



Microsoft Access Lab Guide

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Introduction

A successful database should be quick, efficient, and easy to use. MS Access can store a large amount of text (up to two gigabytes) in a single database. This helps to create reports that can be run at any time. It can also provide access to multiple users working on data at the same time. This lab guide helps you to create a database, generate forms and reports, create pivot tables and charts, subreports and parameterized queries.

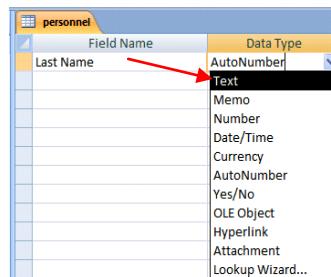
First we see the data types available in MS Access.

MS Access Database Datatype

The different types of data types are as follows:

1. **Text:** This data type can take in alphabetical/numerical data. This data type has a maximum length of 255 characters. One cannot perform mathematical operations on the content stored in this field. Examples of text data are: names, addresses, EmployeeCode, ZipCodes, etc.
2. **Memo:** This field is essentially used for textual comments. It can take up to a maximum of 32,000 characters.
3. **Number:** Numerical calculations such as addition, subtraction, multiplication, division, etc. can be performed on the contents stored in Number data type.
4. **Date/Time:** This is a field for displaying dates and times.
5. **Currency:** This data type can hold a currency value such as Dollars (\$).
6. **AutoNumber:** This field is an automatic counter that assigns a number each time you add data into a new field.
7. **Yes/No:** This is a Boolean field that can store value such as “True/False” or “Yes/No”.

Given below is a snapshot from MS Access on the various data types available for a field.



Field Properties

The screenshot shows the 'Field Properties' dialog for the 'Last Name' field. The 'General' tab is selected, displaying properties like Field Size (set to 255), Format, Input Mask, Caption, Default Value, Validation Rule, Validation Text, Required (set to No), Allow Zero Length (set to Yes), Indexed (set to No), Unicode Compression (set to No), IME Mode (set to No Control), IME Sentence Mode (set to None), and Smart Tags. A tooltip on the right side of the dialog explains the 'Field Size' property: "The maximum number of characters you can enter in the field. The largest maximum you can set is 255. Press F1 for help on field size."

Field Size

It is currently set to 255 characters for a text field. A text field can hold a maximum of 255 characters. However, the size can be increased or decreased as per the requirements.

Format

Custom text and memo formats can be created by using the following symbols. If all the characters in the text or memo field are required in lowercase, use the symbol “<”. If all the characters in the text or memo field are required in uppercase, use the symbol “>”. However, if a text character is not required, use the symbol “&”. If a text character (either a character or space) is required, use the symbol “@”.

Input Mask

To control the manner in which the user provides the input and to provide clear instructions to the user on how to provide the input, “Input Masks” are used.

For Example: A Phone Number field displayed as (---) --- - ----, clearly specifies that the user should provide three digits within circular brackets, three digits before the hyphen sign (-) and four digits after the hyphen sign. A phone number entered as (111)555-0266 is valid.

Caption

When used on a form, this is the label for the field. If you don't enter a caption, the field name is used as a label.

Default Value

This is the value that is automatically entered in this field for new records, if the value is not provided by the user.

MS Access Database Hierarchy

There are three database models:

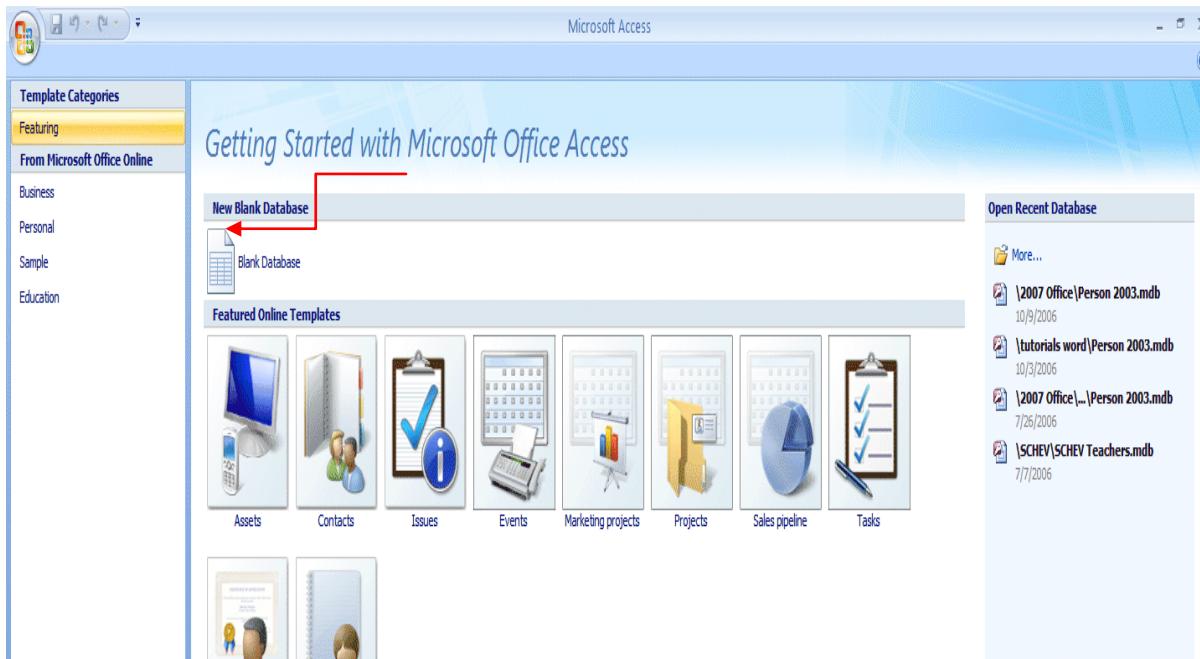
- 1. Hierarchical Database:** In a hierarchical database model, data is organized in a tree structure. There is a One-to-Many (1: M) relationship between parent and child.
- 2. Network Database:** The network database model supports many-to-many (M: N) relationships in data.
- 3. Relational Database:** In a relational database, data is stored in a table/relation in the form of rows (records/tuples) and columns (attributes/fields). For Example: a relation/table, “Employee” has three columns: EmpID, EmpName and Designation. It has three records as shown below:

EmpID	EmpName	Designation
E101	Felix	Project Manager
E102	Maria	System Engineer
E103	Julianne	System Engineer

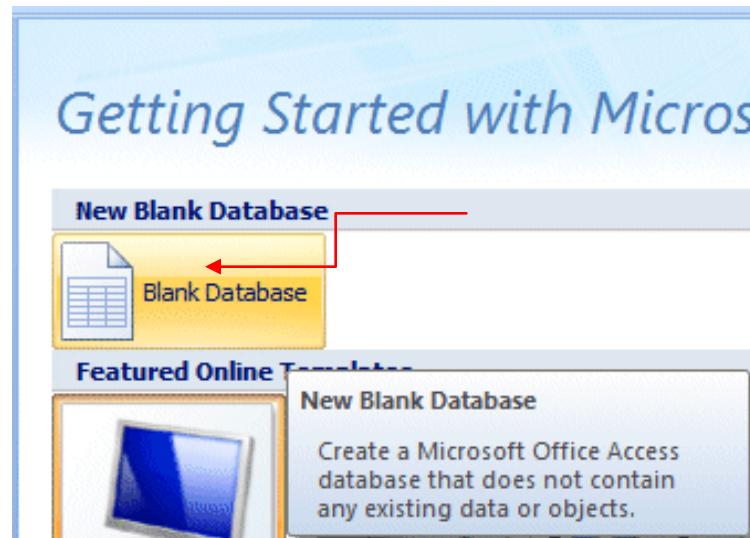
Now let us see Getting Started with Microsoft Office Access.

Creating a Database

When you click on MS Access in the Start Menu, you get a dialog box as given below:



Let us create a new database by clicking on Blank Database.



As soon as you click the Blank Database button, the right side of your Access screen will change and look like the image below.



One of the unique features of the Access database is that it requires you to save your database as soon as you click on Create. As per the figure above, a database by the name, “employeedb.accdb” is created.

Creating a Table

To create a table, click on the “Create” button. This table will be created within the “Employeedb.accdb” database (which was created in the earlier step). The following window will be displayed. Let us save the table by the name “employee” before proceeding any further.

As can be seen from the screen shot below, an “employee” table has been created. Now let us proceed to add some fields/ columns to the table. One is required to specify the field name, data type, and other properties for each field. Let us begin by adding the first field “ID” of data type “AutoNumber” to the table. Let us choose to make this field the “Primary Key” by clicking on the “Primary Key” option as shown. A column designated as the “Primary Key” column has the “Not Null” and “Unique” Property.

Field Name	Data Type	Description
ID	AutoNumber	

Field Properties

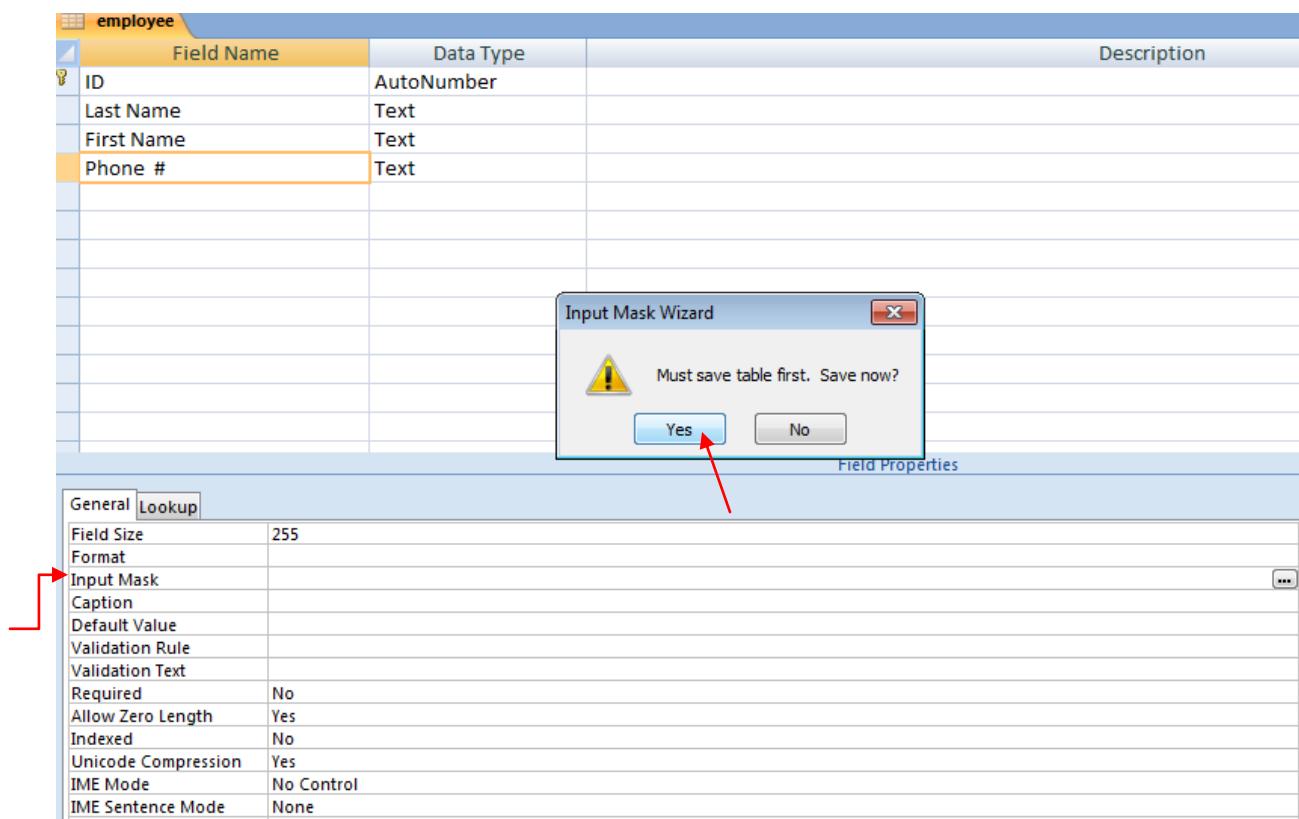
General	Lookup
Field Size	Long Integer
New Values	Increment
Format	
Caption	
Indexed	Yes (No Duplicates)

Field Name	Data Type
ID	AutoNumber
Last Name	Text
First Name	Text

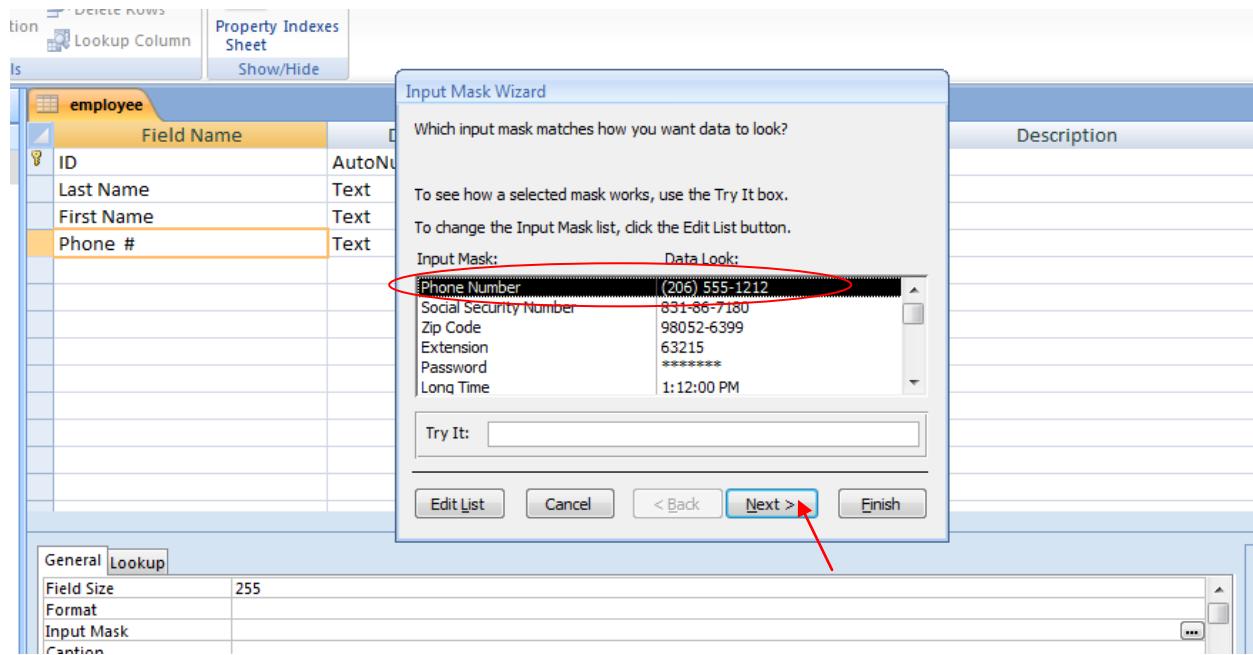
Field Properties

General	Lookup
Field Size	25
Format	>
Input Mask	
Caption	

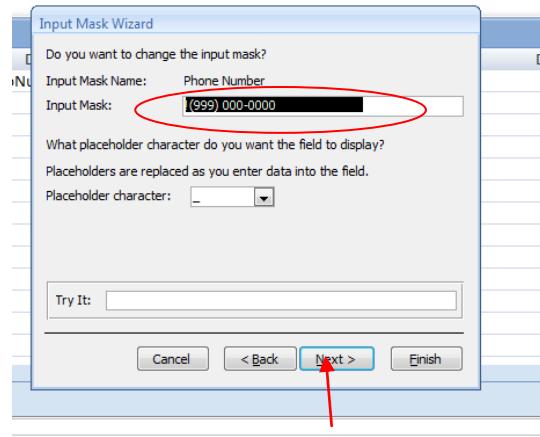
The above figure shows two more fields , “Last Name” and “First Name” of data type “Text” being added to the table, employee. Let us see how we can add an “Input Mask” for the “Phone #” field.



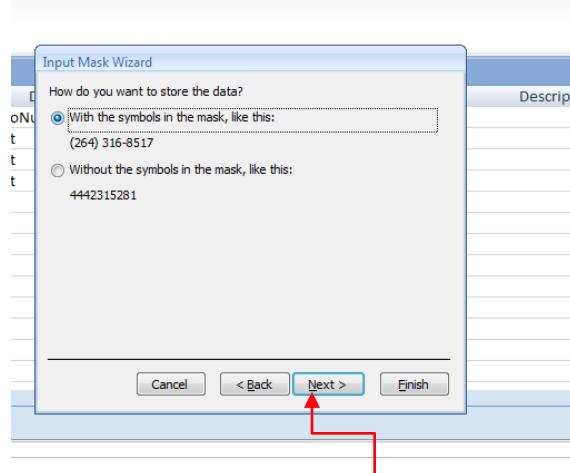
Click on the Input Mask to specify how the data should look. It is required to save the table prior to proceeding with setting the input mask property.



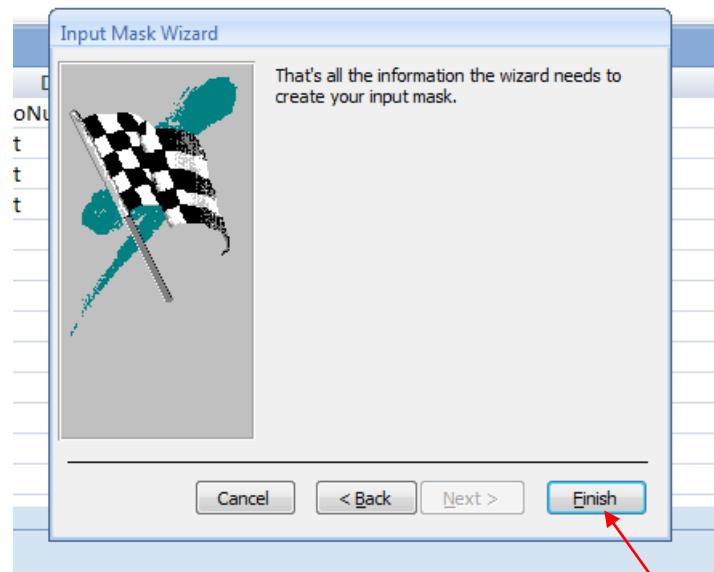
If you want to change the input mask, change the input mask field then click on Next.



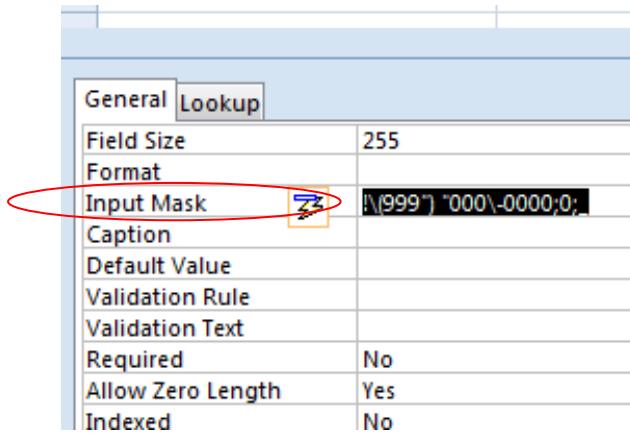
You will be given choices to mask the data with or without the symbols. Then click on Next again.



Now, click on Finish.



The Input Mask area for Phone # will display numbers and special characters. You will be able to see how this works when you enter data in the Phone # field.

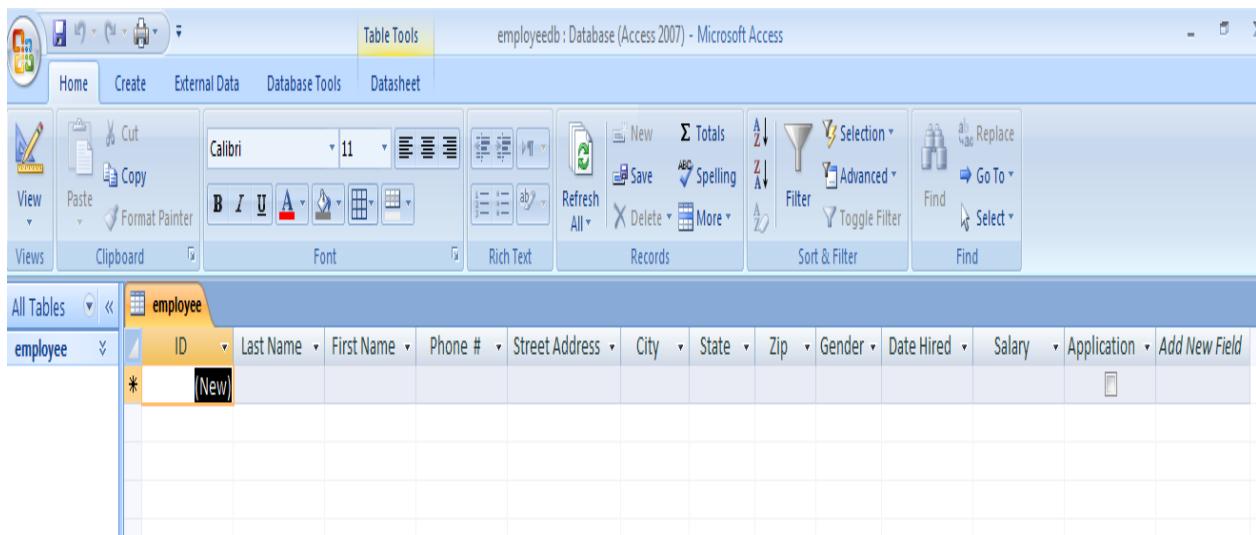
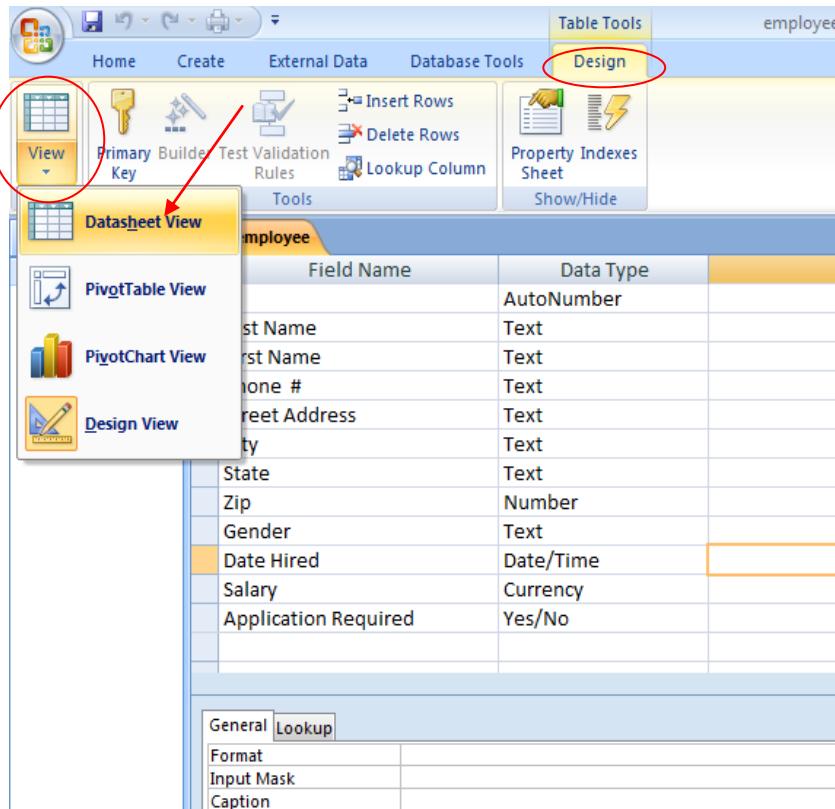


You will now see all the field names and data types with their field properties. Similarly, you can proceed to add as many fields as are required. Once you have completed, click on the **Save** option in the Home tab to save the employee table.

Field Name	Data Type
ID	AutoNumber
Last Name	Text
First Name	Text
Phone #	Text
Street Address	Text
City	Text
State	Text
Zip	Number
Gender	Text
Date Hired	Date/Time
Salary	Currency
Application Required	<input type="button" value="Text"/> <input type="button" value="Field"/> Text Memo

General	Lookup
Field Size	255
Format	
Input Mask	
Caption	
Default Value	
Validation Rule	
Validation Text	
Required	No
Allow Zero Length	Yes
Indexed	No
Unicode Compression	Yes
IME Mode	No Control
IMF Sentence Mode	None

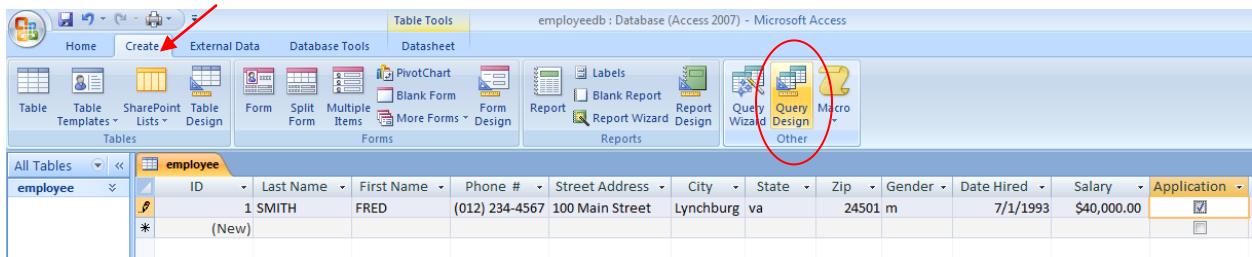
Now you can view the datasheet by clicking on the View button in the Design tab. You will get a drop down menu from where you can click on datasheet view. It will appear as shown below.



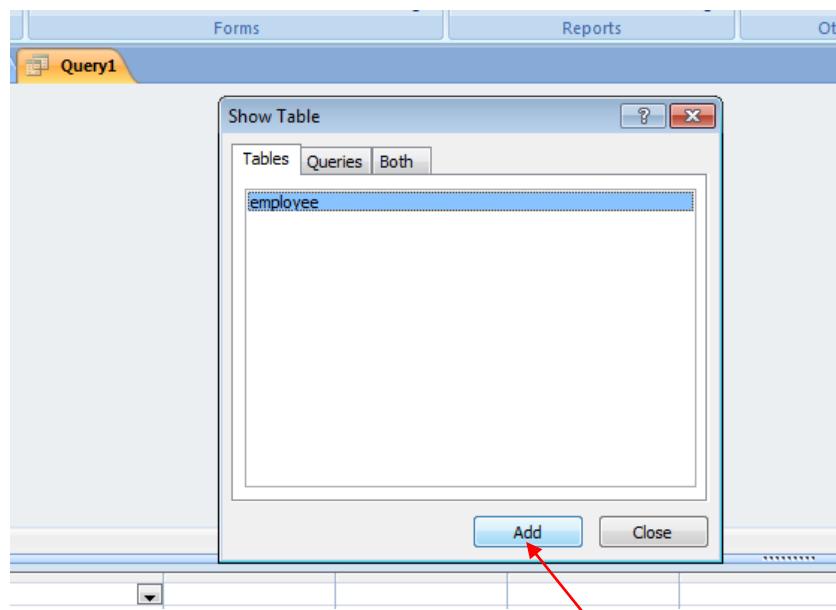
In this datasheet view you can either directly insert your records or you can use Query Design for inserting a record. Direct insertion is done as shown below. We have shown the insertion of one record into the database table. Likewise as many number of records as required can be inserted.

The screenshot shows the Microsoft Access 2007 interface in Datasheet mode. The ribbon at the top has 'Table Tools' selected under the 'Home' tab. The 'Font' group is visible, and the 'Records' group contains options like Refresh All, New, Save, Totals, Filter, and Find. The 'employee' table is open, displaying columns for ID, Last Name, First Name, Phone #, Street Address, City, State, Zip, Gender, Date Hired, Salary, and Application. A new record is being added, indicated by the '(New)' placeholder in the first column.

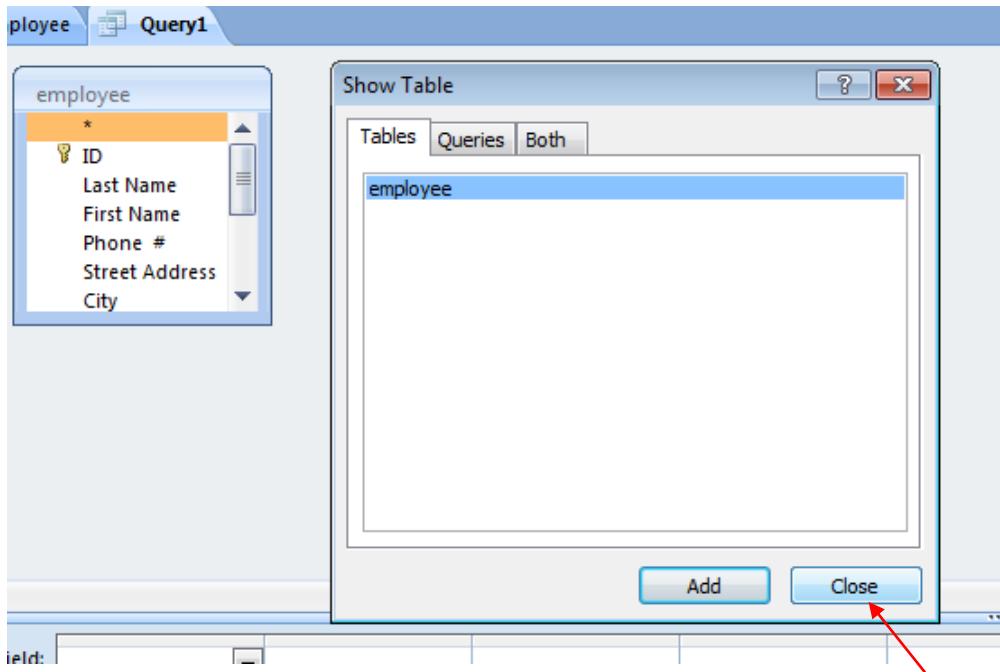
For designing a query, go to Query Design under the Create tab.



You will see tables in your database. Now you can select the table and click on Add, as shown below.

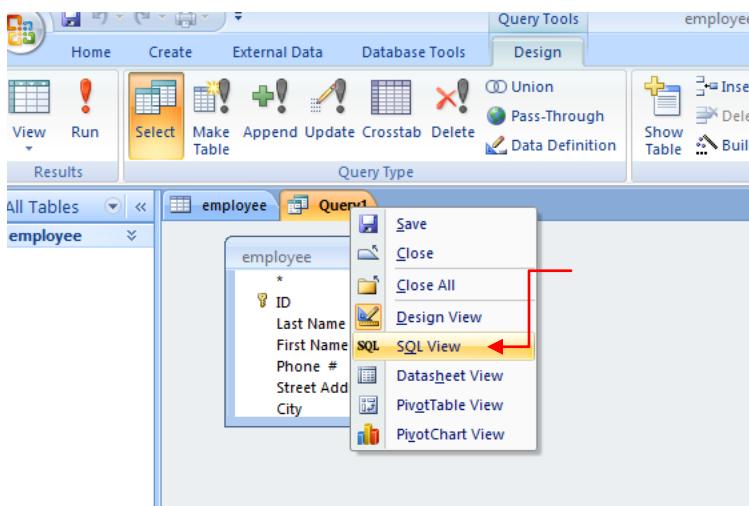


After selecting the employee table your screen should now look similar to the one below. Now, you can click on Close.



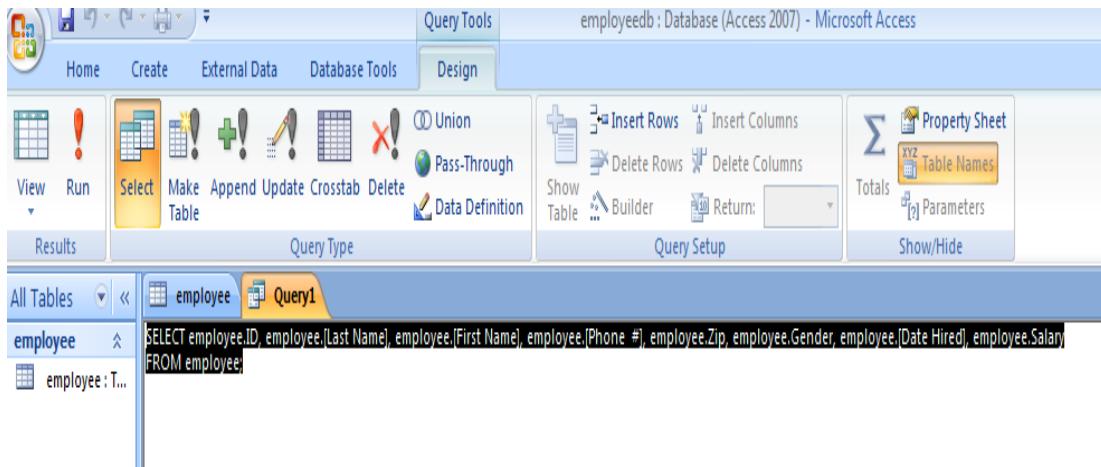
Now, right click on Query1, and you will get a drop down list as shown in the figure below.

Click on SQL View.



You can view the page as shown below, where you can write all DDL and DML commands. DDL are Data Definition Language statements. They are used to create objects such as table, view, index, etc. Few examples of DDL statements are: Create table <table name>...., Alter table <tablename>...., Drop table <table name>...., etc.

DML stands for Data Manipulation Language statement. DML statements help you to insert data, delete data, view data and modify/update data in a table. Few examples of DML statements are: Select * from <table name>, insert into <table name> values (.....), delete from <table name>, etc.



Let us execute the SQL statement displayed in the figure above.

The execution of the SQL statement displays all the records of the employee table.

Query1												
ID	Last Name	First Name	Phone #	Street Address	City	State	Zip	Gender	Date Hired	Salary	Application	
1	SMITH	FRED	(012) 234-4567	100 Main Street	Lynchburg	va	24501	m	7/1/1993	\$40,000.00	<input checked="" type="checkbox"/>	
2	FRANK	ROYCE	(123) 456-7120	121 cross street	los angel	va	25789	m	7/5/1999	\$45,000.00	<input checked="" type="checkbox"/>	
3	ELLEN	SMITH	(234) 567-1323	111 main street	lynchburg	va	23601	f	5/12/2000	\$50,000.00	<input checked="" type="checkbox"/>	
4	JACK	SAM	(121) 456-7828	54th cross street	vegas	va	24501	m	3/4/2000	\$50,000.00	<input checked="" type="checkbox"/>	
5	SARA	JOE	(123) 456-7234	72 main street	lynchburg	va	25789	f	4/4/2001	\$35,000.00	<input checked="" type="checkbox"/>	
6	JOESPH	HENRY	(145) 671-1100	100 main street	los angel	sa	24501	m	7/3/1999	\$43,000.00	<input checked="" type="checkbox"/>	
*	(New)											

Creating Relationships between Tables

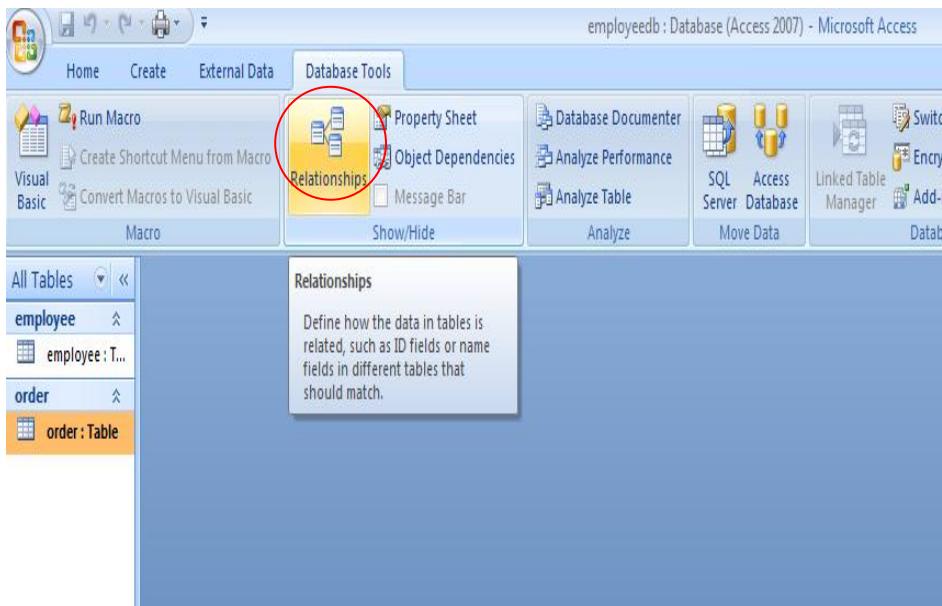
A relationship can be created between two tables (employee and order) through creating Primary Foreign Keys and populating them with data. We already have the “employee” table with us. Similarly we can create the “Order” table and insert records into it.

Home												
Views	Cut	Copy	Format Painter	Clipboard	B	I	U	A	Font	Rich Text	New	Totals
All Tables											Save	Spelling
employee											Refresh All	More

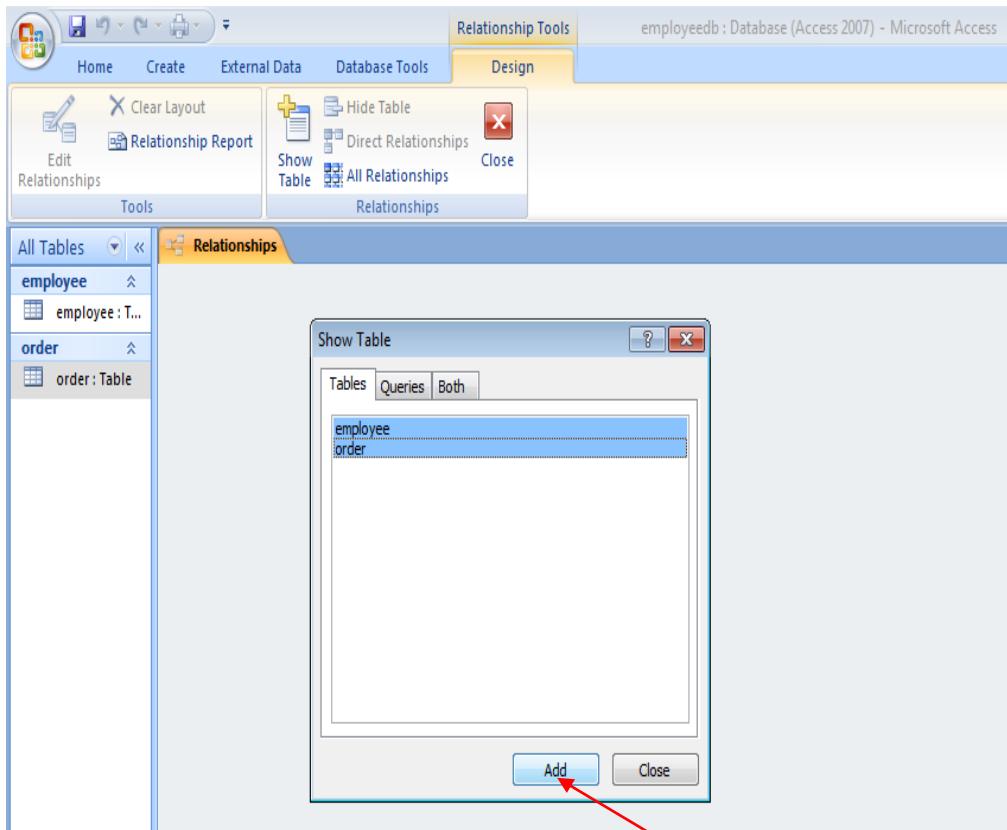
order : Table

Relationships show the data in tables which are related, such as matching ID fields or name fields in different tables.

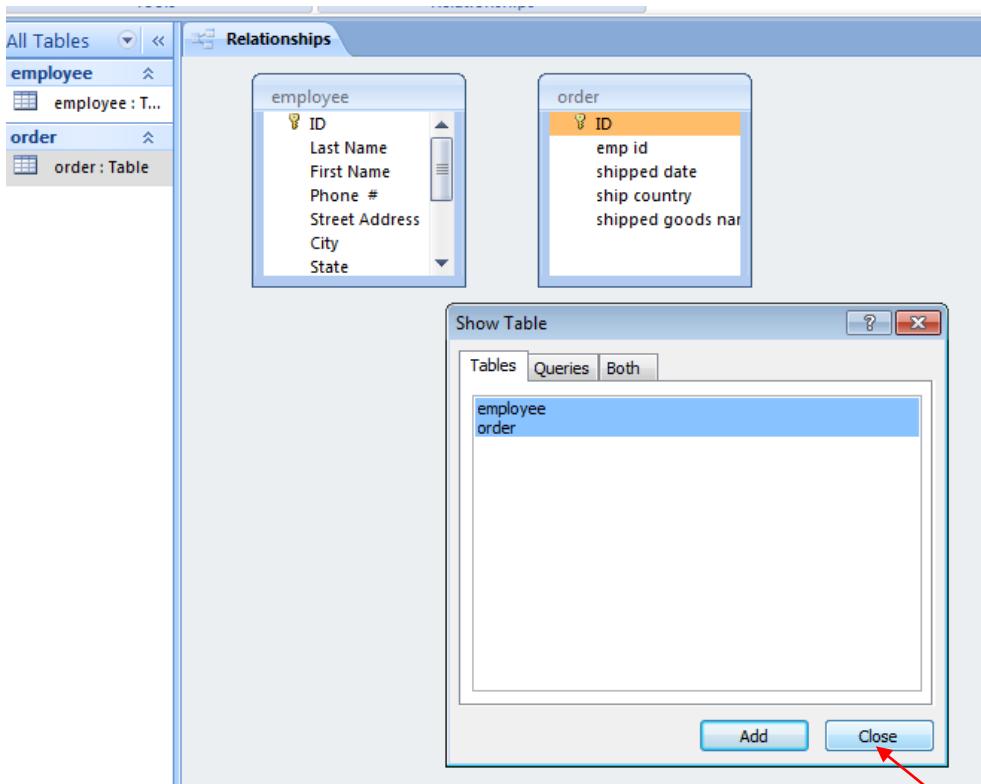
To create relationships between tables, go to the Database Tools tab and click on the Relationships button.



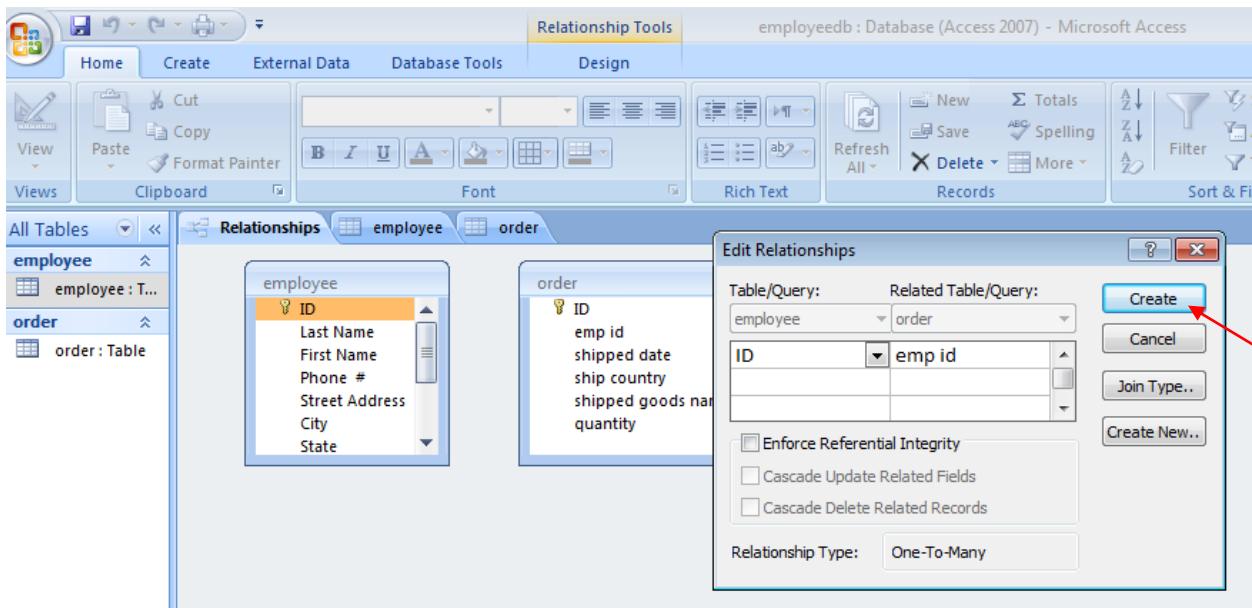
Now you can view the Show Table as shown below.



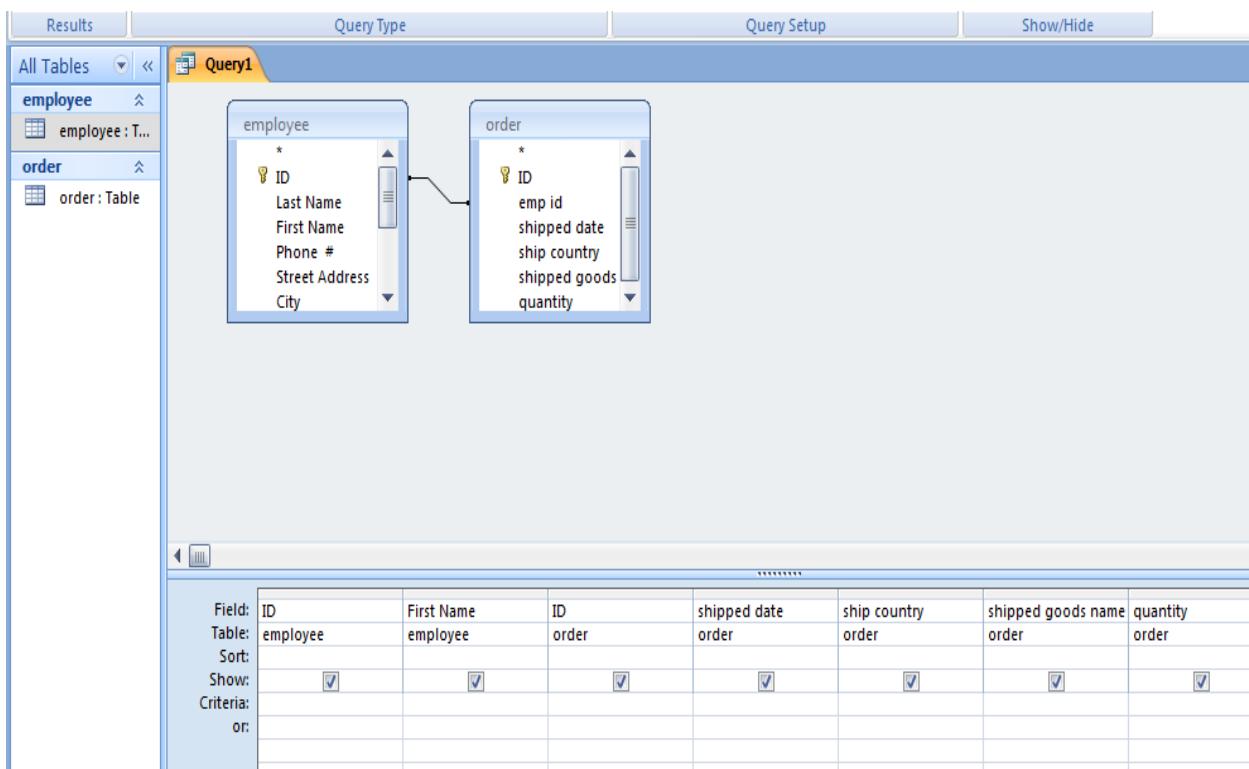
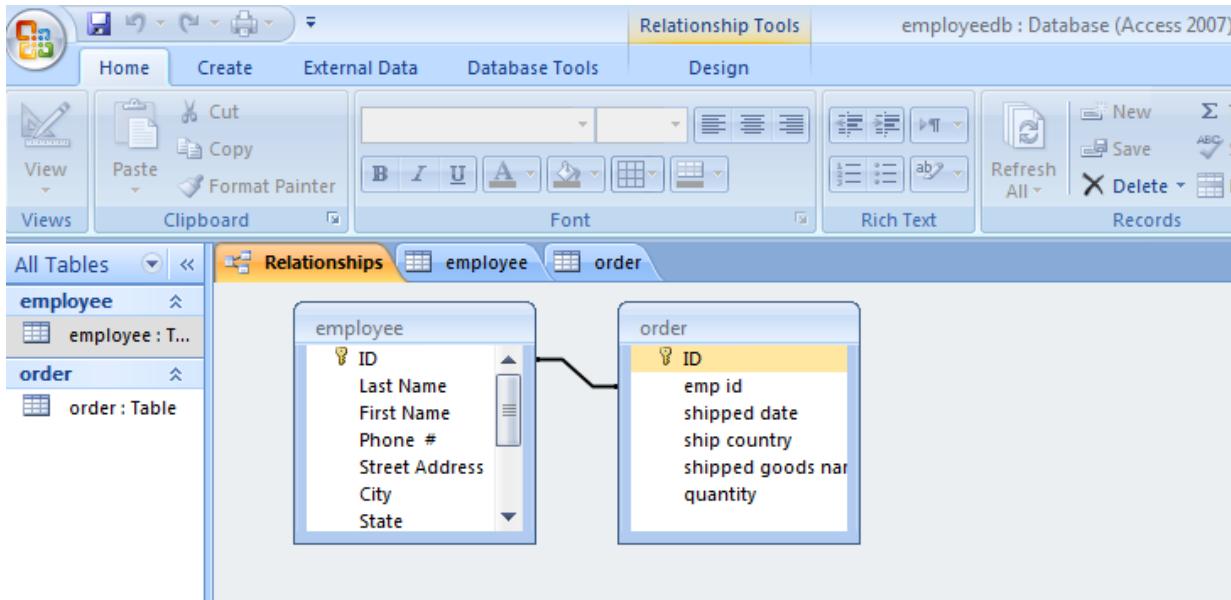
You can select the tables between which you wish to establish the relationship.



Once you have chosen the tables, you can connect the employee.ID (the ID field belonging to the employee table) with the order.emp id (the emp id field belonging to the order table) by drag and drop. Now you can view the Edit Relationships window, where you can enforce referential integrity to create the relationship between tables.



After creating the relationships between the employee table and the order table, your Access screen should look as shown below.



Now you can select the fields which you want to be sorted and you can apply the required criteria.

The screenshot shows the Microsoft Access Query Designer interface. On the left, the 'All Tables' pane lists 'employee' and 'order' tables. The main area displays a query named 'Query1' with two tables joined by a relationship line. The 'employee' table has fields: ID, Last Name, First Name, Phone #, Street Address, City. The 'order' table has fields: ID, emp id, shipped date, ship country, shipped goods, quantity. Below the tables is a query grid with the following settings:

Field:	ID	Table:	employee	First Name	ID	Table:	order	shipped date	Table:	order	ship country	Table:	order	shipped goods name	Table:	order	quantity	Table:	order
Sort:														Ascending					
Show:	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>					
Criteria:																			
or:																			

Once you have sorted the data using the field properties, click on the Run command as shown below.

The screenshot shows the Microsoft Access ribbon with the 'Home' tab selected. The 'Run' button in the 'Results' group is highlighted with a red circle. A tooltip for the 'Run' button is displayed, stating 'Performs the actions specified in a query.' Below the ribbon is the same query design and grid as the previous screenshot, with the sorting applied to the 'shipped goods name' column.

You can view the relationship of two tables with their field names with sorted shipped goods records, as shown below.

employee.ID	First Name	order.ID	shipped date	ship country	shipped goo	quantity
3	SMITH	3	1/14/2001	INDIA	BENTLEY	2
1	FRED	1	7/1/1996	INDIA	BMW	1
5	JOE	5	12/10/2001	US	MERCEDES	1
2	ROYCE	2	7/6/1999	AUSTRALIA	SANTRO	3
6	HENRY	6	12/23/2000	AUSTRALIA	SONY LCD	15
4	SAM	4	12/9/2000	GERMANY	SONY LCD	10
*	(New)					

Queries

A *query* is a term used to question or quiz. In Access, to query a database is to get the exact information about the database. It can be a data about a single table or multiple related tables. MS Access provides a large number of queries like select, insert, update, and delete records. In this lab guide we will see how these queries can be created using the Query Wizard.

Query Wizard

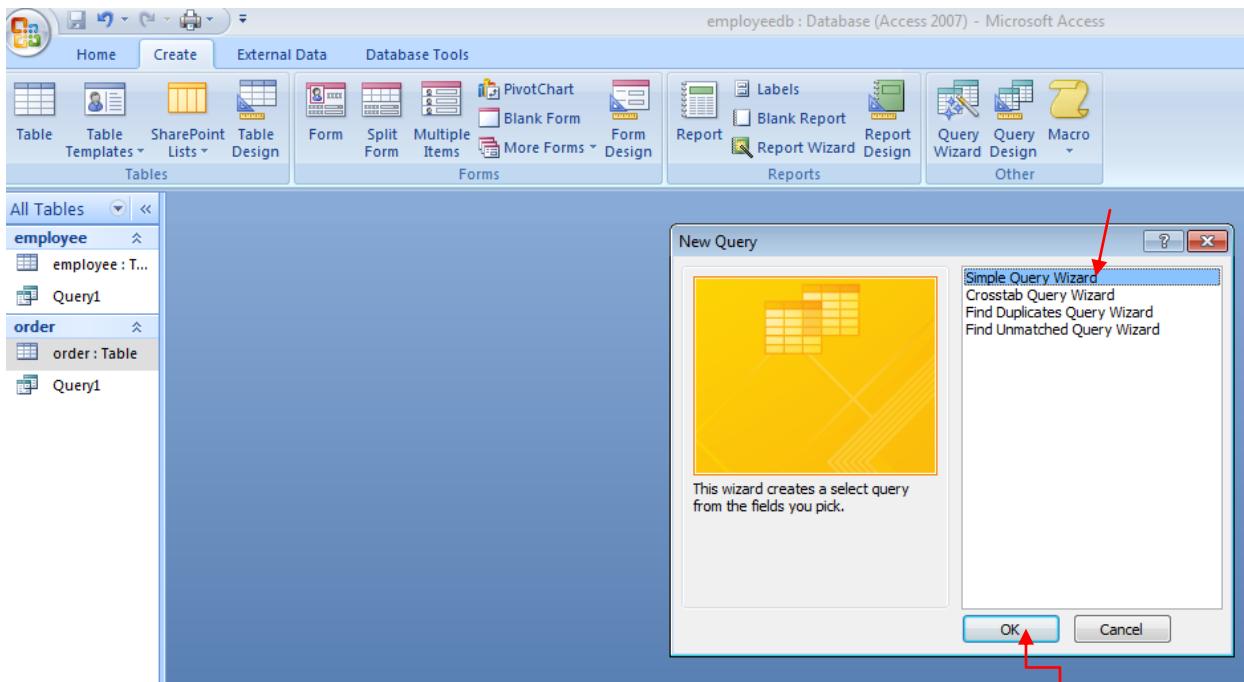
It helps to create a simple query, a cross table query, a “find duplicates” query, or a “find unmatched” query. This can be done by clicking on the Query Wizard button under the Create tab.

The screenshot shows the Microsoft Access ribbon with the 'Create' tab selected. Below the ribbon, the 'Tables' section of the ribbon bar is visible. On the right side of the screen, there is a 'Query Wizard' dialog box with the following text:

Query Wizard
Launch the Query Wizard, which helps you create a Simple query, a Crosstab query, a Find Duplicates query, or a Find Unmatched query.

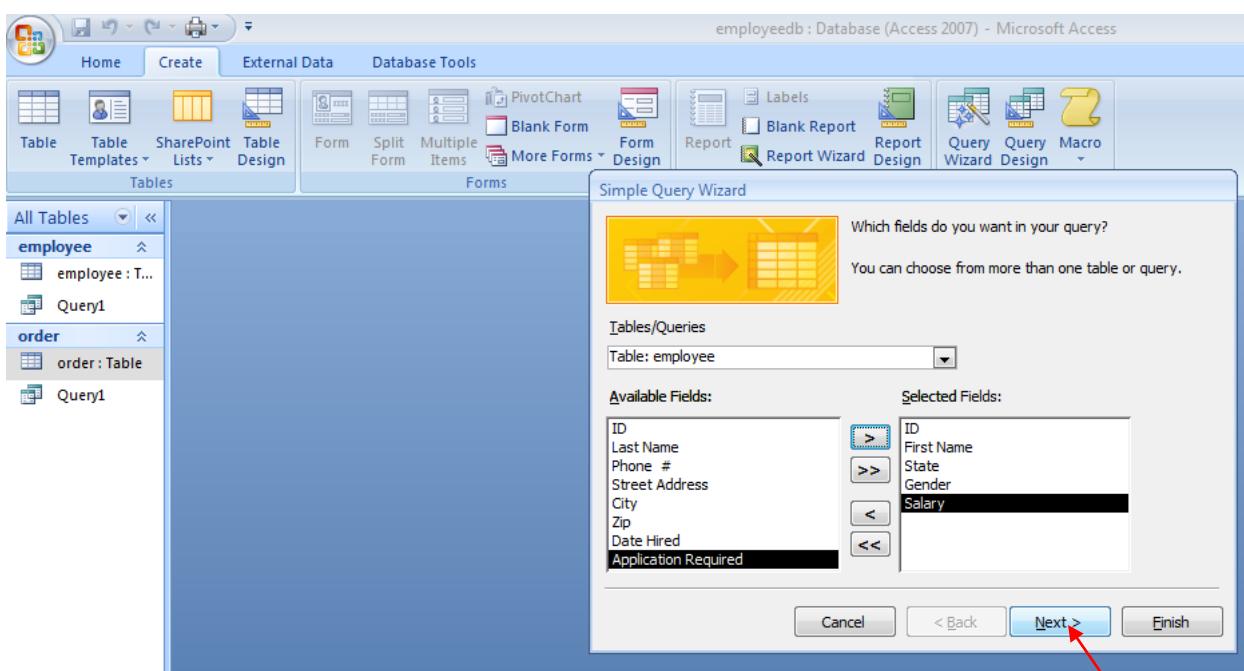
After clicking on Query Wizard, you can see a new query window as shown below. From that you can select your query wizard. Now let us see how Simple Query Wizard works.

Select Simple Query Wizard and click OK.

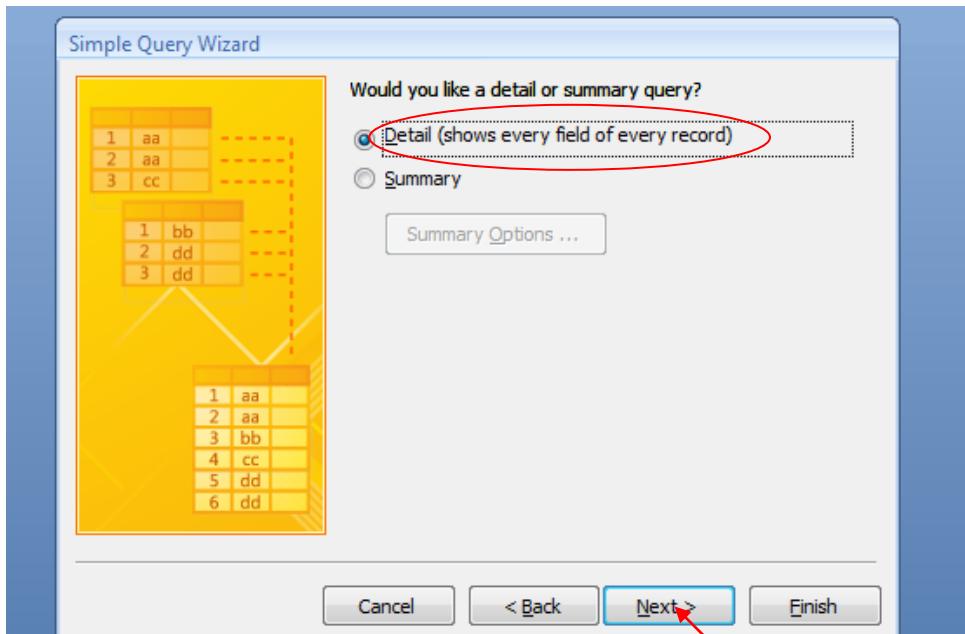


You can generate a query by using the Simple Query Wizard to select the table and its field names.

Only the fields you select from your table will be shown in the query table. To bring fields into the table individually, click on the name of the field (in the list of fields in the area under Available Fields) and then click-on the button marked “>”. The order in which you click on the fields will be their order in the query table. The “>>” button transfers all the fields from the Available Fields pane to Selected Fields pane. The “<” button brings back the field which you have selected and the “<<” button brings back all of the fields. If you make a mistake, or want to start over, click the “<<” button to bring back all of the fields and try again.

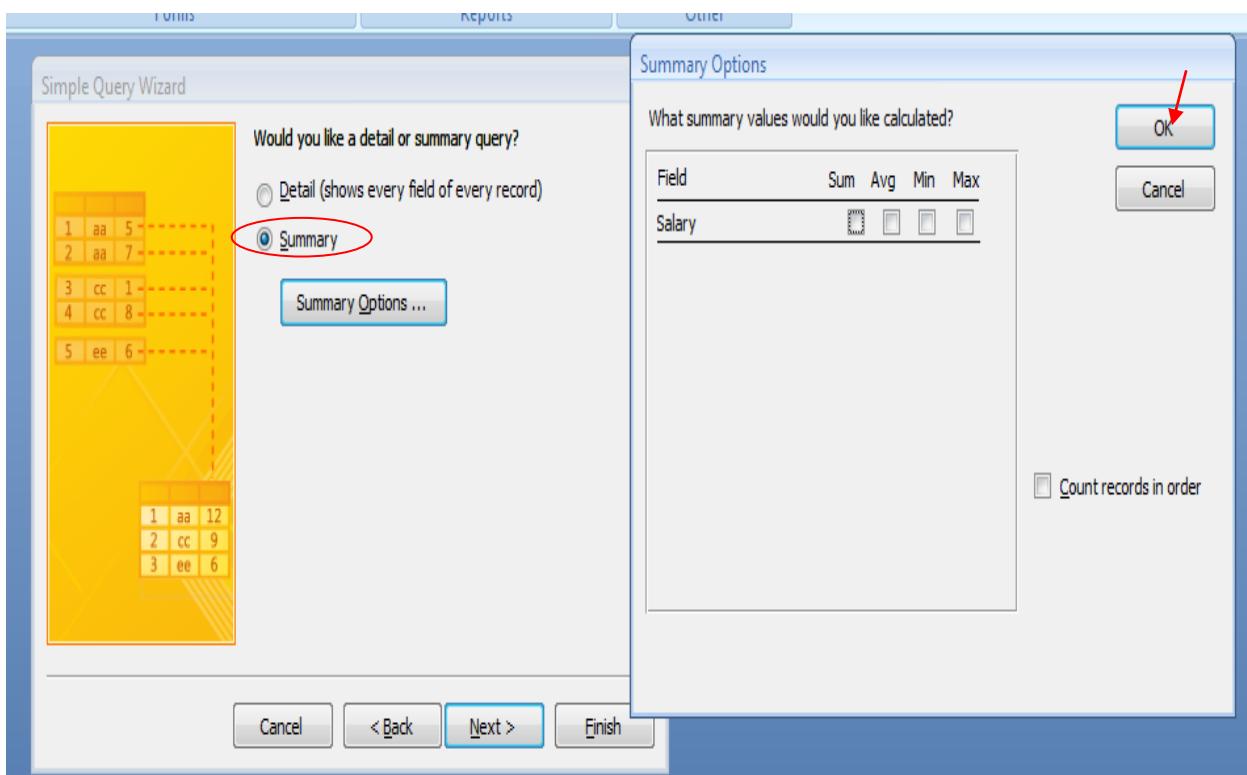


Click on Next to choose a detail or a summary query as shown below.

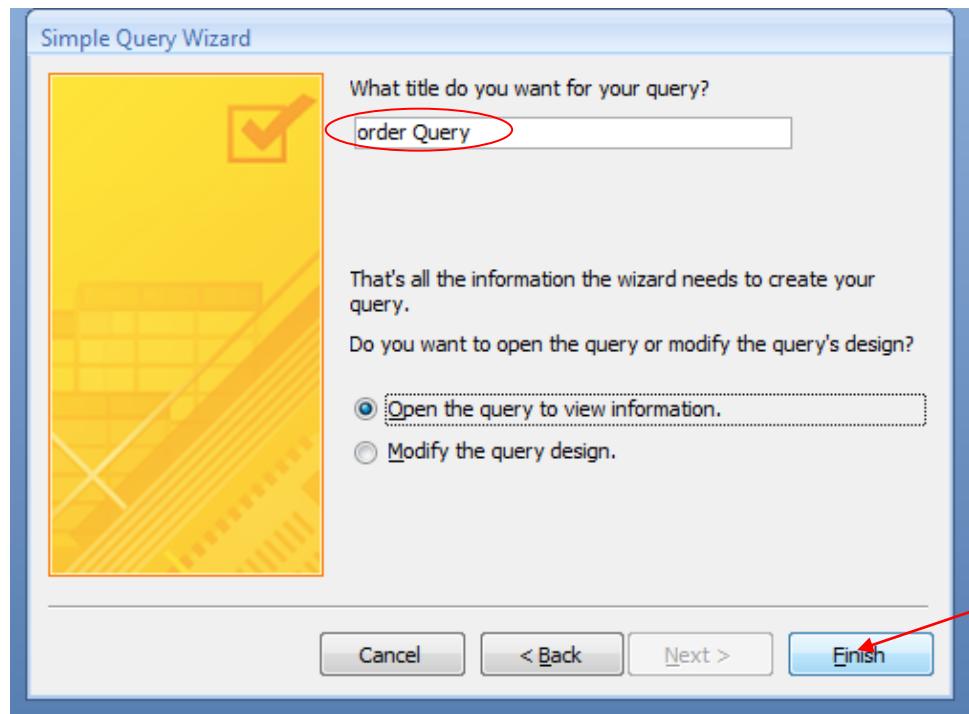


When you click on the Summary query, summary options will be given to you.

You can check your summary values as needed and also you can count records in order.



Once you have completed your detail/summary query click on Finish.



All Tables <<

	ID	First Name	State	Gender	Min Of Salary
employee ^	1	FRED	VA	M	\$40,000.00
employee : T...	2	ROYCE	VA	M	\$45,000.00
order ^	3	SMITH	VA	F	\$50,000.00
order : Table	4	SAM	VA	M	\$50,000.00
order Query	5	JOE	VA	F	\$35,000.00
Query1	6	HENRY	SA	M	\$43,000.00

Results | Query Type | Query Setup | Show

All Tables <<

```
SELECT DISTINCTROW order.ID, employee.[First Name], employee.State, employee.Gender, Min(employee.Salary) AS [Min. Of Salary]
FROM employee INNER JOIN [order] ON employee.[ID] = order.[emp id]
GROUP BY order.ID, employee.[First Name], employee.State, employee.Gender;
```

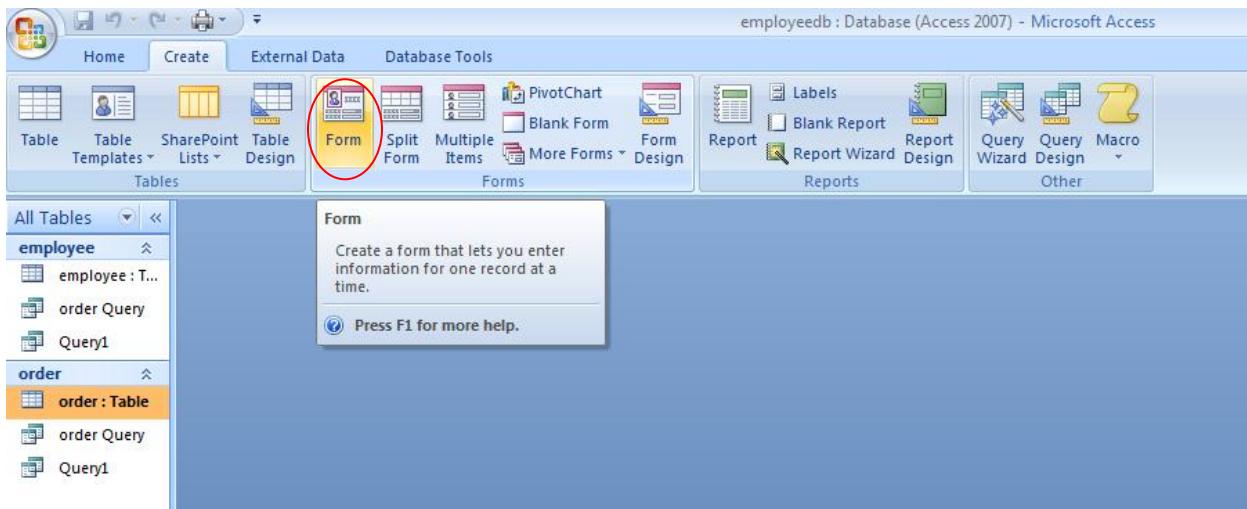
employee ^
 employee : T...
order Query
Query1
order ^
 order : Table
 order Query
 Query1

Creating Forms

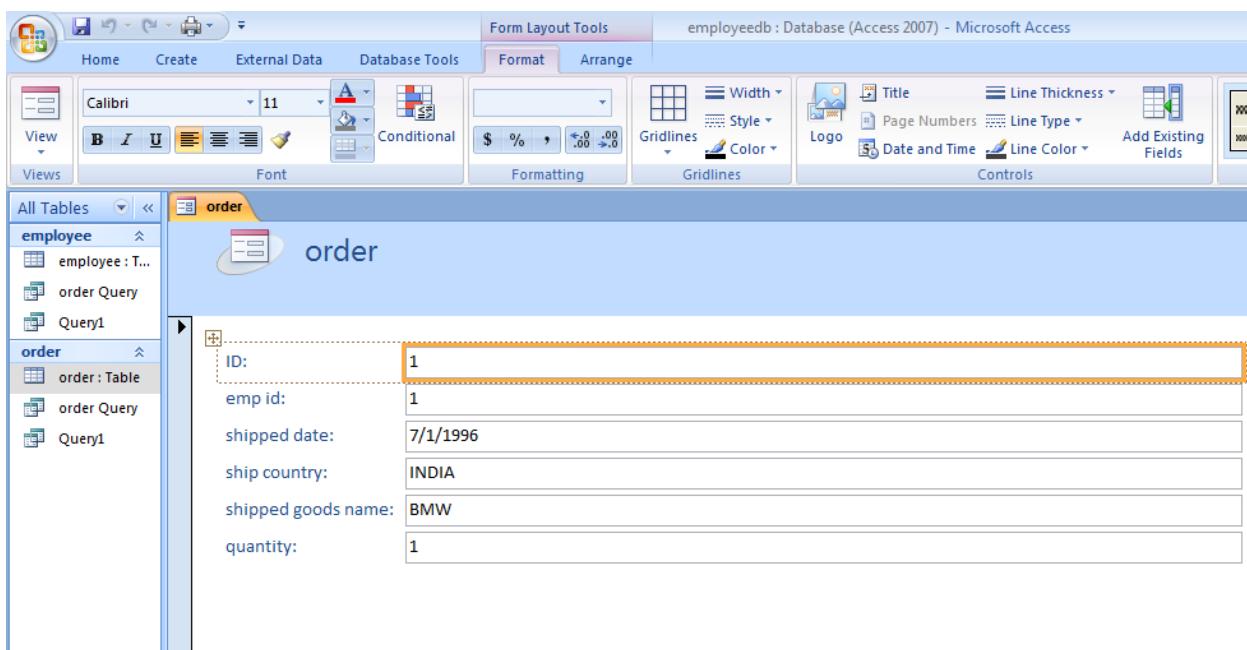
Forms are used for data entry, editing and viewing. Using a form, you can print data, or you can save a form as a report for more customization followed by printing later. Reports are mainly used for presenting data in a static format.

Now let us see how to Create a Form in Access.

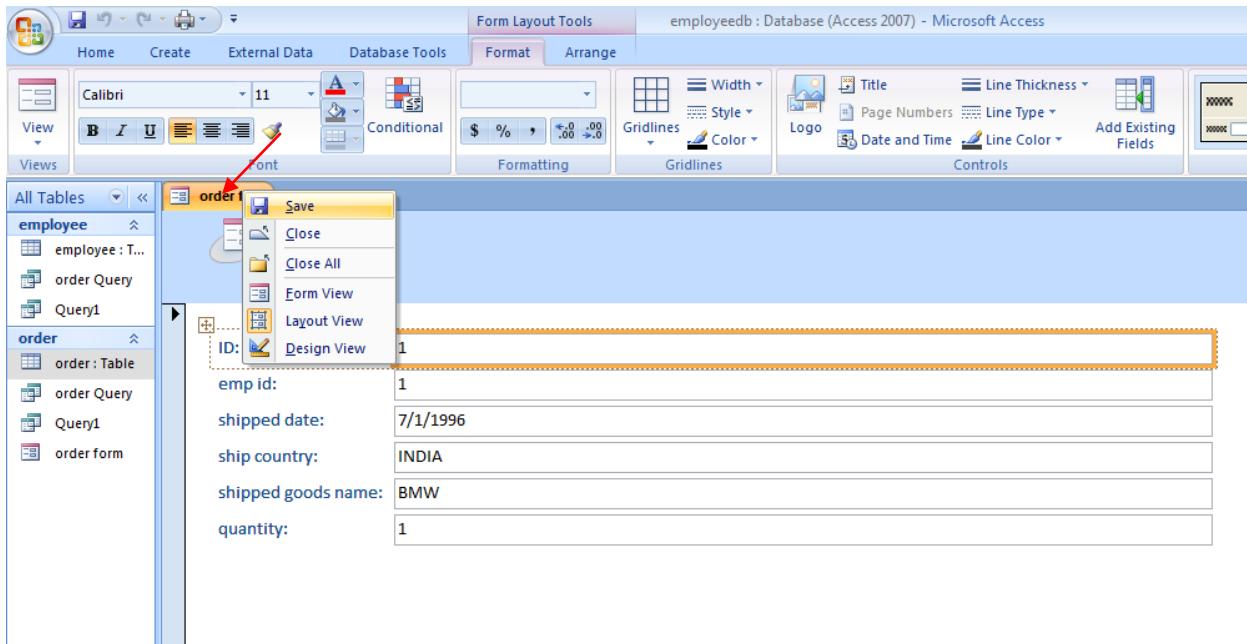
Notice that the Order: Table is currently selected. Click on the Create tab on top of the Access screen, and then click on the Form button as shown. You'll notice that Access – knowing you were entering data from the Order Table – created a Form with all of the fields in your table! You're all ready to enter data in this form.



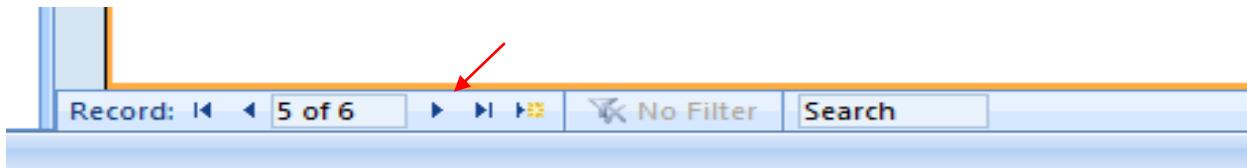
Your Order Form should look something like the image below.



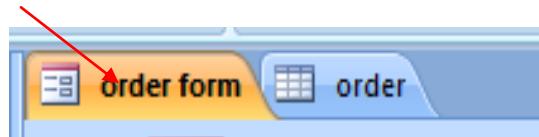
Now you can save the form by right clicking on the order tab.



The data entry form is now saved as order form, just like the table. Notice that at the bottom of the Form screen there is a status area (see below) that tells you what record you are on. You can use the arrows to move from one record to another, or select a new record in which to enter data. Click on each of the arrows to see how they work. Some will take you forward or back to the next or previous record, and some will take you to the beginning or end of your records. The arrow with an asterisk will take you to a new blank record. Enter a few records to see how the Form View works.



You may choose your favorite method to enter data: The data form or datasheet. Look on the left side of your screen to see all the tables.



Have a good number of records (at least 24) to see the power of the Access database. You may use either Form View or Datasheet View.

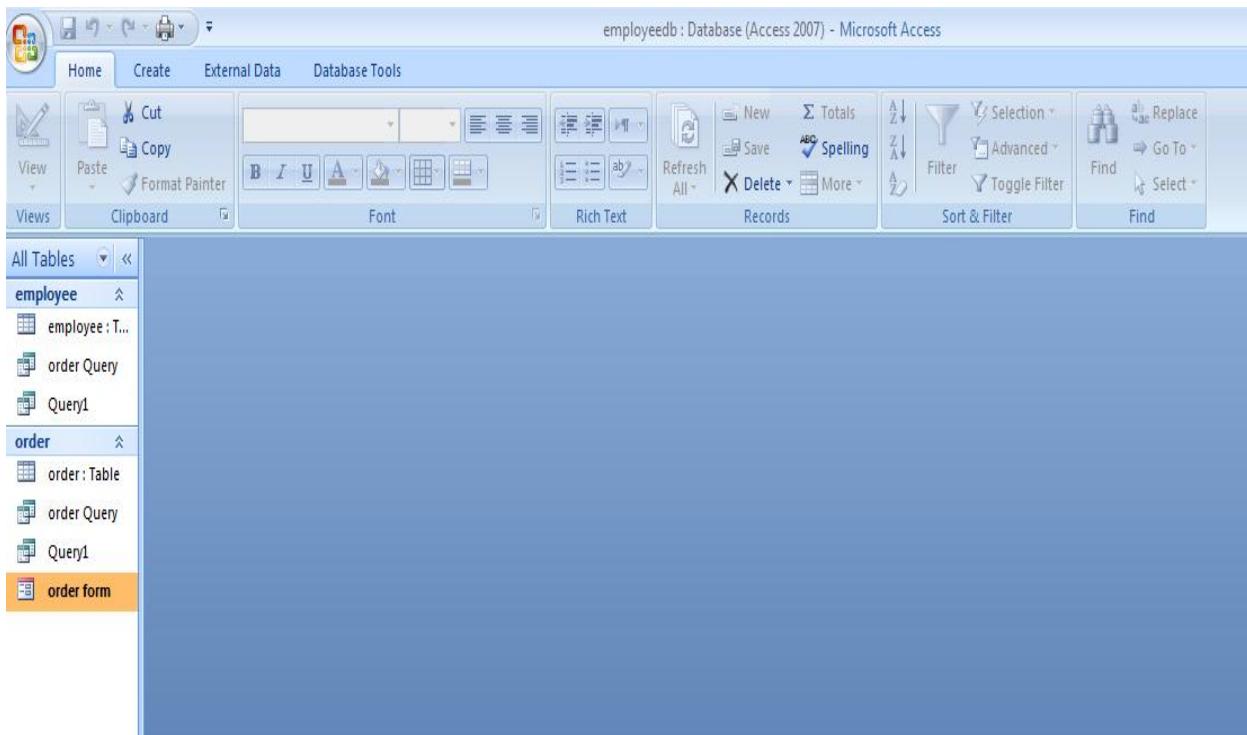
Now you have learned how to create forms. Next we will move to the creation of reports.

Reports

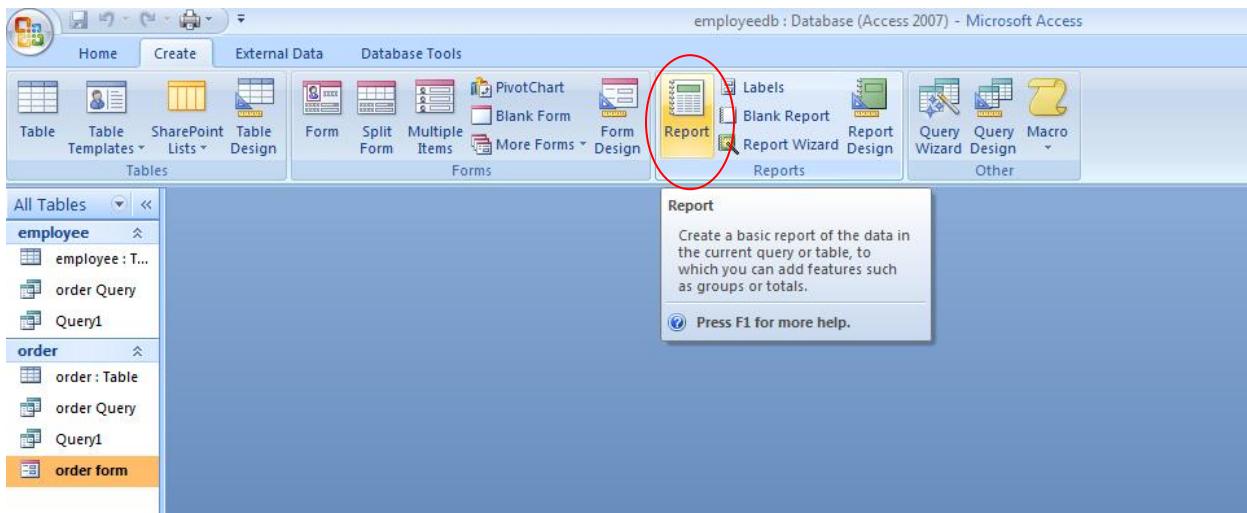
A report contains complete information of one or more tables that calculate information and displays it in different visual representations. There are several types of reports. We'll use Access Wizards to design several simple reports.

First, make sure that you have closed any Tables, Forms, or Queries which are open.

Your Access screen should look similar to the image below.

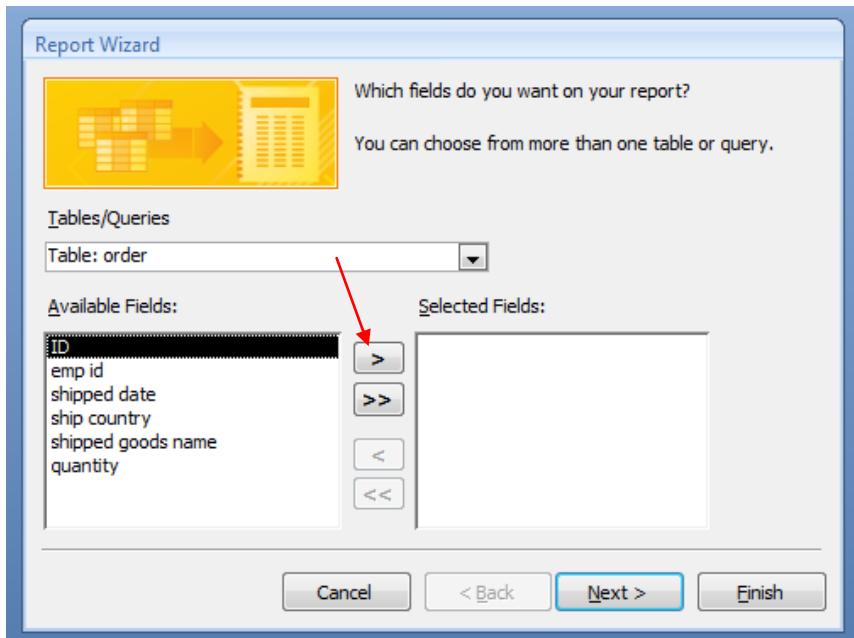


Click the Create tab and you will see the Report button.



We'll begin our report lesson using the Report Wizard. Once you've created a report with the Wizard, you'll be somewhat familiar with reports. We'll then use some of the other selections in this group to create reports.

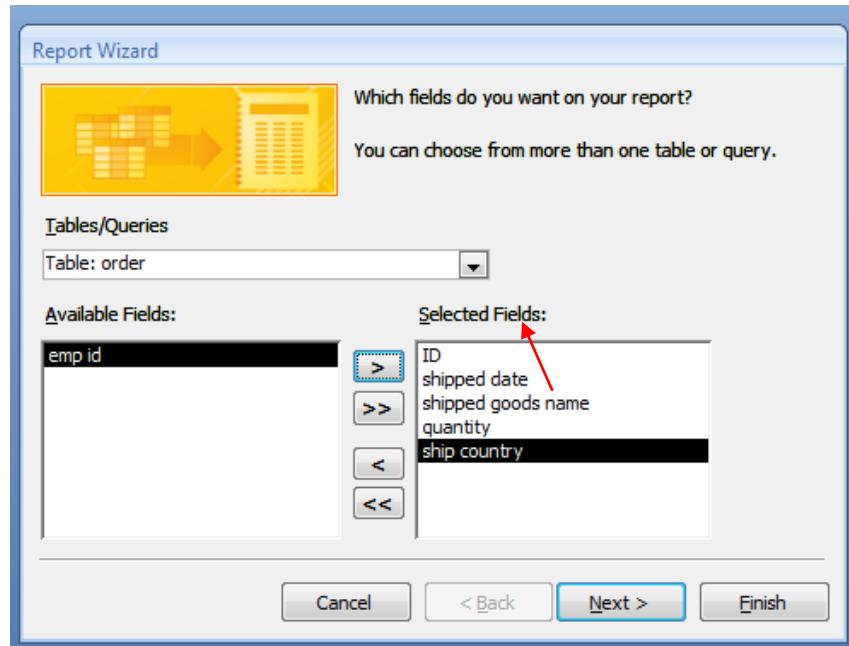
Click on the Report Wizard button in the Reports Group. The Report Wizard menu screen will appear as shown below:



Only the fields you select from your table will show in the report. To bring fields into the report individually, click on the name of the field (in the list of fields in the area under Available Fields:) and then click on the “>” button. The order which you click on the fields will be the order in the report. The “>>” button brings over all of the fields. The “<” button brings back one of the fields which you have selected and “<<” brings back all of the fields. If you make a mistake, or want to start over, click the “<<” button to bring back all of the fields and try again.

To begin, click on ID, then click on “>” (notice how the ID field went from the “Available Fields:” to the “Selected Fields:” area). Now do the same with the shipped date, shipped goods name, quantity, and ship country. These are the fields that will appear in our first report.

Your Report Wizard menu screen should now look like the one below.

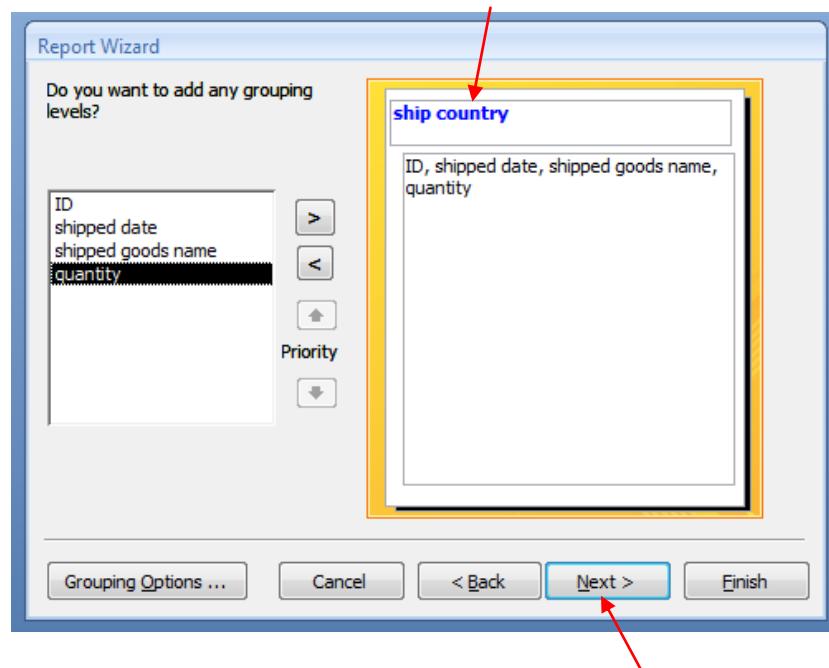


Click-on the Next button.

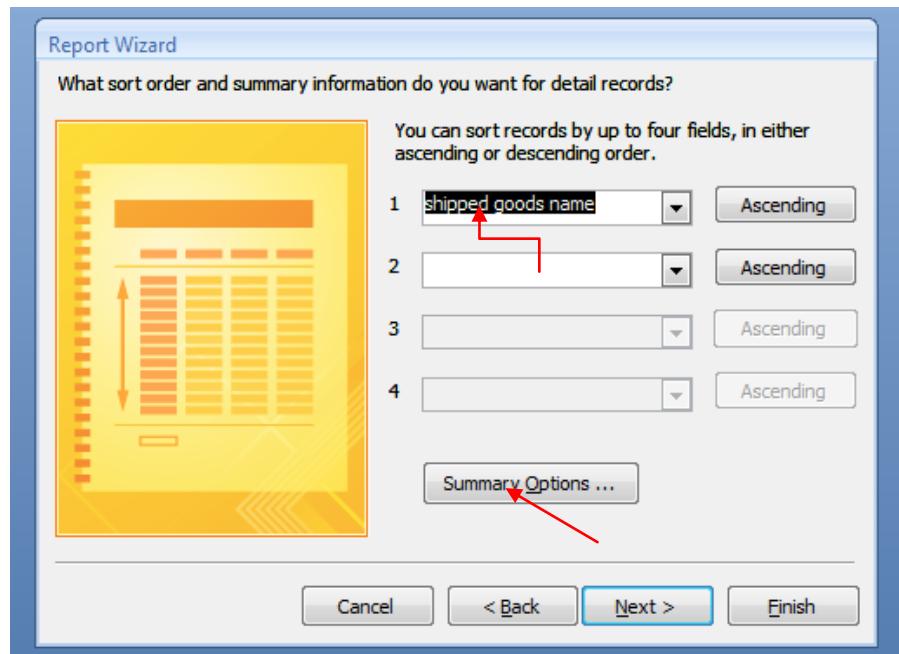
Grouping In Reports

This Report Wizard menu screen asks if you want to add *grouping*. Grouping simply “groups” records by an item in the report you are designing. We’ll group by ship country. This means that “records” from a ship country will be in a “group”. This will be easy to see when we look at the report. So, click on ship country, then click on “>”. If you select the wrong attribute, just use the “<” button.

Your screen should now look like the one below.

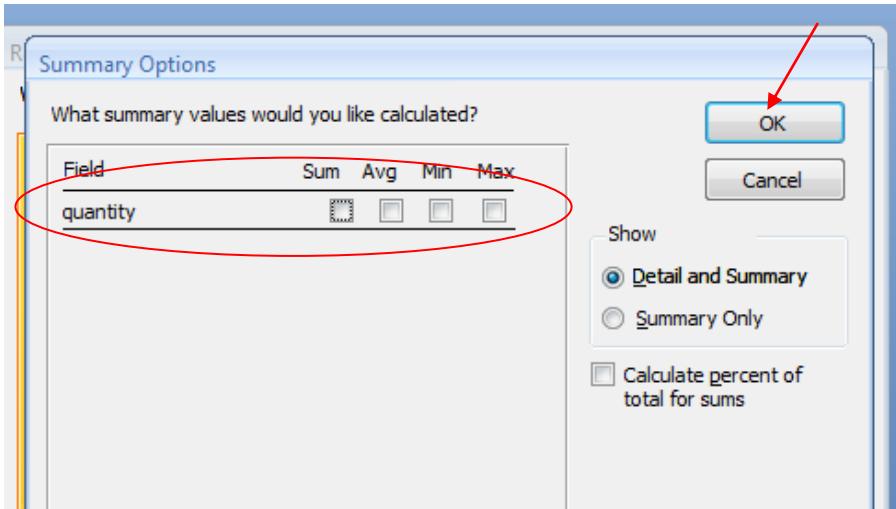


Click on Next again. Another Report Wizard menu screen will follow.



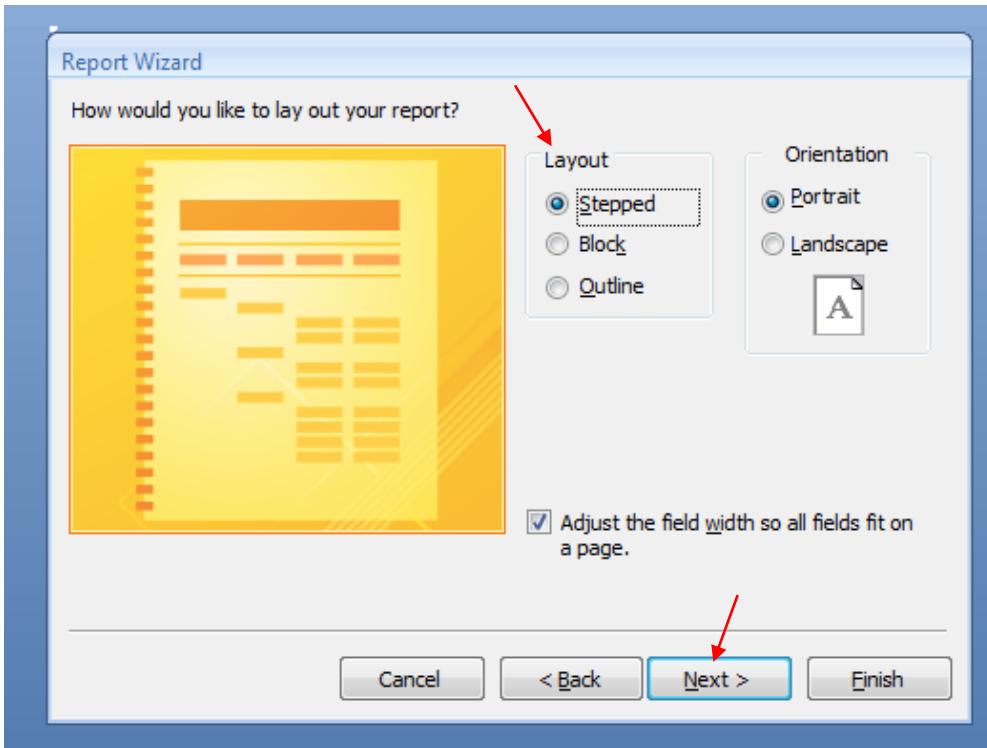
The above screen indicates that you can sort and summarize your information. Notice the Ascending button to the right of the Sort boxes. This indicates that the field that you select is in A to Z or ascending order. If you click on this button, it will reverse the order from Z to A, or descending order.

The Summary Options menu box allows you to enter calculations for numerical and currency fields if you have selected any. It will summarize these calculations by each group, and in total. If you want percentages as well, click on the checkbox next to Calculate percent of total for sums.

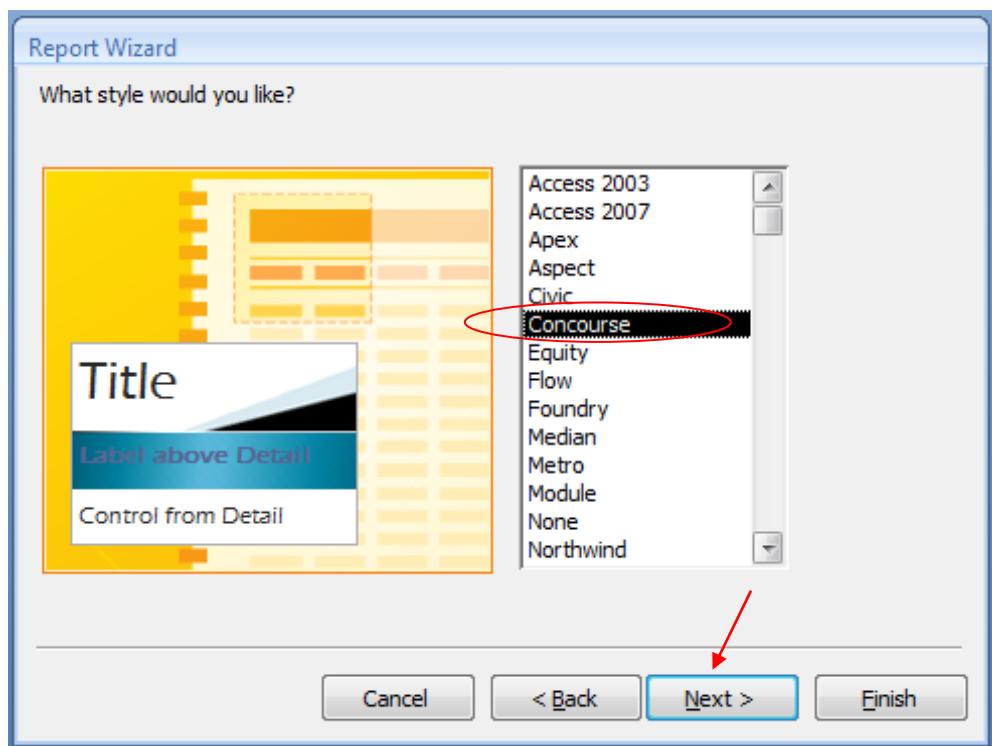


Click on OK. This will return you to the previous Wizard screen. Click on Next again.

This Report Wizard screen allows you to select a layout for your report. Click on the radio buttons to the left of each choice in the Layout area and observe the results. For the moment, we'll stay with the default: Stepped. So select the stepped layout and portrait option, respectively.

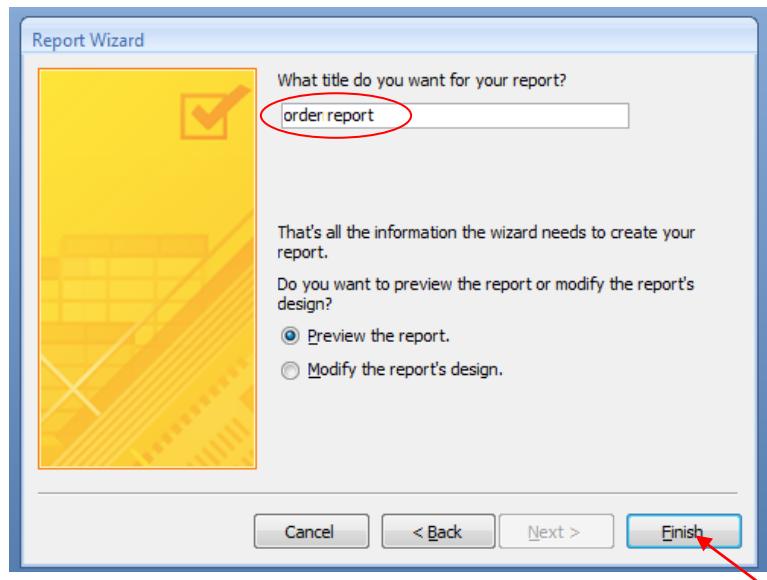


Click on Next again. The next Report Wizard will appear.



This menu screen allows you to select the Style that you would like for your report. Click on the choices (Apex, Aspect, etc.) and see what each “looks like”. Choose whichever style you desire and click on Next again.

The next Report Wizard screen is the last screen in the sequence. It allows you to select a title different from the name of your database and also you can select the Preview the report option. When you click the Finish button, Access will go to a preview copy of your report. We'll title this report order report. Use this name, or any name you desire, and click on Finish.



This is a report in tabular (columnar) format. Your screen should look something like the one below.

The screenshot shows a report window titled "order report". The data is presented in a tabular format with columns: "ship country", "shipped goods name", "ID", "shipped date", and "quantity". The data is grouped by "ship country" (AUSTRALIA, GERMANY, INDIA, US). The "AUSTRALIA" section contains two rows: SANTRO (ID 2, date 7/6/1999, quantity 3) and SONY LCD (ID 6, date 12/23/2000, quantity 15). The "GERMANY" section contains one row: SONY LCD (ID 4, date 12/9/2000, quantity 10). The "INDIA" section contains two rows: BENTLEY (ID 3, date 1/14/2001, quantity 2) and BMW (ID 1, date 7/1/1996, quantity 1). The "US" section contains one row: MERCEDES (ID 5, date 12/10/2001, quantity 1).

ship country	shipped goods name	ID	shipped date	quantity
AUSTRALIA				
	SANTRO	2	7/6/1999	3
	SONY LCD	6	12/23/2000	15
GERMANY				
	SONY LCD	4	12/9/2000	10
INDIA				
	BENTLEY	3	1/14/2001	2
	BMW	1	7/1/1996	1
US				
	MERCEDES	5	12/10/2001	1

You will see your order report. Right click on the “order report” and choose the “Layout View”. You will see the following image.

The screenshot shows the "Layout View" of the "order report". The layout structure is as follows:

- Report Header:** Contains the title "order report".
- Page Header:** Contains fields for "ship country", "shipped goods name", "ID", "shipped date", and "quantity".
- ship country Header:** A repeating section header for "ship country".
- Detail:** A repeating section for the data rows, containing fields for "shipped goods name", "ID", "shipped date", and "quantity".
- Page Footer:** Contains a "Now" field and a page number indicator "-Page 1 of 1 Page 1 of 1 Pages".
- Report Footer:** A solid black bar at the bottom.

You see a number of headings appear, such as : Report Header, Page Header, ship country Header, Detail, Page Footer and Report Footer

The significance of these headers is as follows:

Report Header: If some content (text) is placed here, it will only be shown on the first page of the report.

Report Header	order report								
---------------	--------------	--	--	--	--	--	--	--	--

Page Header: If some content (text) is placed here, it will show on each page of the report.

Page Header	ship country	shipped goods name	ID	shipped date	quantity				
-------------	--------------	--------------------	----	--------------	----------	--	--	--	--

Ship country Header: This is the group header. It repeats for every group.

ship country Header	ship country								
---------------------	--------------	--	--	--	--	--	--	--	--

Detail: These are the field names for the record from our database. Access will “pull” the data for the individual fields from our database records and display it in the “Detail” region. The number of output lines in the detail region is equal to the number of records in the table.

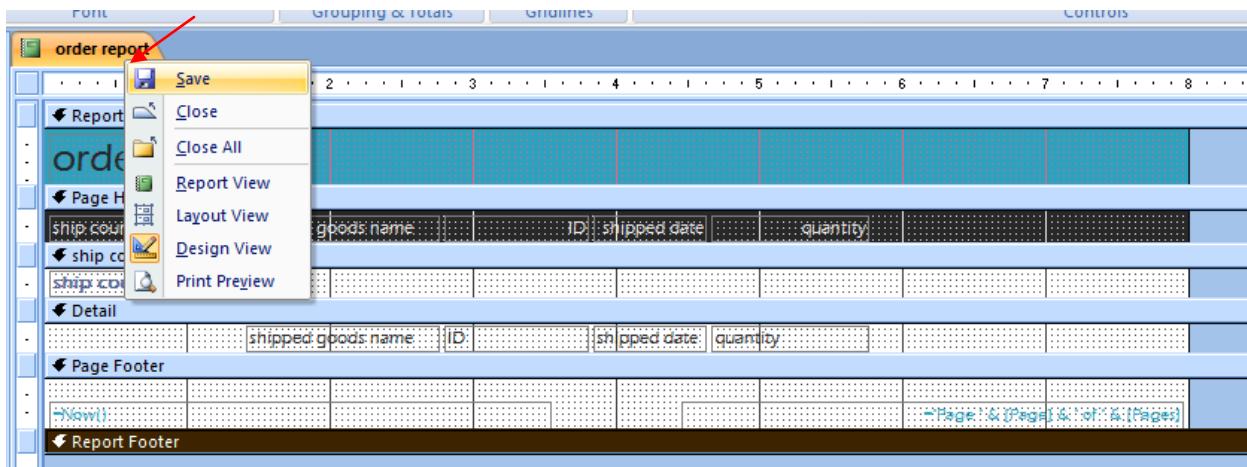
Detail	shipped goods name	ID	shipped date	quantity					
--------	--------------------	----	--------------	----------	--	--	--	--	--

Page Footer: It shows the current page and the number of pages available. The current page and the number of pages available get displayed on each page of the report.

Page Footer									
Now()									Page 1 of 5 (Page 1 of 5 Pages)

Report Footer: The content in the report footer is displayed only on the last page of the report.

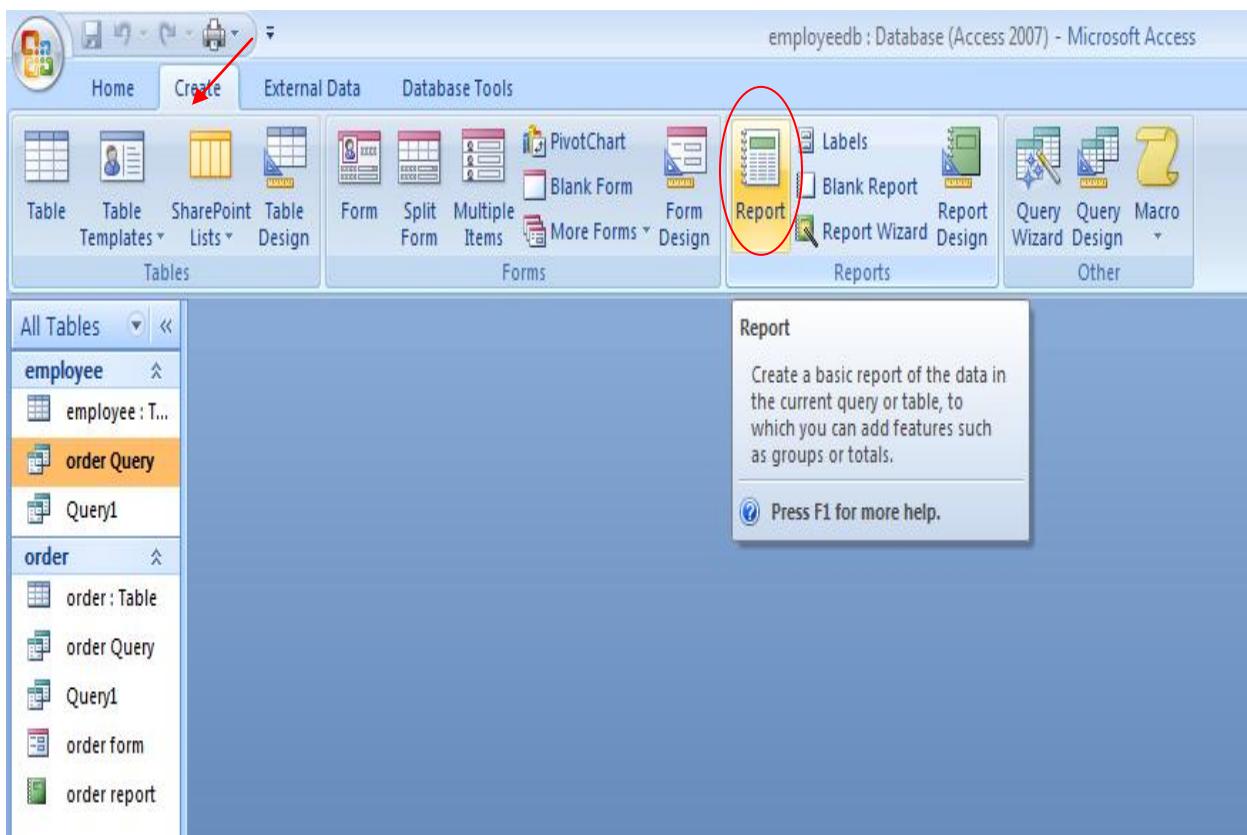
Report Footer									
---------------	--	--	--	--	--	--	--	--	--



Right click on Save. You will see your order report in the area on the left of your screens with your table, form and query.

Quick Reports

Click on the Create tab. Then, click your selection under All Tables. Move your cursor over the Report button in the Reports group. Read the pop-up Help box and then click on Report.



Now you can view the quick report of order table as shown below.

The screenshot shows the Microsoft Access ribbon with the 'Report Layout Tools' tab selected. The 'Format' tab is active. The left pane displays the 'All Tables' list with 'employee' and 'order' tables selected. The main area shows a report for the 'order' table with the following data:

ID	emp id	shipped date	ship country	shipped goods name	quantity
1	1	7/1/1996	INDIA	BMW	1
2	2	7/6/1999	AUSTRALIA	SANTRO	3
3	3	1/14/2001	INDIA	BENTLEY	2
4	4	12/9/2000	GERMANY	SONY LCD	10
5	5	12/10/2001	US	MERCEDES	1
6	6	12/23/2000	AUSTRALIA	SONY LCD	15

Page 1 of 1

You can change the format of the report screen as you need when you click on the AutoFormat group.

The screenshot shows the Microsoft Access ribbon with the 'Report Layout Tools' tab selected. The 'Format' tab is active. The 'AutoFormat' group is open, displaying various style options. A context menu is open over the first row of the report table, showing the 'Trekery Sheet' option. The report data remains the same as in the previous screenshot.

So far, you have learned report generation using report wizard and quick reports.

Importing Data from Excel Sheet

We can import the data from different sources like excel, text file, xml file, any databases, HTML document, etc. Here, we will look at the steps involved in importing the data from an excel sheet to MS Access 2007. This data will then be used to generate a parameterized report and a subreport.

Steps to import data from an excel sheet to MS Access 2007:

The excel file is: Northwind_Dataset.xls

Click on the “External Data” tab on the menu bar. You will see the import group tab as shown below (Figure 1).

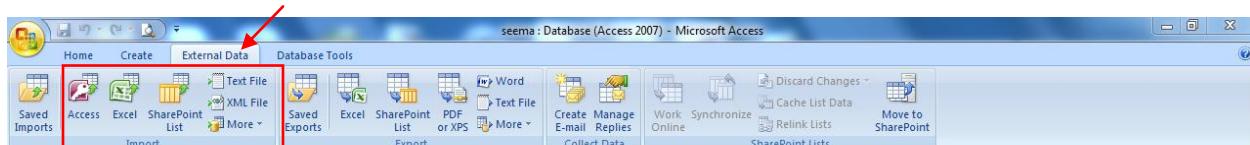


Figure 1: External Data tab on the Microsoft Access Menu Bar.

Select the data source from where you wish to import the data from. In our example, we wish to import the data from an excel sheet. Click on the “Excel Source”. The screen in Figure 2 shows up.

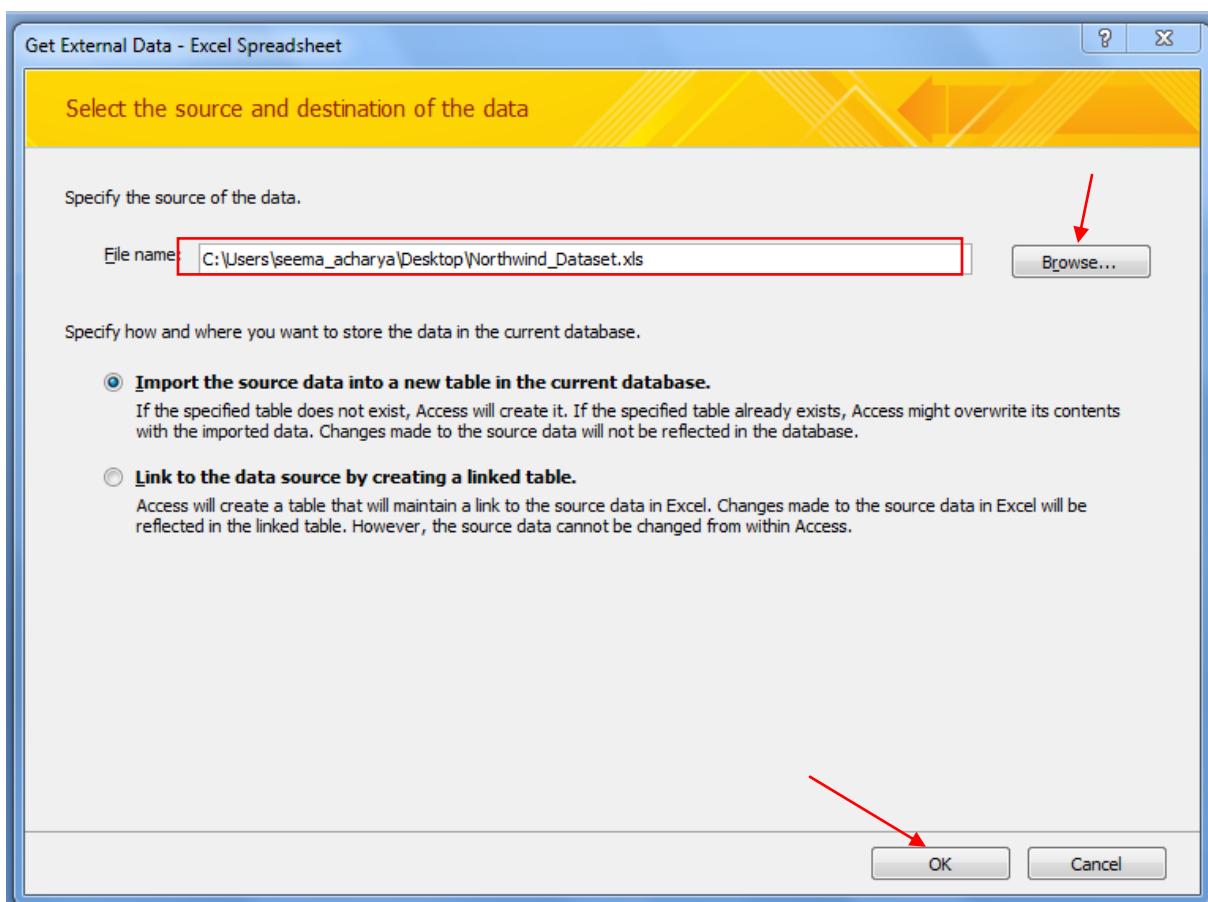


Figure 2: Get External Data – Excel Spreadsheet.

Type the path of the source data or click on the browse button to select the path. Click on the OK button as shown above.

The next screen (Figure 3) shows up.

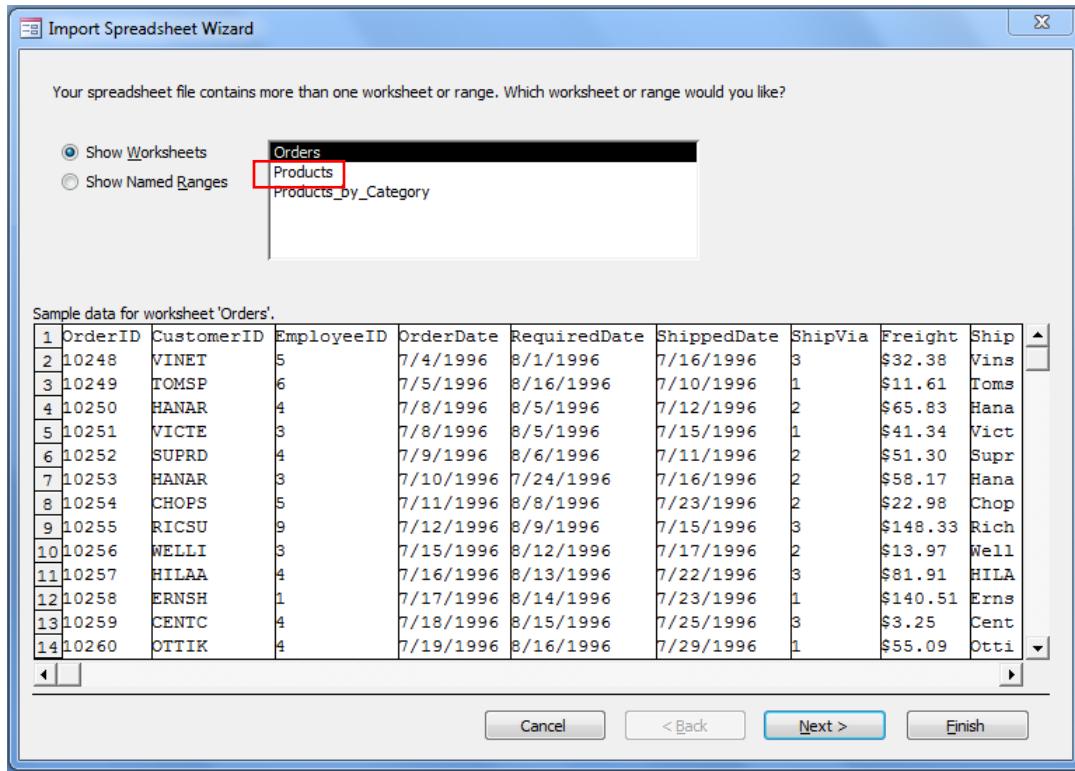


Figure 3: Selection of Worksheet.

The “Import Spreadsheet Wizard” shows the worksheets available in the excel. Select the “Products” worksheet and click on the Next button (Figure 4).

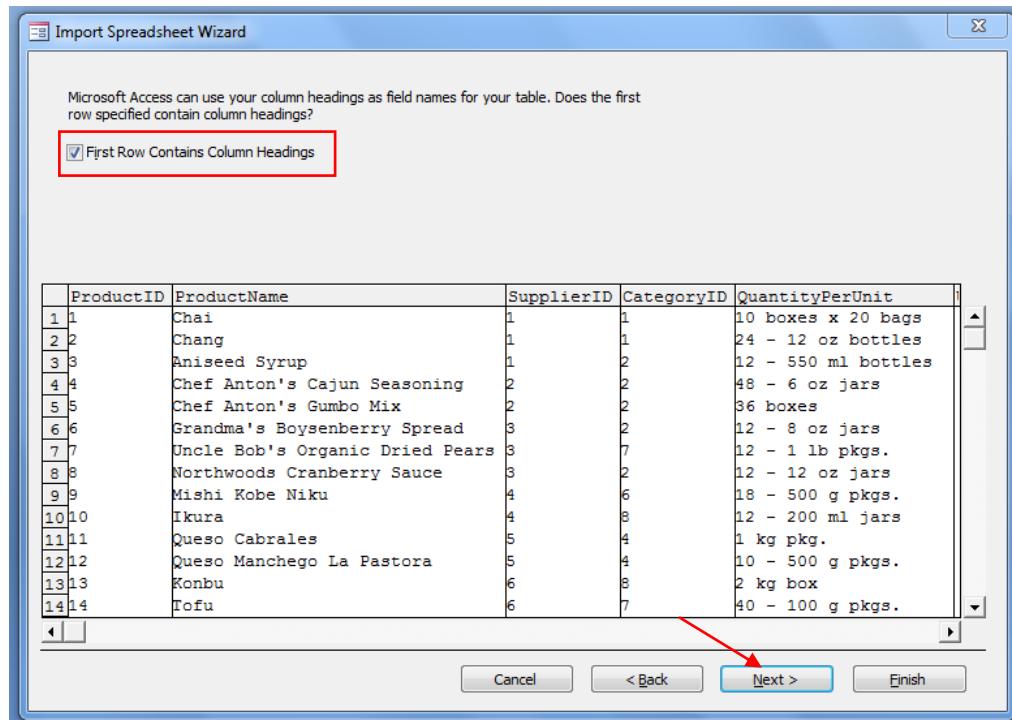


Figure 4: First Row contains Column Headings.

Check the “First Row Contains Column Headings” check box and Click on -> Next. See Figure 5.

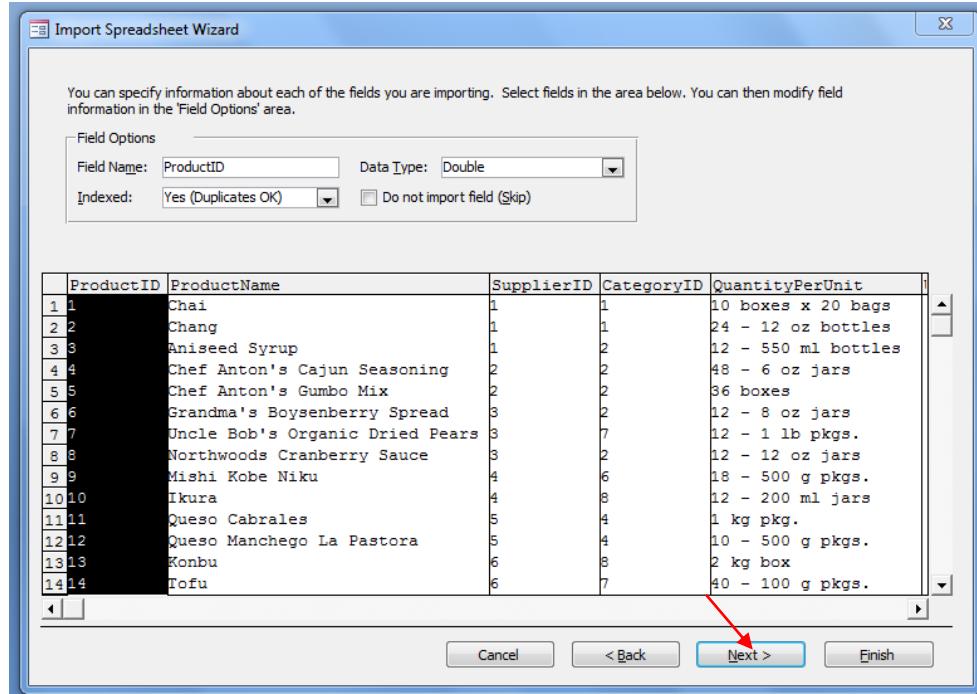


Figure 5: Changing the date types, if need be.

You can modify the data type if you want to, else you can use the default data types. Click on Next (Figure 6).

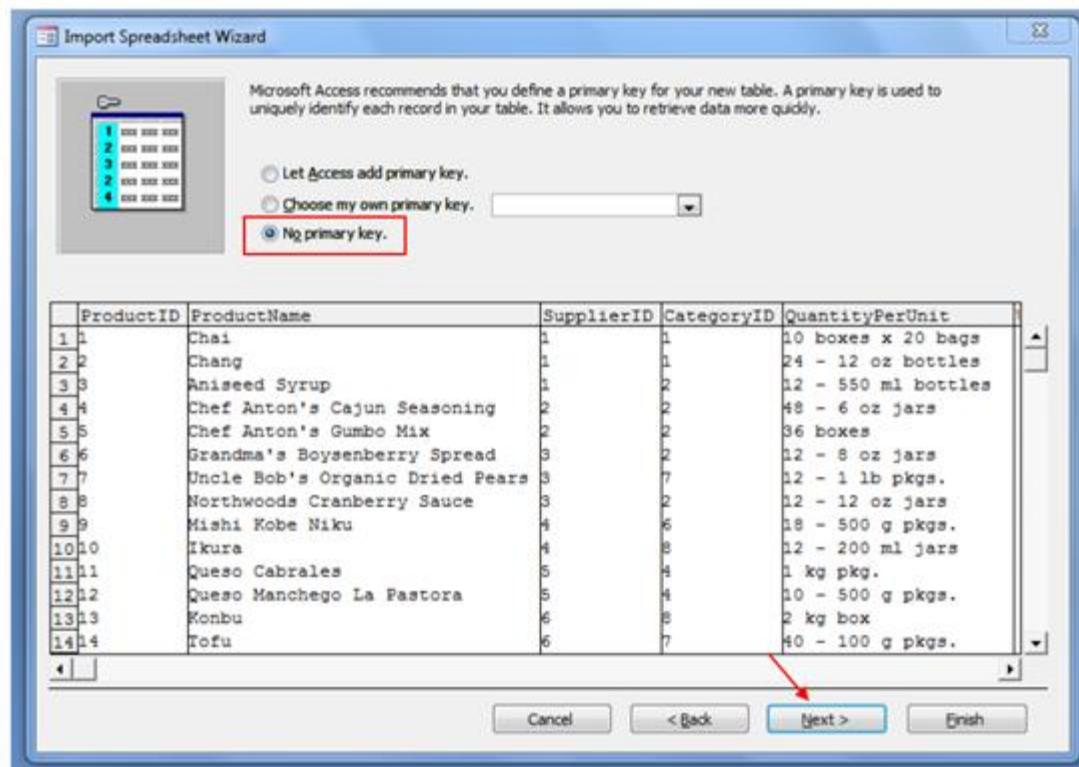


Figure 6: Primary key Selection, if so desired.

There are three options before us.

1. Let Access add primary key.
2. Choose my own primary key.
3. No primary key.

Let us go with “No Primary Key” and click on Next.

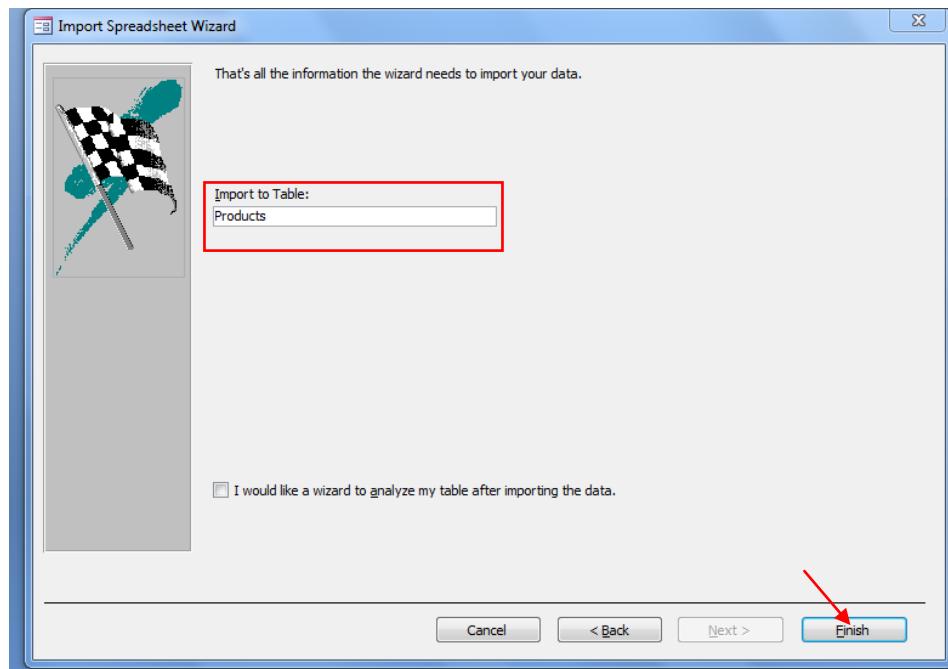
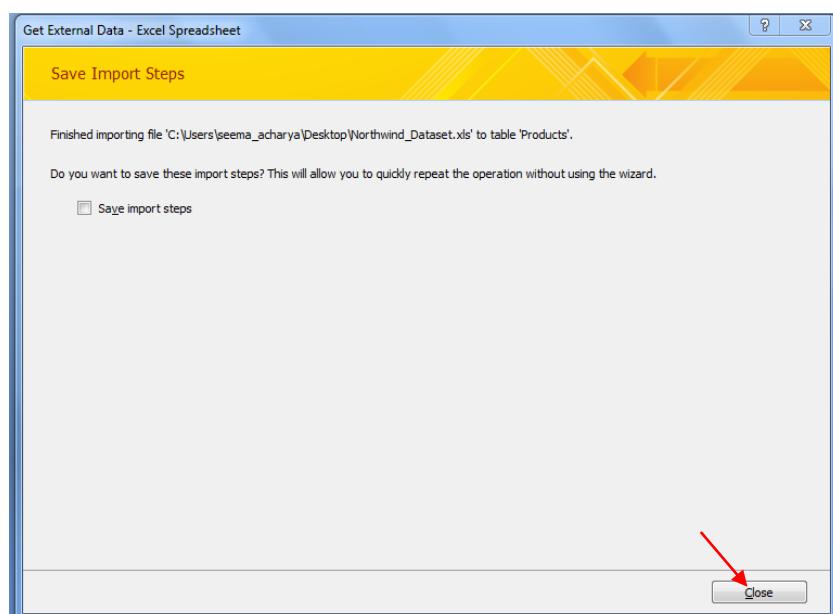


Figure 7: Providing a name to the table

In the “Import to Table” textbox, type “Products” and click on “Finish”.



Click on Close.

You can see your “products” table in your MS Access. Double click on the name of the table to open it. The records are as shown in Figure 8.

ProductID	ProductName	SupplierID	CategoryID	QuantityPerUnit	UnitPrice	UnitsInStock	UnitsOnOrder	ReorderLevel	Discontinued	
1	Chai	1	1	10 boxes x 20	\$18.00	39	0	10	0	
2	Chang	1	1	24 - 12 oz bottles	\$19.00	17	40	25	0	
3	Aniseed Syrup	1	2	12 - 550 ml bottles	\$10.00	13	70	25	0	
4	Chef Anton's Cajun Seasoning	2	2	48 - 6 oz jars	\$22.00	53	0	0	0	
5	Chef Anton's Gumbo Mix	2	2	36 boxes	\$21.35	0	0	0	-1	
6	Grandma's Boysenberry Jam	3	2	12 - 8 oz jars	\$25.00	120	0	25	0	
7	Uncle Bob's Organic Dried Pears	3	7	12 - 1 lb pkgs.	\$30.00	15	0	10	0	
8	Northwoods Cranberry Sauce	3	2	12 - 12 oz jars	\$40.00	6	0	0	0	
9	Mishi Kobe Niku	4	6	18 - 500 g pkgs.	\$97.00	29	0	0	-1	
10	Ikura	4	8	12 - 200 ml jars	\$31.00	31	0	0	0	
11	Queso Cabrales	5	4	1 kg pkg.	\$21.00	22	30	30	0	
12	Queso Manchego La P	5	4	10 - 500 g pkgs.	\$38.00	86	0	0	0	
13	Konbu	6	8	2 kg box	\$6.00	24	0	5	0	
14	Tofu	6	7	40 - 100 g pkgs.	\$23.25	35	0	0	0	
15	Genen Shouyu	6	2	24 - 250 ml bottles	\$15.50	39	0	5	0	
16	Pavlova	7	3	32 - 500 g boxes	\$17.45	29	0	10	0	
17	Alice Mutton	7	6	20 - 1 kg tins	\$39.00	0	0	0	-1	
18	Carnarvon Tin	7	8	16 kg pkg.	\$62.50	42	0	0	0	
19	Teatime Chocolate	8	3	10 boxes x 12	\$9.20	25	0	5	0	
20	Sir Rodney's Marmalade	8	3	30 gift boxes	\$81.00	40	0	0	0	
21	Sir Rodney's Salsa	8	3	24 pkgs. x 4 oz	\$10.00	3	40	5	0	
22	Gustaf's Knäckebrot	9	5	24 - 500 g pkgs.	\$21.00	104	0	25	0	
23	Tunnbröd	9	5	12 - 250 g pkgs.	\$9.00	61	0	25	0	
24	Guaraná Fanta	10	1	12 - 355 ml cans	\$4.50	20	0	0	-1	

Figure 8: View records of the table.

We have successfully imported the “Products” table from the excel sheet to MS Access. In a similar way one can extract data from any other excel sheets.

Creating a Parameterized Query

A parameterized query is a query that takes user’s input at the time of execution. Let us look at the procedure of creating a parameterized query. Click on Query Design as shown in Figure 9.

Table	Table	SharePoint	Table	Forms	Report	Labels	Query	Macro	Other
-------	-------	------------	-------	-------	--------	--------	-------	-------	-------

Figure 9: Query Design Window.

Access displays the “Show Table” window. Select “Products” and click on Add and then Close as shown in Figure 10.

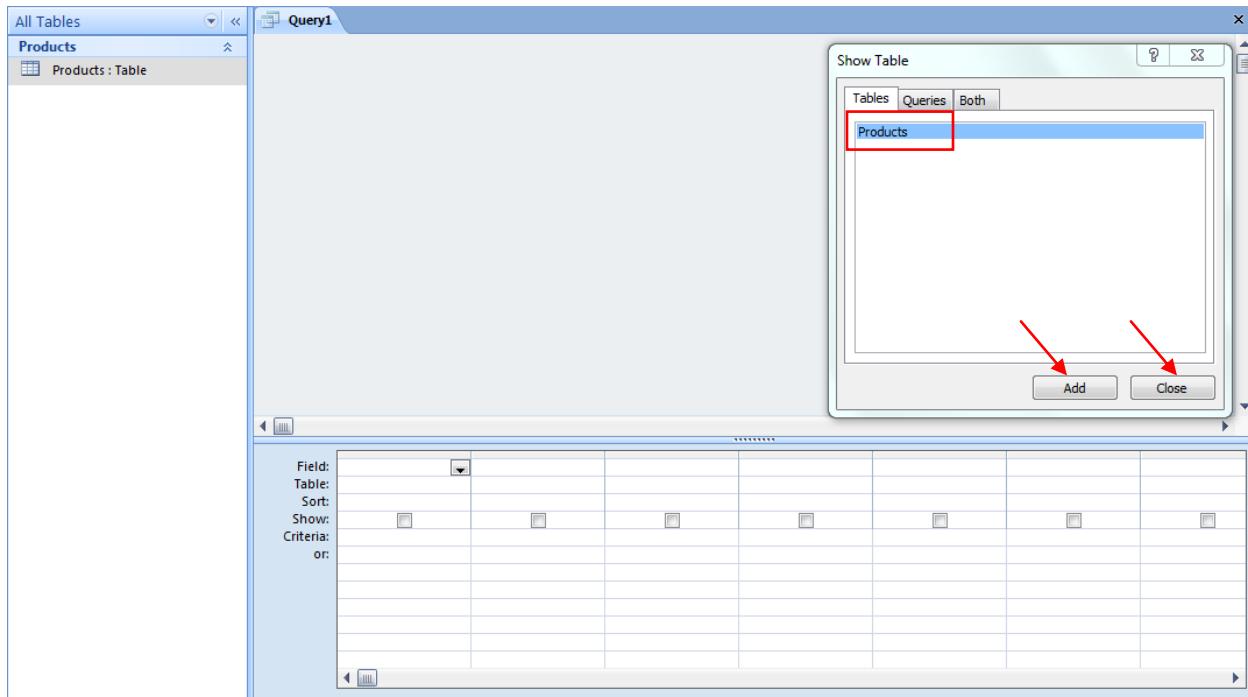


Figure 10: Selection of table.

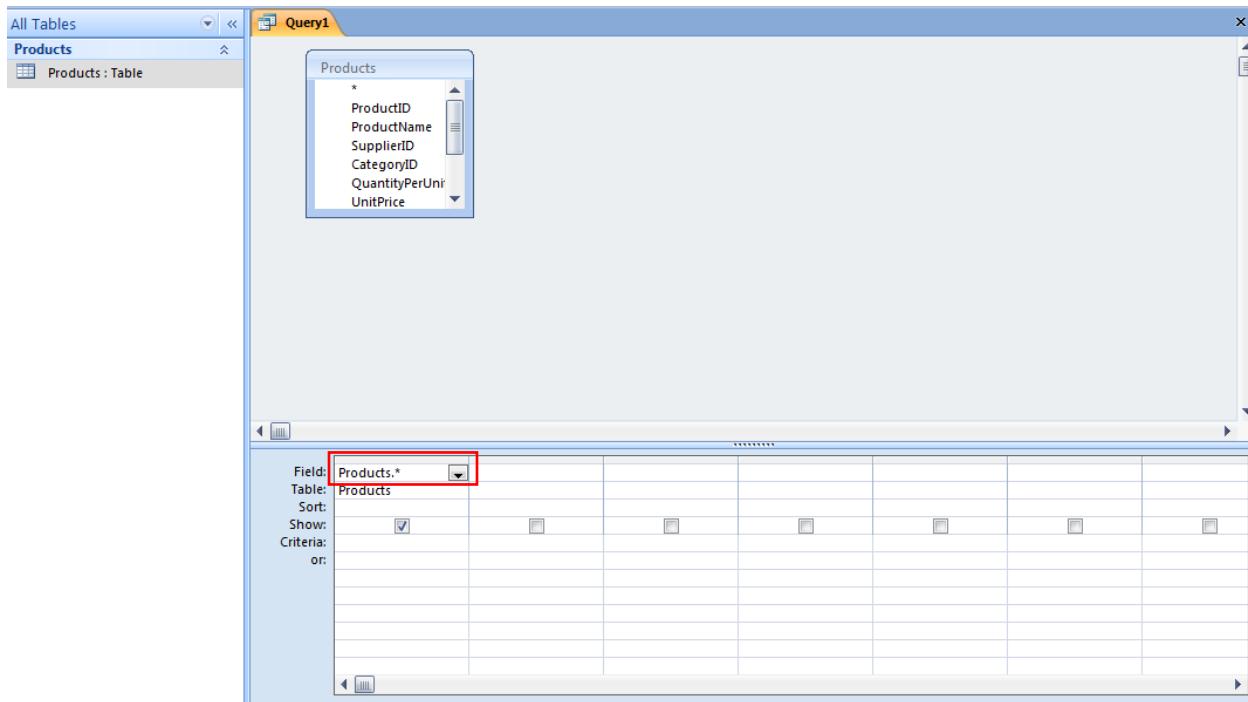


Figure 11: Selection of Fields.

In the field properties window Select “Products.*” as shown in Figure 11.

In the second column select the column name which you want to parameterize. Here we have selected “ProductID” as shown in Figure 12, uncheck the show column and in the criteria field type the Parameterized query:

Between [type ProductID] AND [type PID]

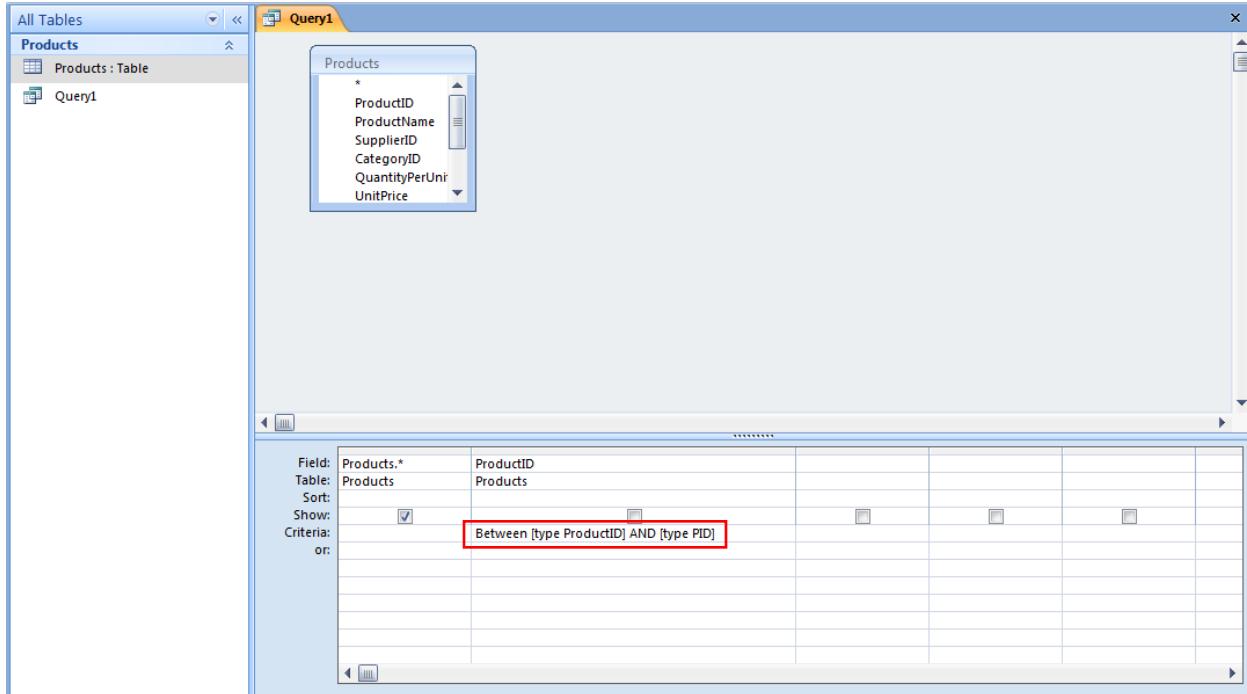


Figure 12: Specifying the parameters.

Click on the Run command.

Access window displays the “Enter Parameter Value” window, twice. First enter the value 1 and the second time, enter the value 25. See Figure 13.

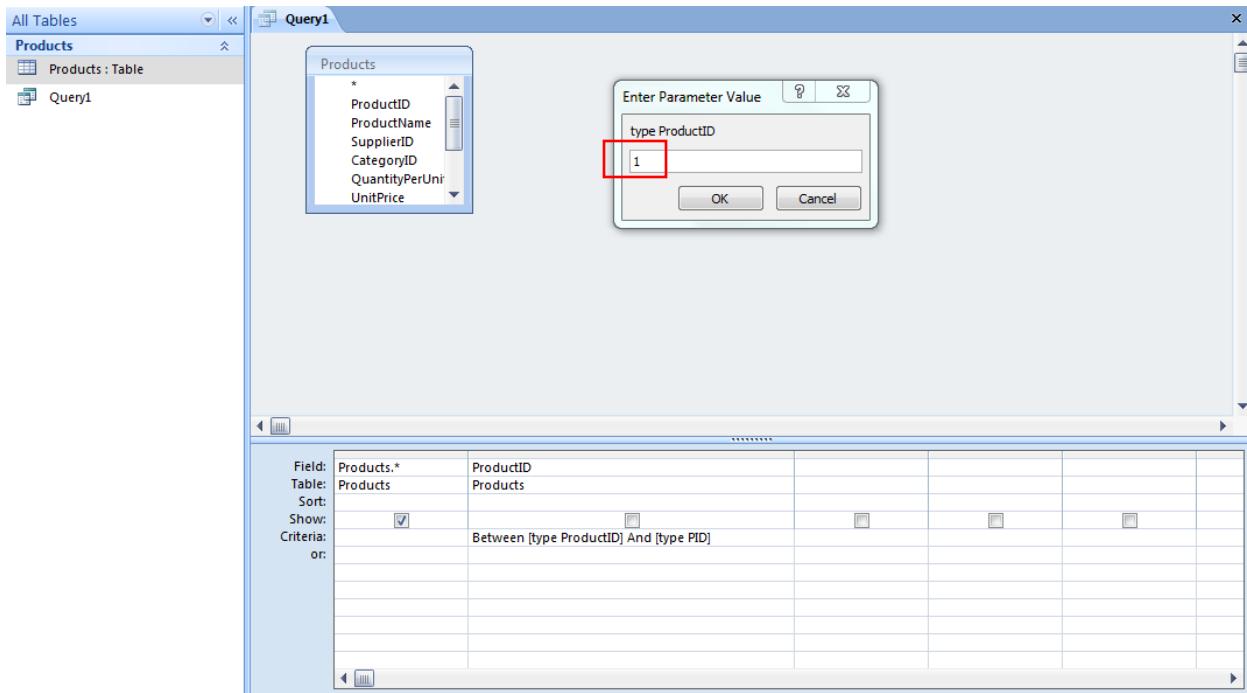


Figure 13: Providing values for the parameter.

MS Access displays the details of all products wherein the ProductID is between 1 and 25. This is as shown in Figure 14.

ProductID	ProductName	SupplierID	CategoryID	QuantityPerUnit	UnitPrice	UnitsInStock	UnitsOnOrder	ReorderLevel	Discontinued
1	Chai	1	1	10 boxes x 20	\$18.00	39	0	10	0
2	Chang	1	1	24 - 12 oz bo	\$19.00	17	40	25	0
3	Aniseed Syrup	1	2	12 - 550 ml b	\$10.00	13	70	25	0
4	Chef Anton's	2	2	48 - 6 oz jars	\$22.00	53	0	0	0
5	Chef Anton's	2	2	36 boxes	\$21.35	0	0	0	-1
6	Grandma's Bo	3	2	12 - 8 oz jars	\$25.00	120	0	25	0
7	Uncle Bob's O	3	7	12 - 1 lb pkgs	\$30.00	15	0	10	0
8	Northwoods C	3	2	12 - 12 oz jar	\$40.00	6	0	0	0
9	Mishi Kobe Ni	4	6	18 - 500 g pk	\$97.00	29	0	0	-1
10	Ikura	4	8	12 - 200 ml ja	\$31.00	31	0	0	0
11	Queso Cabrales	5	4	1 kg pkg.	\$21.00	22	30	30	0
12	Queso Manchego	5	4	10 - 500 g pk	\$38.00	86	0	0	0
13	Konbu	6	8	2 kg box	\$6.00	24	0	5	0
14	Tofu	6	7	40 - 100 g pk	\$23.25	35	0	0	0
15	Genen Shouyu	6	2	24 - 250 ml b	\$15.50	39	0	5	0
16	Pavlova	7	3	32 - 500 g bo	\$17.45	29	0	10	0
17	Alice Mutton	7	6	20 - 1 kg tins	\$39.00	0	0	0	-1
18	Carnarvon Tigr	7	8	16 kg pkg.	\$62.50	42	0	0	0
19	Teatime Choc	8	3	10 boxes x 12	\$9.20	25	0	5	0
20	Sir Rodney's M	8	3	30 gift boxes	\$81.00	40	0	0	0
21	Sir Rodney's S	8	3	24 pkgs. x 4	\$10.00	3	40	5	0
22	Gustaf's Knäck	9	5	24 - 500 g pk	\$21.00	104	0	25	0
23	Tunnbröd	9	5	12 - 250 g pk	\$9.00	61	0	25	0
24	Guaraná Fant	10	1	12 - 355 ml c	\$4.50	20	0	0	-1

Figure 14: Records of the table.

Creating a Pivot Chart

Charts are used to graphically represent data. The PivotChart tool in Access provides a simple way to create a PivotTable and an accompanying chart. Remember, a chart is only as good as the data or the summary table (PivotTable). If you try to cram too many fields into a chart, you will end up with a non-informative chart. You want to keep it simple and informative. Go to the Design tab. Click on View. You can see the various options available in the drop down menu. Click on “Pivot Chart view”. You will see a screen as shown in Figure 15.

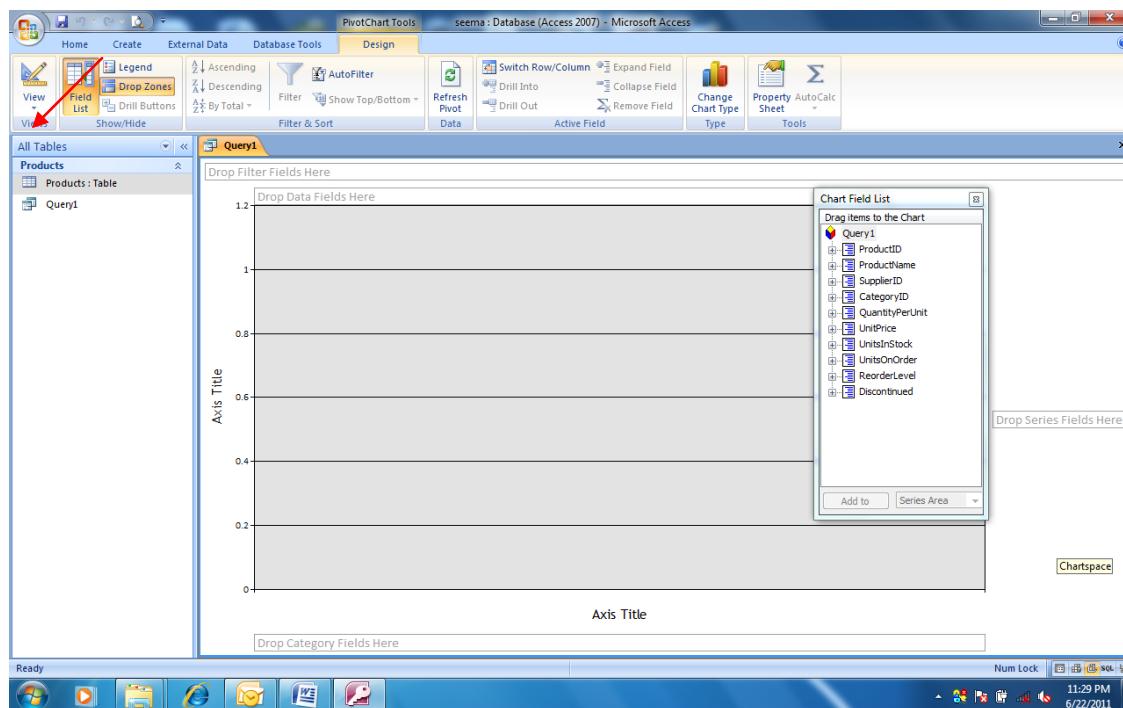
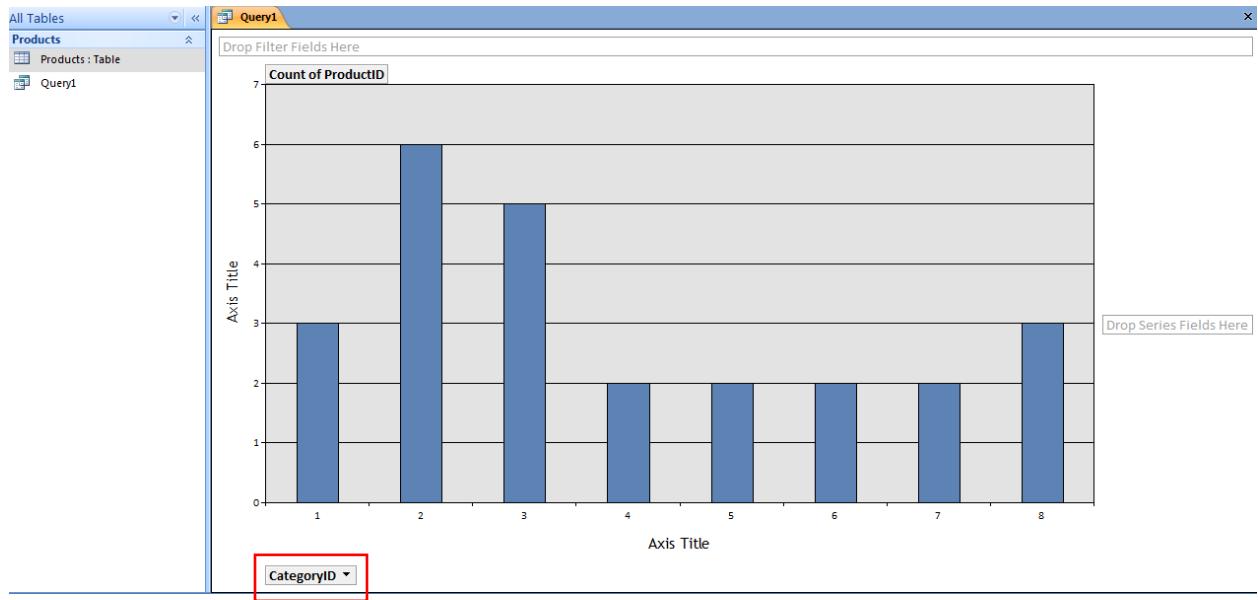
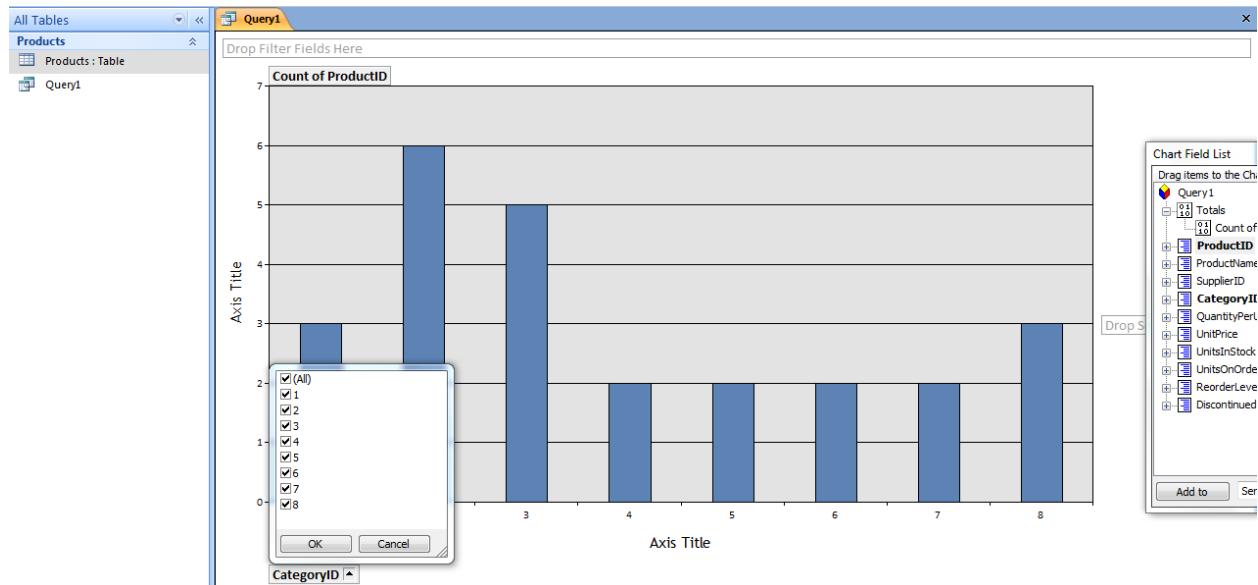


Figure 15: Creating a Pivot chart.

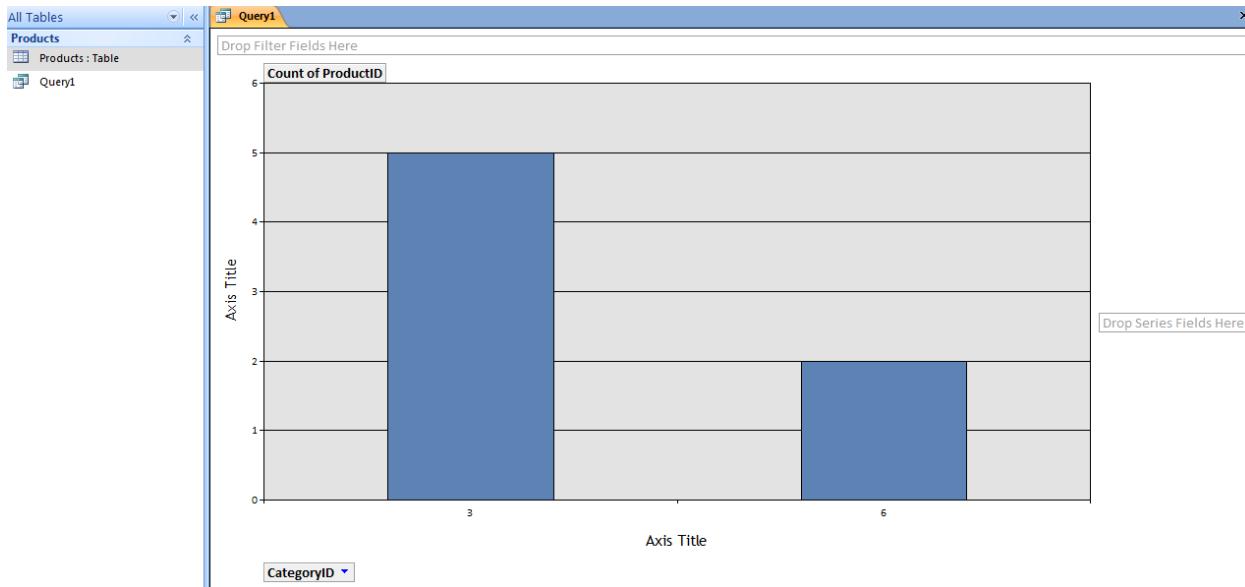
Drag and drop “CategoryID” from the chart field list to the “Drop Category Fields Here”. Drag and drop the “ProductID” field to the “Drop Data Fields Here”. Right Click on “Sum of ProductID”. Click on “Auto Calc” and select “Count”. The pivotchart appears as follows:



You can filter on “CategoryID”. Click on the drop down arrow that appears besides “CategoryID”.



You can make your selections.



Above screen shot displays the bar columns for CategoryIDs “3” and “6”.

Creating a Pivot Table

Go to **Design** tab on the menu bar. Click on “**Pivot Table View**”. It displays the output shown in Figure 16.

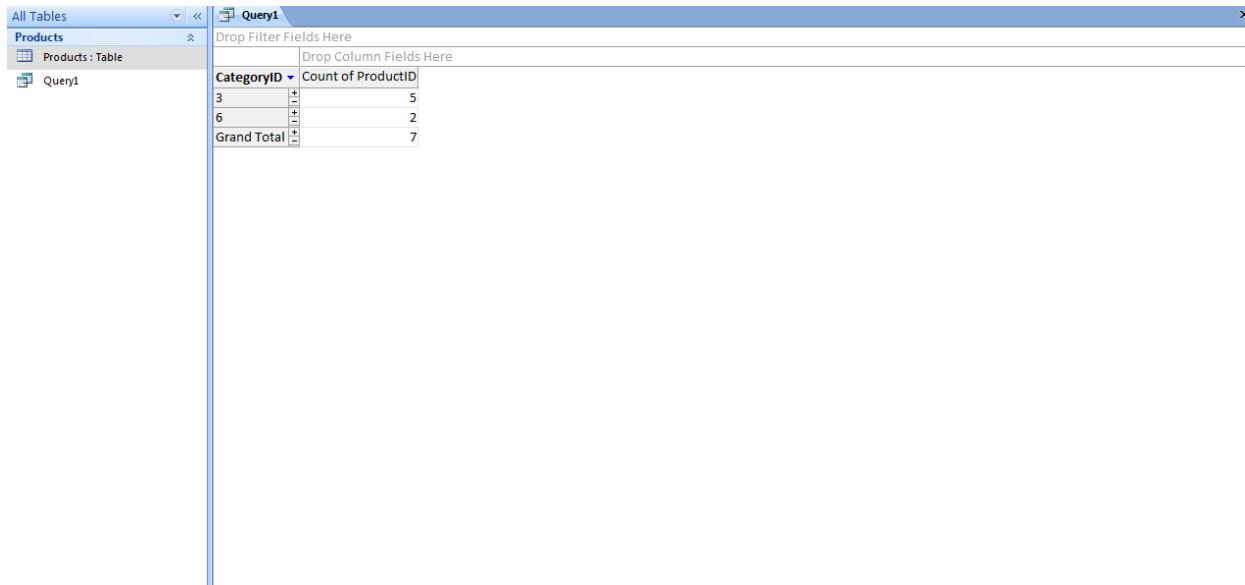


Figure 16: A pivot table.

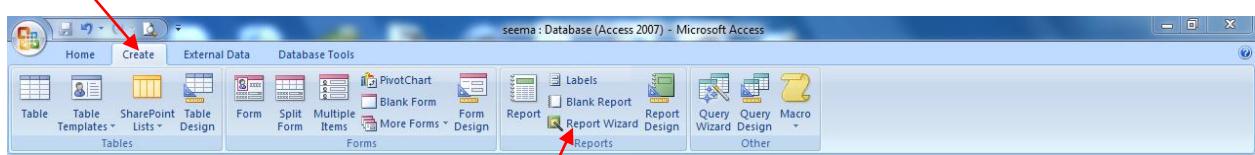
Drag and drop “**UnitsInStock**” and “**UnitsOnOrder**” fields besides the “**Count of ProductID**” column on the pivot table. The output changes to as shown below:

CategoryID	Count of ProductID	Sum of UnitsInStock	Sum of UnitsOnOrder
3	5	173	40
6	2	29	0
Grand Total	7	202	40

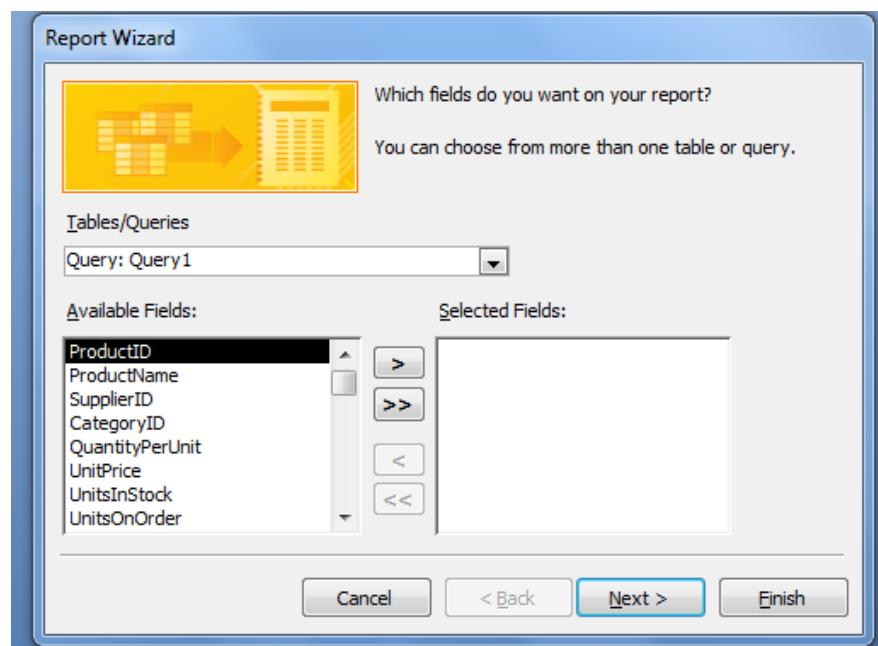
Generating a Report using a Report Wizard

The report so generated will be used in the subreport/subform.

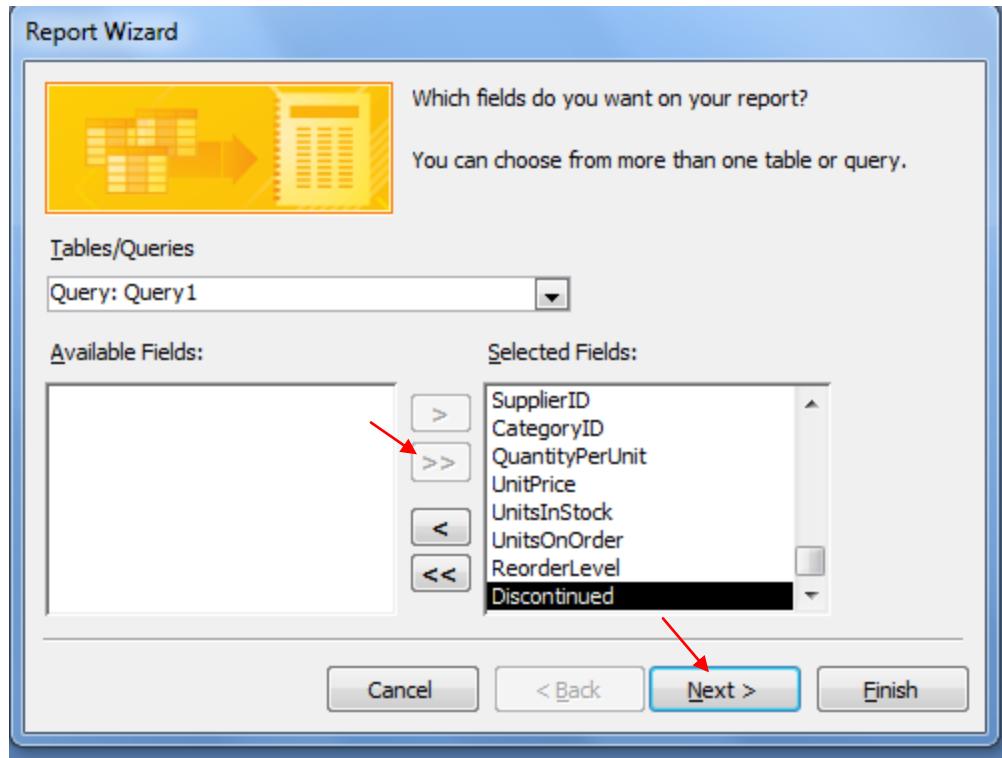
Go to **Create** tab on the menu bar. Click on **Report Wizard**.



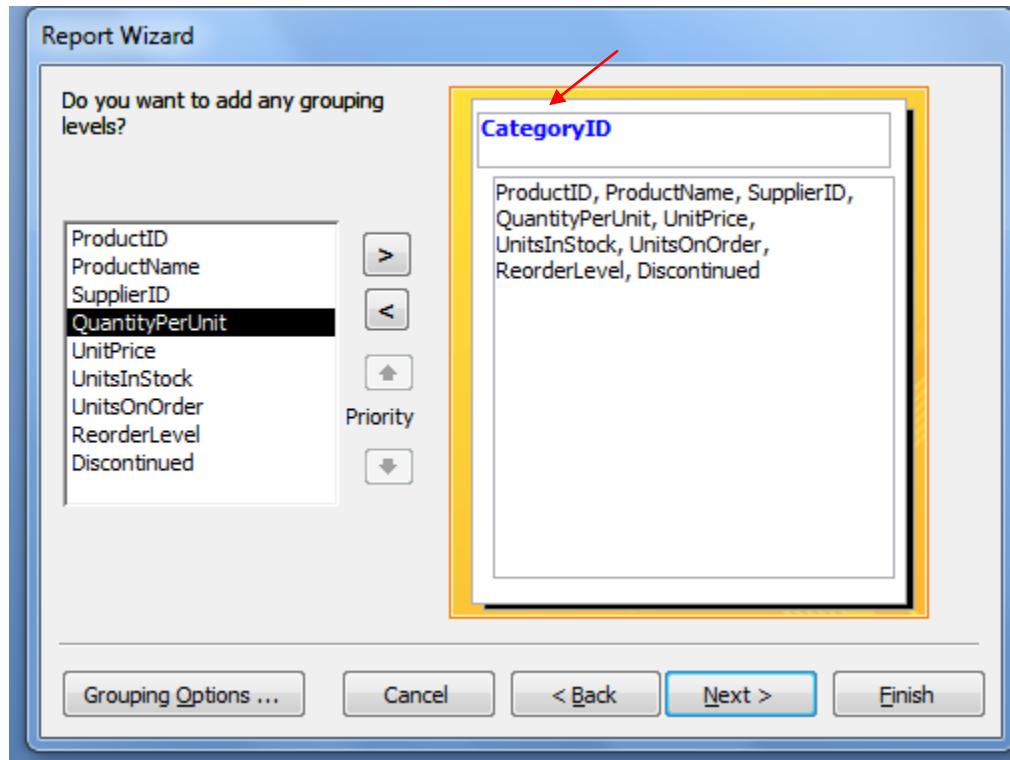
It displays the below screen:



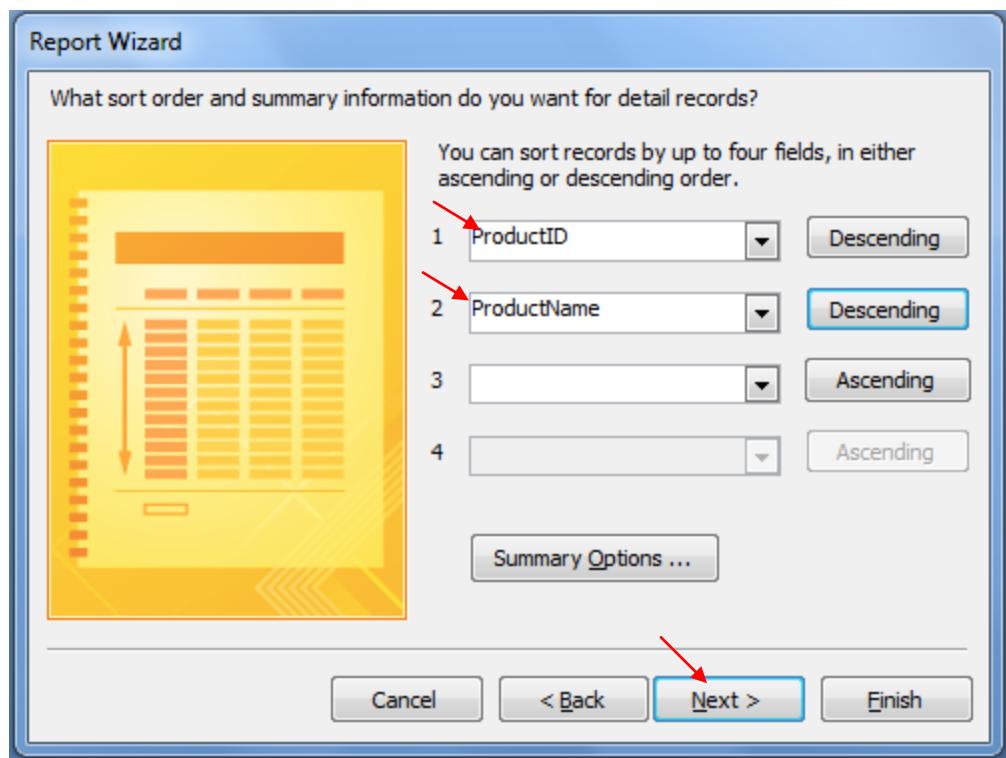
Select all fields by Clicking on “>>” button.



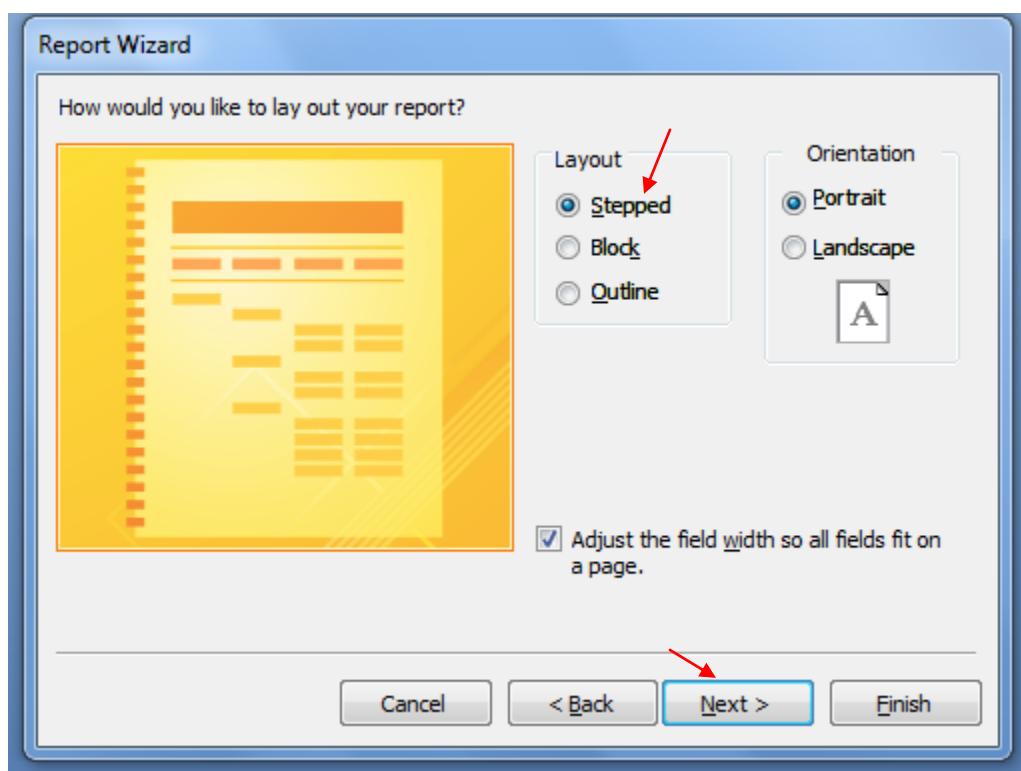
Click on the “Next” button. Let us group our records on “CategoryID”.



Let us now sort the records within each group on “ProductID” in ascending order and then on “ProductName” in descending order. Click on the “Next” button.

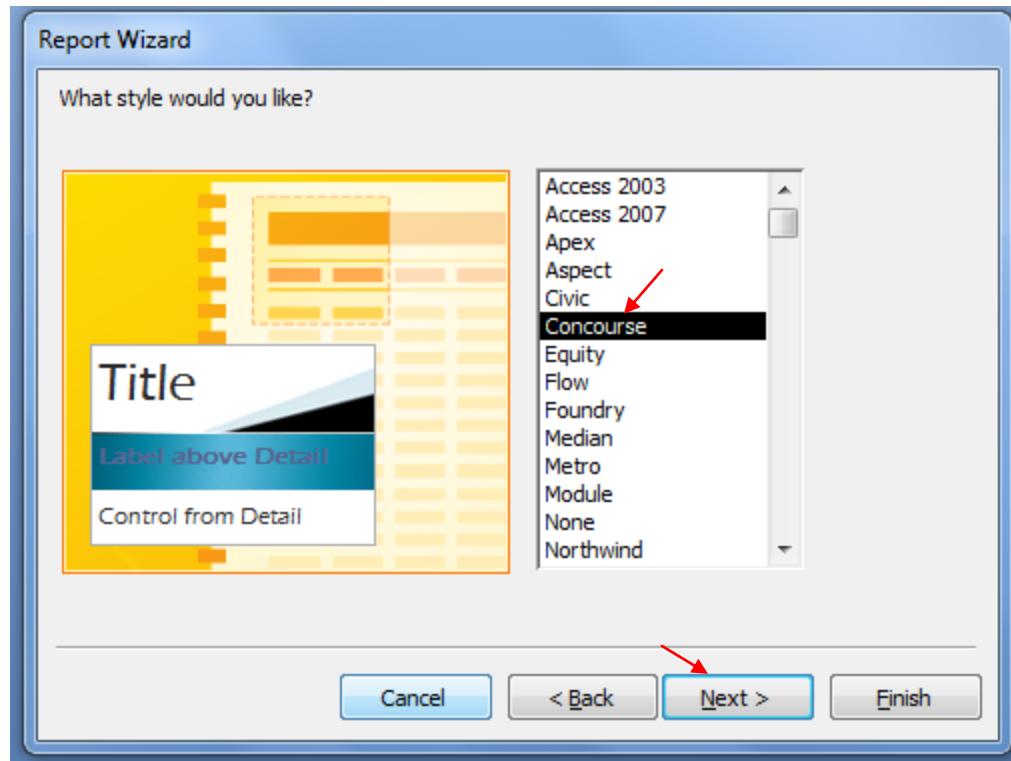


Let us proceed with the “**Stepped**” layout.



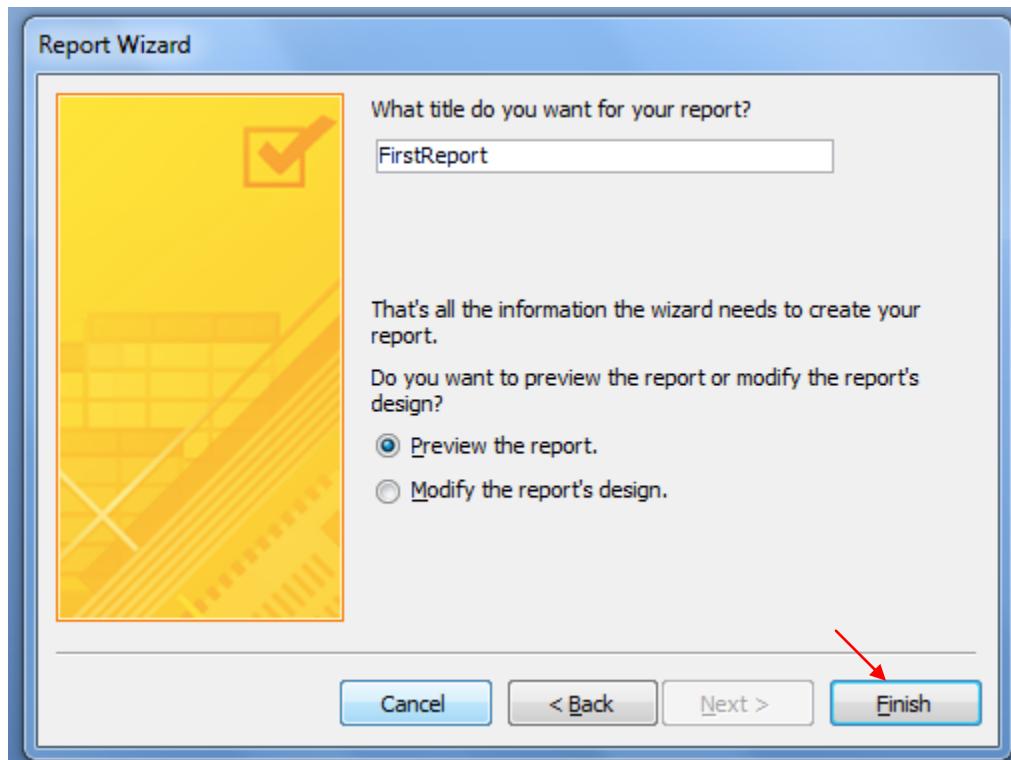
Click on the “**Next**” button.

Let us proceed with the “**Concourse**” style.



Click on “Next”.

Give a title to the Report. Let us go with “FirstReport”.



Click on “Finish”.

It displays the following report:

FirstReport

CategoryID	ProductID	ProductName	SupplierID	QuantityPerUnit	UnitPrice	nStock	nOrder	ReorderLevel
1								
24	Guaraná Fantástica	10 12 - 355 ml cans	10	12 - 355 ml cans	\$4.50	20	0	0
2	Chang	1 24 - 12 oz bottles	1	24 - 12 oz bottles	\$19.00	17	40	25
1	Chai	1 10 boxes x 20 bags	1	10 boxes x 20 bags	\$18.00	39	0	10
2								
15	Genen Shouyu	6 24 - 250 ml bottles	6	24 - 250 ml bottles	\$15.50	39	0	5
8	Northwoods Cranberry Sau	3 12 - 12 oz jars	3	12 - 12 oz jars	\$40.00	6	0	0
6	Grandma's Boysenberry Spr	3 12 - 8 oz jars	3	12 - 8 oz jars	\$25.00	120	0	25
5	Chef Anton's Gumbo Mix	2 36 boxes	2	36 boxes	\$21.35	0	0	0
4	Chef Anton's Cajun Seasoni	2 48 - 6 oz jars	2	48 - 6 oz jars	\$22.00	53	0	0
3	Aniseed Syrup	1 12 - 550 ml bottles	1	12 - 550 ml bottles	\$10.00	13	70	25
3								
25	NuNuCa Nuß-Nougat-Crem	11 20 - 450 g glasses	11	20 - 450 g glasses	\$14.00	76	0	30
21	Sir Rodney's Scones	8 24 pkgs. x 4 pieces	8	24 pkgs. x 4 pieces	\$10.00	3	40	5
20	Sir Rodney's Marmalade	8 30 gift boxes	8	30 gift boxes	\$81.00	40	0	0
19	Teatime Chocolate Biscuits	8 10 boxes x 12 pieces	8	10 boxes x 12 pieces	\$9.20	25	0	5
16	Pavlova	7 32 - 500 g boxes	7	32 - 500 g boxes	\$17.45	29	0	10

Creating a Subreport

A subreport, a complete report in its own right, is inserted into another report, called the main report. A subreport can show charts and graphs summarizing and illustrating the numbers in the main report. We will make use of two tables: “Products” and “Products_by_Category”. Please import the table “products_by_category” into the Microsoft Access database. The two tables are as shown.

“Products” Table

All Tables

Products

Products : Table

Query1

FirstReport

Products_by_Category

Products_by_Category : Table

Products

ProductID	ProductName	SupplierID	CategoryID	QuantityPerUnit	UnitPrice	UnitsInStock	UnitsOnOrder	ReorderLevel	Discontinued
1	Chai	1	1	10 boxes x 20	\$18.00	39	0	10	0
2	Chang	1	1	1 24 - 12 oz bo	\$19.00	17	40	25	0
3	Aniseed Syrup	1	2	12 - 550 ml b	\$10.00	13	70	25	0
4	Chef Anton's C	2	2	2 48 - 6 oz jars	\$22.00	53	0	0	0
5	Chef Anton's C	2	2	2 36 boxes	\$21.35	0	0	0	-1
6	Grandma's Bo	3	2	2 12 - 8 oz jars	\$25.00	120	0	25	0
7	Uncle Bob's Or	3	7	12 - 1 lb pkgs	\$30.00	15	0	10	0
8	Northwoods C	3	2	12 - 12 oz jar	\$40.00	6	0	0	0
9	Mishi Kobe Ni	4	6	6 18 - 500 g pk	\$97.00	29	0	0	-1
10	Ikura	4	8	8 12 - 200 ml ji	\$31.00	31	0	0	0
11	Queso Cabra	5	4	1 kg pkg.	\$21.00	22	30	30	0
12	Queso Manche	5	4	10 - 500 g pk	\$38.00	86	0	0	0
13	Konbu	6	8	2 kg box	\$6.00	24	0	5	0
14	Tofu	6	7	40 - 100 g pk	\$23.25	35	0	0	0
15	Genen Shouyu	6	2	2 24 - 250 ml b	\$15.50	39	0	5	0
16	Pavlova	7	3	3 32 - 500 g bo	\$17.45	29	0	10	0
17	Alice Mutton	7	6	20 - 1 kg tins	\$39.00	0	0	0	-1
18	Carnarvon Tigr	7	8	16 kg pkg.	\$62.50	42	0	0	0
19	Teatime Choc	8	3	10 boxes x 12	\$9.20	25	0	5	0
20	Sir Rodney's M	8	3	30 gift boxes	\$81.00	40	0	0	0
21	Sir Rodney's S	8	3	24 pkgs. x 4	\$10.00	3	40	5	0
22	Gustaf's Knäck	9	5	24 - 500 g pk	\$21.00	104	0	25	0
23	Tunnbröd	9	5	12 - 250 g pk	\$9.00	61	0	25	0
24	Guaraná Fant	10	1	1 12 - 355 ml c	\$4.50	20	0	0	-1

“Products_by_Category” Table

All Tables

CategoryName	ProductName	QuantityPerUnit	UnitsInStock	Discontinued
Beverages	Chai	10 boxes x 20 bags	39	0
Beverages	Chang	24 - 12 oz bottles	17	0
Beverages	Sasquatch Ale	24 - 12 oz bottles	111	0
Beverages	Steeleye Stout	24 - 12 oz bottles	20	0
Beverages	Côte de Blaye	12 - 75 cl bottles	17	0
Beverages	Chartreuse verte	750 cc per bottle	69	0
Beverages	Ipoh Coffee	16 - 500 g tins	17	0
Beverages	Laughing Lumberjack Lager	24 - 12 oz bottles	52	0
Beverages	Outback Lager	24 - 355 ml bottles	15	0
Beverages	Rhönbräu Klosterbier	24 - 0.5 l bottles	125	0
Beverages	Lakkalikööri	500 ml	57	0
Condiments	Aniseed Syrup	12 - 550 ml bottles	13	0
Condiments	Chef Anton's Cajun Seasoning	48 - 6 oz jars	53	0
Condiments	Grandma's Boysenberry Pie	12 - 8 oz jars	120	0
Condiments	Northwoods Cranberry Sauce	12 - 12 oz jars	6	0
Condiments	Genen Shouyu	24 - 250 ml bottles	39	0
Condiments	Gula Malacca	20 - 2 kg bags	27	0
Condiments	Syrup d'éráble	24 - 500 ml bottles	113	0
Condiments	Vegie-spread	15 - 625 g jars	24	0
Condiments	Louisiana Hot Spicy Nuts	32 - 8 oz bottles	76	0
Condiments	Louisiana Hot Spice	24 - 8 oz jars	4	0
Condiments	Original Frankfurter	12 boxes	32	0
Confections	Pavlova	32 - 500 g boxes	29	0
Confections	Teatime Chocolate	10 boxes x 12 piece	25	0

Using the report wizard, create a report titled “**ProductsReport**”. This report should be grouped on “**CategoryID**”. The report should be sorted on “**ProductID**” in ascending order and “**ProductName**” in ascending order. The report should have the records summed up on “**UnitsInStock**” and “**UnitsOnOrder**” field. The report should look like as shown below:

ProductsReport

CategoryID	ProductID	ProductName	SupplierID	QuantityPerUnit	UnitPrice	UnitsInStock	UnitsOnOrder
1	1	Chai	1	10 boxes x 20 bags	\$18.00	39	
	2	Chang	1	24 - 12 oz bottles	\$19.00	17	
	24	Guaraná Fantástica	10	12 - 355 ml cans	\$4.50	20	
	34	Sasquatch Ale	16	24 - 12 oz bottles	\$14.00	111	
	35	Steeleye Stout	16	24 - 12 oz bottles	\$18.00	20	
	38	Côte de Blaye	18	12 - 75 cl bottles	\$263.50	17	
	39	Chartreuse verte	18	750 cc per bottle	\$18.00	69	
	43	Ipoh Coffee	20	16 - 500 g tins	\$46.00	17	
	67	Laughing Lumberjack Lager	16	24 - 12 oz bottles	\$14.00	52	
	70	Outback Lager	7	24 - 355 ml bottles	\$15.00	15	
	75	Rhönbräu Klosterbier	12	24 - 0.5 l bottles	\$7.75	125	
	76	Lakkalikööri	23	500 ml	\$18.00	57	
		Summary for 'CategoryID' = 1 (12 detail records)					
		Sum				559	60
2	3	Aniseed Syrup	1	12 - 550 ml bottles	\$10.00	13	
	4	Chef Anton's Cajun Seasoning	2	48 - 6 oz jars	\$22.00	53	

Create another report using the report wizard but this time on “**Products_by_Category**” table. The report should have the groups formed on “**CategoryName**”. Each group should be summed up on “**UnitsInStock**”.

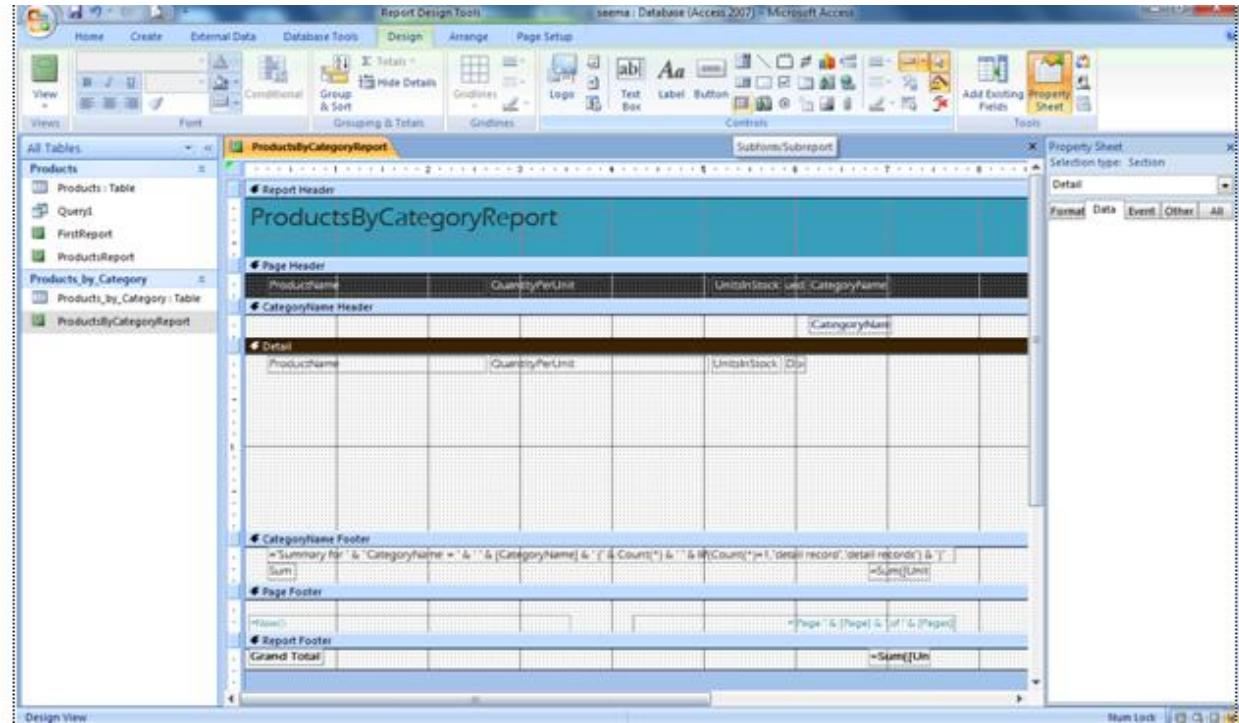
CategoryName	ProductName	QuantityPerUnit	UnitsInStock
Beverages			
	Chai	10 boxes x 20 bags	39 0
	Chang	24 - 12 oz bottles	17 0
	Chartreuse verte	750 cc per bottle	69 0
	Côte de Blaye	12 - 75 cl bottles	17 0
	Ipoh Coffee	16 - 500 g tins	17 0
	Lakkalikööri	500 ml	57 0
	Laughing Lumberjack Lager	24 - 12 oz bottles	52 0
	Outback Lager	24 - 355 ml bottles	15 0
	Rhönbräu Klosterbier	24 - 0.5 l bottles	125 0
	Sasquatch Ale	24 - 12 oz bottles	111 0
	Steeleye Stout	24 - 12 oz bottles	20 0
Summary for 'CategoryName' = Beverages (11 detail records)			539
Condiments			
	Aniseed Syrup	12 - 550 ml bottles	13 0
	Chef Anton's Cajun Seasoning	48 - 6 oz jars	53 0

Let us now design a subreport.

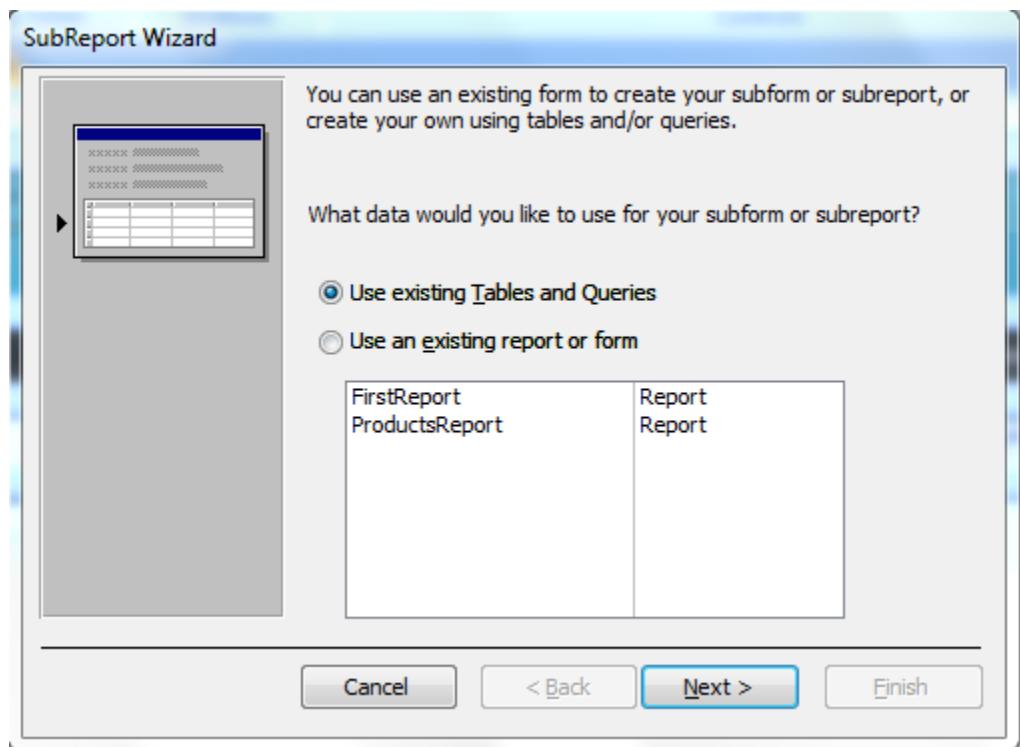
Open the “**ProductsByCategory**” report in the design view.

Enlarge the detail section by selecting its row border and dragging it down.

Click on the subreport/subform control.

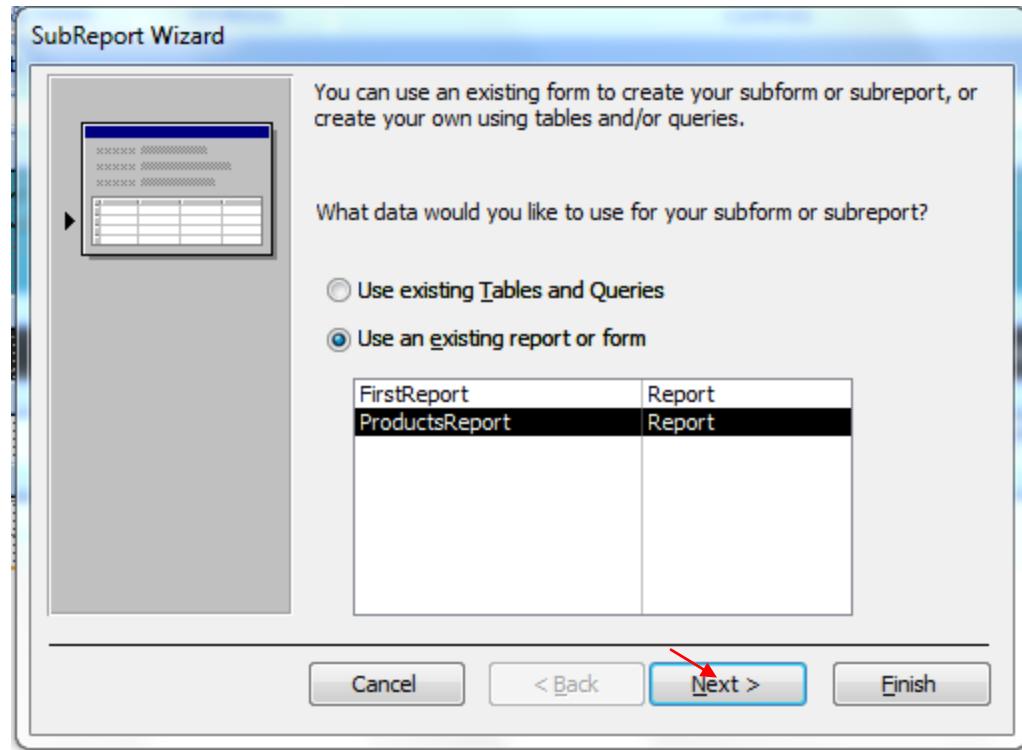


Place the subreport/subform control in the detail section. It opens a window as follows:

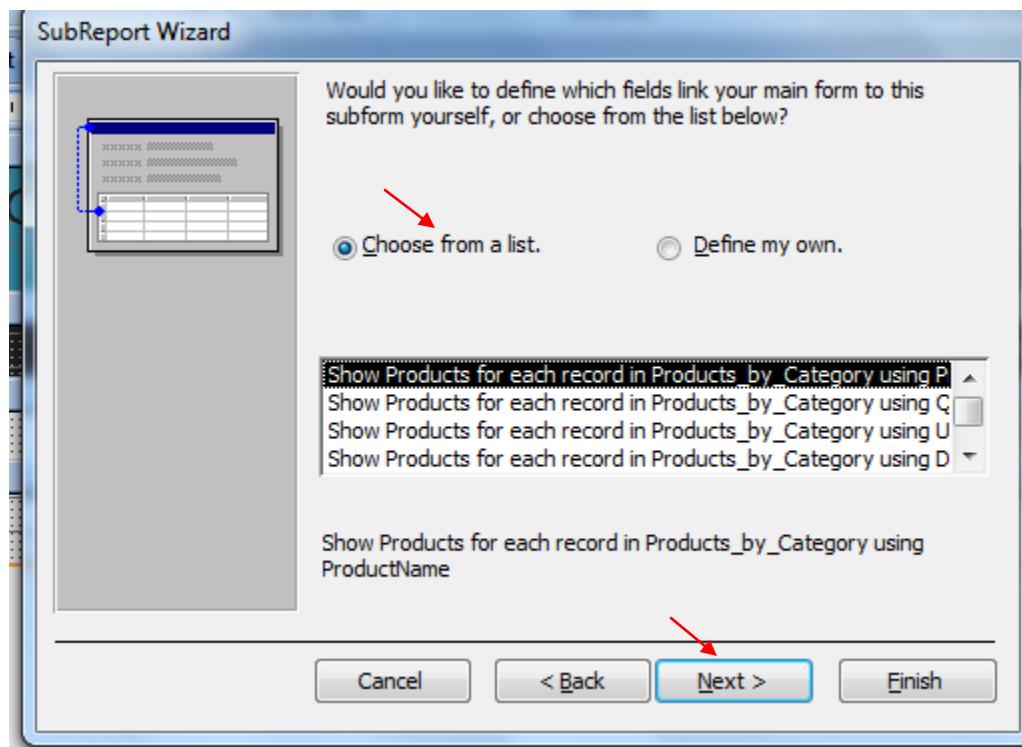


Click on the radio button “**Use an existing report or form**”.

Select “**ProductsReport**”.

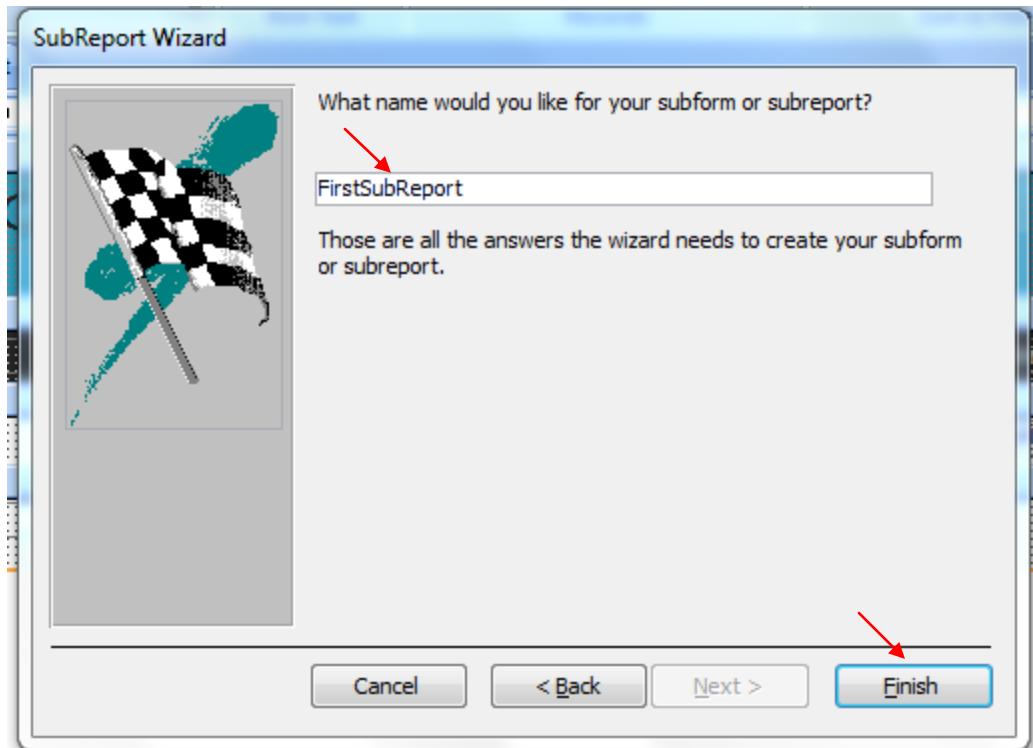


Click on “Next” button.



Select the radio button, “Choose from a list”. Select the first line item in the list “Show Products for each record in Products_by_Category using ProductName”.

Provide a name for the subreport/subform. Let us go with the name, “**FirstSubReport**”.



Click on “Finish”. In the design view the report appears as shown below:

The screenshot shows the Microsoft Access Report Design View for the "ProductsByCategoryReport". The report structure is as follows:

- Report Header:** Contains the title "ProductsByCategoryReport".
- Page Header:** Contains fields for ProductName, QuantityPerUnit, UnitsInStock, and CategoryName.
- CategoryName Header:** Contains a single field for CategoryName.
- Detail:** This section contains a subreport named "ProductsReport". The subreport has its own header and footer sections. The main body of the subreport displays data from the "Products" table, including ProductName, QuantityPerUnit, UnitsInStock, and Description. The subreport's header section contains the title "ProductsReport".
- CategoryName Footer:** Contains summary logic: "=Summary for : & [CategoryName] & : & [Count()] & : & [Count()]=1; detail.records=records; 5;" and a "Sum" field.
- Page Footer:** Contains page number logic: "=(Page - 1) * (Pages) + 1" and a "Page" field.
- Report Footer:** Contains a "Grand Total" section.

The left side of the screen shows the "All Tables" list, which includes the "Products" table, "Query1", "FirstReport", "ProductsReport", "Products_by_Category" table, and the "ProductsByCategoryReport" report itself.

View the report in the “Print Preview”.

ProductsByCategoryReport

ProductName	QuantityPerUnit	UnitsInStock	CategoryName
Chai	10 boxes x 20 bags	39	Beverages

ProductsReport

CategoryID	Product Name	Quantity	Unit Price	Total
1	Chai	10 boxes x 20 bags	\$18.00	39
		Summary for CategoryID = 1 (1 detail record)		
		Sum		39 0
		Grand Total		39 0

CategoryID	Product Name	Quantity	Unit Price	Total
2	Chang	24 - 12 oz bottles	\$19.00	17

ProductsReport

CategoryID	Product Name	Quantity	Unit Price	Total
1	Chai	10 boxes x 20 bags	\$18.00	39
		Summary for CategoryID = 1 (1 detail record)		
		Sum		39 0
		Grand Total		39 0

References

1. The Complete References Microsoft Office Access 2007 by Virginia Anderson-Tata McGraw-Hill Edition.
2. <http://office.microsoft.com/en-us/access-help/up-to-speed-with-access-2007-RZ010193319.aspx>

Unsolved Exercises

1. You are familiar with the Northwind database. The Northwind traders trade in various products belonging to several different categories. Their products are sold in different territories like Boston, New York, Columbia, Austin, and Redmond, so on. The Sales Manager of the company needs a report which will have details of the largest order by region in the year 1998.
2. The sales representative of the company needs a report on each product category along with the supplier name. (Group by product and their territories).
3. The sales manager of the company wants to view the details of the products wherein the unit price is between 25 and 50. The report should have the product name, Unit Price, Category name and supplier's country.
4. Create a pivot chart for the sales manager that will depict the details of the product with the highest demand displayed by region, by customer and by discount amount.
5. The sales manager wishes to maintain a record of each product category in stock with their category name and product details. Generate a report to display the product category with the largest stock.
6. The manager of the company wants to know the performance of each employee. (The number of orders serviced by them along with the shipment details of the order). Generate the report to display the largest order (in terms of unit quantity).