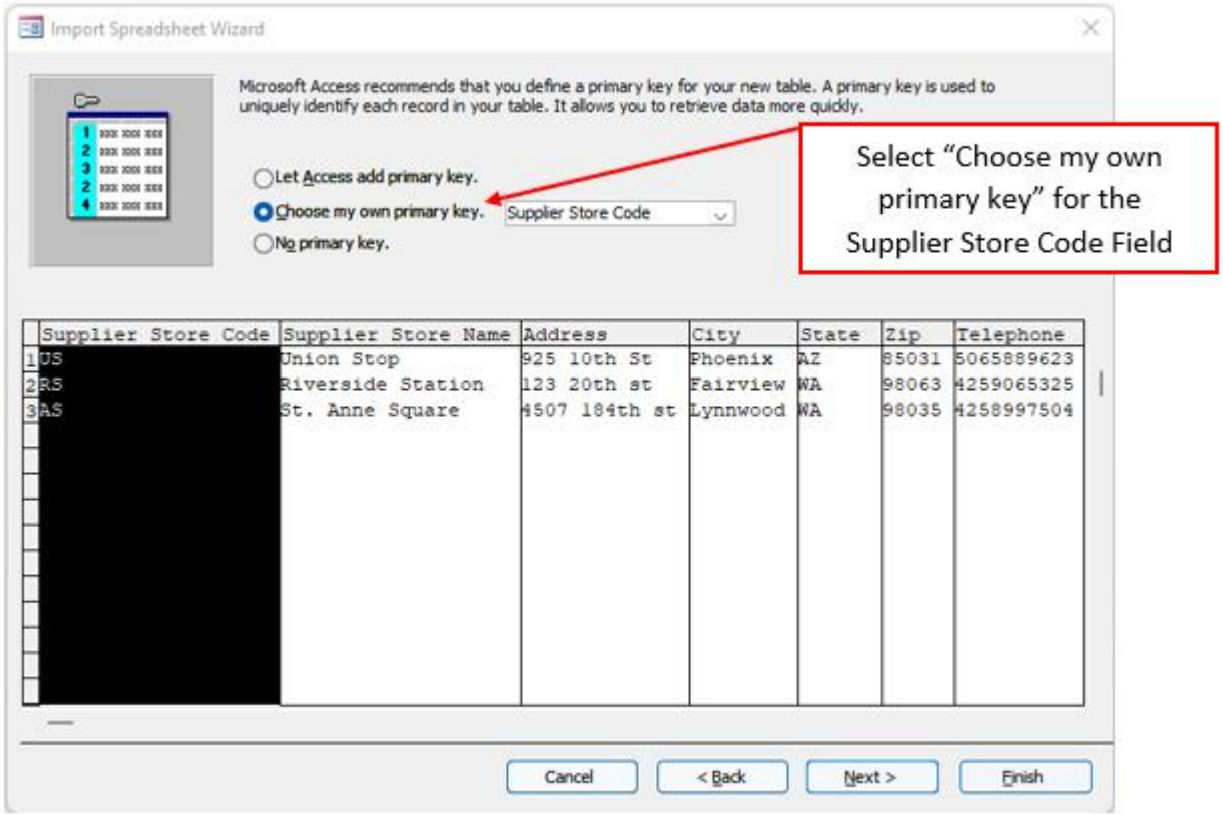
b. In the next window, make sure that “First Row Contains Column Headings” is selected and then click Next.



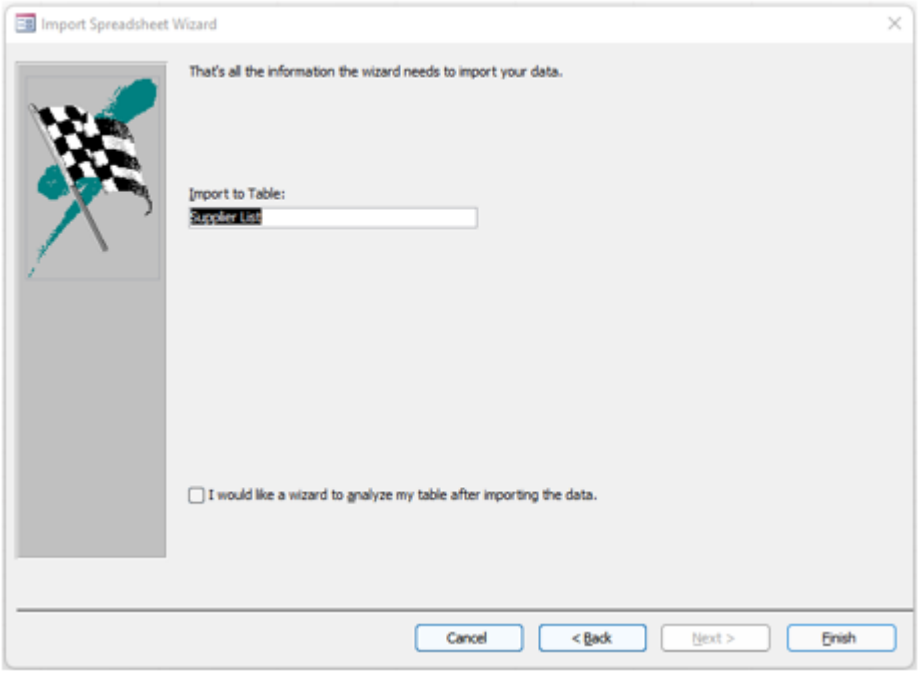
c. In the next window, in the “Field Options”, on the “Indexed:” textbox dropdown arrow, select “Yes (No Duplicates) and then click Next.



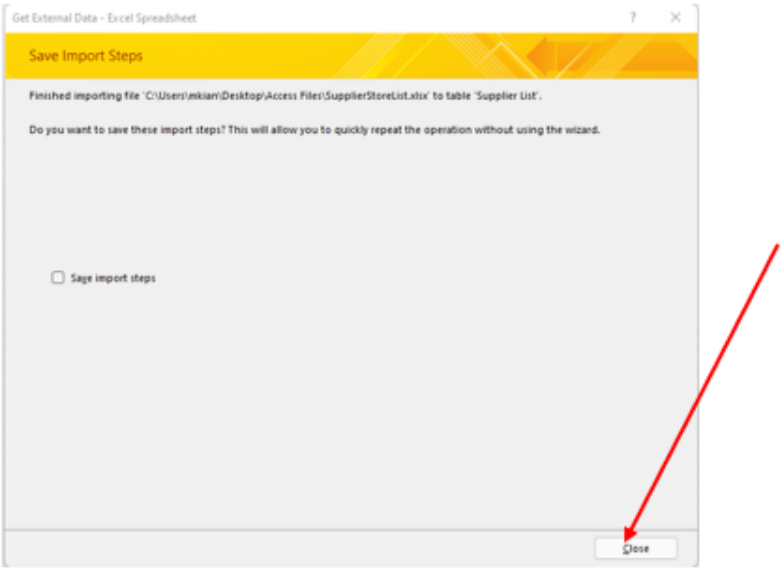
d. In the Next window, select “Choose my own primary key” for the supplier store code field. Then click Next.



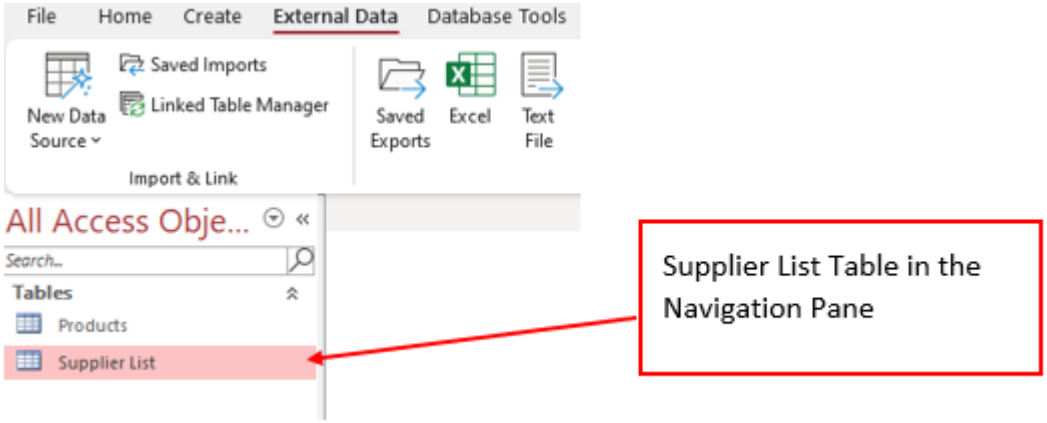
e. In the next window, you can accept the table name “Supplier List”. Then click Finish



f. In the last window click the Close button.



g. Now we can see the imported Supplier List Table in the Navigation Pane.



7. Repeat the same Steps as in No. 6 (a – g) to import “CustomerListFromExcel.xlsx”.

Add Data Types and Field Properties to each Field in the Tables:

- Different Data Types:

Data Types	Usage	Size
Short Text	Alphanumeric data (names, titles, etc.)	Up to 255 characters by default is 255 characters
Long Text	Large amounts of alphanumeric data: sentences and paragraphs.	1 to 65535 characters
Number	Numeric data	1 to 15 digits
Large Number	Numeric data	-2^63 to 2^63
Date/Time	Dates and Times	8 bytes
Currency	Monetary data, stored with 4 decimal places of precision	15 digits on the left side of the decimal point and up to 4 digits on the right side. 8 bytes
AutoNumber	Unique value generated by Access for each new record	4 bytes - 9 digits
Yes/No	Boolean (true/false) data; Access stores the numeric value zero (0) for false, and -1 for true	1 byte - 1 character
OLE object	Pictures, graphs, or other ActiveX objects from another Windows-based application	Up to about 2 GB
Hyperlink	A link address	Up to 65,535 characters total for the four parts of the hyperlink
Attachment	You can attach files such as pictures, documents, spreadheets, ….	Up to 2 GB
Calculated	You can create an expression (formula)	Dependent on the data type
Lookup Wizard	The lookup Wizard can lookup a value from another column in a different table (Primary Key)	Dependent on the data type of the lookup field

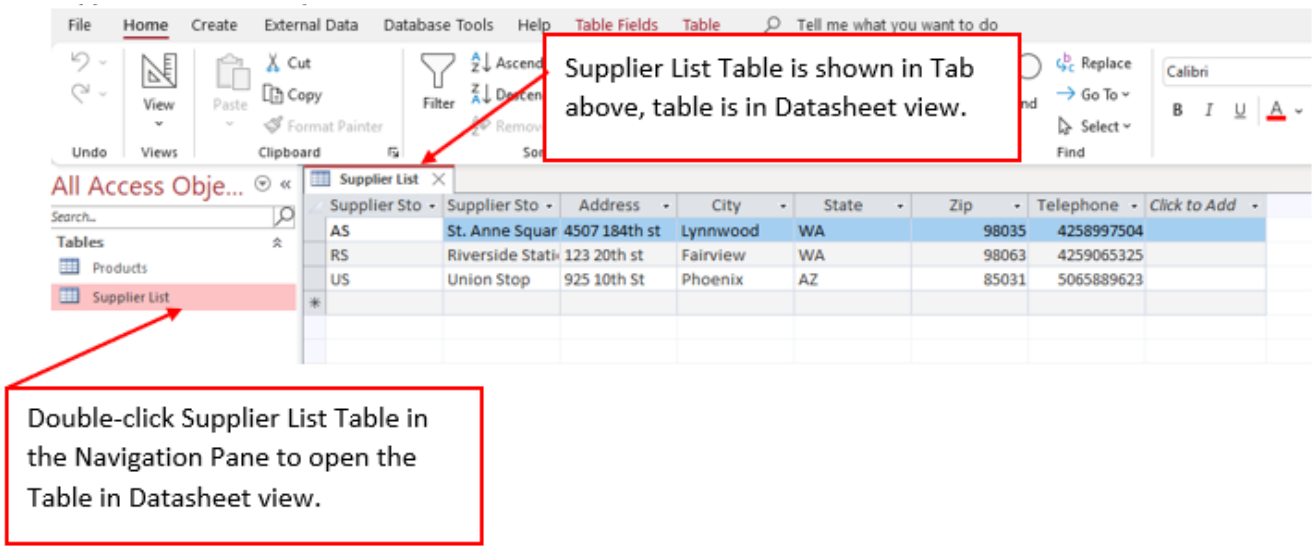
- Code for Input Mask (Like Number Formatting in Excel) for Field Properties:

Character	Description
0	Digit (0 to 9, entry required, plus (+) and minus (-) signs not allowed.
9	Digit or space (entry not required, plus and minus sign not allowed.
#	Digit or space (entry not required; spaces are displayed as blanks while in Edit mode, but blanks are removed when data is saved; plus and minus signs allowed).
L	Letter (A to Z, entry required)
?	Letter (A to Z, entry optional)
A	Letter or digit (entry required)
a	Letter or digit (entry optional)
&;	Any character or a space (entry required)
C	Any character or a space (entry optional)
. , ; : - /	Decimal placeholder and thousand, date, and time separators. (The actual character used depends on the settings in the Regional settings Properties dialog box in Windows Control Panel).
<	Causes all characters to be converted to lowercase.
>	Causes all characters to be converted to uppercase.
!	Causes the input mask to display from right to left, rather than from left to right. Characters typed into the maks always fill it from left to right. You can include the exclamation mark anywere in the input mask.
\	Causes the character that follows to be displayed as the literal character (for example, \A is displayed as just A).

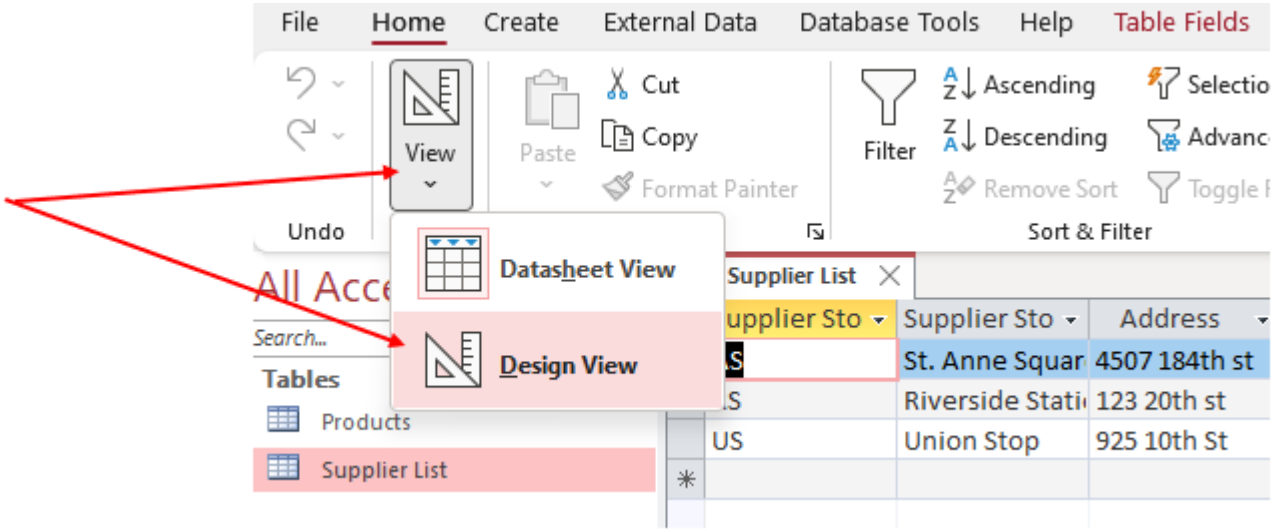
- Number Field Size Properties:

Field Size	Description	
Byte	Integer:	0 to 255
Integer	Integer:	-32,678 to 32,767
Long Integer	Integer:	-2,147,483,648 to 2,147,483,648
Single	Decimals with 7 significant digits	Requires 4 butes of storage
Double	Decimals with > 'Single' significant digits:	Requires 8 bytes of storage
Decimal	Decimals with > 'Double' significant digits:	Requires 12 bytes of storage
Replication ID	Globally unique identifier (GUID)	16 bytes of storage

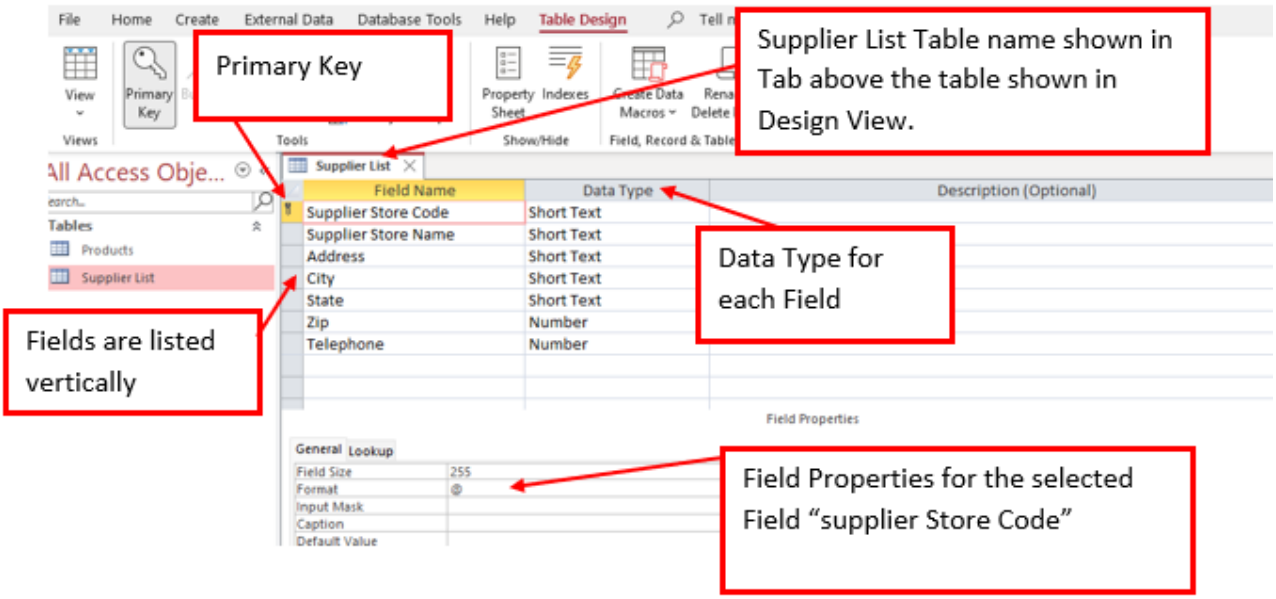
8. Open the Supplier List Table in the Regular view "Datasheet View". In the Navigation Pane, double click the Supplier List Table to open.



   a. Change the View to Design View so that we can add the correct Data Types and Field Properties to each Field. To show the table in Design View click the View Button in the View group in the Home Ribbon Tab.



   b. Design View for the Supplier List Table is shown below:
      i. Notice that the fields are listed vertically, the first field name is "Supplier Store Code" and there is a key icon that indicates this is the Primary Key. This is the Primary Key we set while importing the Excel Table.



ii. For the Supplier Store Code Field Data type:

a) Data Type = Short Text

b) Description = Primary Key – 2 Capital Letters

c) Field Properties:

1. Field Size = 2
2. Input Mask = >LL (this means only two letters can be entered and must be uppercase)
3. Validation Rule = LL
4. Validation Text = Must enter 2 Capital Letters.

Supplier List

Field Name	Data Type	Description (Optional)
Supplier Store Code	Short Text	Primary Key - 2 Capital Letters
Supplier Store Name	Short Text	This is the name of the Store
Address	Short Text	The address where the store is located
City	Short Text	The city where the store is located
State	Short Text	The State where the store is located
Zip	Short Text	The suppliers Zip code
Telephone	Short Text	The suppliers phone number

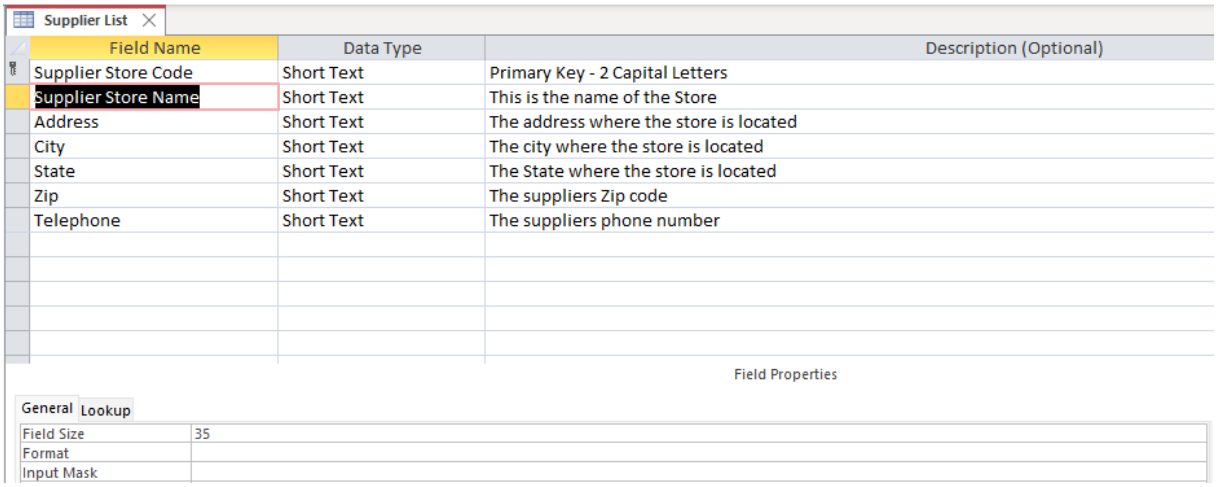
Field Properties

General Lookup

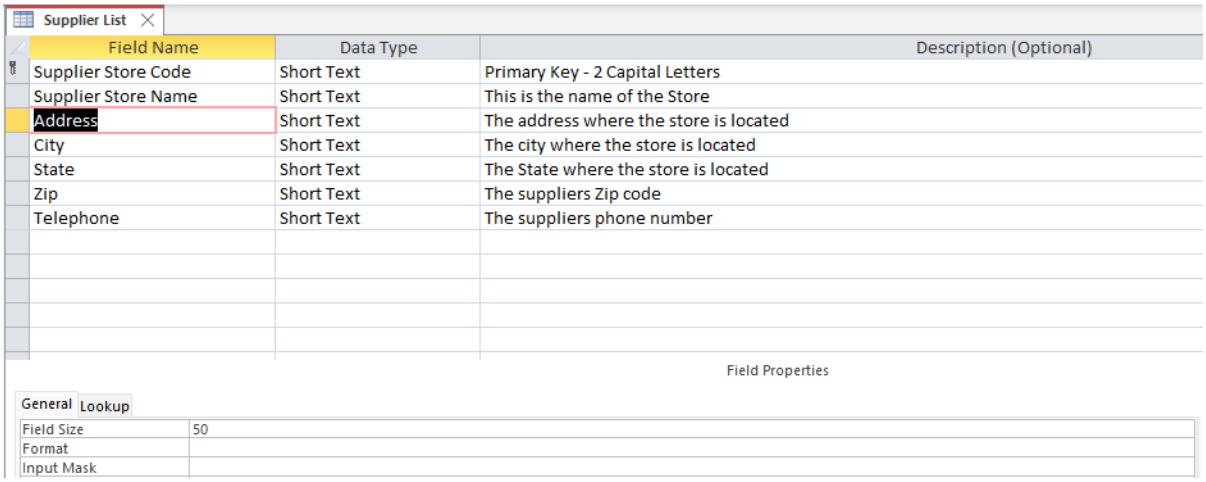
Field Size	2
Format	
Input Mask	>LL
Caption	
Default Value	
Validation Rule	"LL"
Validation Text	Must enter 2 capital letters
Required	Yes
Allow Zero Length	Yes
Indexed	Yes (No Duplicates)
Unicode Compression	No
IME Mode	No Control
IME Sentence Mode	None
Text Align	General

iii. The remaining Data Types, Descriptions and the Field Types for each field are seen in the following pictures, one for each field. Follow the pictures to update your Data Type, Descriptions and Field Types.

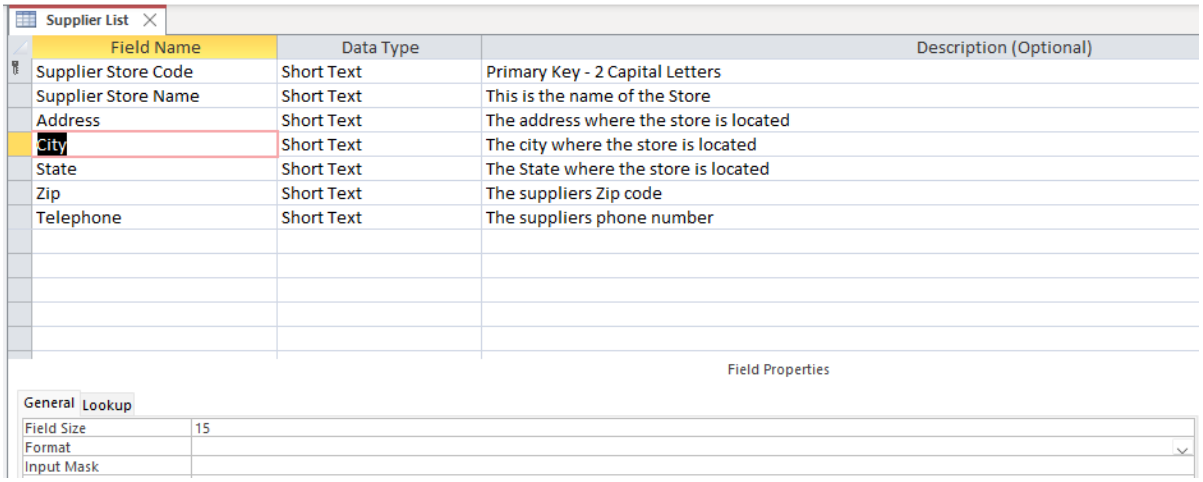
iv. Supplier Store Name:



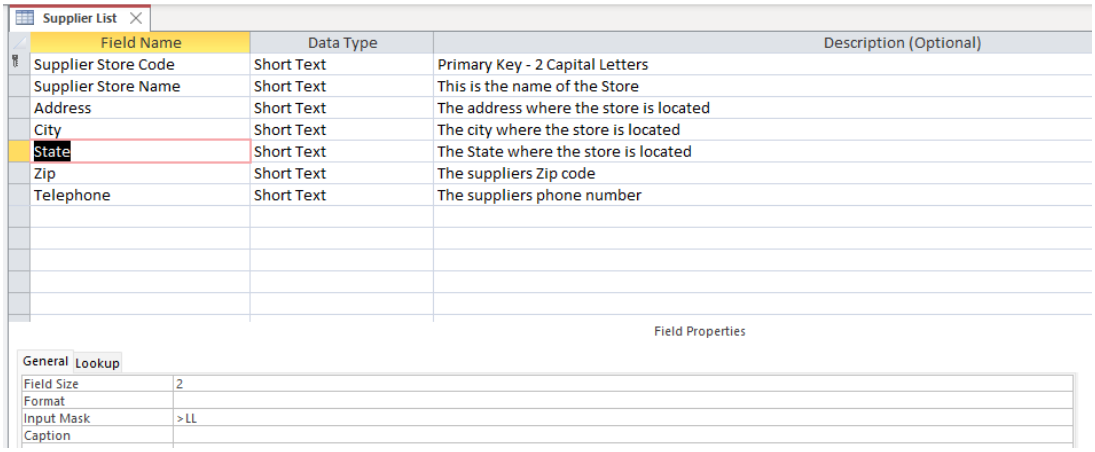
v. Address:



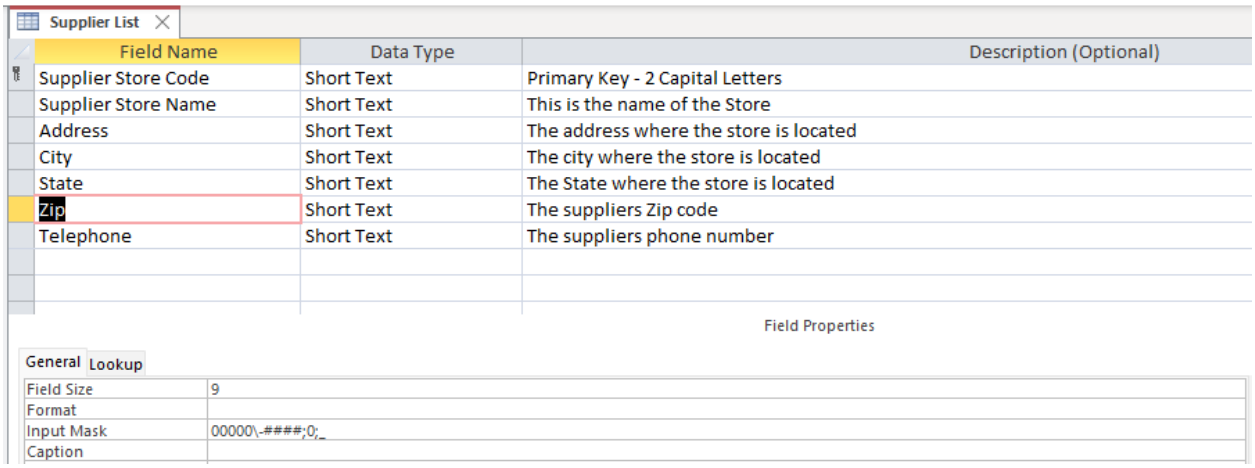
vi. City:



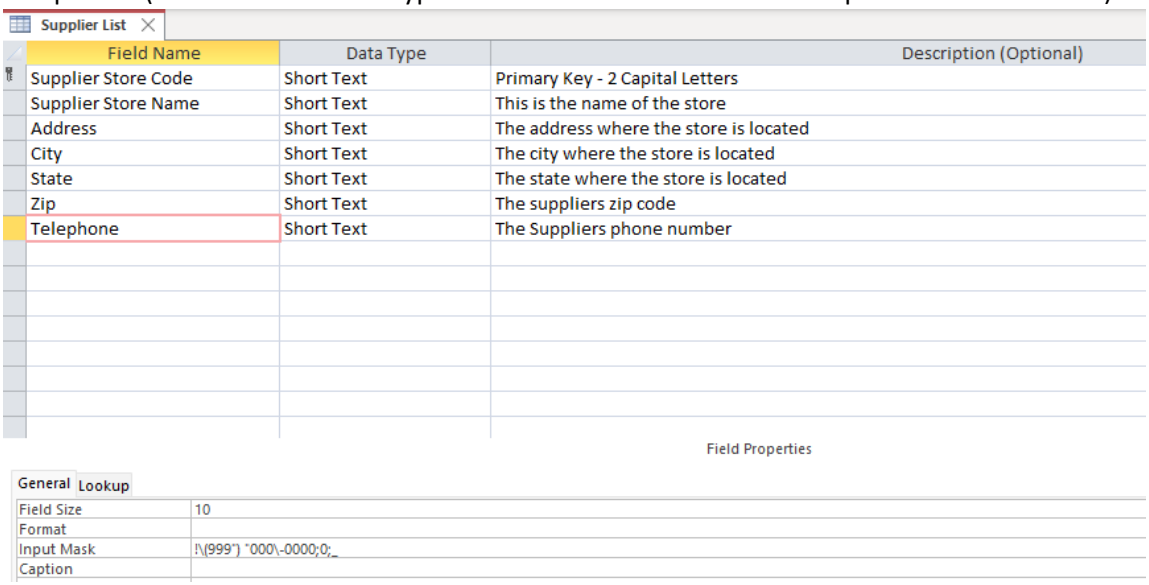
vii. State: (State is two capital letter abbreviated so we will use the input mask >LL).



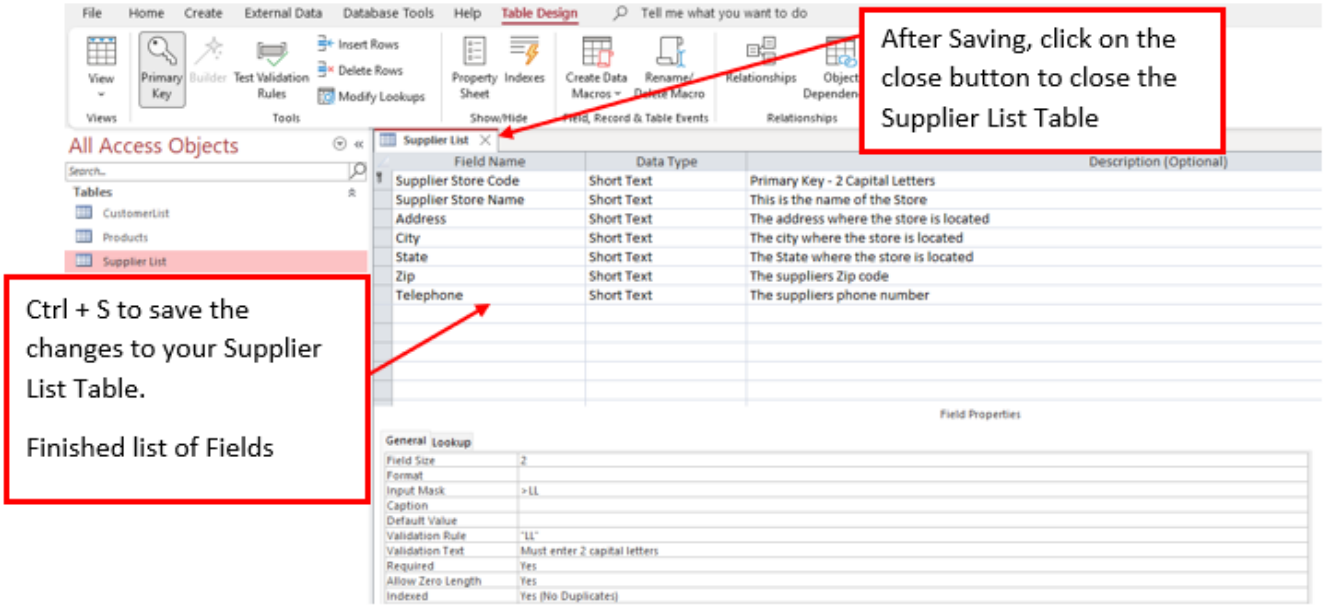
viii. Zip: (Zip Code not a Number Data Type because we will never do math operations on this field).



ix. Telephone: (not a Number Data Type because we will never do math operations on this field).



x. The finished list of fields, Data Types and Description is seen below. Save the changes using the keyboard shortcut: Ctrl + S, to save the changes you made to the Supplier List Table. Then close the Supplier List Table.



9. Repeat the Steps 8 (a – b) to view the CustomerList Table in Design View and make the changes to the Field Properties, Data Type and Description.
    i. Design view for the CustomerList Table:
        a. For the Customer Code Field Data type:
        b. Data Type = Short Text
        c. Description = Primary Key – 2 Capital Letters and 3 Numbers
        d. Field Properties:
            1. Field Size = 5
            2. Input Mask = >LL000(this means only two letters can be entered and must be uppercase and only 3 numbers)
            3. Validation Rule = LL000
            4. Validation Text = Must enter 2 Capital Letters and 3 numbers.

CustomerList

Field Name	Data Type	Description (Optional)
Customer Code	Short Text	Primary Key - 2 Capital Letters and 3 Numbers
Last Name	Short Text	Customers last name
First Name	Short Text	Customers first name
Address	Short Text	Customers address
City	Short Text	Customers city
State	Short Text	Customers state
Zip	Short Text	Customers zip code
Telephone	Short Text	Customers telephone number
Email Address	Short Text	Customers email address

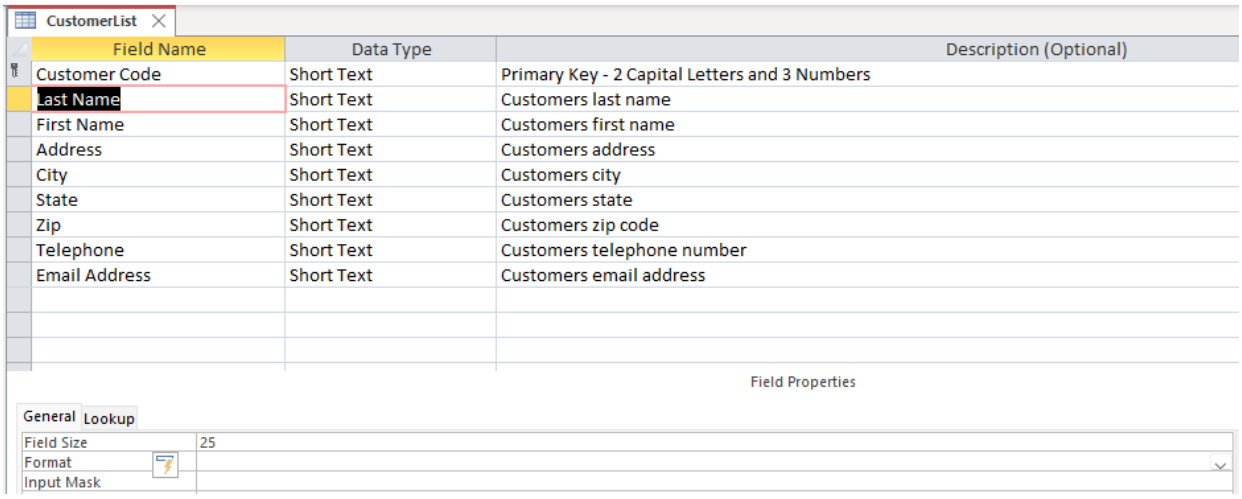
Field Properties

General | Lookup

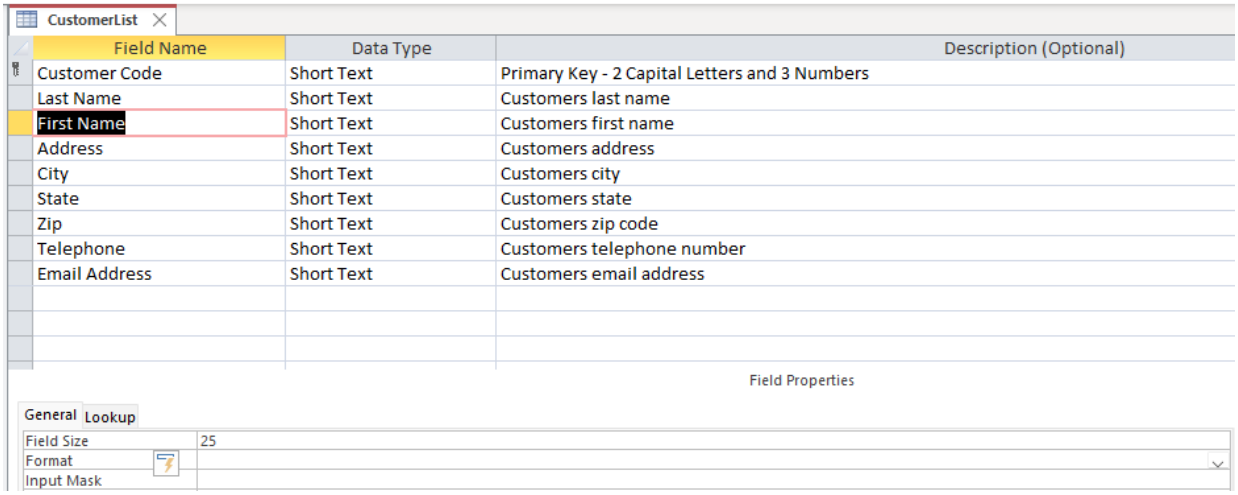
Field Size	5
Format	
Input Mask	>LL000
Caption	
Default Value	
Validation Rule	"LL000"
Validation Text	Must enter 2 capital letters and 3 numbers
Required	Yes
Allow Zero Length	Yes
Indexed	Yes (No Duplicates)

ii. The remaining Data Types, Descriptions and the Field Types for CustomerList Table for each field are seen in the following pictures, one for each field. Follow the pictures to update your Data Type, Descriptions and Field Types:

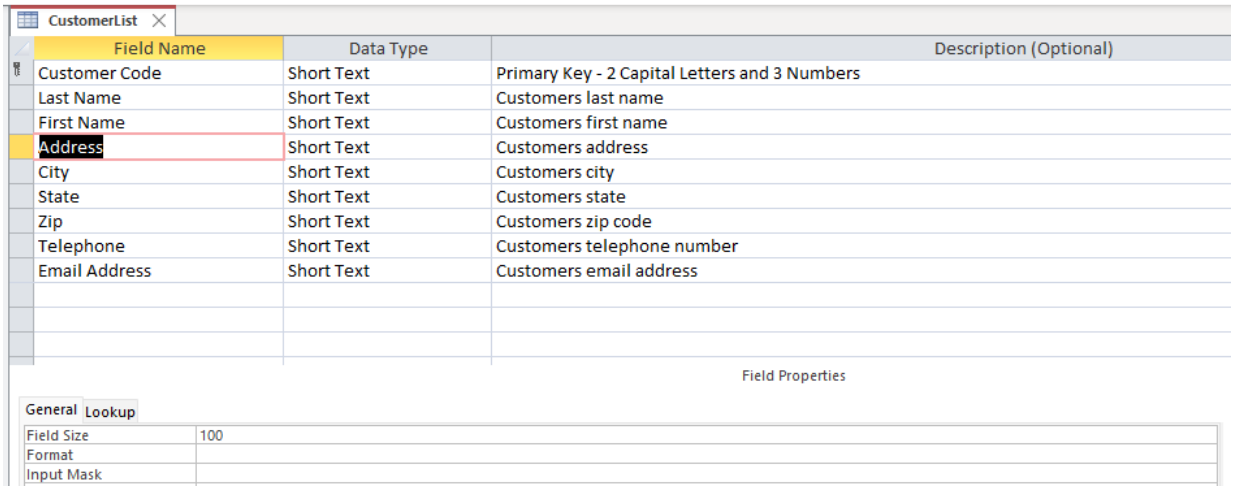
iii. Last Name:



iv. First Name:



v. Address:



vi. City:

CustomerList

Field Name	Data Type	Description (Optional)
Customer Code	Short Text	Primary Key - 2 Capital Letters and 3 Numbers
Last Name	Short Text	Customers last name
First Name	Short Text	Customers first name
Address	Short Text	Customers address
City	Short Text	Customers city
State	Short Text	Customers state
Zip	Short Text	Customers zip code
Telephone	Short Text	Customers telephone number
Email Address	Short Text	Customers email address

Field Properties

General Lookup

Field Size	50
Format	
Input Mask	

vii. State: (State is two capital letter abbreviated so we will use the input mask >LL).

CustomerList

Field Name	Data Type	Description (Optional)
Customer Code	Short Text	Primary Key - 2 Capital Letters and 3 Numbers
Last Name	Short Text	Customers last name
First Name	Short Text	Customers first name
Address	Short Text	Customers address
City	Short Text	Customers city
State	Short Text	Customers state
Zip	Short Text	Customers zip code
Telephone	Short Text	Customers telephone number
Email Address	Short Text	Customers email address

Field Properties

General Lookup

Field Size	2
Format	
Input Mask	>LL
Caption	
Default Value	
Validation Rule	"LL"
Validation Text	Must enter 2 Abbreviation letters for the state

viii. Zip: (Zip Code not a Number Data Type because we will never do math operations on this field).
If you get the Warning Message, Click 'Yes' to all the warning messages.

CustomerList

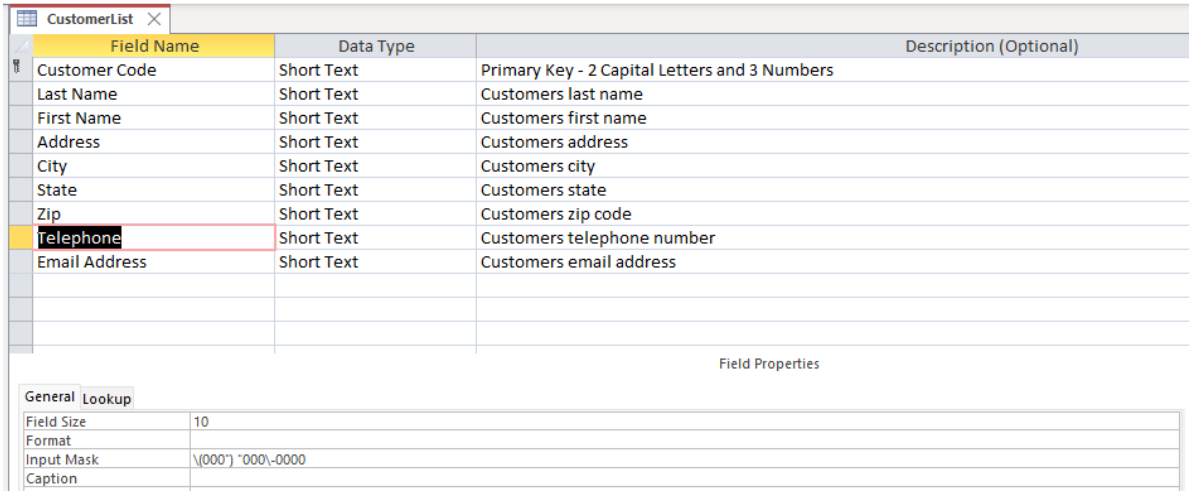
Field Name	Data Type	Description (Optional)
Last Name	Short Text	Customers last name
First Name	Short Text	Customers first name
Address	Short Text	Customers address
City	Short Text	Customers city
State	Short Text	Customers state
Zip	Short Text	Customers zip code
Telephone	Short Text	Customers telephone number
Email Address	Short Text	Customers email address

Field Properties

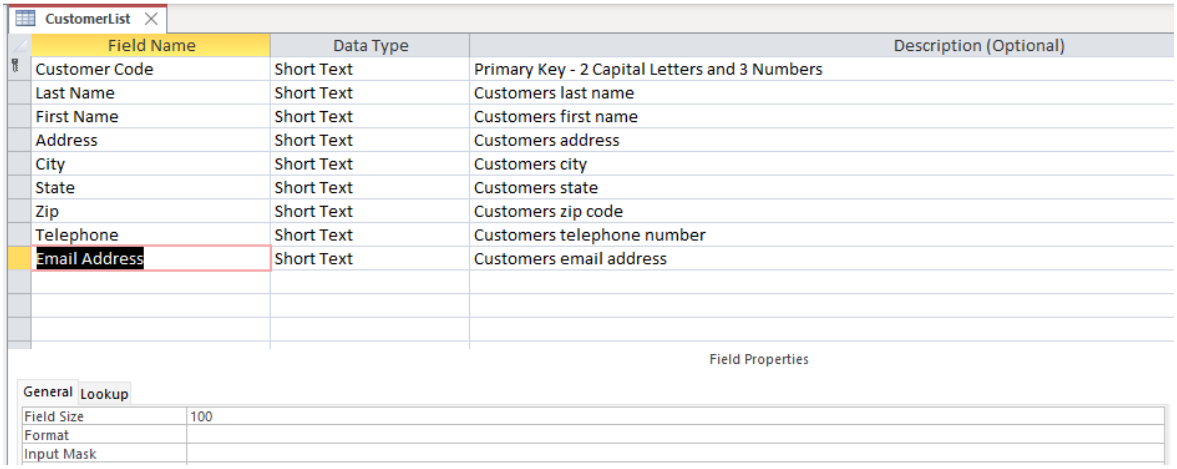
General Lookup

Field Size	9
Format	
Input Mask	00000\-####;0;_
Caption	

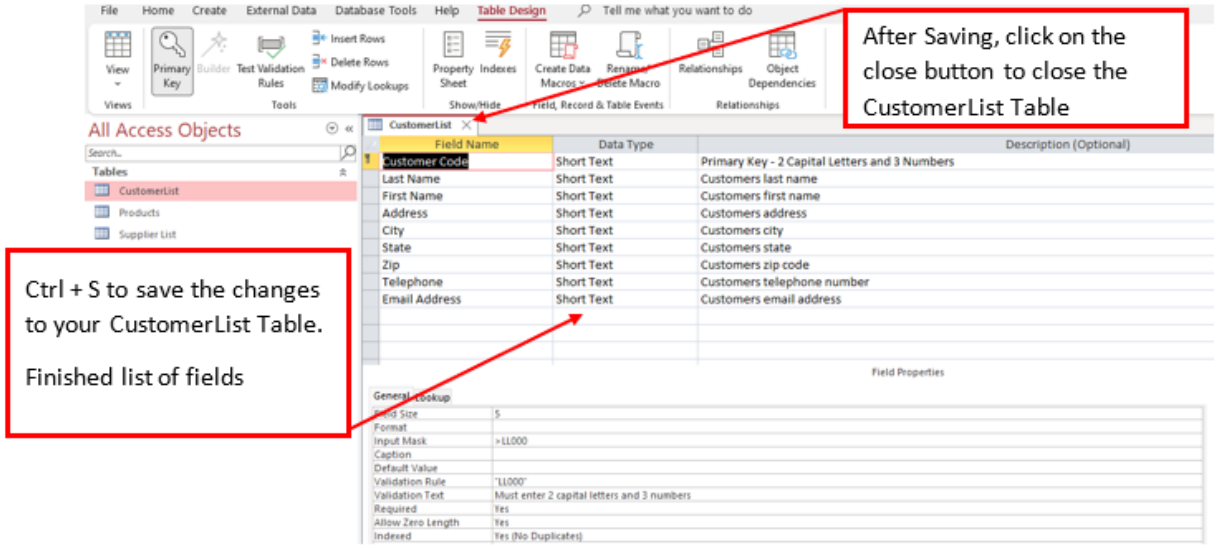
ix. Telephone: (not a Number Data Type because we will never do math operations on this field).



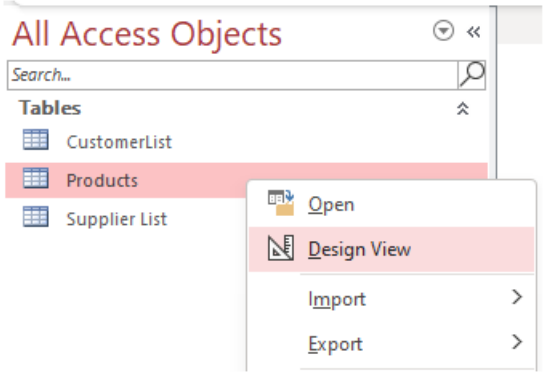
x. Email Address:



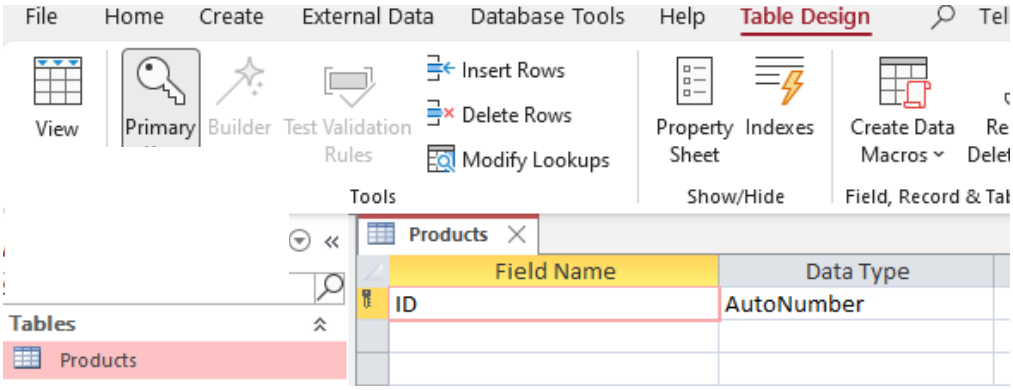
xi. The finished list of fields, Data Types and Description is seen below. Save the changes using the keyboard shortcut: Ctrl + S, to save the changes you made to the CustomerList Table. Then close the CustomerList Table.



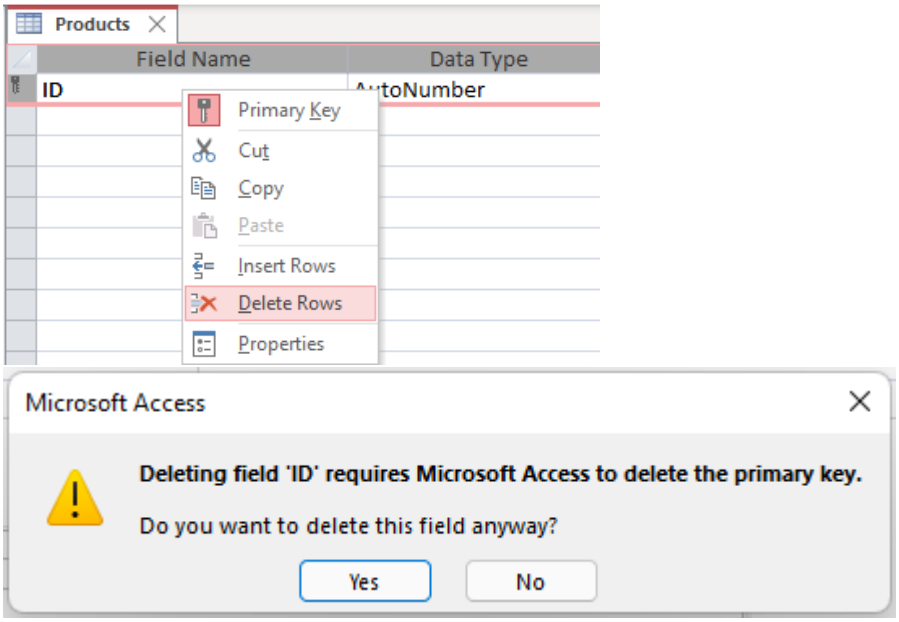
10. We already have the Automatic Table which we named “Products”. Open this table in Design View and we will add Field, Data Types, Description and Field Properties.
    i. To open the Table in Design View, right click the Products Table in the Navigation Pane and click to select Design View.



    ii. Below is the Products Table shown in Design View. An automatic Primary Key was added with an AutoNumber Data Type. We need to change this as we do not want this Field in our Table and so we will delete this field.

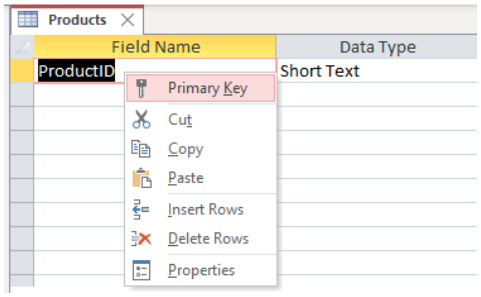


    iii. To Delete this Field, Right click on the Field Name and then click Delete Rows. When the dialog box pops up, Click Yes. See Pictures below.

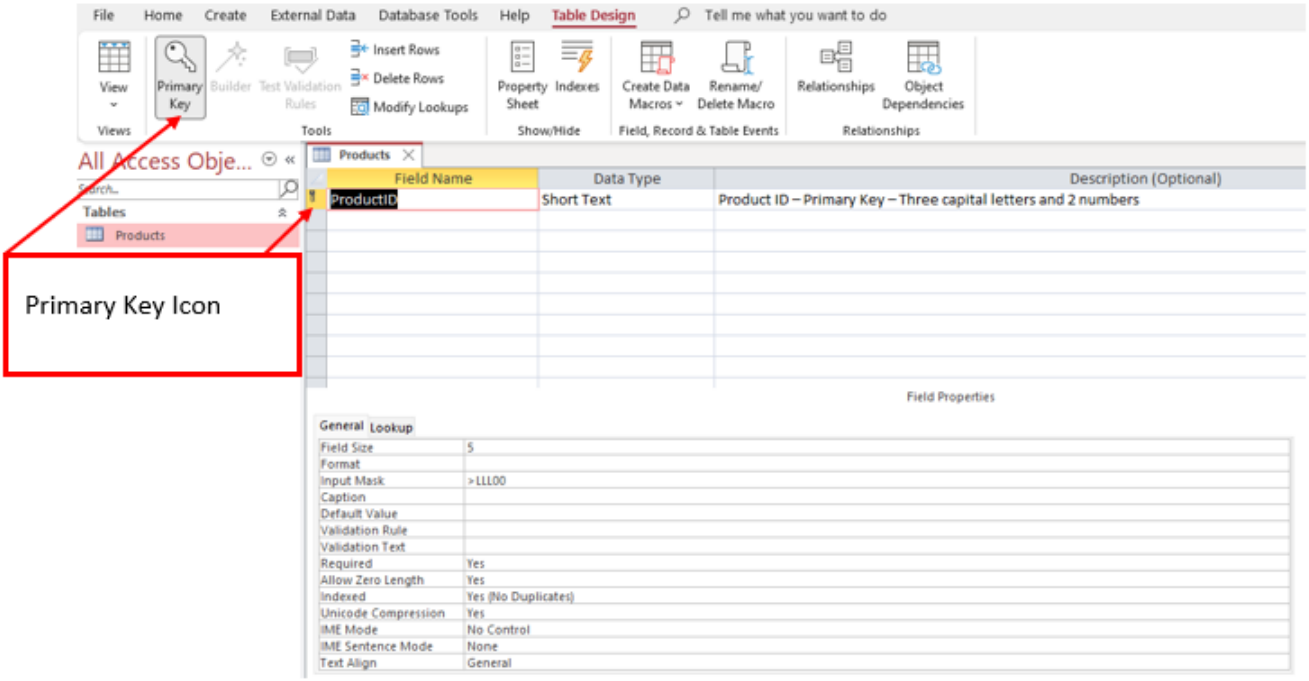


    iv. Create your own Primary Key (Unique Identifier for each product). So for the first field in the Products Table:

a. Field Name = ProductID
    1. Right Click on the ProductID Field and convert the field to a Primary Key (see Picture below).



b. Data Type = Short Text
c. Description = Product ID – Primary Key – Three capital letters and 2 numbers
d. Field Properties:
    1. Field Size = 5
    2. Input Mask = >LLL00 (two letters and two numbers must be entered and the letters will be capitalized)



v. The remaining Field Names, Data Types, Descriptions and Field Properties are seen on the next page. The Raw Data for the Products Table is also provided on the next page.

Field Names, Data Types and Field Properties for the Products Table:

Field Name	ProductID	Product Description	Quantity on Hand	Cost	Sell Price	Supplier Code	Customer Code	Quantity Sold	Wholesale Retail
Data Type	Short Text	Short Text	Number	Currency	Currency	Short Text	Short Text	Number	Short Text
Description	Product ID - Primary Key - Three capital letters and 2 numbers	Description of the product	Quantity of our inventory to sell	Cost of the product	The selling price of our products	The code of the supplier we bought from - Lookup to supplier table to get the supplier code	The code of the customer we sold to - Lookup to customer table to get the customer code	The quantity number we sold out	Lookup to list if we sold the product on retail or wholesale. Not from a different table but from a list we will type in.
Field Size	5	25				2	5		25
Format									
Input Mask	>LLL00								
Validation Rule				>=0 And <=100					
Validation Text				must be between $0 and $100					

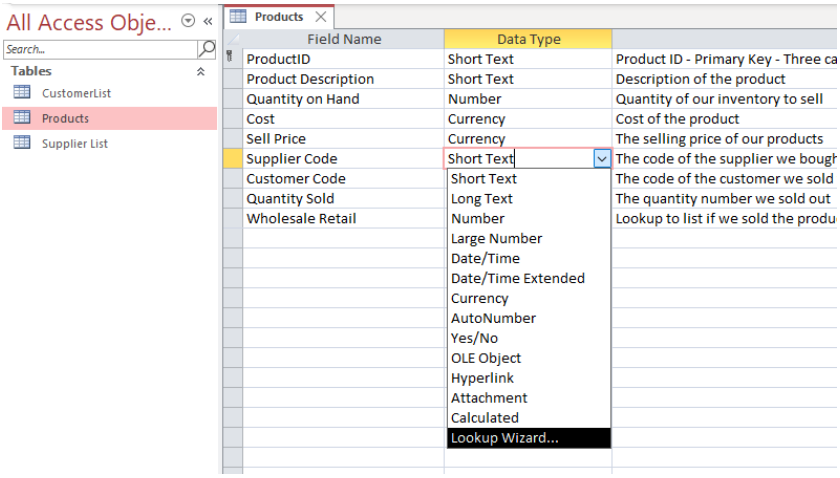
Raw Data for the Products Table:

Field Name	ProductID	Product Description	Quantity on Hand	Cost	Sell Price	Supplier Code	Customer Code	Quantity Sold	Wholesale Retail
Raw Data	CTB42	Chocolate Teddy Bear	15	$8.00	$17.00	AS	DG005	5	Retail
	HPB22	Hearts Puppy Bear	23	$11.00	$24.00	AS	AA001	13	Retail
	HTB32	Hugs Teddy Bear	22	$5.00	$15.00	RS	BS003	9	Retail
	LLB21	Lovable Lion Bear	30	$13.00	$20.00	RS	BS003	3	Retail
	PBB41	Pink Bouquet Bear	25	$26.00	$38.00	RS	BS003	12	Retail
	RRB01	Red Roses Bear	20	$20.00	$40.00	AS	CH004	5	Retail
	TTB52	Timeless Teddy Bear	16	$8.00	$21.00	US	AN002	10	Retail
	VHB11	Valentine Heart Bear	30	$13.00	$23.00	US	DD007	12	Retail
	WBB31	White Bouquet Bear	45	$26.00	$45.00	RS	FM009	15	Retail
	YBB51	Yellow Bouquet Bear	15	$25.00	$39.00	RS	GM010	10	Retail

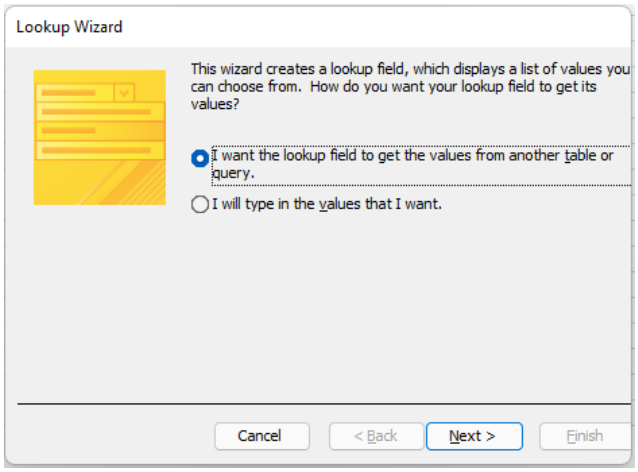
vi. Use Data Type Lookup Wizard to connect the Products Table to the CustomerList Table and the Supplier List Table with One-To-Many Relationship between the Supplier Code and the Customer Code Fields. We will also use the Lookup Wizard to create a Wholesale Retail Field. Here are the instructions:

a. Supplier Code Field:

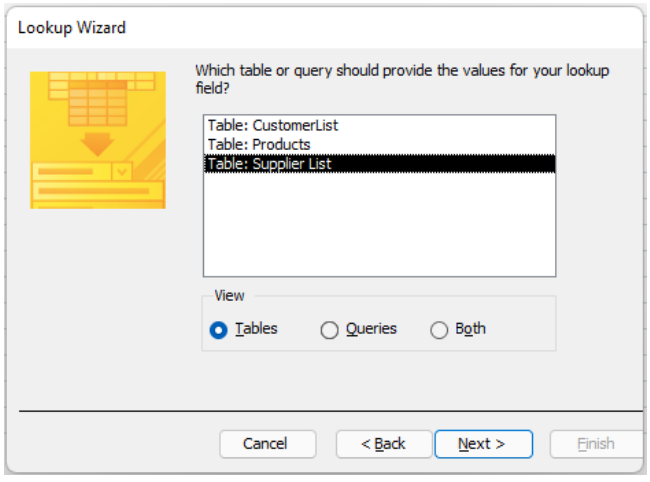
1. Field Name “Supplier Code”
2. Select Data Type “Lookup Wizard”



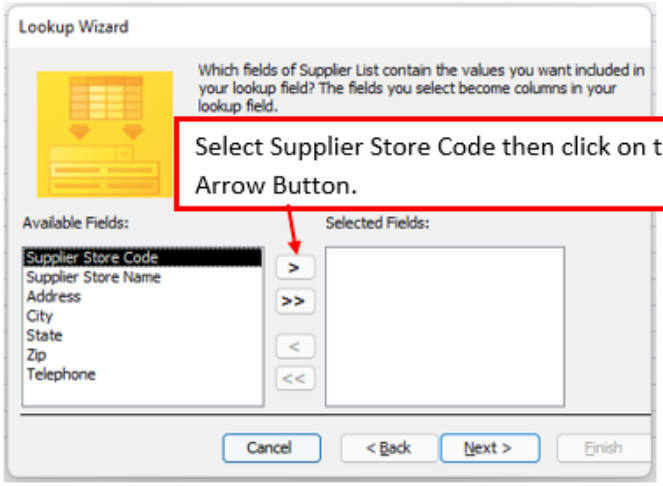
3. In the first dialog box select “I want the lookup field to get values from another table or query”. Then click next.



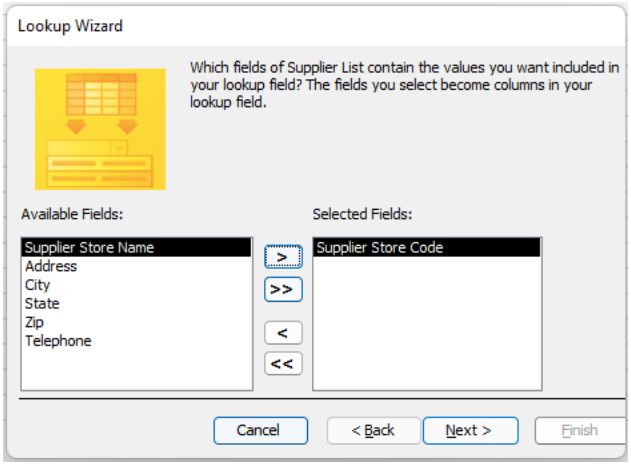
4. In the next dialog box, select the supplier List Table. Then click next.



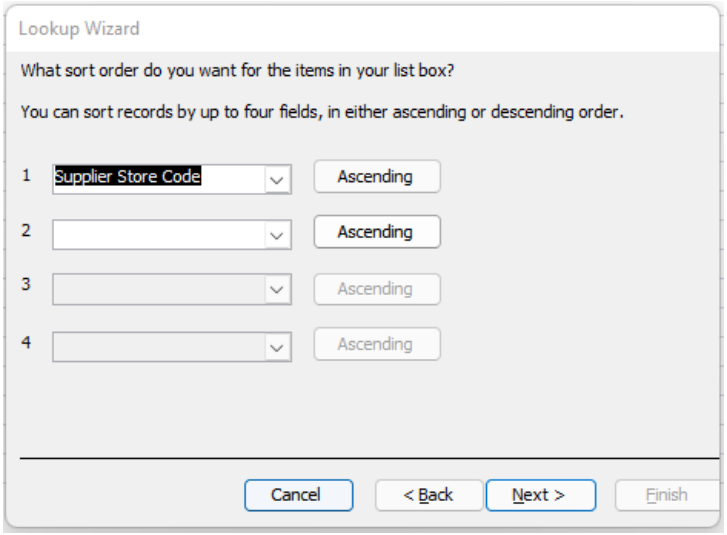
5. In the third dialog box from the Available Fields List, select the Supplier Store Code and then click n the Single Arrow button to move this field to the Selected Fields on the right.



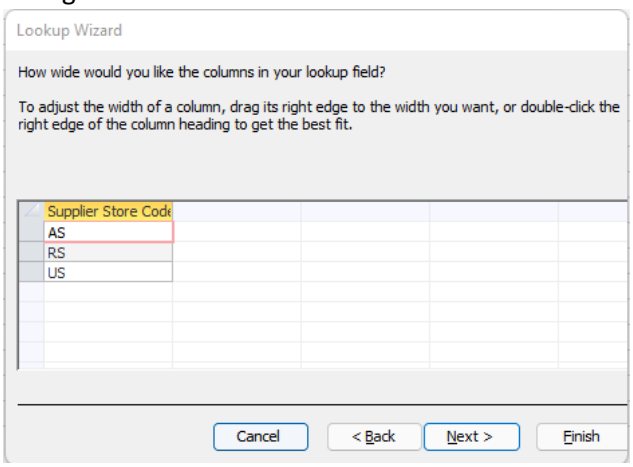
6. After you click on the single arrow button the Supplier Store Code is moved to the Selected Fields on the right. Then Click Next.



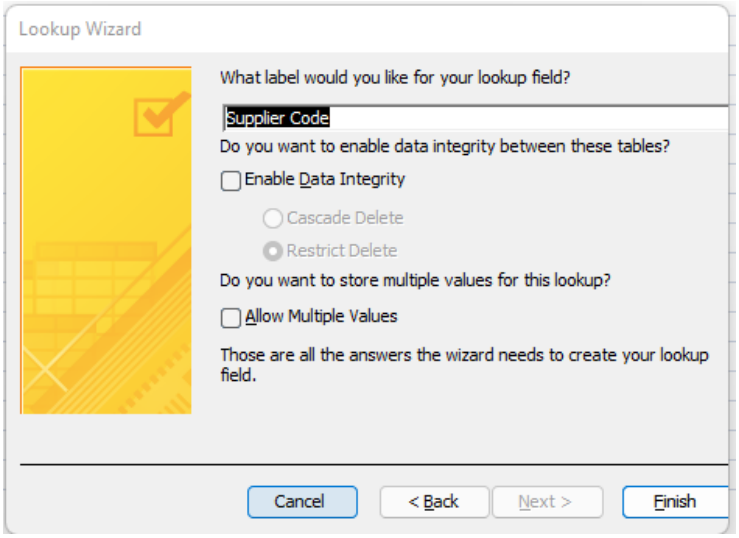
7. In the next dialogue box, select Supplier Store Code from the Ascending textbox drop-down. Then Click Next.



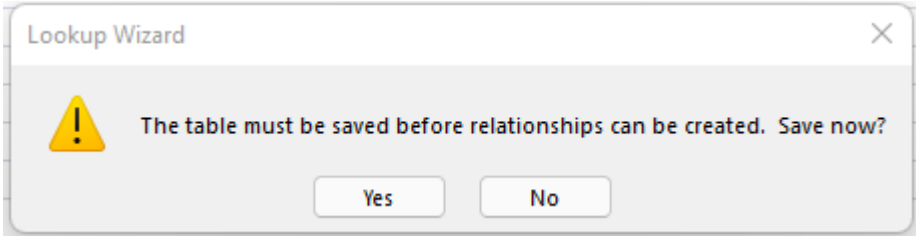
8. In the next dialog box, do not change anything just click next to advance to the next dialog box.



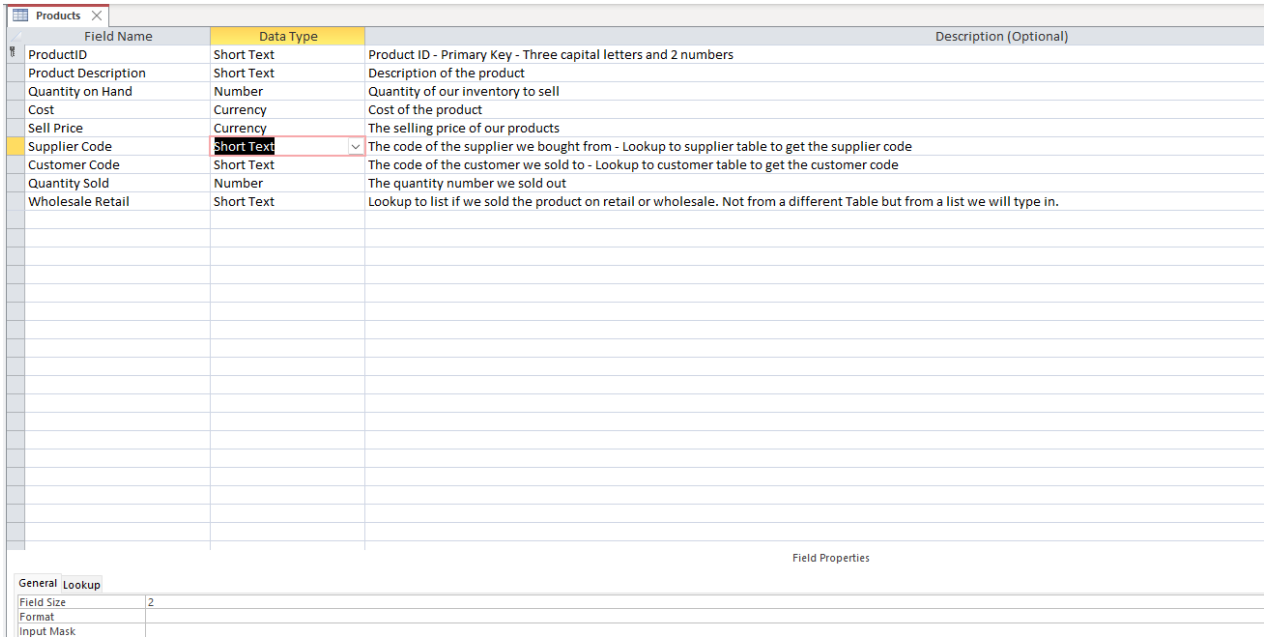
9. In the next dialog box, click Finish.



10. The next dialog box asks you to save before relationships can be created, click Yes.

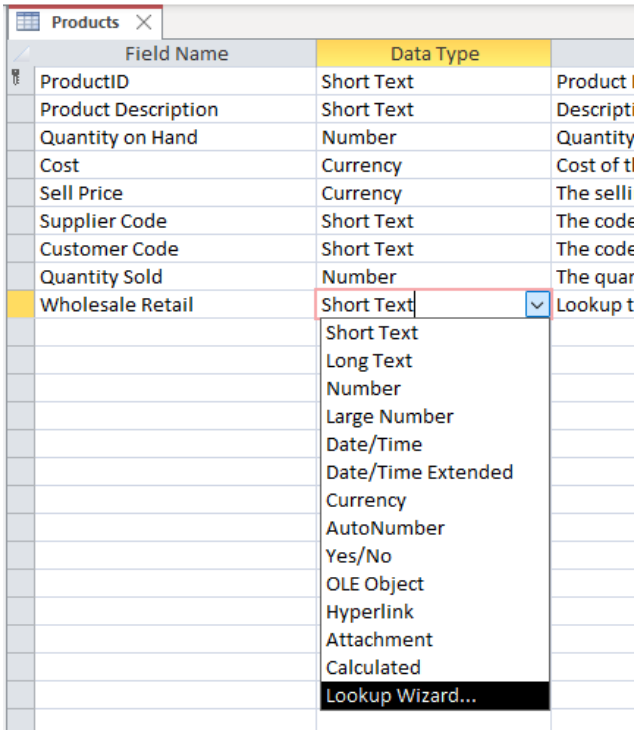


11. The finished Supplier Store Code Field is shown below, and it has adopted the Field size of 2 from the Primary Key in the Supplier List Table.

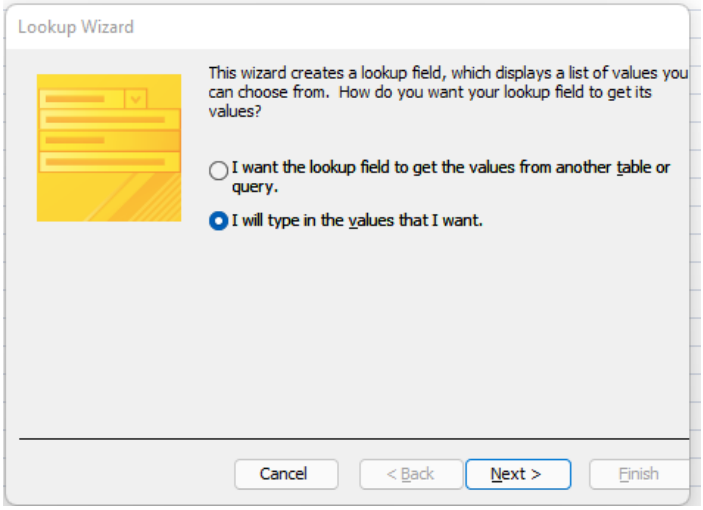


b. Repeat the same steps above from 10; vi; a; 1 – 10 to create a relationship for the Customer Code Field.
    1. Field Name = Customer Code (while repeating these steps, remember you are using the CustomerList Table and Customer Code Field.

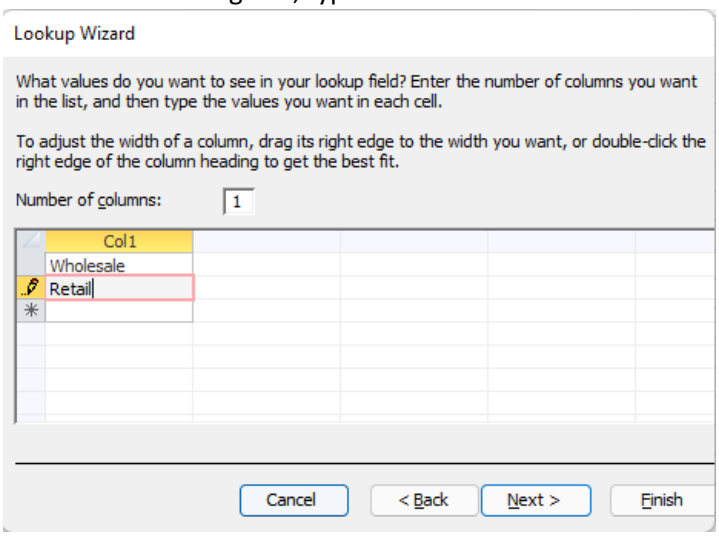
vii. Wholesale Retail Field:
    a. Field Name: “Wholesale Retail”
    b. Select Data Type: “Lookup Wizard”



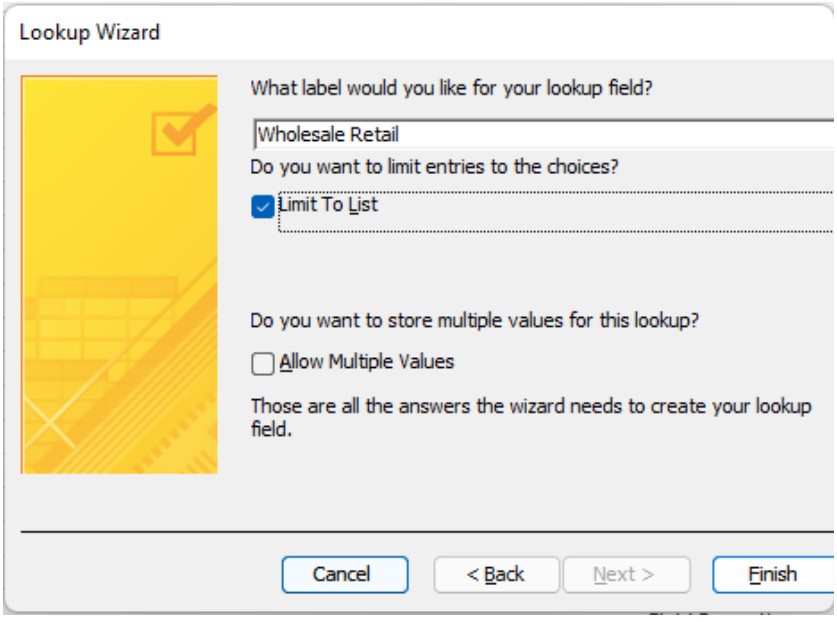
c. In the first dialog box select, “I will type in the values that I want.” Then click Next.



d. In the second dialog box, type the two values as seen in the picture below and then click next.

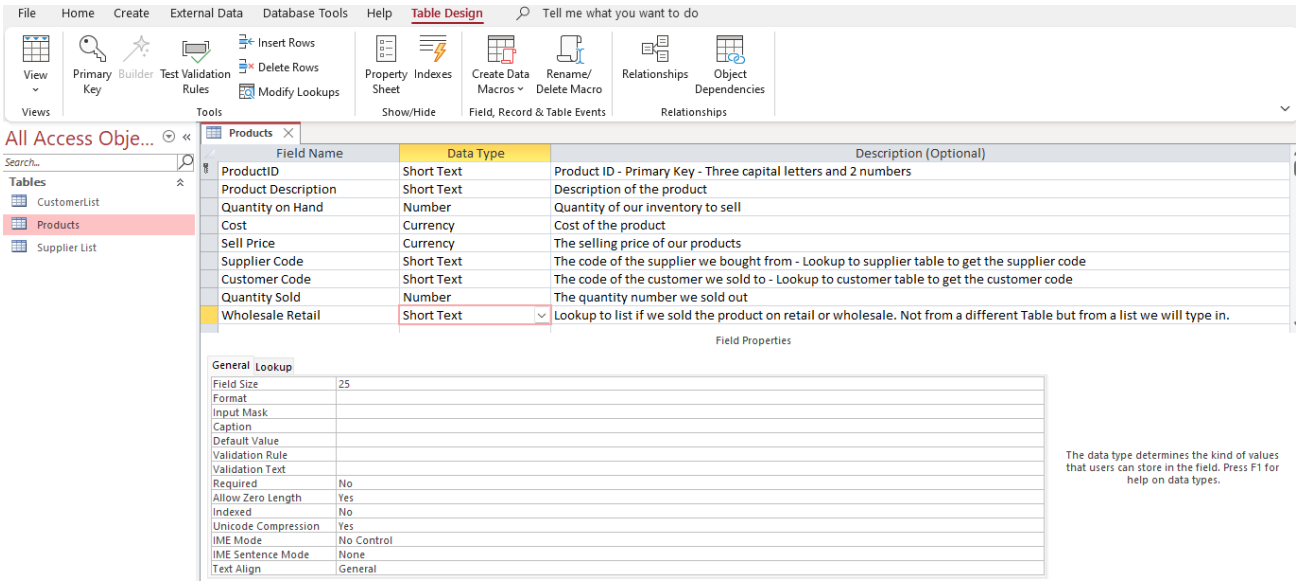


e. In the third dialog box check the box “Limit To List” and then click Finish.

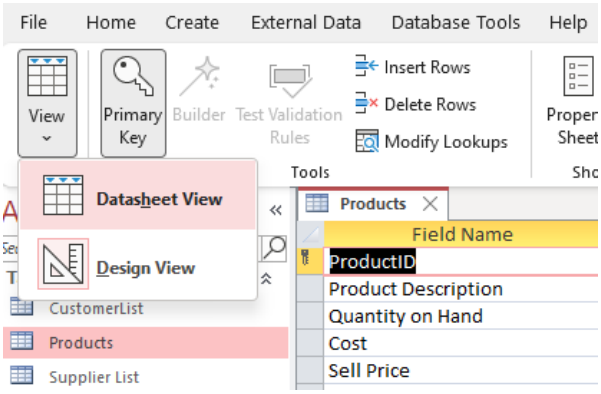


viii. Save the completed Products Table. Ctrl + S.

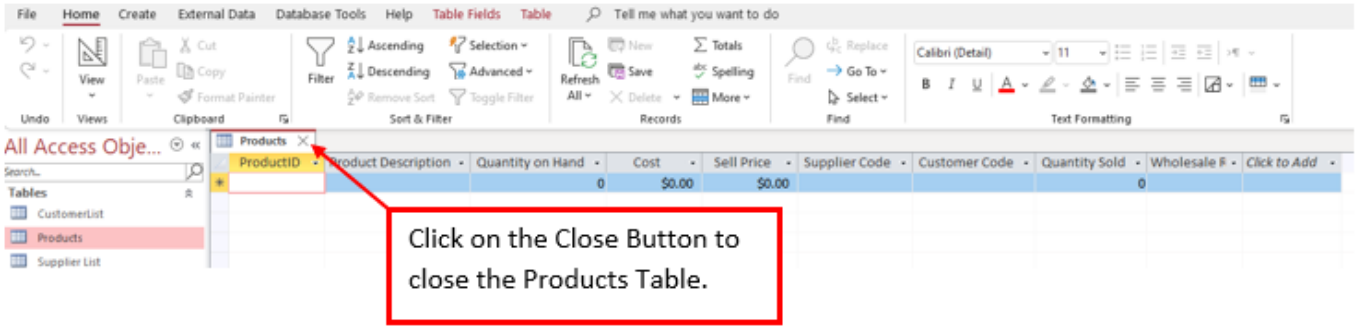
ix. Finished Products Table in Design View looks like the picture shown below.



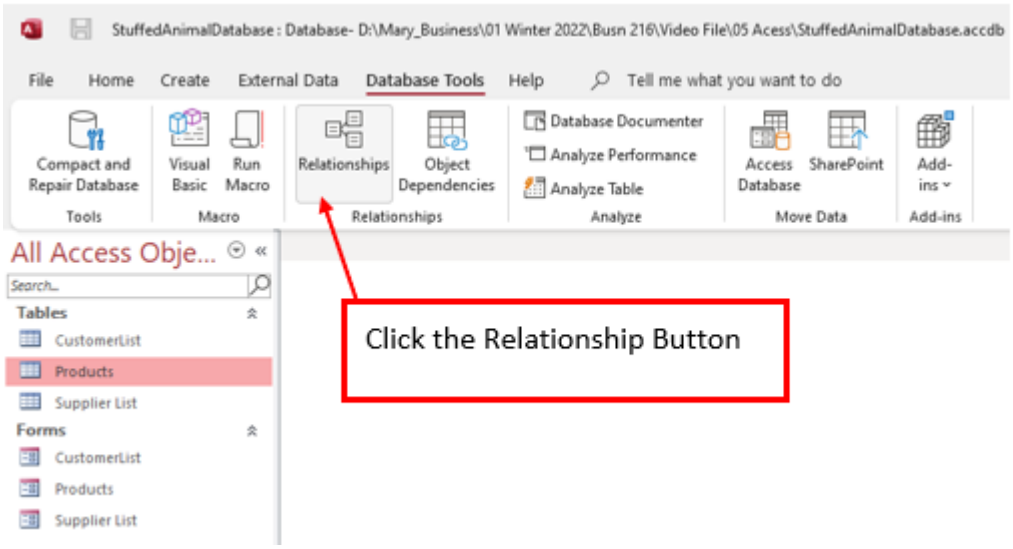
x. Click on the View Button to view in Datasheet View.



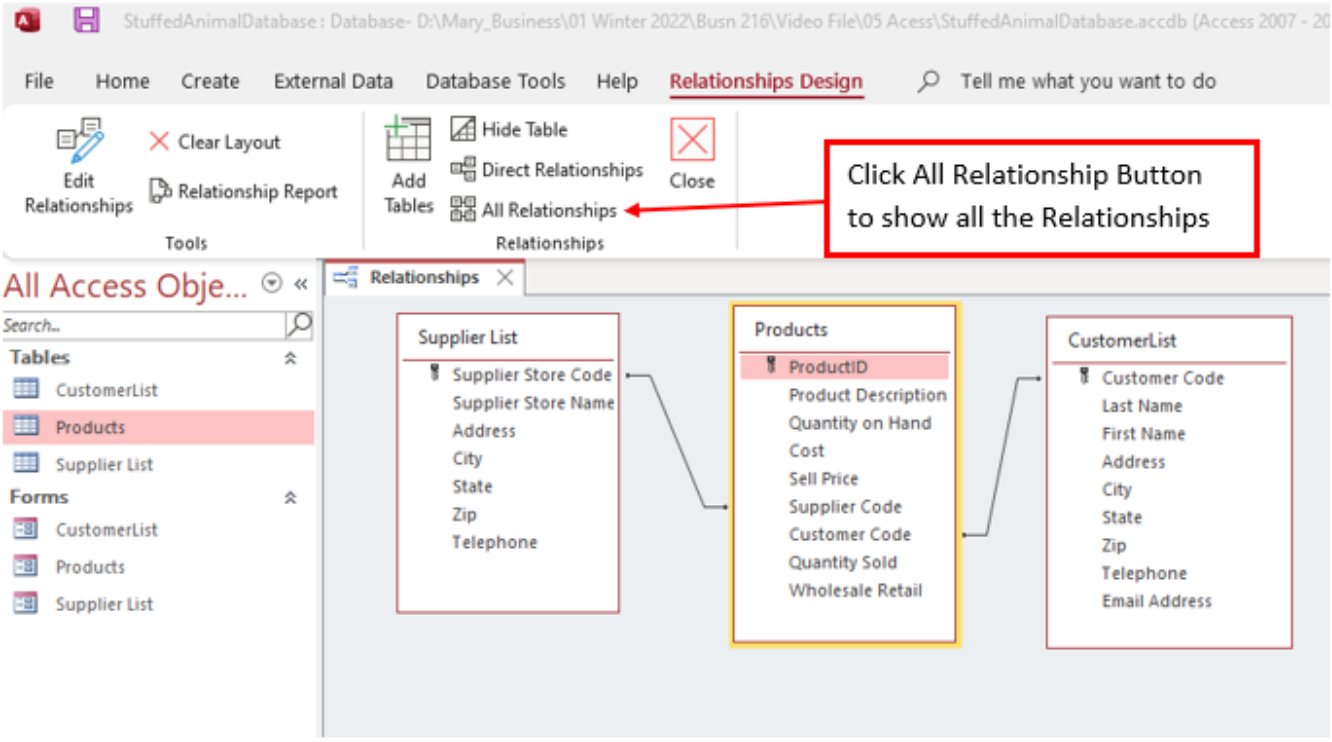
xi. The Products Table in Datasheet View. It has no records. Click on the Close Button to close the Products Table.



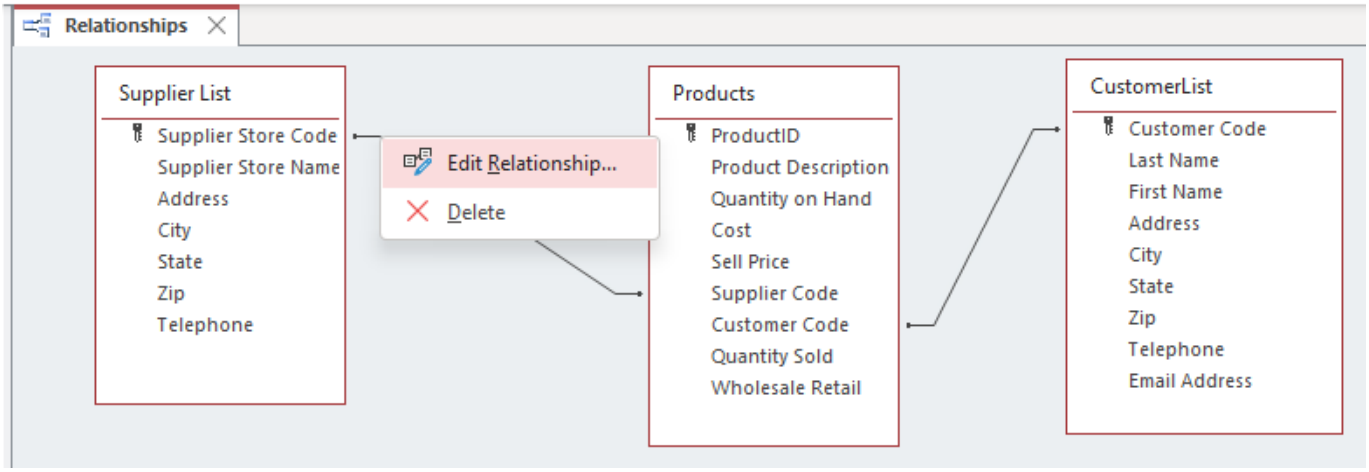
11. Use the Relationship Window to add the "referential Integrity" to One-To-Many Relationship between the two Supplier code fields and the two Customer Code Fields. We created a relationship when we used the Lookup Wizard for both the supplier List Table and the CustomerList Table. We need to edit these relationships.
    i. To edit a Relationship, click Relationships button in the Relationships group in the Database Tools Ribbon Tab.



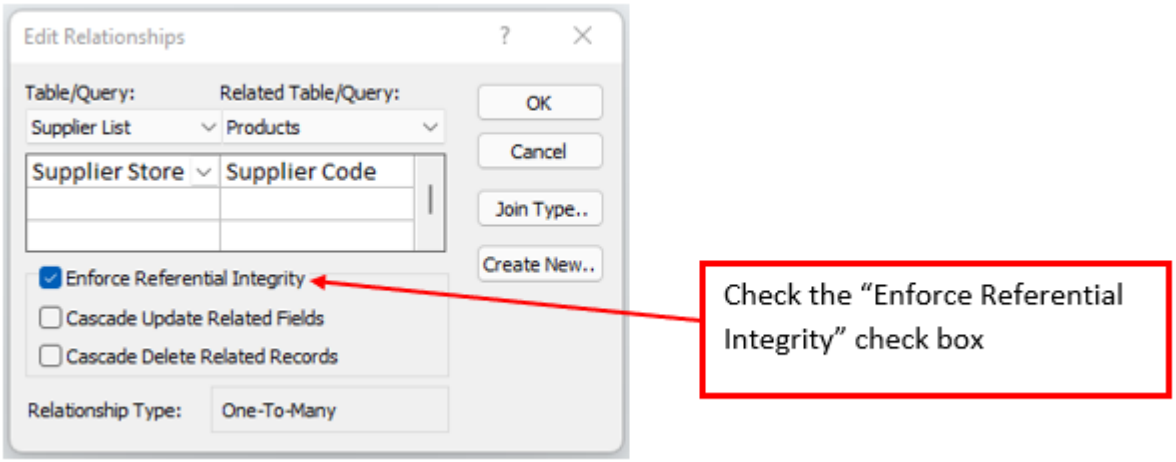
    ii. In the Relationship Window, we can see that there is a relationship line between the Supplier Store Code Field in both the supplier List Table Field List and the Products Table Field List. We also see the same relationship line between the Customer Code Field in both the CustomerList Table Field List and the Products Table Field List.
        a. If you do not see all the table relationships, click on "All Relationships" Button in the Relationships group in the Relationship Design Ribbon Tab.
    iii. Using your cursor, resize the Field Lists to show all the Fields as shown in the picture below.



iv. Carefully hover you mouse on one of the Relationship Line and then Right click and click Edit Relationship.



v. The Edit Relationship dialog box opens, check the box "Enforce Referential Integrity" check box to make sure that you are ONLY allowed to enter the Supplier Code in the Products Table if it is already in the Supplier List Table. This ensures a One-To-Many Relationship.



vi. Repeat Steps iv and v to Enforce Referential Integrity for the CustomerList Table and Products Table too.

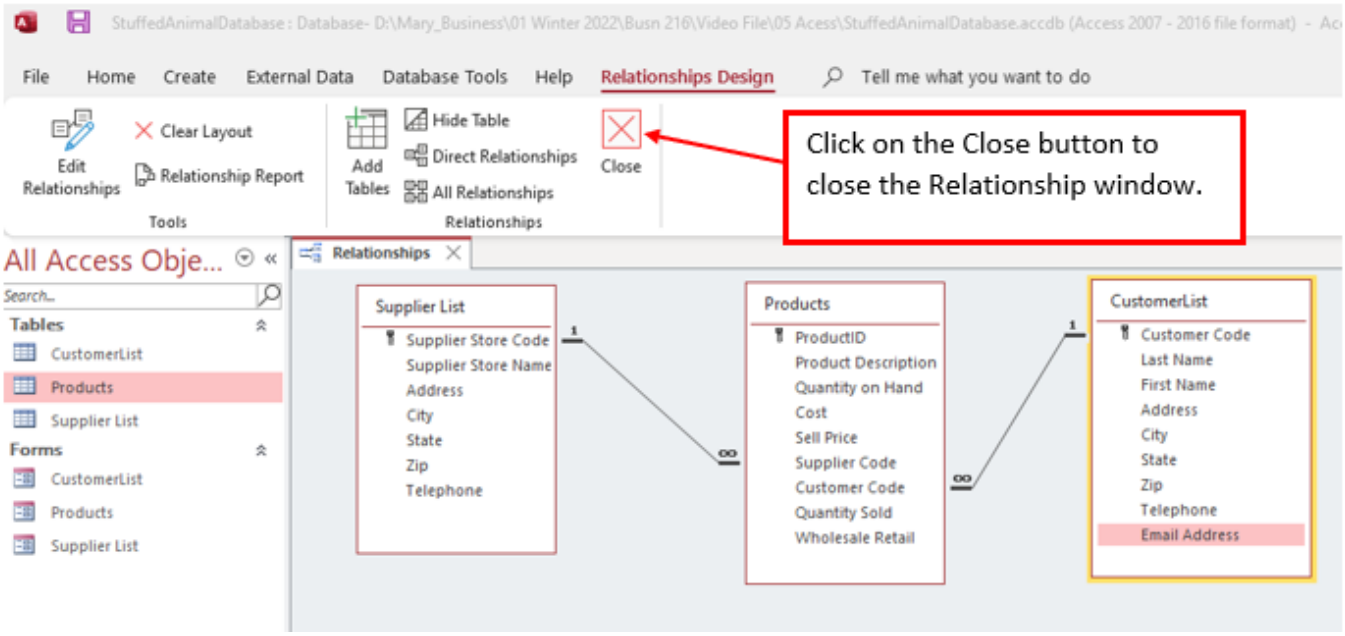
vii. Notes:

a. **Referential Integrity**:
This is a set of rules that Access enforces to maintain consistency between the related tables when you update data in your database.

b. When adding a record to a related table, matching record must already exist in the primary table which prevents any chance of having orphaned records. If you try to change the primary key in the primary table, Access will prevent this change if matching records exist in a related table, but if you choose **Cascade Update Related Fields** option, Access will allow this change to the Primary key and will also change the appropriate primary key in the foreign table and thus this will also eliminate any chance of inconsistency in your data.

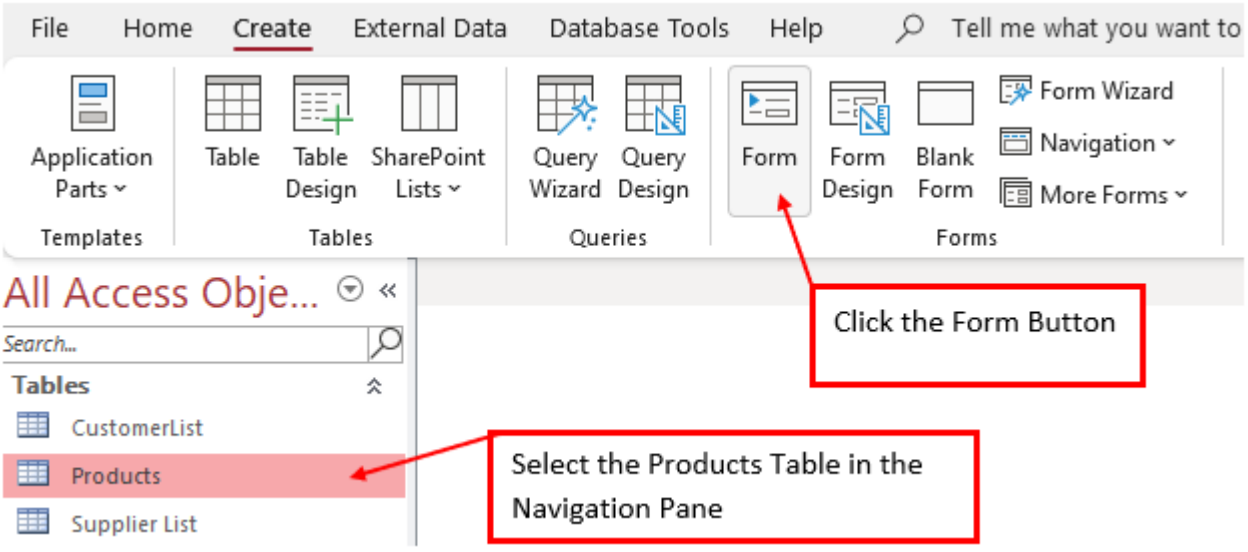
c. You cannot also delete a record in the Primary table since Access will prevent you from doing this if there are matching records in a related table but if you choose **Cascade Delete Related Records** option, Access will then delete the record from the Primary table and all the matching records in the related tables.

viii. Now we can see the One-To-Many Relationship. Click on the Close Button to close the Relationship Window.

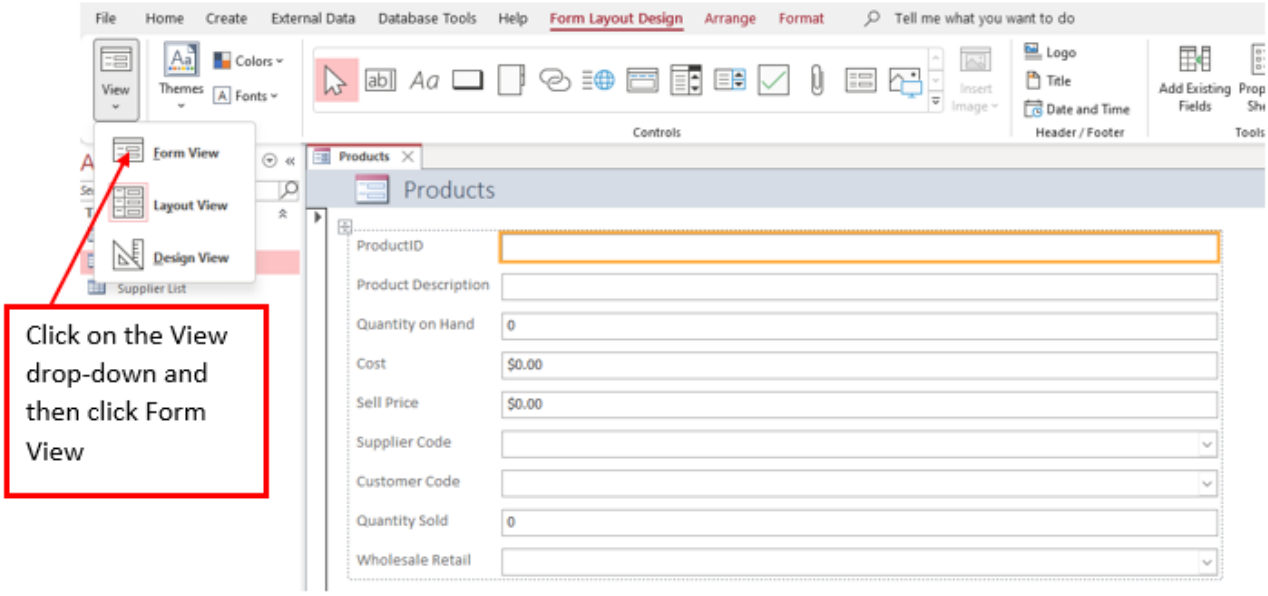


12. Create a Form for the Products Table

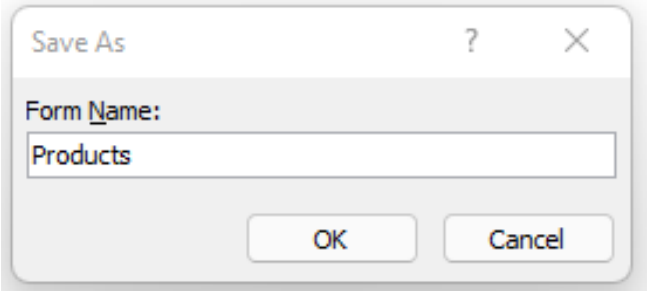
i. We will create a Form for each of the Tables so that we can enter, edit, and delete data in each of the tables. To create a Form for the Products Table: Select the Products Table from the Navigation Pane and then click the Form Button in the Forms group in the Create Ribbon Tab.



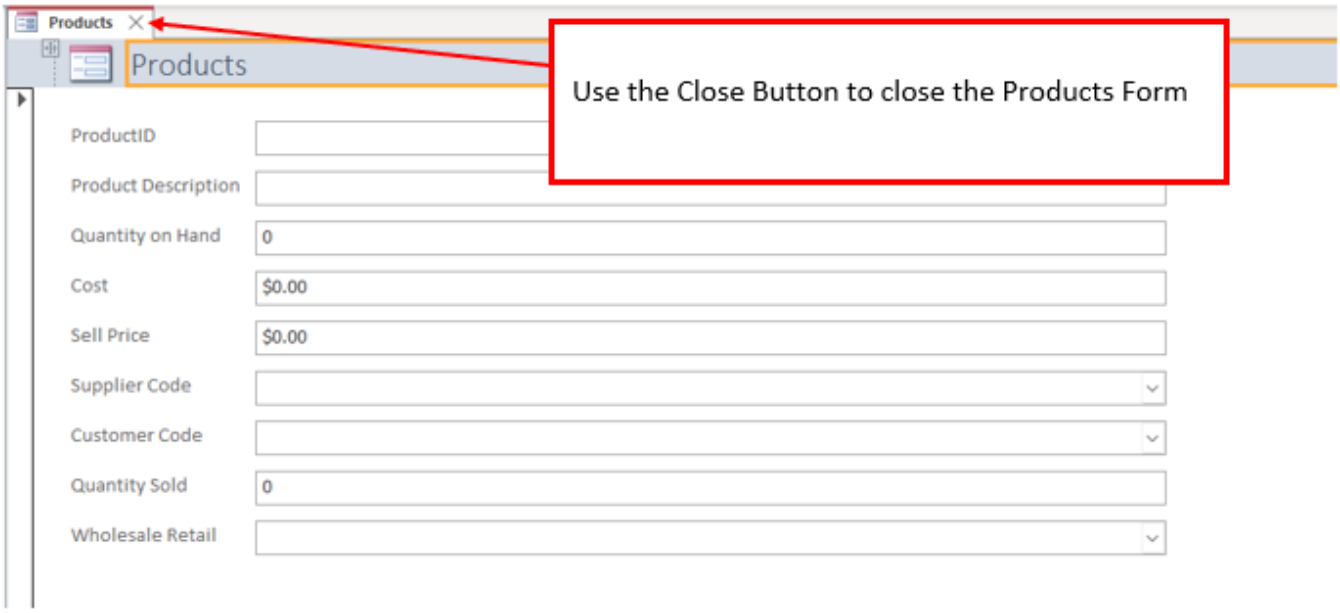
ii. The Form for the Products Table is created. Click on the View drop-down and then click Form View.



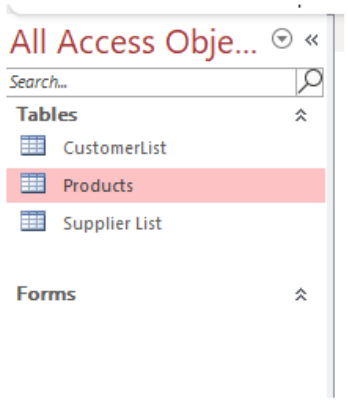
iii. Use the keyboard shortcut: Ctrl + S to save the Products Form, when the Save As dialog box appears, Click OK.



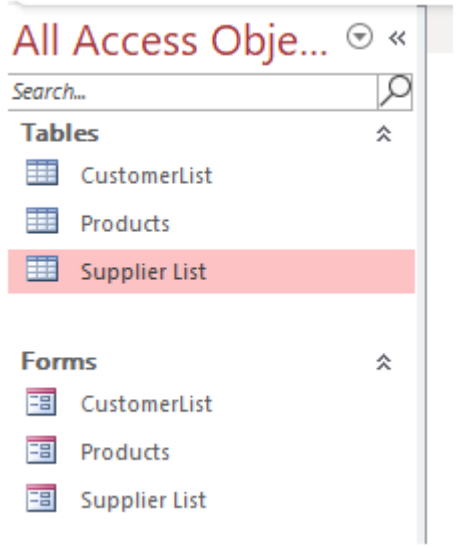
iv. Use the Close Button to close the Products Form:



v. The Products Form now appears on the Navigation Pane.



vi. Repeat the same steps and create the Forms for CustomerList and Supplier List Tables. Close each Form after you complete creating it. The Navigation Pane should now contain the Three Tables Forms. See the Picture below.

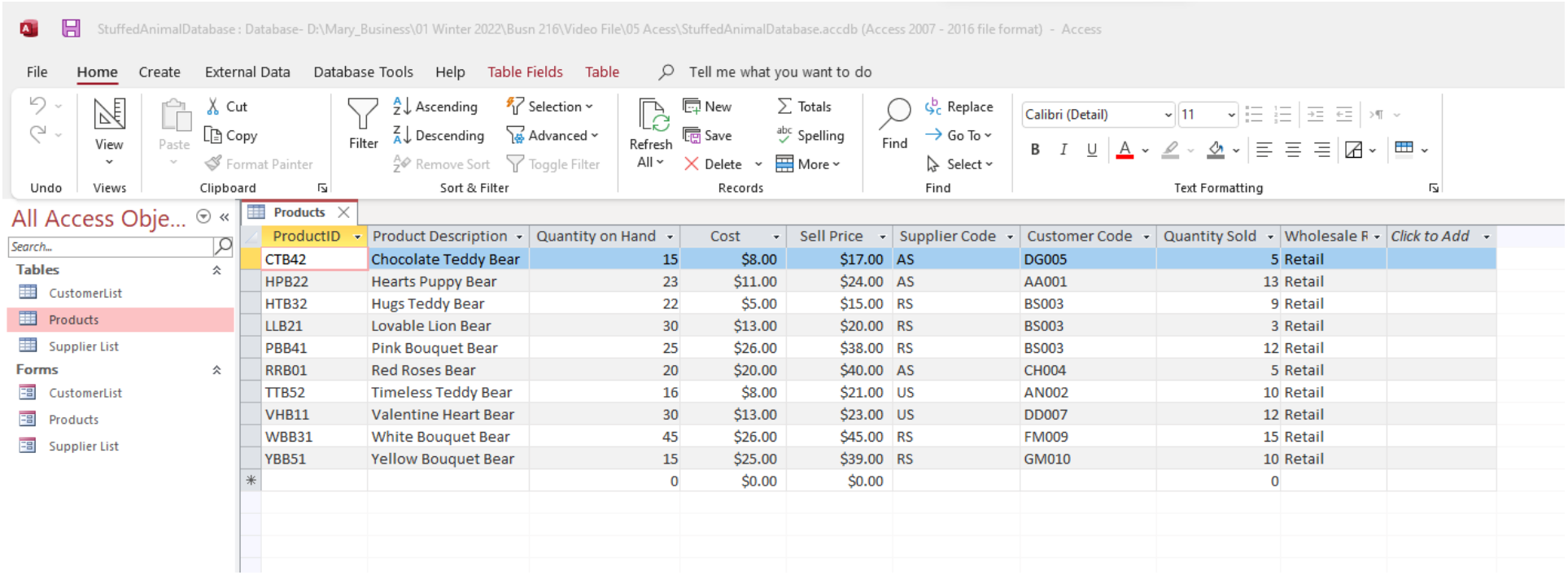


13. Add Data to the Products Table using the Product Forms. The Raw Data is provided below, and also same raw data is on page 19.
    i. Double-click on the Products Form to open it and then enter the raw data for each of the records.
    ii. Use Tab key to move to the next field. When you get to the end of the last field for each record, press Tab to move to the first field of the next record.
    iii. Remember you have the data validations so if you type more than the specified characters, you will get a message to enter the correct characters, for example in the ProductID field it must be 3 letters and 2 numbers e.g DGK77, entering anything different will not work for this field.

Field Name	ProductID	Product Description	Quantity on Hand	Cost	Sell Price	Supplier Code	Customer Code	Quantity Sold	Wholesale Retail
Raw Data	CTB42	Chocolate Teddy Bear	15	$8.00	$17.00	AS	DG005	5	Retail
	HPB22	Hearts Puppy Bear	23	$11.00	$24.00	AS	AA001	13	Retail
	HTB32	Hugs Teddy Bear	22	$5.00	$15.00	RS	BS003	9	Retail
	LLB21	Lovable Lion Bear	30	$13.00	$20.00	RS	BS003	3	Retail
	PBB41	Pink Bouquet Bear	25	$26.00	$38.00	RS	BS003	12	Retail
	RRB01	Red Roses Bear	20	$20.00	$40.00	AS	CH004	5	Retail
	TTB52	Timeless Teddy Bear	16	$8.00	$21.00	US	AN002	10	Retail
	VHB11	Valentine Heart Bear	30	$13.00	$23.00	US	DD007	12	Retail
	WBB31	White Bouquet Bear	45	$26.00	$45.00	RS	FM009	15	Retail
	YBB51	Yellow Bouquet Bear	15	$25.00	$39.00	RS	GM010	10	Retail

14. Picture of the Finished Product Table after entering all the Raw Data is shown on the next page. Next Video we will learn how to create Queries in Access. We will use this same data that we have created in this video.

Picture of the finished Products Table



Products

ProductID	Product Description	Quantity on Hand	Cost	Sell Price	Supplier Code	Customer Code	Quantity Sold	Wholesale F	Click to Add
CTB42	Chocolate Teddy Bear	15	$8.00	$17.00	AS	DG005	5	Retail	
HPB22	Hearts Puppy Bear	23	$11.00	$24.00	AS	AA001	13	Retail	
HTB32	Hugs Teddy Bear	22	$5.00	$15.00	RS	BS003	9	Retail	
LLB21	Lovable Lion Bear	30	$13.00	$20.00	RS	BS003	3	Retail	
PBB41	Pink Bouquet Bear	25	$26.00	$38.00	RS	BS003	12	Retail	
RRB01	Red Roses Bear	20	$20.00	$40.00	AS	CH004	5	Retail	
TTB52	Timeless Teddy Bear	16	$8.00	$21.00	US	AN002	10	Retail	
VHB11	Valentine Heart Bear	30	$13.00	$23.00	US	DD007	12	Retail	
WBB31	White Bouquet Bear	45	$26.00	$45.00	RS	FM009	15	Retail	
YBB51	Yellow Bouquet Bear	15	$25.00	$39.00	RS	GM010	10	Retail	
		0	$0.00	$0.00			0		

Keyboards to Learn:

F6 = Jump from Field Name area to Field Properties area in the Table Design View.