Microsoft Access 2016

Simple Queries

INFOCUS COURSEWARE

Designed to fast-track you through the process of learning about computers and information technology, the *In Focus* range is a unique and innovative concept in learning.

A quick reference summary of key procedures is provided at the bottom of each page together with handy tips and additional information.

Each title in the *In Focus* series can be used as:

- a classroom workbook for instructor-led teaching and training;
- a self-study guide for self-paced learning;
- a tutorial guide for distance education programs;
- a resource collection of just-in-time support and information for help desk users and support staff;
- a handy, desk-side reference for computer users.

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Microsoft Access 2016
Simple Queries

MICROSOFT ACCESS 2016
SIMPLE QUERIES

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READ ME FIRST

In case you're not familiar with the terminology, *Read Me First* is quite often the name given to a computer file that contains important information for people to know prior to using an application.

This section contains some important information to help you use this book so we thought we'd start with a *Read Me First* section.

What skills and knowledge you will acquire...

The skills and knowledge acquired in Microsoft Access 2016 - Simple Queries are sufficient to be able to use and operate the software effectively.

What you'll need to know before beginning this course...

Microsoft Access 2016 - Simple Queries assumes little or no knowledge of the software. However, it would be beneficial to have a general understanding of personal computers and the Windows operating system environment.

The objectives of this guide…

At the completion of this course you should be able to:

- create simple and effective queries
- perform more advanced queries using a variety of querying techniques
- create queries based on one or more tables
- create meaningful reports from tables

What you get in a chapter...

Each chapter begins with a summary page listing the topics covered in that chapter. The chapter then consists of single-page topic sheets pertaining to the theme of the chapter.

What you'll need to have before commencing this course...

Many of the topics in this learning guide require you to open an existing file with data in it. These files can be obtained from your instructor and need the product code for this course which is AccessSimpleQueries.

As you work through this guide…

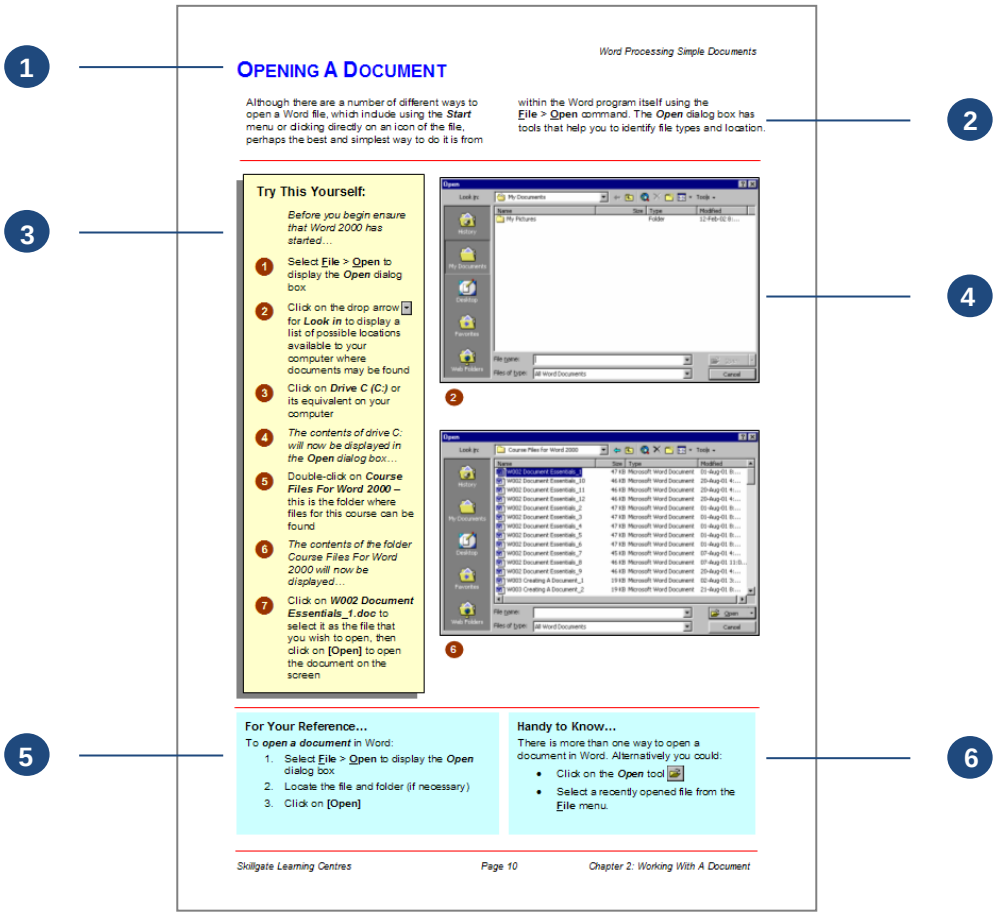
It is strongly recommended that you close all open files, if any, prior to commencing each new chapter in this learning guide. Each chapter, where relevant, has its own set of exercise files and any from a previous chapter are no longer required.

Where to from here...

Have a look at the next page which explains how a topic page works, ensure that you have access to the exercise files (see above), and you're ready to make a start.

WORKING WITH TOPIC SHEETS

The majority of this book comprises single-page topic sheets. There are two types of topic sheets: ***task*** and ***reference***. The layout of both is similar – an *overview* at the top, *detail* in the centre and *additional reference* (optional) material at the bottom. *Task* sheets contain a *Try This Yourself* step-by-step exercise panel in the detail area as shown below.



1	Topic name
2	General topic overview provides an introduction to the topic
3	*Try This Yourself* (*Task*-based topic sheets) is a detailed step-by-step practice exercise for you to work through. In *Reference* topic sheets this is usually replaced by a box with reference information.
4	In *Task* topic sheets screen shots and graphics provide a visual clue as to what will happen when you work through the *Try This Yourself* practice exercise. In *Reference* topic sheets the screen shots and graphics are used to visually represent information and concepts.
5	The *For Your Reference* (optional) element provides a quick summary of the steps required to perform a task. These usually only appear in Task-based topic sheets.
6	The *Handy To Know* (optional) element provides additional information such as alternate ways of accomplishing a task or further information providing handy tips.

CONTENTS

CHAPTER 1 CREATING QUERIES

INFOCUS

You can easily sort and locate data using table sorting and filtering options. However, these are relatively lightweight when compared to using queries.

Queries are sometimes known as ***Query By Example***, or ***QBE***. A query is like a report based on the data in a table. With a query you are required to specify which fields to see in the query, and which records to display.

This is done by giving Access ***criteria*** to search for, much the same as what is done for a simple filter. For example, listing all of the records that have ***Sales*** in the ***Department*** field, or all of the records that occurred on ***12/3/2016***, are examples of queries.

Once the ***criteria*** and ***output fields*** are nominated, Access will search through the data and produce a table of matching records.

In this session you will:

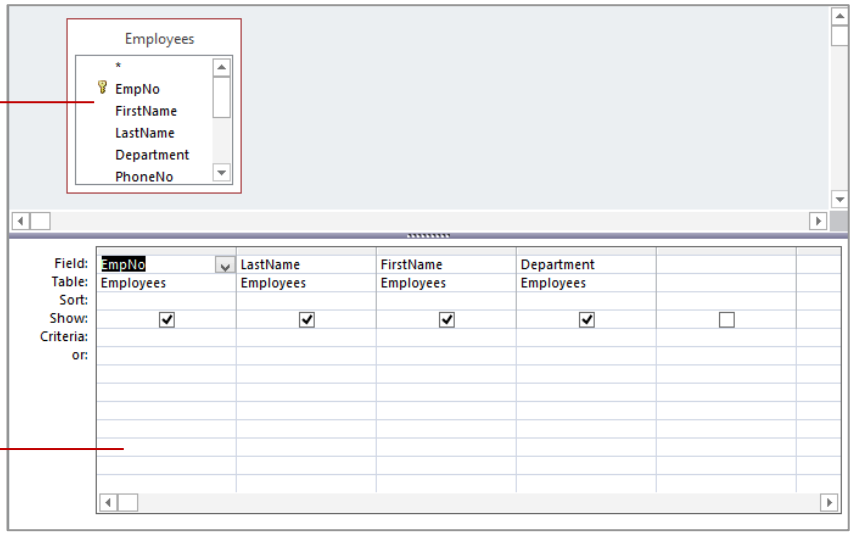
- ✓ gain an understanding of how queries work
- ✓ learn how to create a new query design
- ✓ learn how to work with a query
- ✓ learn how to modify a query design
- ✓ learn how to apply record criteria for a query
- ✓ learn how to clear selection criteria
- ✓ learn how to save a query
- ✓ learn how to run queries from the ***Navigation*** pane
- ✓ learn how to delete a query from a database file
- ✓ gain an understanding of creating additional queries.

UNDERSTANDING QUERIES

A ***select query*** is like a filter that you place on your data so that you see only the information that is relevant to you. Select queries can be used, for example, to produce a list of customers from Tasmania, or all of the items that you've purchased in the last six months valued at $300 or more. Select queries are so named because they *select* records according to your query design.

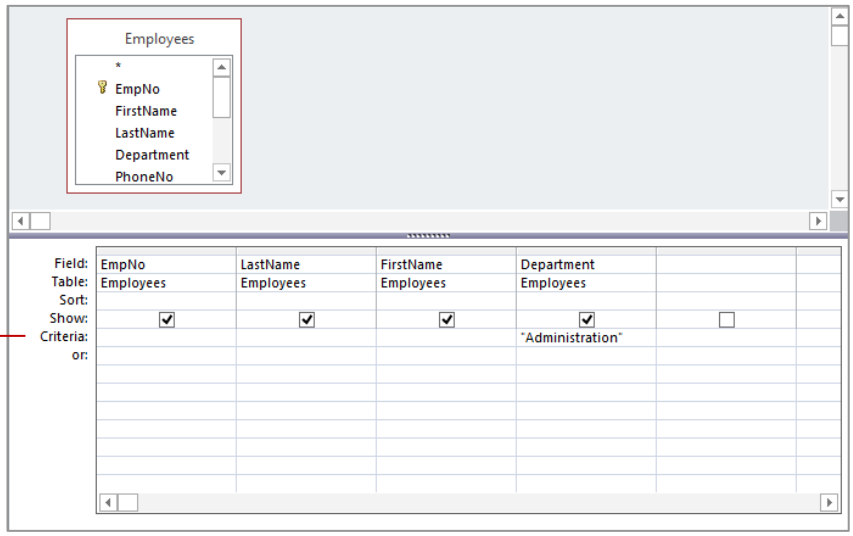
Select queries are created using the ***Create*** tab of the ribbon, and are run and modified as a ***Query*** object in the ***Navigation*** pane.

Select queries are based on a ***Query Design***. The upper part of the design is known as the ***Field List***, while the lower portion is known as the ***Query Grid***.



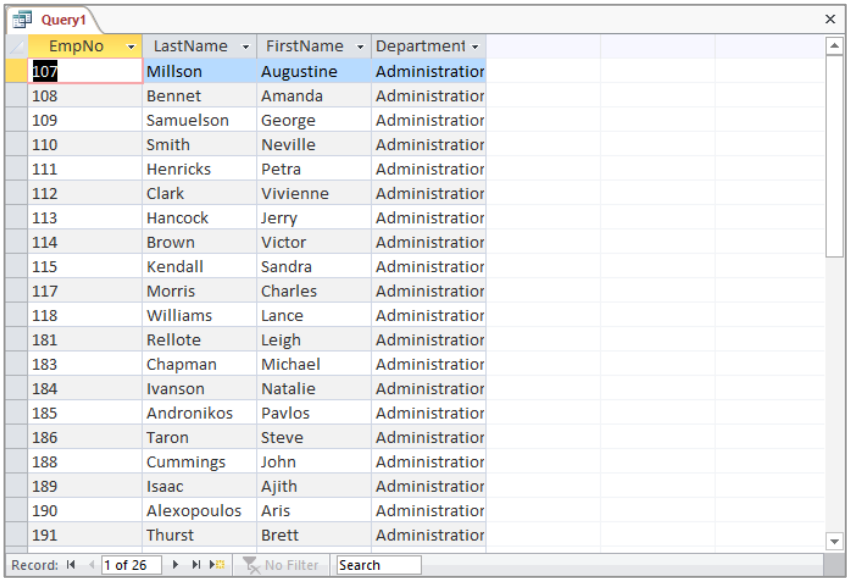
Field list
Query grid

The records displayed in the query are determined by the sample data that you enter into the ***Criteria row*** in the ***Query Grid*** – this is why the process is sometimes referred to as *query by example.*



Criteria row

The easiest way to see the data is to switch to ***Datasheet*** view. In ***Datasheet*** view the data that matches the query criteria is displayed in a special ***dynaset*** table. A ***dynaset*** is a subset of the full table of data – however, it is still a live set of data and any changes made to data here will be reflected back in the full table later on.



CREATING A QUERY DESIGN

Queries are created from the ***Create*** tab on the ribbon. Like table structures, there is a ***design*** view where the layout, criteria, and the like, required for the query are specified, and a ***run*** view where the data is brought into the design layout structure from the relevant table. The first step in creating a query, therefore, is to create a query design structure.

Try This Yourself:

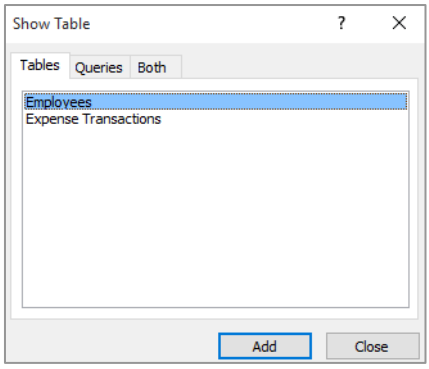
Open File

Before starting this exercise you MUST open the file Creating Queries_1.accdb…

1. Click on the ***Create*** tab, then click on ***Query Design*** in the ***Queries*** group to display a new query design and the ***Show Table*** dialog box
2. Click on **[Add]** to add the ***Employees*** table fields to the design, then click on **[Close]** to close the dialog box
3. In the field listing double-click on ***EmpNo***, ***LastName***, ***FirstName*** and ***Department*** to add these fields to the grid in this order
4. Click on ***Save*** in the ***QAT*** to display the ***Save As*** dialog box
5. Type **qryEmployees** in ***Query Name***, then click on **[OK]**

   The name of the query will now appear in the Navigation pane under the Queries header…
6. Close the query

1



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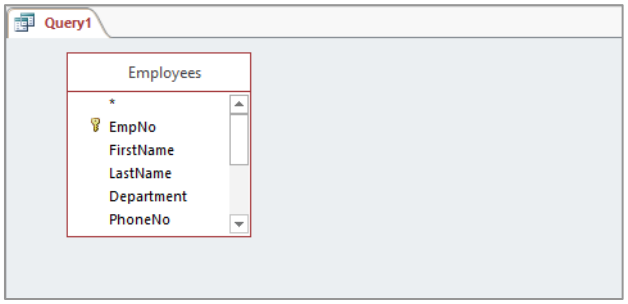
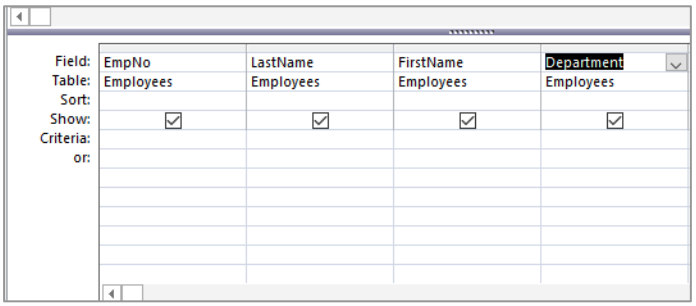


Double-click on the entries here to add them to the table below



3

For Your Reference…

To ***create*** a ***query design***:

1. Click on the ***Create*** tab
2. Click on ***Query Design*** in the ***Queries*** group
3. Add the table and select the fields
4. Save the query

Handy to Know…

- The ***Show Table*** dialog box, displayed when creating a new query design, lists all of the tables and queries in the current database file.

WORKING WITH A QUERY

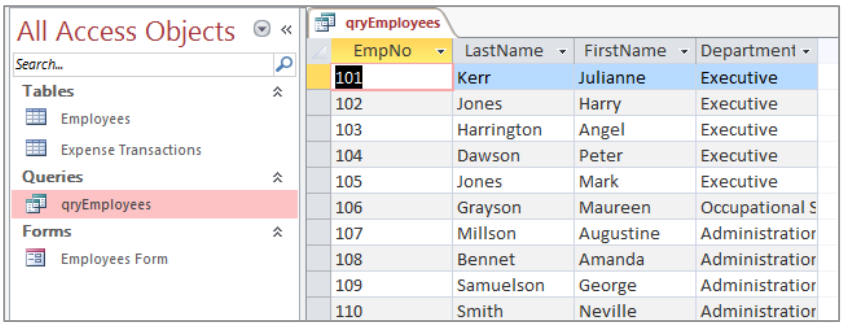
Queries offer you the ability to see snapshots of your data – a particular view or representation of your data at a point in time. There are three main views within a query: the ***design*** view where you specify what data you wish to see in the snapshot; the ***datasheet*** view where the data based on the design is displayed; and ***SQL*** view which shows the programming behind the query.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Creating Queries_2.accdb...

1. Double-click on ***qryEmployees*** to see the query in ***Datasheet*** view, displaying the data
2. On the ***Home*** tab, click on the top half of ***View*** in the ***Views*** group to toggle between ***Design*** and ***Datasheet*** views
3. Click on the bottom half of ***View*** to display a menu of options
4. Select **SQL View** to see the ***SQL*** code required behind the scenes to create the query
5. Close the query



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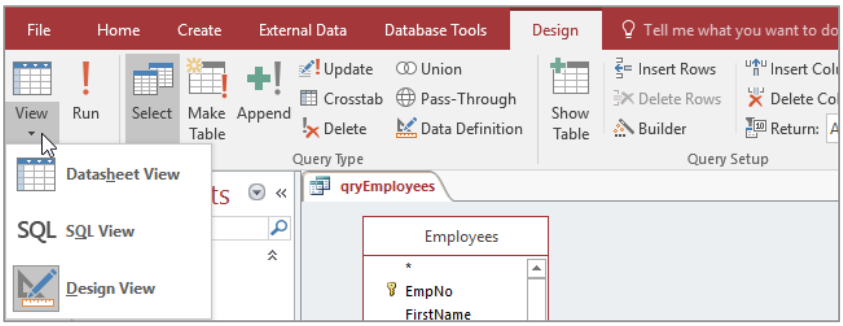

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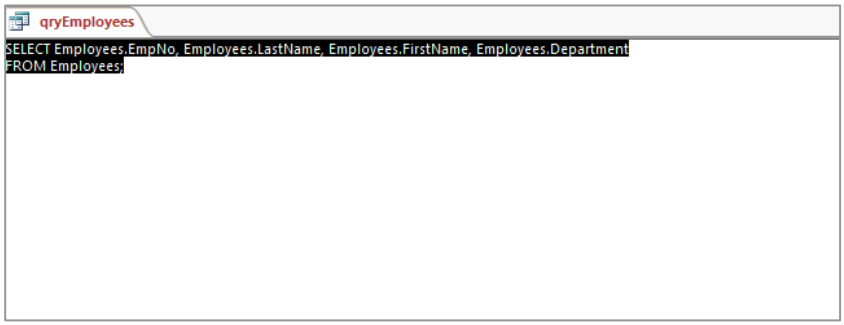


4

For Your Reference…

To ***see different aspects*** of a ***query***:

1. Double-click on the query to see it in ***Datasheet*** view
2. On the ***Home*** tab, click on the top half of ***View*** in the ***Views*** group to toggle between ***Design*** and ***Datasheet*** views

Handy to Know…

- Until you seriously get into programming, you won't use the ***SQL View*** option for queries all that often. SQL is pronounced "sequel" or simply S.Q.L.

CHANGING A QUERY DESIGN

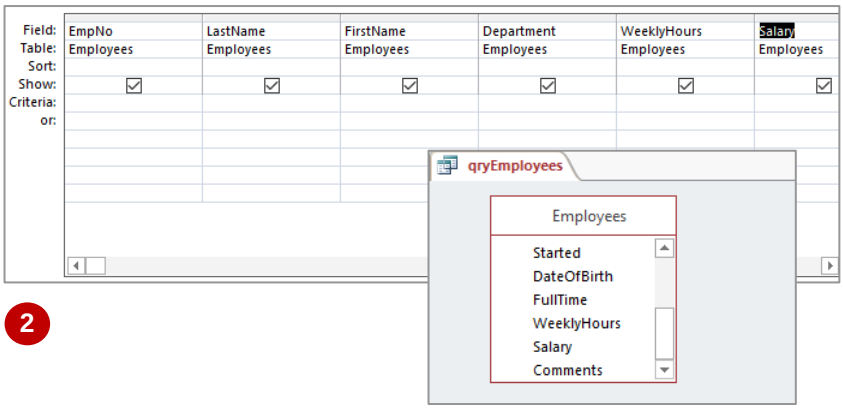
Most ***query designs*** are not as critical as table designs and can therefore be changed randomly and when the need arises. ***Select queries***, where you are trying to extract matching data, are often run using a trial and error approach where the query design is experimented with and modified until the perfect solution is found.

Try This Yourself:

Same File *Continue using the previous file with this exercise, or open the file Creating Queries_3.accdb...*

1. In the ***Navigation*** pane, right-click on ***qryEmployees*** to display a menu of options, then select **Design View** to see the query in ***Design*** view
2. Scroll down the list of fields in the ***Employee*** field listing and double-click on ***WeeklyHours*** and then ***Salary*** to place both fields at the end of the grid
3. Click on ***WeeklyHours*** in the grid then, on the ***Query Tools: Design*** tab, click on ***Insert Columns*** in the ***Query Setup*** group

   A new, blank column will appear…
4. Click on the drop arrow in the new column and select **Started**
5. Click on the ***Home*** tab, then click on the top half of ***View*** in the ***Views*** group to run the query and see the data presented in the modified design
6. Click on ***Save*** in the ***QAT***, then close the query



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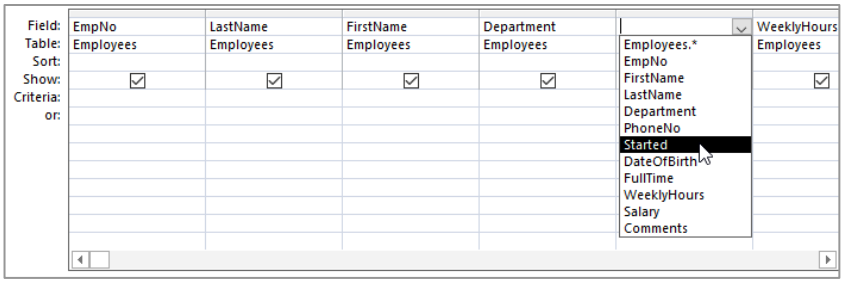

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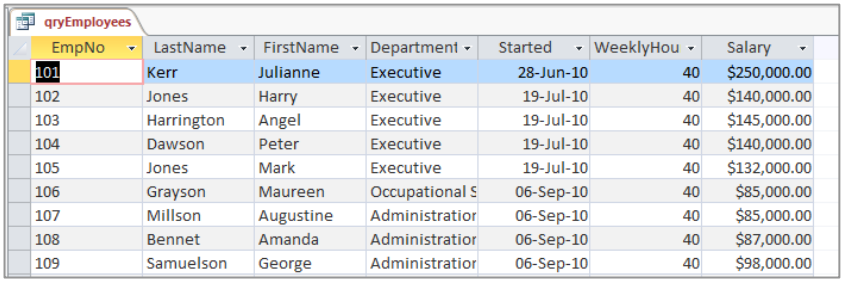


5

For Your Reference…

To ***insert more fields*** into a ***Design grid***:

- Double-click on the field name in the field listing, or
- Click in the grid, then click on ***Insert Columns*** in the ***Query Setup*** group

Handy to Know…

- You can delete a field from a query grid by clicking on it and then clicking on ***Delete Columns*** in the ***Query Setup*** group on the ***Home*** tab.

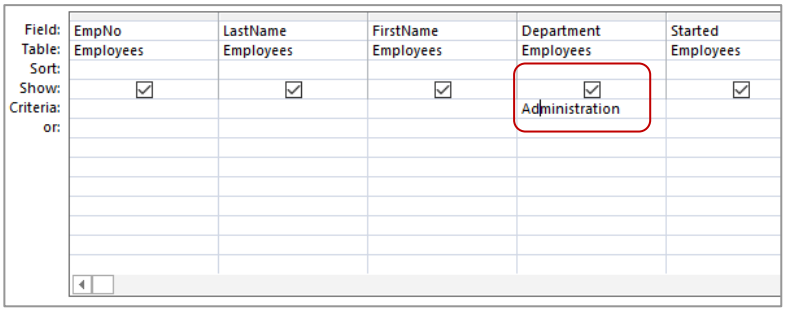
APPLYING RECORD CRITERIA

The real power of a query lies in its ability to display a filtered list of records in a ***dynaset***. To filter the records and see only the ones that you want, you will need to enter search criteria in the criteria row in the query grid. You simply type an example of the data that you want to see in the criteria cell and run the query to display all records from the original table that match the criteria.

Try This Yourself:

Same File *Continue using the previous file with this exercise, or open the file Creating Queries_4.accdb...*

1. Right-click on ***qryEmployees*** to display a menu of options and select **Design View**
2. Click in the ***Criteria*** cell for ***Department*** and type **Administration**
3. On the ***Query Tools: Design*** tab, click on the top half of ***View*** in the ***Views*** group to see only those records with ***Administration*** in the ***Department*** field
4. Repeat step ***3*** to switch back to ***Design*** view
5. Type **40** in the ***Criteria*** cell for ***WeeklyHours***, then click on ***View*** to display only those people who work **40** hours in the ***Administration*** department
6. Switch to ***Design*** view and type **>=80000** in the ***Criteria*** cell for ***Salary***, then click on ***View*** to see all ***Administration*** people who work ***40*** hours and earn ***$80,000*** or more
7. Save and close the query



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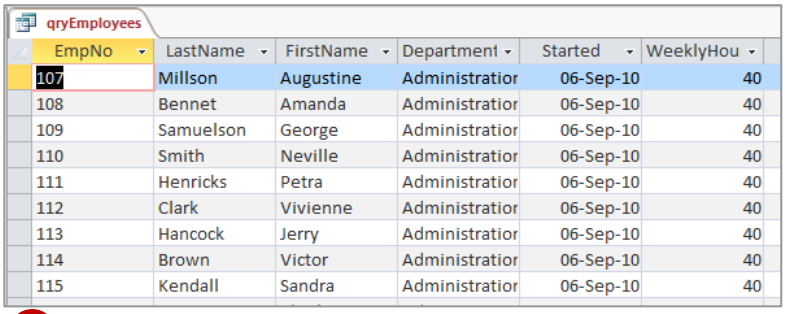

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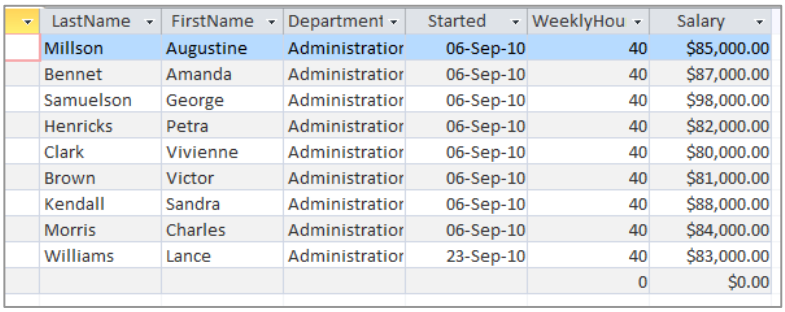


6

For Your Reference…

To ***select records*** in a ***query***:

1. Click in the ***Criteria*** cell for a field and type the desired search criteria
2. On the ***Query Tools:Design*** tab, click on ***View*** in the ***Views*** group to run the query

Handy to Know…

- When creating queries, if you add more criteria across fields, you are creating what is known as an ***AND*** query – you want records that have this AND this AND this...
- When constructing queries, use **>** for greater than and **<** for less than situations.

CLEARING SELECTION CRITERIA

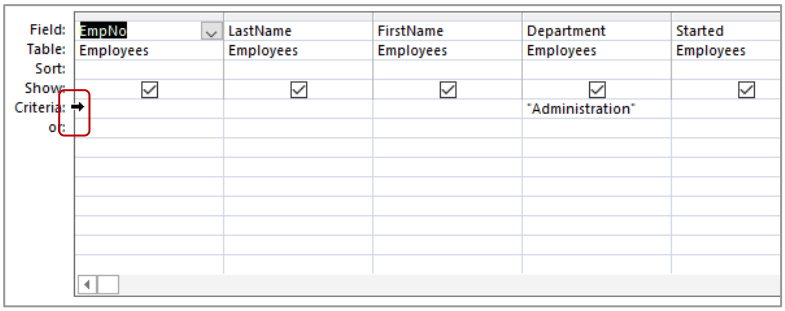
You do need to exercise a little care when running queries. If you leave residual criteria from an earlier query in the query grid (which is easy to do if you have more fields than can be seen on the screen), you may end up with incorrect results. It is a good idea therefore to clear the selection criteria after you have performed a query and found the data that you want.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Creating Queries_5.accdb...

1. In the ***Navigation*** pane, right-click on ***qryEmployees*** to display a menu of options and select **Design View**
2. Point to the left of the first criteria cell until the mouse pointer changes to a black horizontal arrow ➡
3. Click once to select the entire criteria row
4. Press Del to delete all of the criteria in the row
5. Save and close the query



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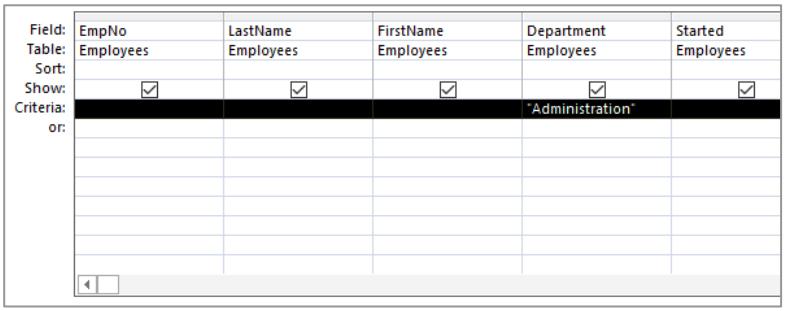

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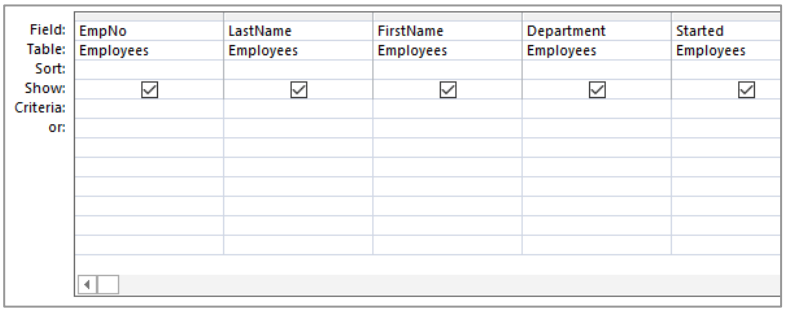


4

For Your Reference…

To ***clear selection criteria***:

1. Point to the left of the row and click once to select it
2. Press Del to delete the criteria in the row

Handy to Know…

- When working with a query design, you can delete the contents of a single cell in the ***Criteria*** row by double-clicking on the value in the cell and pressing Del.

SAVING A QUERY

There are two main types of select queries: those that you create as a one-off search of the data; and those that you create for repeated and on-going use. If you are going to use a query on a regular basis it should be saved. You can then also use it as a template to create other queries with variations perhaps to the criteria or the field grid.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Creating Queries_6.accdb...

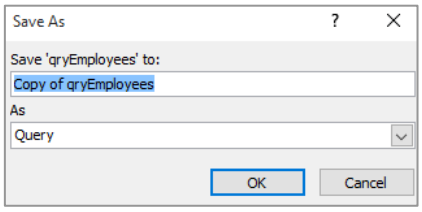
1. Right-click on ***qryEmployees*** to display a menu of options and select **Design View**
2. Type **Administration** in the ***Criteria*** cell for ***Department***
3. On the ***Query Tools: Design*** tab, click on ***View*** in the ***Views*** group to see the results – there should be 26 records
4. Click on the ***File*** tab, then click on **Save As** to display the ***Save As*** area
5. Click on ***Save Object As*** in ***File Types***, then click on **[Save As]** to display the ***Save As*** dialog box
6. Type **qryEmployeesAdmin** and click on **[OK]**

   The new query appears in the Navigation bar…
7. Switch to ***Design*** view then repeat steps ***2*** to ***6*** to create another query that only displays employees from the ***Executive*** department – save this query as ***qryEmployeesExec***
8. Close the query

189	Isaac	Ajith	Administratior	16-Dec-10	40
190	Alexopoulos	Aris	Administratior	27-Nov-10	40
191	Thurst	Brett	Administratior	16-Dec-10	40
192	Ahlund	Christof	Administratior	09-Dec-10	40
193	Zylinski	David	Administratior	20-Nov-10	32
194	Hurst	Ellinor	Administratior	27-Nov-10	40
203	Hutchins	Philip	Administratior	27-Nov-10	40
204	Baker-Smith	Susan	Administratior	16-Dec-10	40
205	Abelseth	Trond	Administratior	02-Dec-10	25
*					0

Record: 1 of 26 | No Filter | Search

3



5

7

qryEmployeesAdmin

EmpNo	LastName	FirstName	Department	Started	Week
101	Kerr	Julianne	Executive	28-Jun-10	
102	Jones	Harry	Executive	19-Jul-10	
103	Harrington	Angel	Executive	19-Jul-10	
104	Dawson	Peter	Executive	19-Jul-10	
105	Jones	Mark	Executive	19-Jul-10	
*					

For Your Reference…

To ***save*** a ***query***:

1. Create the query
2. On the ***File*** tab, click on **Save As**, then click on ***Save Object As*** and click on **[Save As]**
3. Type a name and click on **[OK]**

Handy to Know…

- It is important to give your queries meaningful names so that you remember what they are for. Using a prefix, such as ***qry***, will tell you at a glance that you are looking at a list of queries and make the queries easier to distinguish from tables, forms and reports.

RUNNING QUERIES FROM THE NAVIGATION PANE

Queries store the layout, fields, criteria and other information required to produce the list of data that you want. Given that they can be time consuming to create, especially in the case of complex queries, it makes sense to save them and then run them as often as you require. Queries can be run directly from the object listing in the ***Navigation*** pane, as often as you like.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Creating Queries_7.accdb...

1. In the ***Navigation*** pane under ***Queries***, double-click on ***qryEmployees***, then double-click on ***qryEmployeesAdmin***, then double-click on ***qryEmployeesExec***

   Notice how the names of the three queries appear in three separate tabs at the top of the window. The last query opened is the one that is currently seen and is known as the "active" query…

2. Click on the tab for ***qryEmployeesAdmin*** to see the employees in the ***Administration*** department
3. Click on the tab for ***qryEmployees*** to see all of the employees
4. Close each query

qryEmployees | qryEmployeesAdmin | **qryEmployeesExec**

EmpNo	LastName	FirstName	Department	Started	WeeklyHou	Salary
101	Kerr	Julianne	Executive	28-Jun-10	40	$250,000.00
102	Jones	Harry	Executive	19-Jul-10	40	$140,000.00
103	Harrington	Angel	Executive	19-Jul-10	40	$145,000.00
104	Dawson	Peter	Executive	19-Jul-10	40	$140,000.00
105	Jones	Mark	Executive	19-Jul-10	40	$132,000.00
*					0	$0.00

1

qryEmployees | **qryEmployeesAdmin** | qryEmployeesExec

EmpNo	LastName	FirstName	Department	Started	WeeklyHou	Salary
107	Millson	Augustine	Administratior	06-Sep-10	40	$85,000.00
108	Bennet	Amanda	Administratior	06-Sep-10	40	$87,000.00
109	Samuelson	George	Administratior	06-Sep-10	40	$98,000.00
110	Smith	Neville	Administratior	06-Sep-10	40	$78,000.00
111	Henricks	Petra	Administratior	06-Sep-10	40	$82,000.00
112	Clark	Vivienne	Administratior	06-Sep-10	40	$80,000.00
113	Hancock	Jerry	Administratior	06-Sep-10	40	$79,000.00

2

qryEmployees | qryEmployeesAdmin | qryEmployeesExec

EmpNo	LastName	FirstName	Department	Started	WeeklyHou	Salary
101	Kerr	Julianne	Executive	28-Jun-10	40	$250,000.00
102	Jones	Harry	Executive	19-Jul-10	40	$140,000.00
103	Harrington	Angel	Executive	19-Jul-10	40	$145,000.00
104	Dawson	Peter	Executive	19-Jul-10	40	$140,000.00
105	Jones	Mark	Executive	19-Jul-10	40	$132,000.00
106	Grayson	Maureen	Occupational S	06-Sep-10	40	$85,000.00
107	Millson	Augustine	Administratior	06-Sep-10	40	$85,000.00

3

For Your Reference…

To ***run*** a ***query from*** the ***Navigation pane***:

- In the ***Navigation*** pane, double-click on the name of the query from the ***Query*** object list

Handy to Know…

- Queries do not contain data. Each time a query is opened in ***Datasheet*** view, Access retrieves the latest data from the table upon which the query is based and uses the query design to display the relevant records and information.

DELETING A QUERY

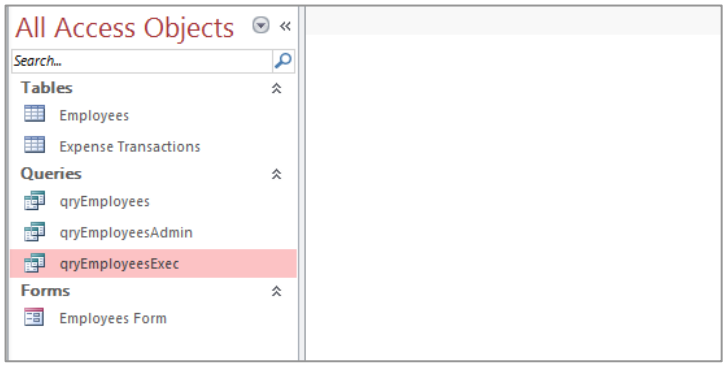
Queries often work with data that is stored in tables or that results from other queries. They can be used to create data by performing calculations and can be used as a source of data for other queries, forms and reports. Therefore, you should be especially careful when deleting queries – make sure that the query is not used by any other objects in the database first.

Try This Yourself:

Same File

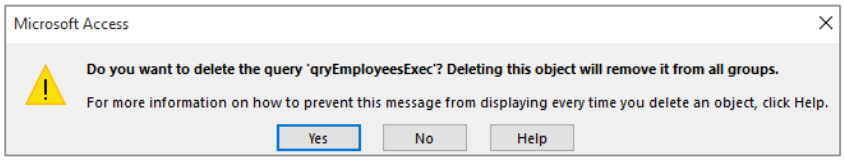
Continue using the previous file with this exercise, or open the file Creating Queries_7.accdb...

1. Click on ***qryEmployeesExec*** in the ***Navigation*** pane to select it



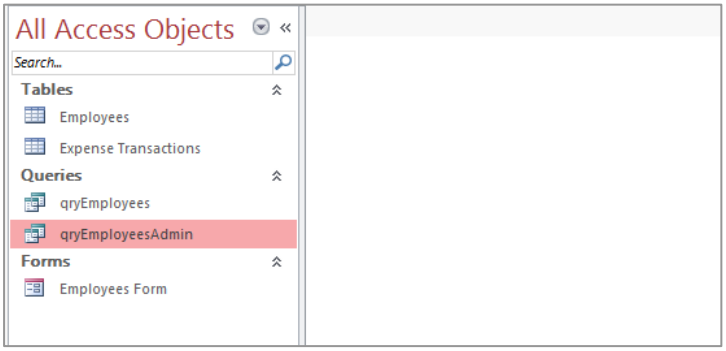
2. On the ***Home*** tab, click on ***Delete*** in the ***Records*** group

   A warning message will appear, seeking your confirmation to delete the query…



3. Click on **[Yes]** to confirm the deletion

   The query no longer appears listed under Queries in the Navigation pane



For Your Reference…

To ***delete*** a ***query from*** a ***database file***:

1. Click on the name of the query in the ***Navigation*** pane
2. On the ***Home*** tab, click on ***Delete*** in the ***Records*** group

Handy to Know…

- You can delete a query by clicking on it in the ***Navigation*** pane and pressing Del.

CREATING ADDITIONAL QUERIES

Select queries are by far the most common type of query that you will create and use. In this assignment you will have the opportunity to put your understanding of queries to use by creating a wide range of different queries, including those that show records that match specific criteria, and those that fit within specific ranges of dates.

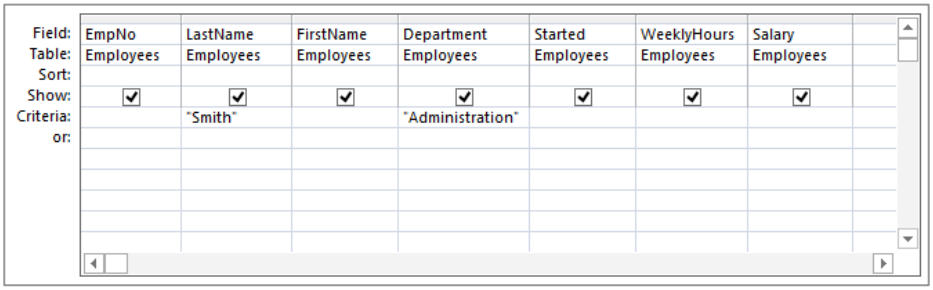
Sub Heading

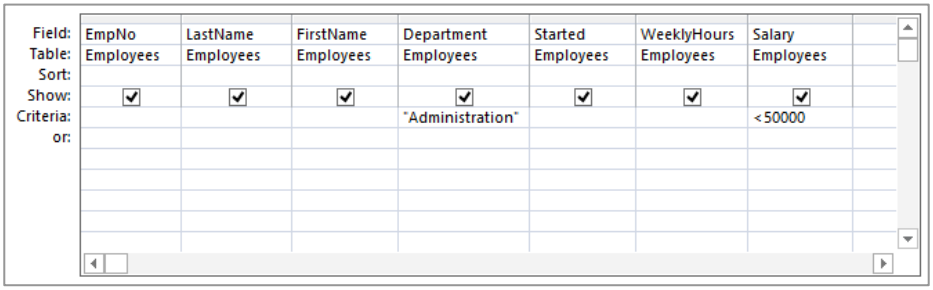
Use the qryEmployees query to run the various queries as shown. Note that you will have to clear the criteria from time to time. Also, we won't need these queries so there is no need to save them.

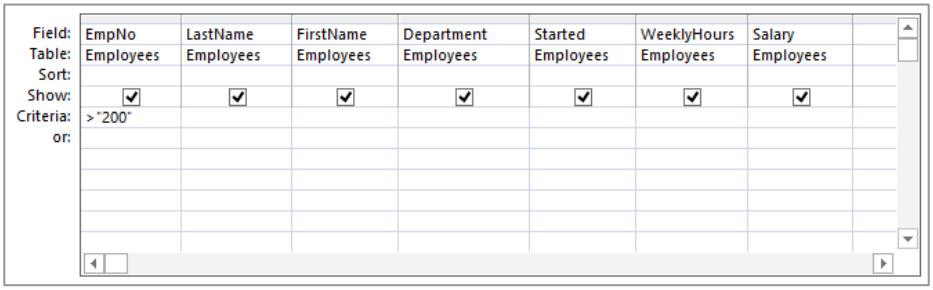
Save the final query design as ***qryEmployeesNew*** then close it.

The datasheet that shows the results is exactly like a table and you can therefore use the Print commands on the ***File*** tab to print the result once the datasheet is displayed.

Access automatically places quotation marks around criteria based on text. The quotation marks are programming symbols that tell the computer to treat the data as character strings rather than numbers.







NOTES:

CHAPTER 2 QUERYING TECHNIQUES

INFOCUS

Queries provide a very powerful way of extracting information from your table structures. But there is more to queries than just simple select statements. By using features such as expressions, operators, and sorting and moving fields within a query, there is virtually no limit to the information you can extract from a table.

In this session you will:

- ✓ learn how to change a saved query
- ✓ learn how to create an ***AND*** query
- ✓ learn how to create ***OR*** queries
- ✓ learn how to query numeric data
- ✓ learn how to query dates
- ✓ learn how to use a range expression to extract records between values
- ✓ learn how to query for opposite values
- ✓ learn how to move fields in a query grid
- ✓ learn how to sort the output of a query
- ✓ learn how to remove fields from a query
- ✓ learn how to use wildcards to query data
- ✓ learn how to handle problem characters in queries
- ✓ learn how to create a query using a transaction and a lookup table
- ✓ learn how to sort data numerically
- ✓ learn how to search for empty fields using a query
- ✓ learn how to query for uniqueness.

MODIFYING A SAVED QUERY

Queries can be run as a one off and then discarded when no longer needed, or they can be saved and run over and over again. Saved queries, however, are not set in stone and can easily be modified and adapted as your changing needs arise. Saved queries can also be used as templates for creating other queries.

Try This Yourself:

Open File

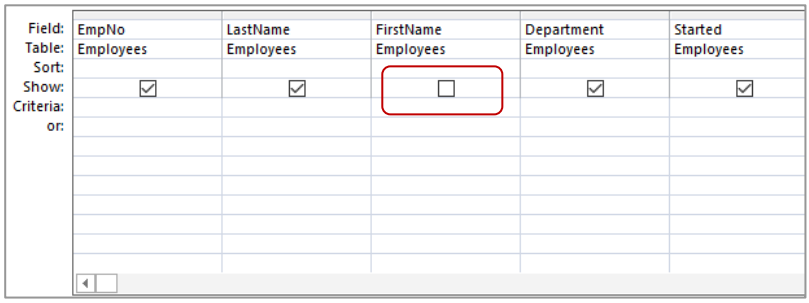
Before starting this exercise you MUST open the file Query Techniques_1.accdb…

1. In the ***Navigation*** pane, double-click on ***qryEmployees*** to run the query
2. On the ***Home*** tab, click on the top half of ***View*** in the ***Views*** group to see the query in ***Design View***
3. Click on the checkbox in ***Show*** for ***FirstName*** until it appears *without* a tick, as shown
4. Click on the top half of ***View*** to display the datasheet, this time without the ***FirstName*** field
5. Click on ***Save*** to save the design changes
6. Close the query

qryEmployees

EmpNo	LastName	FirstName	Department	Started
101	Kerr	Julianne	Executive	28-Jun-10
102	Jones	Harry	Executive	19-Jul-10
103	Harrington	Angel	Executive	19-Jul-10
104	Dawson	Peter	Executive	19-Jul-10
105	Jones	Mark	Executive	19-Jul-10
106	Grayson	Maureen	Executive	06-Sep-10
107	Millson	Augustine	Administration	06-Sep-10
108	Bennet	Amanda	Administration	06-Sep-10
110	Smith	Neville	Administration	06-Sep-10

1



3

qryEmployees

EmpNo	LastName	Department	Started	WeeklyHou
101	Kerr	Executive	28-Jun-10	40
102	Jones	Executive	19-Jul-10	40
103	Harrington	Executive	19-Jul-10	40
104	Dawson	Executive	19-Jul-10	40
105	Jones	Executive	19-Jul-10	40
106	Grayson	Executive	06-Sep-10	40
107	Millson	Administration	06-Sep-10	40
108	Bennet	Administration	06-Sep-10	40
110	Smith	Administration	06-Sep-10	40

4

For Your Reference…

To ***modify*** a ***saved query***:

1. Open the query in ***Design View***
2. Make changes as appropriate
3. Click on ***Save***

Handy to Know…

- Each time you run a query, a fresh set of data from the underlying table(s) is queried and extracted. When you make a change to a query you are changing its structure and design – not the data that it presents.

CREATING AND QUERIES

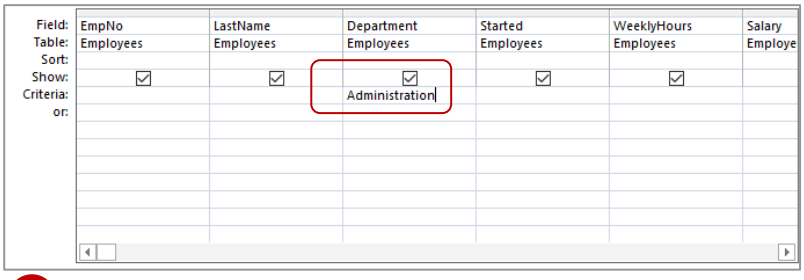
When you create a simple query you place an example of what you want in the ***Criteria*** cell in the query grid. If you place criteria in several cells for different fields, you create an ***AND query***.

This means that for a record to be displayed it must satisfy all of the criteria, that is, it must satisfy the first criteria *AND* the second criteria *AND* any other criteria as specified.

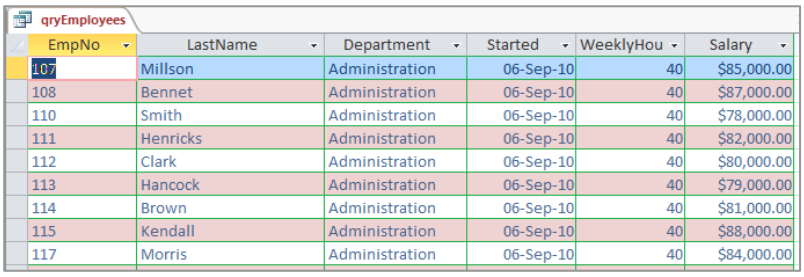
Try This Yourself:

Same File *Continue using the previous file with this exercise, or open the file Query Techniques_2.accdb...*

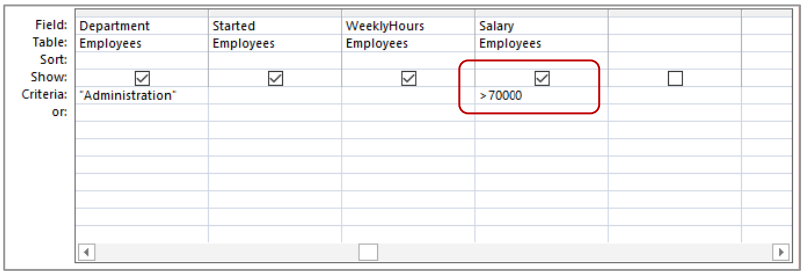
1. Right-click on ***qryEmployees*** and select **Design View**
2. Click in the ***Criteria*** cell for ***Department*** and type **Administration**
3. On the ***Query Tools: Design*** tab, click on the top half of ***View*** in the ***Views*** group to run the query – only ***Administration*** employees are shown (25 records)
4. Click on the top half of ***View*** to return to ***Design View***
5. Click in the ***Criteria*** cell for ***Salary*** and type **>70000**
6. Click on the top half of ***View*** to run the query – only Administration employees with a salary greater than $70,000 are now shown (10 records)
7. Click on the ***File*** tab, click on **Save As**, then click on ***Save Object As*** and click on **[Save As]**
8. Type **Query – AND Example** in ***Save to***, then click on **[OK]**
9. Close the query



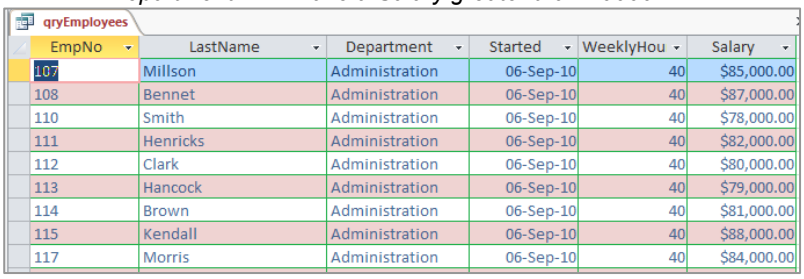
2



3



5 *This query translates to "show all records that have Administration in Department AND have a Salary greater than 70000"*



6

For Your Reference…

To ***create*** an ***AND query***:

1. Open the query in ***Design View***
2. Type multiple criteria in the same ***Criteria*** row for different fields

Handy to Know…

- If no records appear when you run a query, you should check the spelling of the criteria – Access will only find records in the table that exactly match what you have typed.
- To create an ***AND*** query, there must be criteria in the same row in two or more ***Criteria*** cells.

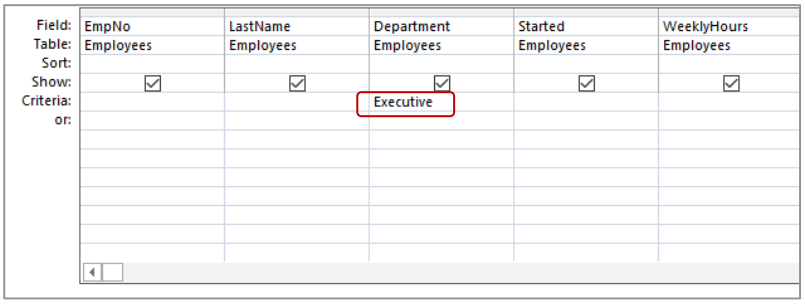
CREATING OR QUERIES

In normal language we use ***AND*** and ***OR*** interchangeably and make ourselves understood. In computers this ambiguity is not possible. For example, we might want Access to list all of the Administration records and to list all of the Executive records. What we really need to ask is to find all records that have ***Administration*** in ***Department*** **OR** ***Executive*** in ***Department***.

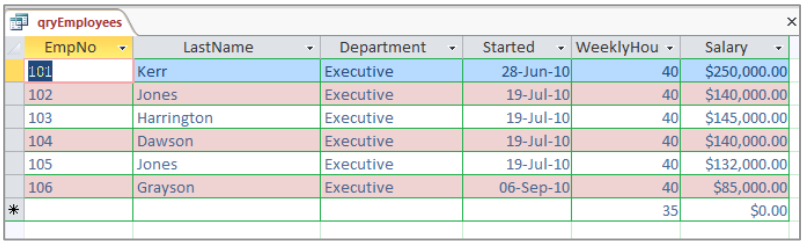
Try This Yourself:

Same File *Continue using the previous file with this exercise, or open the file Query Techniques_3.accdb...*

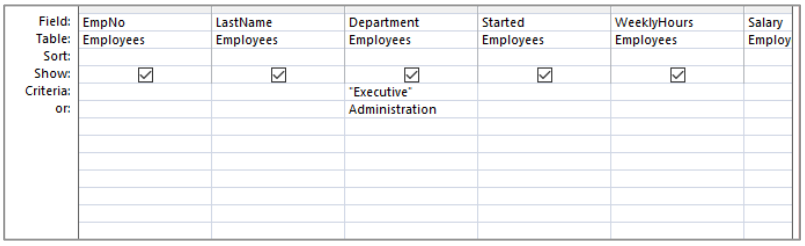
1. Right-click on ***qryEmployees*** and select **Design View**
2. Click in the ***Criteria*** field for ***Department*** and type **Executive**
3. On the ***Query Tools: Design*** tab, click on the top half of ***View*** in the ***Views*** group to run the query – only Executives are shown (6 records)
4. Click on ***View*** to return to ***Design View***
5. Click in the ***or*** field for ***Department*** and type **Administration**
6. Click on ***View*** to run the query – only records with Executive *OR* Administration in ***Department*** are shown (32 records)
7. Click on the ***File*** tab, click on **Save As**, then click on ***Save Object As*** and click on **[Save As]**
8. Type **Query – OR Example** in ***Save to***, then click on **[OK]**
9. Close the query



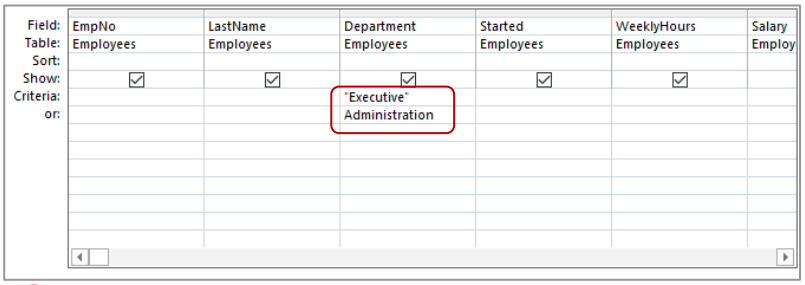
2



3



5



6

For Your Reference…

To ***create*** an ***OR query***:

1. Open the query in ***Design View***
2. Type the first value in the ***Criteria*** field
3. Type subsequent values in the ***or*** fields below the ***Criteria*** field
4. Run the query

Handy to Know…

- Rather than typing multiple values in the ***or*** fields below ***Criteria***, you can use the ***OR*** operator to list multiple matches. To do this you would, for example, type ***"Executive" OR "Administration"*** (including the quotation marks) in the ***Criteria*** field for ***Department***.

QUERYING NUMERIC DATA

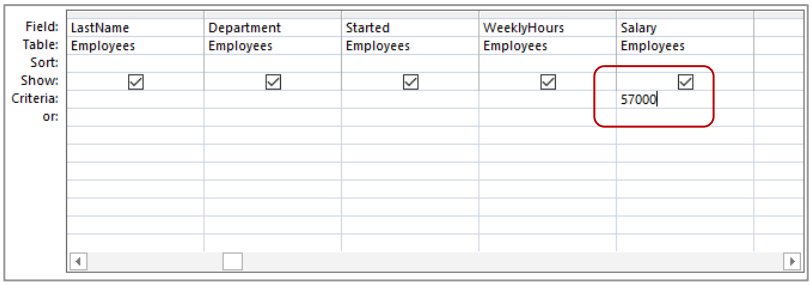
When you select text, you are usually searching for whole words. When querying numeric data however, you generally search for values greater than or less than a specific number. For example, you might want all expenses over $20.00. Numbers can be searched using special ***logical operators*** which tell Access to look for values that are *greater than*, *less than* or *equal to* specific values.

Try This Yourself:

Same File *Continue using the previous file with this exercise, or open the file Query Techniques_4.accdb...*

1. Open ***qryEmployees*** in **Design View**
2. Click in the ***Criteria*** field for ***Salary*** and type **57000**
3. On the ***Query Tools: Design*** tab, click on the top half of ***View*** in the ***Views*** group to show employees with a salary of exactly $57,000
4. Click on ***View*** to return to ***Design View***
5. Click to the immediate left of ***57000***, type **<** , then click on ***View*** to display all employees with a salary less than $57,000
6. Repeat steps ***4*** and ***5*** with the criteria as shown
7. Click on the ***File*** tab, click on **Save As**, then click on ***Save Object As*** and click on **[Save As]**
8. Type **Query – Numeric Data Example** in ***Save to***, then click on **[OK]**
9. Close the query

2



3

qryEmployees

EmpNo	LastName	Department	Started	WeeklyHou	Salary
131	Awad	Sales & Marketing	27-Nov-10	40	$57,000.00
140	Miller	Sales & Marketing	16-Dec-10	40	$57,000.00
170	Hardsley	Research & Develo	06-Nov-10	40	$57,000.00
175	Roberts	Sales & Marketing	06-Nov-10	40	$57,000.00
178	Aaronson	Sales & Marketing	02-Dec-10	40	$57,000.00
*				35	$0.00

5

qryEmployees

EmpNo	LastName	Department	Started	WeeklyHou	Salary
120	Moore	Sales & Marketing	03-Jan-10	40	$51,000.00
124	Hansdon	Sales & Marketing	09-Dec-10	40	$48,000.00
125	Goldblum	Sales & Marketing	06-Nov-10	40	$54,000.00
128	Hanbery	Sales & Marketing	09-Dec-10	35	$34,000.00
133	Tayley	Sales & Marketing	16-Dec-10	40	$43,000.00
134	Ali	Sales & Marketing	02-Dec-10	40	$54,000.00

3

Criteria	Purpose	Records
>57000	list all salaries ***greater than*** $57,000	35
>=57000	list all salaries ***greater than or equal to*** $57,000	40
<57000	list all salaries ***less than*** $57,000	60
<=57000	list all salaries ***less than or equal to*** $57,000	65
<>57000	list all salaries ***not equal to*** $57,000	95

For Your Reference…

To ***query numeric data***:

1. Open the query in ***Design View***
2. Type a numeric value in ***Criteria*** (if necessary, precede it with a logical operator such as >, <, >=, <=, or <>)
3. Run the query

Handy to Know…

- When constructing criteria in queries, numeric data does not have quotation marks around them (unlike text).
- When constructing criteria in queries, the equal sign (=) always appears ***after*** the greater than (>) or less than sign (<), for example, >= or <=.

QUERYING DATES

Dates pose a problem in computer applications such as Access. Dates are normally typed using a slash (/) which is the same symbol used to denote the mathematical operation of division. So how does the computer differentiate between a formula and a date? In Access, this is done by enclosing dates in hash (#) signs. Dates can also be used with logical operators.

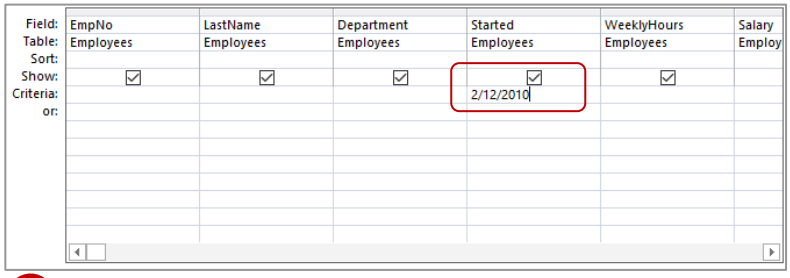
Try This Yourself:

Same File

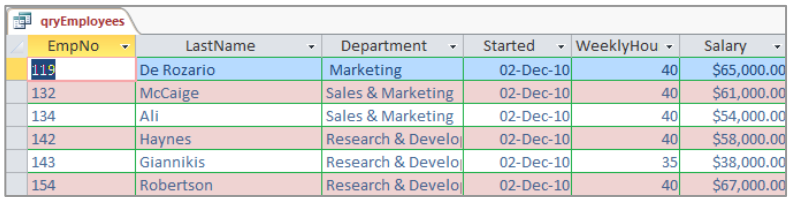
Continue using the previous file with this exercise, or open the file Query Techniques_5.accdb...

1. Right-click on ***qryEmployees*** and select **Design View**
2. Click in the ***Criteria*** field for ***Started*** and type **02/12/10**
3. On the ***Query Tools: Design*** tab, click on the top half of ***View*** in the ***Views*** group to show employees who started on December 2, 2010 (16 records)
4. Click on ***View*** to return to ***Design View***

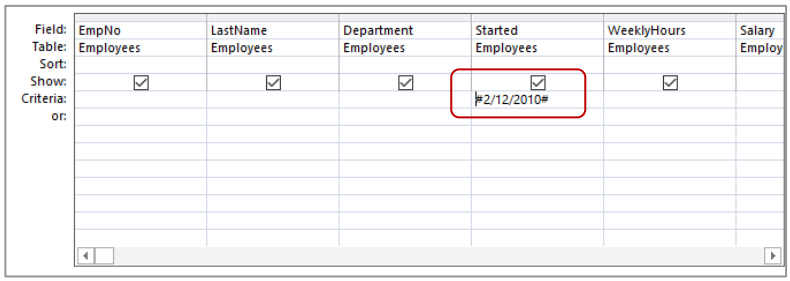
   Notice that the date is enclosed with # symbols…
5. Repeat steps ***2*** to ***4*** for each of the values as shown
6. Click on the ***File*** tab, click on **Save As**, then click on ***Save Object As*** and click on **[Save As]**
7. Type **Query – Date Example** in ***Save to*** and click on **[OK]**
8. Close the query



2



3



4

5

Criteria	Purpose	Records
>2/12/10	employees who started ***after*** December 2, 2010	40
>=2/12/10	employees who started ***on or after*** December 2, 2010	55
<2/12/10	employees who started ***before*** December 2, 2010	45
<=2/12/10	employees who started ***on or before*** December 2, 2010	60
<>2/12/10	employees who started on dates ***other than*** December 2, 2010	85

For Your Reference…

To ***search*** for ***dates using*** a ***query***:

1. Open the query in ***Design View***
2. Type a numeric value (if necessary, precede it with a logical operator such as >, <, >=, <=, or <>)
3. Run the query

Handy to Know…

- In query ***Criteria*** fields, Access will automatically put hash signs around dates for you. The signs will appear when you move off the ***Criteria*** field.
- If your query dates are not working, check Windows to see if your computer is set up for American-style dates (*mm/dd/yy*).

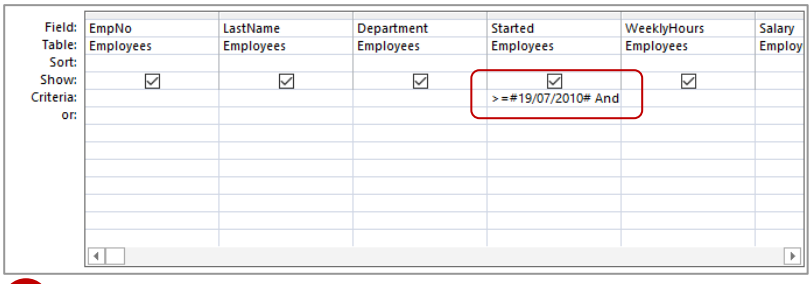
USING A RANGE EXPRESSION

Suppose you want to display all employees who started between *July* and *September*, or all employees with salaries between *80,000* and *100,000*. In this type of query you are looking for records between a ***range*** of criteria. Ranges like this can be handled using a formula in the ***Criteria*** cell of a query – in Access these formulas are known as ***expressions***.

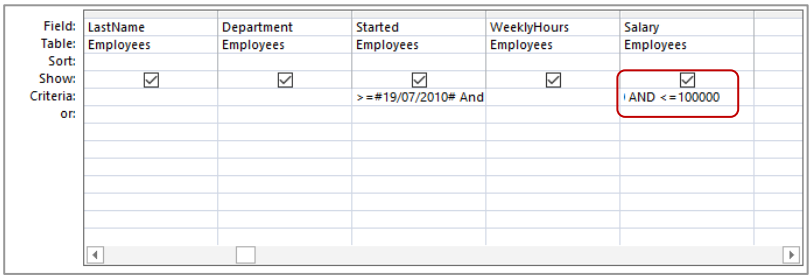
Try This Yourself:

Same File *Continue using the previous file with this exercise, or open the file Query Techniques_6.accdb...*

1. Right-click on ***qryEmployees*** and select **Design View**
2. Click in the ***Criteria*** field for ***Started*** and type **>=19/7/10 AND <=06/9/10**
3. On the ***Query Tools: Design*** tab, click on the top half of ***View*** in the ***Views*** group to show employees who started between July and September, 2010 (15 records)
4. Click on the top half of ***View*** to return to ***Design View***
5. Click in the ***Criteria*** field for ***Salary*** and type **>=80000 AND <=100000**
6. Click on the top half of ***View*** – there should be 8 records
7. Click on the ***File*** tab, click on **Save As**, then click on ***Save Object As*** and click on **[Save As]**
8. Type **Query – Range Expression Example**, then click on **[OK]**
9. Close the query



2



5

qryEmployees

EmpNo	LastName	Department	Started	WeeklyHou	Salary
106	Grayson	Executive	06-Sep-10	40	$85,000.00
107	Millson	Administration	06-Sep-10	40	$85,000.00
108	Bennet	Administration	06-Sep-10	40	$87,000.00
111	Henricks	Administration	06-Sep-10	40	$82,000.00
112	Clark	Administration	06-Sep-10	40	$80,000.00
114	Brown	Administration	06-Sep-10	40	$81,000.00
115	Kendall	Administration	06-Sep-10	40	$88,000.00
117	Morris	Administration	06-Sep-10	40	$84,000.00
				35	$0.00

6 *The range expression in Step 5 pulls out only those employees who started between July and September, 2007 and who have salaries between $80,000 and $100,000.*

For Your Reference…

To ***create*** a ***range formula (expression)***:

1. Open the query in ***Design View***
2. Type the first ***Criteria*** value using **>** or **>=**, type **AND**, then type the second value using **<** or **<=**
3. Run the query

Handy to Know…

- There is a ***Between*** operator that you can use to create a range expression in a query. For example, you can type ***Between 100 And 120*** in the criteria field for (e.g.) ***Amount*** to display the range greater than 100, but less than 120.

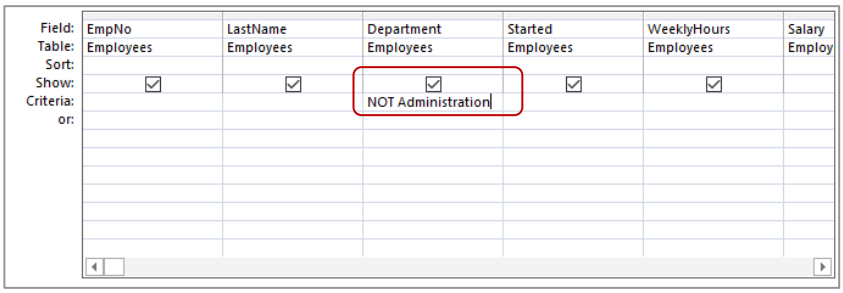
QUERYING OPPOSITE VALUES

Generally, select queries are used to list all of the records that match or conform to specific criteria. However, sometimes you may need to produce an exception listing where all records that do not meet the criteria are selected. This can be done in an Access query using the ***NOT*** operator. This operator is placed in the ***Criteria*** field in front of the sample data.

Try This Yourself:

Same File *Continue using the previous file with this exercise, or open the file Query Techniques_7.accdb...*

1. Right-click on ***qryEmployees*** and select **Design View**
2. Click in the ***Criteria*** field for ***Department*** and type **NOT Administration**
3. On the ***Query Tools: Design*** tab, click on the top half of ***View*** in the ***Views*** group to show all employees who are not in the Administration department (74 records)
4. Click on the top half of ***View*** to return to ***Design View***
5. Click at the end of ***Not "Administration"*** and type **AND NOT Executive**
6. Click on the top half of ***View*** – there should be 68 records
7. Click on the ***File*** tab, click on **Save As**, then click on ***Save Object As*** and click on **[Save As]**
8. Type **Query – Opposite Values Example**, then click on **[OK]**
9. Close the query



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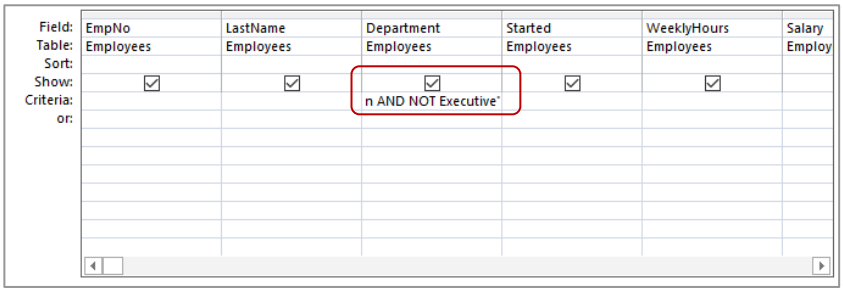


5

qryEmployees

EmpNo	LastName	Department	Started	WeeklyHou	Salary
101	Kerr	Executive	28-Jun-10	40	$250,000.00
102	Jones	Executive	19-Jul-10	40	$140,000.00
103	Harrington	Executive	19-Jul-10	40	$145,000.00
104	Dawson	Executive	19-Jul-10	40	$140,000.00
105	Jones	Executive	19-Jul-10	40	$132,000.00
106	Grayson	Executive	06-Sep-10	40	$85,000.00
107	Millson	Administration	06-Sep-10	40	$85,000.00
108	Bennet	Administration	06-Sep-10	40	$87,000.00
110	Smith	Administration	06-Sep-10	40	$78,000.00

6 *The criteria in Step 5 display only employees that are not in the Administration department and are not in the Executive department*

For Your Reference…

To ***display opposite values***:

1. Open the query in ***Design View***
2. Type the ***Criteria*** value, but precede it with the keyword ***NOT***
3. Run the query

Handy to Know…

- A ***NOT*** expression can sometimes be an efficient substitute for a complex ***OR*** expression. Rather than specifying all of the things you want using ***OR***, you can specify what you *don't want* using ***NOT***.

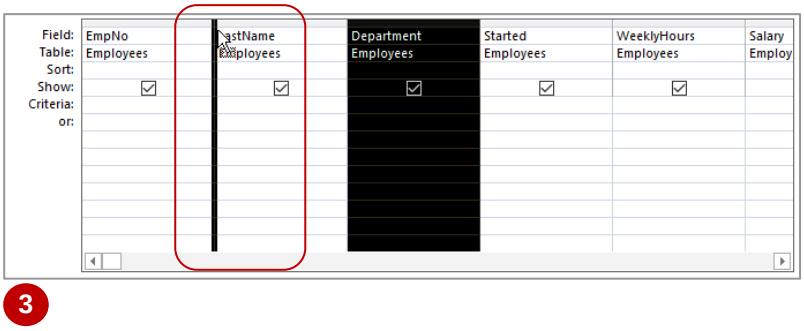
MOVING FIELDS IN A QUERY

When you first create a query, you will add the fields in the order that you think you will need them. However, you may find a situation where you want to reorganise the fields to create a slightly different report. Moving fields in a query grid is virtually the same as moving fields in a table – it is simply a matter of dragging and dropping the fields into their new positions.

Try This Yourself:

Same File *Continue using the previous file with this exercise, or open the file Query Techniques_8.accdb...*

1. Right-click on ***qryEmployees*** and select **Design View**
2. Click slightly above the ***Department*** column header to select the column
3. Drag the column header left, until a thick black vertical line appears to the left of ***EmpNo***
4. Release the mouse button to complete the move
5. Repeat steps ***2*** to ***4*** to move the ***EmpNo*** field to the right of ***LastName***
6. On the ***Query Tools: Design*** tab, click on the top half of ***View*** in the ***Views*** group to see how the moved columns appear
7. Click on the ***File*** tab, click on **Save As**, then click on ***Save Object As*** and click on **[Save As]**
8. Type **Query – Moving Fields Example** in ***Save to***, then click on **[OK]**
9. Close the query



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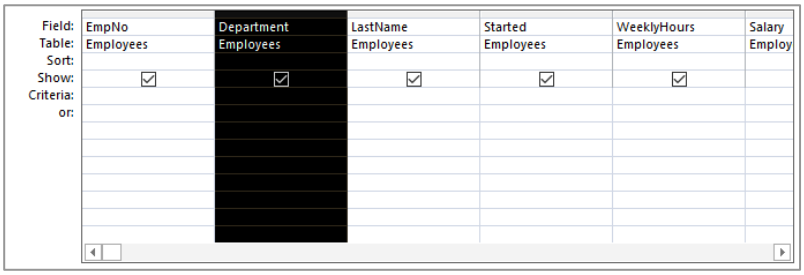

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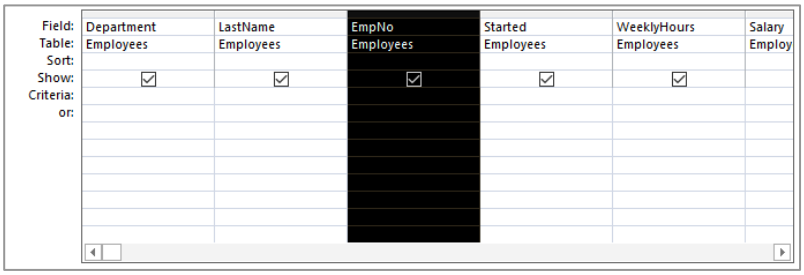


5

qryEmployees

Department	LastName	EmpNo	Started	WeeklyHou	Salary
Executive	Kerr	101	28-Jun-10	40	$250,000.00
Executive	Jones	102	19-Jul-10	40	$140,000.00
Executive	Harrington	103	19-Jul-10	40	$145,000.00
Executive	Dawson	104	19-Jul-10	40	$140,000.00
Executive	Jones	105	19-Jul-10	40	$132,000.00
Executive	Grayson	106	06-Sep-10	40	$85,000.00
Administration	Millson	107	06-Sep-10	40	$85,000.00
Administration	Bennet	108	06-Sep-10	40	$87,000.00
Administration	Smith	110	06-Sep-10	40	$78,000.00

6

For Your Reference…

To ***move*** a ***field*** in the ***query grid***:

1. Open the query in ***Design View***
2. Click on the column header, then drag the header to a new location

Handy to Know…

- Once a query is run you can drag columns around in the ***Datasheet*** view of the query – remember, the ***Datasheet*** view of a query is like the ***Datasheet*** view of a table, and whatever you can do in a table, you can do in the query result.

SORTING QUERY DATA

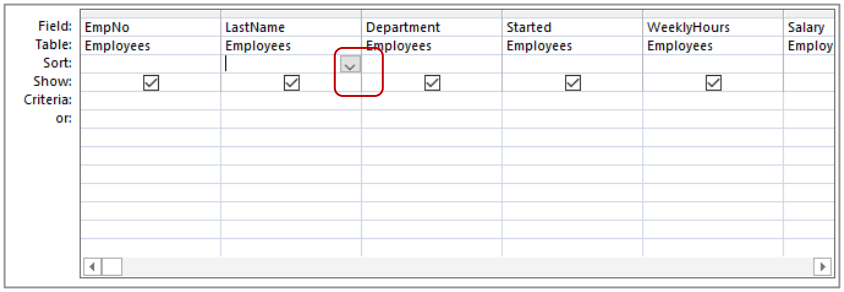
As a default, the data in a query datasheet is sorted in the same order as the underlying table upon which the query is based. You can actually change this using the ***Sort*** option that appears in the query grid. The ***Sort*** option allows you to nominate which fields to sort the results on – you can also specify the sort order (***ascending*** or ***descending***).

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Query Techniques_9.accdb...

1. Right-click on ***qryEmployees*** and select **Design View**
2. Click in the ***Sort*** field for ***LastName*** to display the drop arrow
3. Click on the drop arrow and select **Ascending** so that the ***LastName*** field will be sorted from A – Z
4. On the ***Query Tools: Design*** tab, click on the top half of ***View*** in the ***Views*** group to see the results table sorted by ***LastName***
5. Click on the ***File*** tab, click on **Save As**, then click on ***Save Object As*** and click on **[Save As]**
6. Type **Query – Sorting Example** in ***Save to***, then click on **[OK]**
7. Close the query



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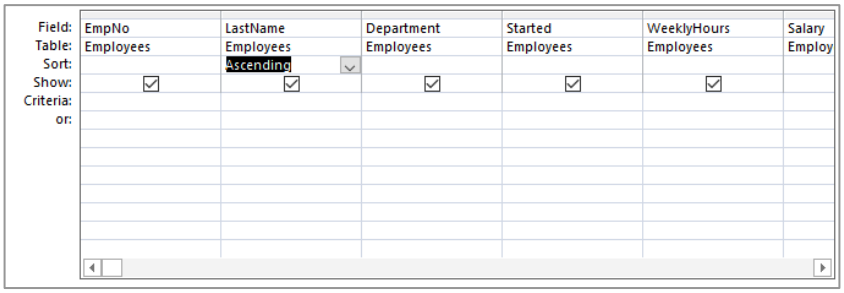
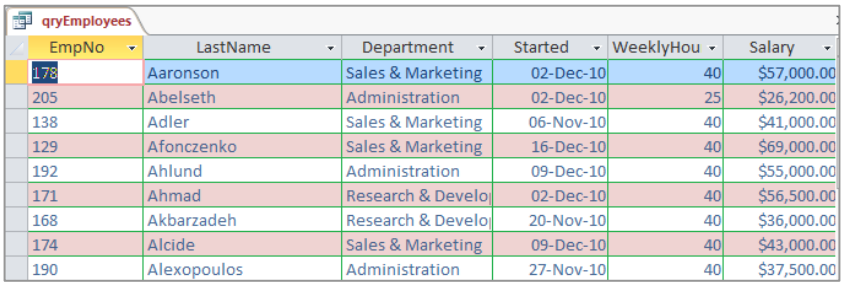


3



4

For Your Reference…

To ***create*** a ***sorted query***:

1. Open the query in ***Design View***
2. Click in ***Sort*** for the field to sort by
3. Click on the drop arrow and select either **Ascending** or **Descending**

Handy to Know…

- By default, sorting in a query grid is performed in the order of the fields in the grid.

REMOVING FIELDS FROM A QUERY

Queries are often constructed using a process of trial and error. Since the structure of a query is largely determined by the underlying table of the query, not as much planning and thought needs to go into choosing the fields for a query. So you can add and remove fields as and when required. Removing a field from a query is done using the ***Delete Columns*** command.

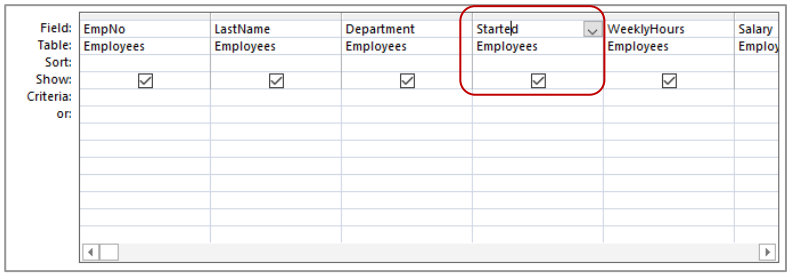
Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Query Techniques_10.accdb...

1. Right-click on ***qryEmployees*** and select **Design View**
2. Click in the ***Started*** field header in the query grid
3. On the ***Query Tools: Design*** tab, click on ***Delete Columns*** in the ***Query Setup*** group to remove the selected field

   You can also remove several fields at once…
4. Click on the grey bar directly above ***Department*** to select the field, then hold down Shift and click on the grey bar above ***Salary*** to select the three fields
5. Repeat step ***3*** to delete the selected fields
6. Click on the ***File*** tab, click on **Save As**, then click on ***Save Object As*** and click on **[Save As]**
7. Type **Query – Deleted Fields Example** in ***Save to***, then click on **[OK]**
8. Close the query



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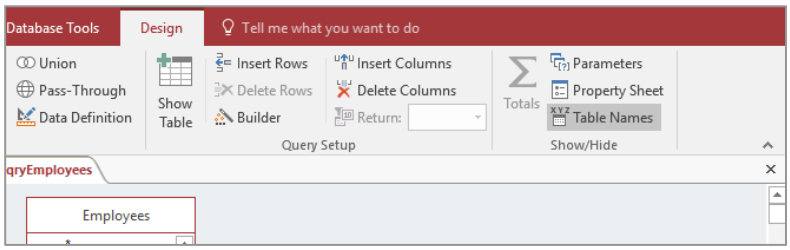
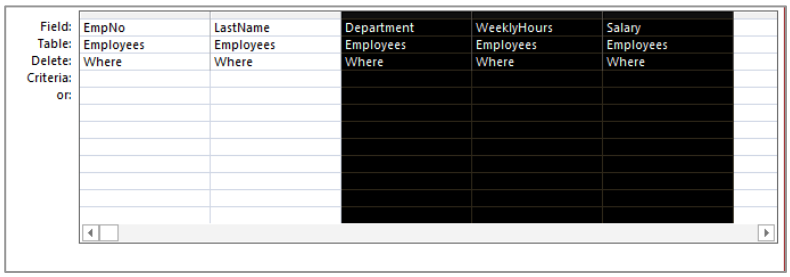
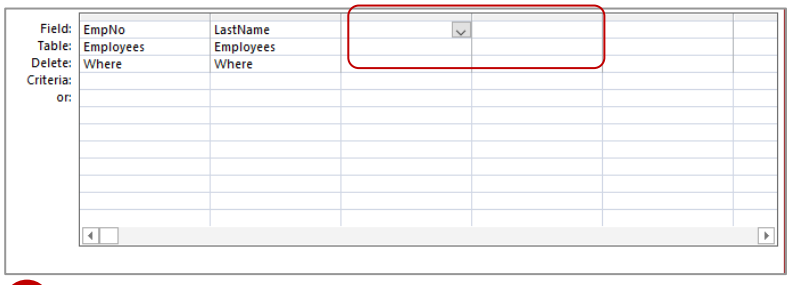


3



4



5

For Your Reference…

To ***delete fields from*** the ***query grid***:

1. Select the field(s) to delete
2. On the ***Query Tools: Design*** tab, click on ***Delete Columns*** in the ***Query Setup*** group

Handy to Know…

- If you are unsure about deleting a field, remove the tick from the ***Show*** tick box of the field. This way, the field will still remain in the query grid, but will not appear when the query is run.

QUERYING USING WILDCARDS

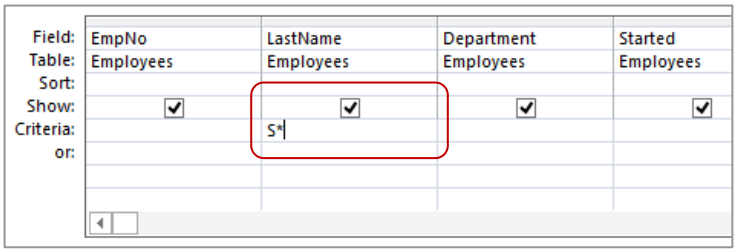
Sometimes you don't know exactly what you are looking for or you may only want to match the first character or two. In these situations you can query using a ***wildcard***. There are two wildcards: the ***asterisk*** (*****) is used to replace any number of characters at the position of the asterisk; while the ***question mark*** (**?**) is used for any single character in the same position as the wildcard.

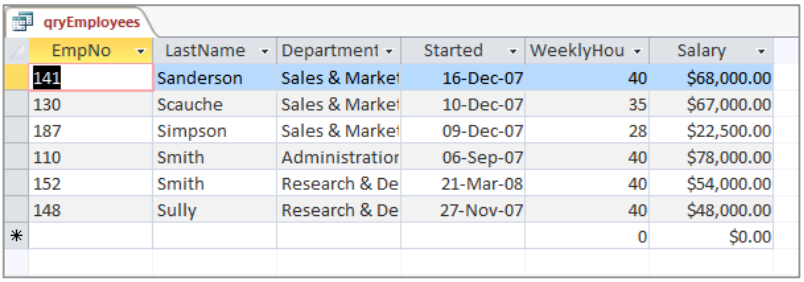
Try This Yourself:

Open File *Before starting this exercise you MUST open the file Query Techniques_11.accdb...*

1. Right-click on ***qryEmployees*** and select **Design View**
2. Click in the ***Criteria*** field for ***LastName*** and type **S***
3. On the ***Query Tools: Design*** tab, click on the top half of ***View*** in the ***Views*** group to see all employees whose last name begins with S (6 records)
4. Click on the top half of ***View*** in the ***Views*** group, to return to ***Design View***
5. Try some alternatives in the ***Criteria*** field for ***LastName***, as shown
6. Click on the ***File*** tab, click on **Save As**, then click on ***Save Object As*** and click on **[Save As]**
7. Type **Query – Wildcard Example** in ***Save to***, then click on **[OK]**
8. Close the query

2





3

5

Criteria	Purpose	Records
Sa*	list all employees whose last name begins with the letters ***Sa***	1
*son	list all employees whose last name ends with the letters ***son***	12
"[CS]*"	list all employees whose last name begins with either the letter ***C*** or ***S***	13
S?m*	list all employees whose last name begins with the letter ***S,*** contains anything as the second letter and has ***m*** as the third letter	1

For Your Reference…

To ***use*** a ***wildcard*** to ***search*** in a ***query***:

1. Open the query in ***Design View***
2. Type the ***Criteria*** using either the ***** wildcard to replace all subsequent characters, or the **?** wildcard to replace only the current letter
3. Run the query

Handy to Know…

- When you use a wildcard in queries, Access uses the ***Like*** operator in the criteria. You will notice that the criteria is changed by Access to (e.g.) ***Like "Sa*"***. You can of course type the criteria this way yourself if you wish.

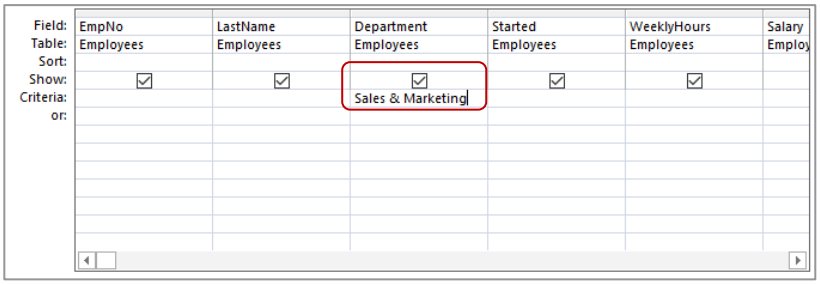
PROBLEM CHARACTERS

There are certain problem characters that can cause errors in select queries. Generally, you should avoid brackets and ampersand (&) characters when working with fields as these are sometimes used to perform special operations. If you need to query using special characters, the whole criteria should be enclosed within quotation marks.

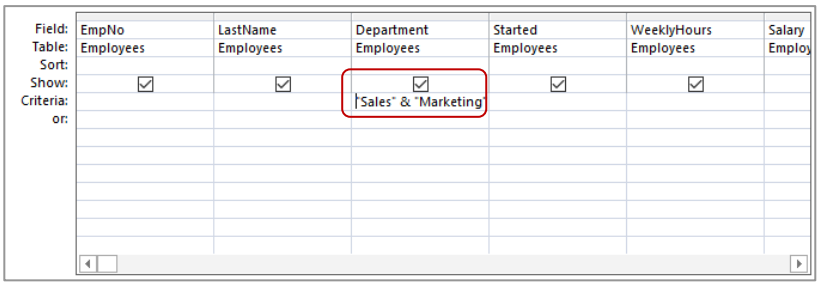
Try This Yourself:

Same File *Continue using the previous file with this exercise, or open the file Query Techniques_12.accdb...*

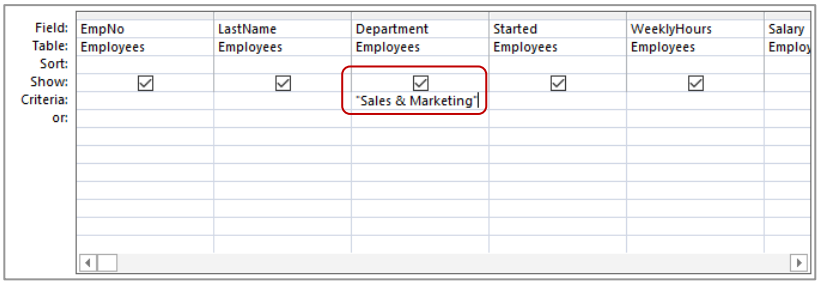
1. Right-click on ***qryEmployees*** and select **Design View**
2. Click in the ***Criteria*** field for ***Department*** and type **Sales & Marketing**
3. On the ***Query Tools: Design*** tab, click on the top half of ***View*** in the ***Views*** group – no records will appear
4. Click on the top half of ***View*** to see how Access has converted your criteria because of the ampersand
5. Replace the value in ***Criteria*** with **"Sales & Marketing"** as shown
6. Click on the top half of ***View*** to now see 32 Sales & Marketing records
7. Click on the ***File*** tab, click on **Save As**, then click on ***Save Object As*** and click on **[Save As]**
8. Type **Query – Problem Character Example** in ***Save to***, then click on **[OK]**
9. Close the query



2 *The query is asking Access to display records that have only Sales and only Marketing in the Department field, rather than Sales & Marketing.*



4 *Quotation marks enclose the individual words **Sales** and **Marketing**…*



5 *…when actually you want the whole phrase **Sales & Marketing** enclosed*

For Your Reference…

To ***query*** when ***special characters*** are ***involved***:

1. Open the query in ***Design View***
2. Click in ***Criteria*** for the relevant field
3. Type the criteria, including the special character, enclosed within quotation marks

Handy to Know…

- If you need to search for an accented word in a query, such as ***café***, use the question mark (?) wildcard character in the place of the accented letter.

QUERYING WITH A LOOKUP TABLE

Queries can be created using more than one table as the source. This is particularly useful where ***lookup tables*** are involved. This is important in transactional tables where informational data is contained in the lookup table. Using queries, it is very easy to extract relevant data from both associated tables in a lookup configuration.

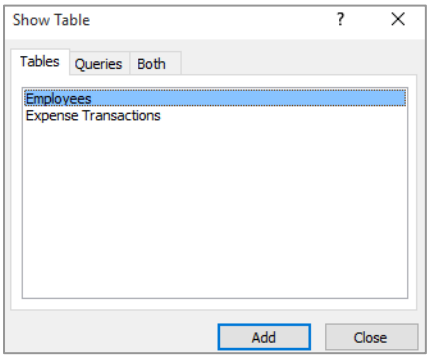
Try This Yourself:

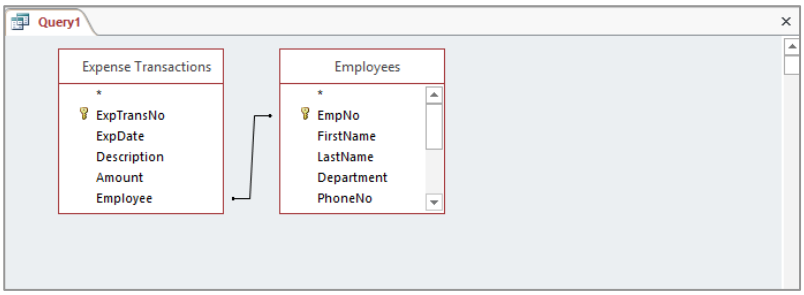
Open File

Before starting this exercise you MUST open the file Query Techniques_13.accdb…

1. Click on the ***Create*** tab, then click on ***Query Design*** in the ***Queries*** group to display the ***Show Table*** dialog box
2. Double-click on ***Expense Transactions***, then on ***Employees*** to add both tables to the query, then click on **[Close]**
3. Double-click on the ***ExpDate***, ***Description*** and ***Amount*** fields in ***Expense Transactions*** to add them to the grid
4. Double-click on the ***LastName***, ***FirstName*** and ***Department*** fields in ***Employees*** to add them to the grid
5. Ensure the ***Query Tools: Design*** tab is selected, then click on the top half of ***View*** in the ***Views*** group to run the query
6. Click on the ***File*** tab and select **Save As**, then click on ***Save Object As*** and click on **[Save As]**
7. Type **Query – Lookup Table Example** in ***Save to*** and click on **[OK]**
8. Close the query

1





2

ExpDate	Description	Amount	LastName	FirstName	Department
2/01/2017	commodatic	$132.00	Dawson	Peter	Executive
2/01/2017	Accommodatic	$145.00	Kerr	Julianne	Executive
2/01/2017	Gifts	$27.06	Ali	Syed	Sales & Marketir
2/01/2017	Postage	$3.59	Moore	Belinda	Sales & Marketir
2/01/2017	Postage	$16.99	Morris	Charles	Administration
2/01/2017	Accommodatic	$154.50	Clark	Vivienne	Administration
2/01/2017	Accommodatic	$125.50	Millson	Augustine	Administration
2/01/2017	Other Expense	$48.39	Dangaard	Elizabeth	Research & Deve
2/01/2017	Coffee and Tea	$18.26	Brown	Victor	Administration
2/01/2017	Accommodatic	$123.44	McDonald	Victoria	Research & Deve
2/01/2017	Accommodatic	$237.86	Williams	Lance	Administration
2/01/2017	Meals	$52.86	Millson	Augustine	Administration
16/01/2017	Accommodatic	$155.60	Millson	Augustine	Administration

5

For Your Reference…

To ***query*** with a ***lookup table***:

1. Click on the ***Create*** tab, then click on ***Query Design*** in the ***Queries*** group
2. Choose the transaction and the lookup table in the ***Show Table*** dialog box
3. Choose fields as normal

Handy to Know…

- When querying with a lookup table, tables are automatically shown as linked (*related*) when they are added to the query because a formal lookup relationship was established when the tables were first built. If no link lines appear in the query, you can create them within the query yourself.

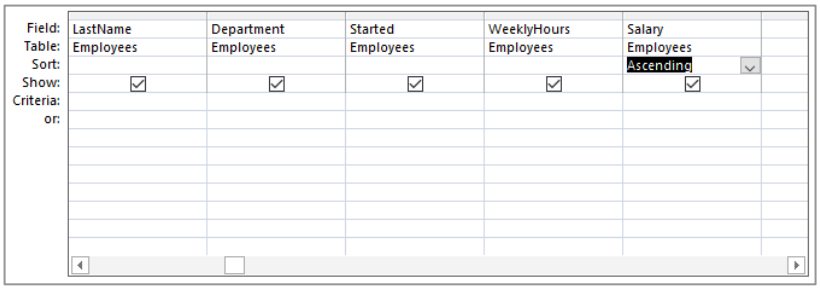
SORTING QUERY DATA NUMERICALLY

Sorting can be done in a query (and also a datasheet for that matter) on either alphabetical or numerical data. When you sort a numeric field, your data will be sorted either from highest to lowest (***descending***) or from lowest to highest (***ascending***). In our case study, for example, we can use this to find out the employees with the highest and lowest salaries.

Try This Yourself:

Open File *Before starting this exercise you MUST open the file Query Techniques_14.accdb...*

1. Right-click on ***qryEmployees*** and select **Design View**
2. Click in the ***Sort*** field for ***Salary*** to display the drop arrow
3. Click on the drop arrow and select **Ascending** to sort the query by ***Salary***, from lowest to highest
4. On the ***Query Tools: Design*** tab, click on the top half of ***View*** in the ***Views*** group to see the sorted query
5. Click on the top half of ***View***, then click on the ***Sort*** drop arrow and select **Descending**
6. Click on the top half of ***View*** to see the salaries sorted from highest to lowest
7. Click on the ***File*** tab, click on **Save As**, then click on ***Save Object As*** and click on **[Save As]**
8. Type **Query – Sorting Numerically** in ***Save to***, then click on **[OK]**
9. Close the query



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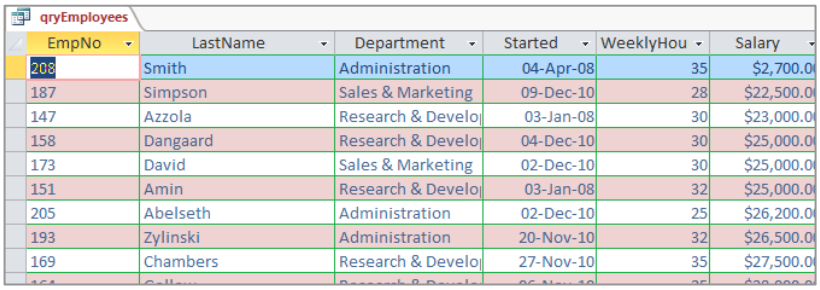

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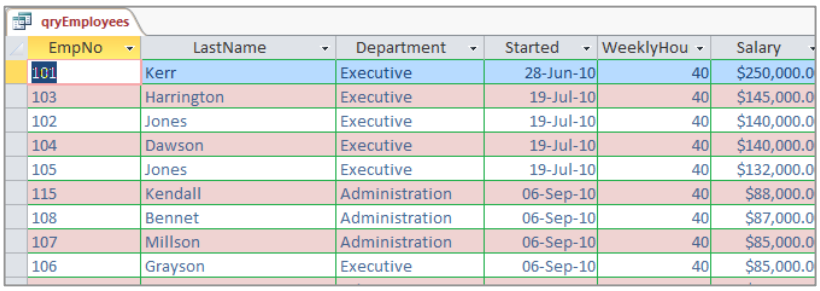


6

For Your Reference…

To ***create*** a ***sorted query***:

1. Open the query in ***Design View***
2. Click in ***Sort*** for the field to sort by
3. Click on the drop arrow and select either **Ascending** or **Descending**

Handy to Know…

- You can easily sort a query table after it has been run by clicking on the field heading you wish to use for sorting.

DISPLAYING NULL VALUES

In Access, a field in a record that is left empty is said to contain a ***NULL*** value. Searching for fields with ***NULL*** values can be challenging. For example, if you leave the appropriate query cell in a grid empty you'll get all records because there is nothing to match. To search for ***NULL*** records you must use the ***Is NULL*** expression which performs a test to see if the field is empty.

Try This Yourself:

Open File

Before starting this exercise you MUST open the file Query Techniques_15.accdb…

1. Double-click on the table ***Employees*** to open it, then if necessary scroll across so you can see the ***Started*** field

   Notice that some of the Started fields are empty…

2. Close the table, then right-click on ***qryEmployees*** and select **Design View**
3. Click in the ***Criteria*** field for ***Started*** and type **Is Null**
4. On the ***Query Tools: Design*** tab, click on the top half of ***View*** in the ***Views*** group to see all of the records that have an empty ***Started*** field
5. Click on the ***File*** tab, click on **Save As**, then click on ***Save Object As*** and click on **[Save As]**
6. Type **Query – NULL Example** in ***Save to***, then click on **[OK]**
7. Close the query

Employees

Department	PhoneNo	Started	DateOfBirth	FullTime	WeeklyHou	Sala
Executive	75001	28-Jun-10	05-Feb-60	☑	40	$25(
Executive	75002	19-Jul-10	13-Apr-65	☑	40	$14(
Executive	75003	19-Jul-10	19-Aug-58	☑	40	$14:
Executive	75004	19-Jul-10	12-Jul-54	☑	40	$14(
Executive	75005	19-Jul-10	06-Aug-63	☑	40	$13:
Executive	61021	06-Sep-10	23-Oct-74	☑	40	$8:
Administration	61022		07-Dec-78	☑	40	$8:
Administration	61023		04-May-59	☑	40	$8:
Administration	61025	06-Sep-10	07-Aug-54	☑	40	$7:

1

Field:	EmpNo	LastName	Department	Started	WeeklyHours	Salary
Table:	Employees	Employees	Employees	Employees	Employees	Employ
Sort:						
Show:	☑	☑	☑	☑	☑	
Criteria:				Is Null		
or:						

3

qryEmployees

EmpNo	LastName	Department	Started	WeeklyHou	Salary
107	Millson	Administration		40	$85,000.(
108	Bennet	Administration		40	$87,000.(
120	Moore	Sales & Marketing		40	$51,000.(
125	Goldblum	Sales & Marketing		40	$54,000.(
190	Alexopoulos	Administration		40	$37,500.(
194	Hurst	Administration		40	$45,000.(
*				35	$0.(

4

For Your Reference…

To ***display empty fields using*** a ***query***:

1. Open a query in ***Design View***
2. Type **Is Null** in the relevant ***Criteria*** cell
3. Run the query

Handy to Know…

- Do not press Space to clear data from a field in a table. A space is a valid character and although you can't see anything in the field, it is still deemed to contain an entry.

QUERYING FOR UNIQUENESS

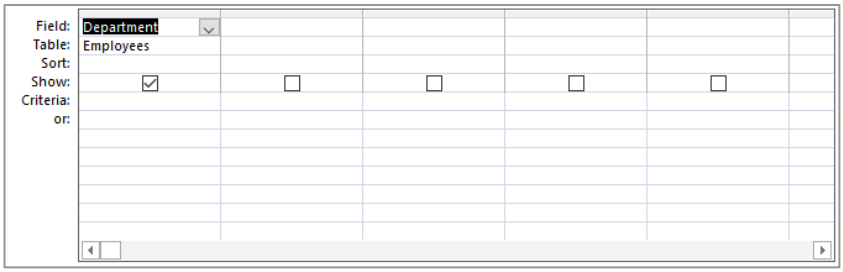
With queries it is possible to see just one example of a record. Let's say you have a database of customer contacts. It is possible in this database that there are multiple contact people for a particular company. If you only want to find the companies that you deal with (rather than all of their contact points), you can run a query for uniqueness on the company.

Try This Yourself:

Same File *Continue using the previous file with this exercise, or open the file Query Techniques_16.accdb...*

1. Click on the ***Create*** tab, then click on ***Query Design*** in the ***Queries*** group
2. Double-click on ***Employees*** in the ***Show Table*** dialog box, then click on **[Close]**
3. Double-click on the ***Department*** field to place it in the query grid
4. Run the query to see all of the records (100 of them), then return to ***Design View***
5. On the ***Query Tools: Design*** tab, click on ***Property Sheet*** in the ***Show/Hide*** group to display the ***Property Sheet*** pane, then click in a blank part of the query so ***Query Properties*** appears in the ***Property Sheet*** pane
6. Click on ***No*** in ***Unique Values***, then click on its drop arrow and click on ***Yes***
7. Click on ***Run***

   Each Department will appear only once…
8. Close the query without saving



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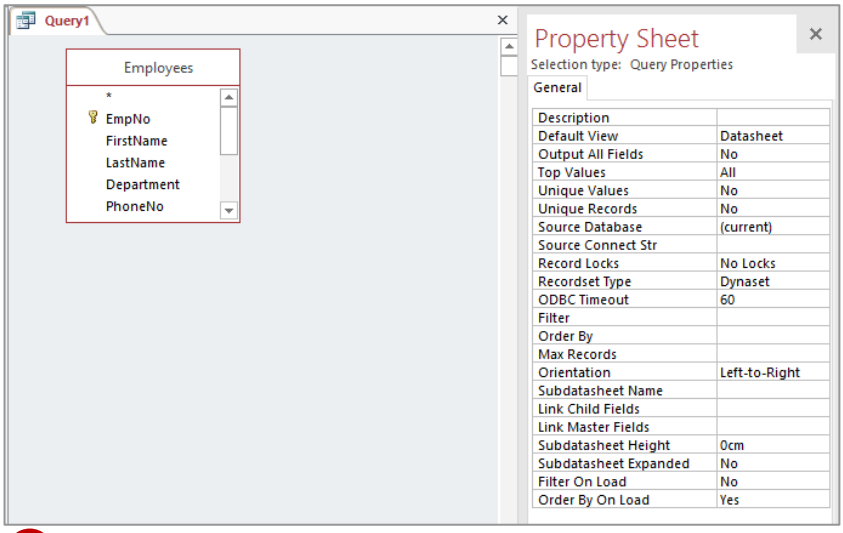

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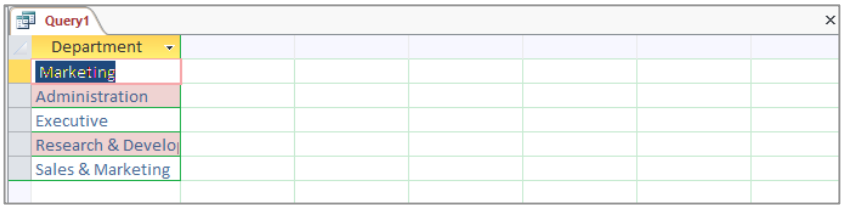


7

For Your Reference…

To ***query*** for ***uniqueness***:

1. In query ***Design View***, display the ***Property Sheet*** pane
2. Change the ***Unique Values*** property to ***Yes***
3. Run the query

Handy to Know…

- When querying for uniqueness, don't confuse ***Unique Values*** with ***Unique Records***. In a table with a primary key every record is unique so marking the ***Unique Record*** property as unique will still give you all of the records.

NOTES:

CHAPTER 3 MULTI-TABLE QUERIES

INFOCUS

The real benefits associated with relational databases and queries become clear when you need to create a query that draws on data from several tables.

With single tables you can create filters that essentially filter out unwanted data and display only what you need to see.

To draw data from several tables, however, you are better advised to create a query. Queries that span multiple tables actually use the underlying table join settings to extract data quickly and easily for either one-off informational queries or full scale report-destined queries.

In this session you will:

- ✓ gain an understanding of how relational queries work
- ✓ learn how to create a relational query design
- ✓ learn how to filter a relational query
- ✓ learn how to filter related fields and some of the associated problems
- ✓ learn how to add more tables and fields to a query design
- ✓ learn how to work with hidden fields in the query grid
- ✓ gain an understanding of the three join types in ***Access***
- ✓ learn how to create an inner join query
- ✓ learn how to create a left outer join
- ✓ learn how to create a right outer join.

UNDERSTANDING RELATIONAL QUERIES

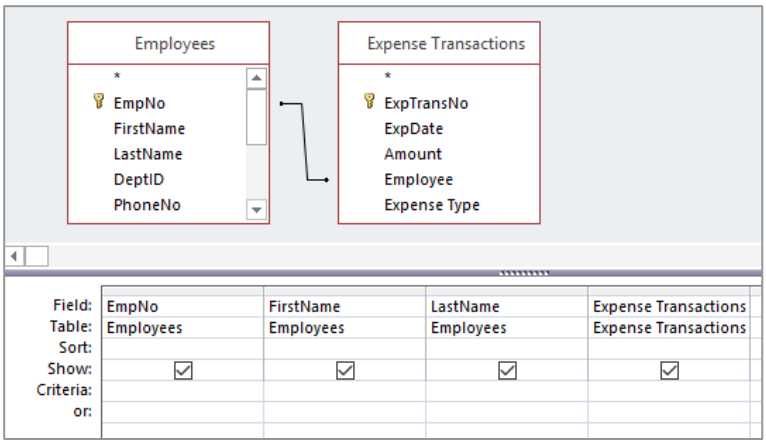
A query is like a filter that you can place on your data so that you can see or work with only the information that is relevant. Queries are used to display data (***Select*** query) or to change data (***Update*** query). ***Relational queries*** involve one or more linked tables and are the ideal way to create reports comprising of data from several different tables.

How Relational Queries Work

All queries, including relational queries, are based on a ***Query Design***.

The upper part of the design is known as the ***Field List***, where Access displays the table or tables used for the query. If more than one table is chosen and the chosen tables are related, relational links will show how the tables are connected.

The lower part of the query design is known as the ***Query Grid***, where Access displays the fields from the tables that need to be used in the query operation. You can choose all fields to display, or a subset of the fields, which is more common. The ***Query Grid*** is also used to enter examples of the data for the query to search for. This sample data is known as ***criteria***.



The Field List displays the related tables – note how the links provide information about the type of join.

The Query Grid contains the settings that determine the data that will be presented.

In the example above, fields from all of the tables have been pulled into the query grid. Because of the nature of the joins (one-to-many) the resultant query will use the data from the transaction table (***Expense Transactions***) and supplement it with information from the two lookup tables (***Employees*** and ***Expense Type***).

The criteria above is asking Access to present us with all transactions on or after March 1, 2015, and for either meals or postage greater than or equal to $50. When run, the resultant query would appear as:

Query1

EmpNo	FirstName	LastName	ExpTransNo	ExpDate	Amount	Employee	Expense Type
104	Peter	Dawson	1	2/01/2015	$132.00	Dawson	Accommodation
101	Julianne	Kerr	2	2/01/2015	$145.00	Kerr	Accommodation
134	Syed	Ali	3	2/01/2015	$27.06	Ali	Gifts
120	Belinda	Moore	4	2/01/2015	$3.59	Moore	Postage
117	Charles	Morris	5	2/01/2015	$16.99	Morris	Postage
112	Vivienne	Clark	6	2/01/2015	$154.50	Clark	Accommodation
107	Augustine	Millson	7	2/01/2015	$125.50	Millson	Accommodation
158	Elizabeth	Dangaard	8	2/01/2015	$48.39	Dangaard	Other
114	Victor	Brown	9	2/01/2015	$18.26	Brown	Subsistence
153	Victoria	McDonald	11	2/01/2015	$123.44	McDonald	Accommodation
118	Lance	Williams	12	2/01/2015	$237.66	Williams	Accommodation
107	Augustine	Millson	13	2/01/2015	$52.86	Millson	Subsistence
107	Augustine	Millson	14	16/01/2015	$155.60	Millson	Accommodation
*			(New)				

CREATING A RELATIONAL QUERY DESIGN

Irrespective of whether you are creating a query for a single table or for multiple tables, the query is originally created from options on the ***Create*** tab on the ribbon. The key to multiple-table queries is selecting the tables to use when the ***Show Table*** dialog box appears. Here you can select which tables to pull into the ***Field List*** on the query design.

Try This Yourself:

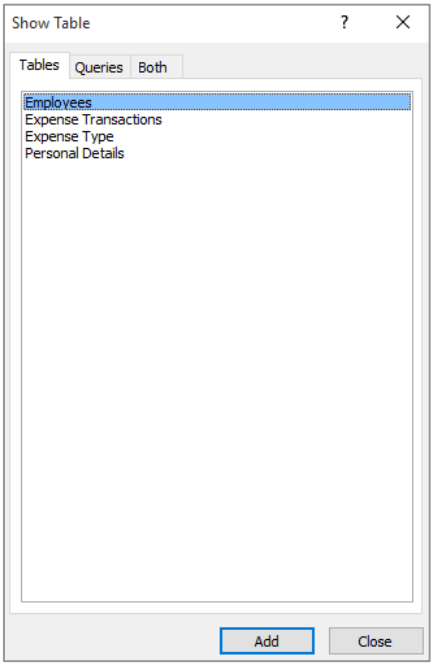
Open File

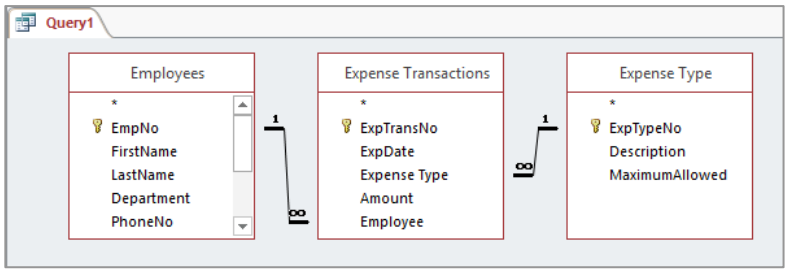
Before starting this exercise you MUST open the file Multi Table Queries_1.accdb…

1. Click on the ***Create*** tab, then click on ***Query Design*** in the ***Queries*** group to display the ***Show Table*** dialog box
2. Double-click on the tables: ***Employees***, ***Expense Transactions*** and ***Expense Type***, then click on **[Close]**
3. Double-click on the fields, as listed, to populate the query grid
4. Click on ***Save*** in the ***QAT*** to display the ***Save As*** dialog box
5. Type **Employee Expenses** in ***Query Name***, then click on **[OK]**

   The new query is listed in the Navigation pane…
6. On the ***Query Tools: Design*** tab, click on ***Run*** to run the query
7. Close the query

1





2

3

Table:	Field:
Expense Transactions	*ExpDate*
	Expense Type
	Amount
Employee	*FirstName*
	LastName
	Department
	PhoneNo

For Your Reference…

To ***create*** a ***relational query***:

1. Click on the ***Create*** tab and click on ***Query Design*** in the ***Queries*** group
2. Double-click on the tables to add
3. Double-click on the fields to add to the query grid

Handy to Know…

- It doesn't matter in which order you place tables in the ***Field List*** in the query because how the data is presented when the query is run is determined by the relationship joins.

FILTERING A RELATIONAL QUERY

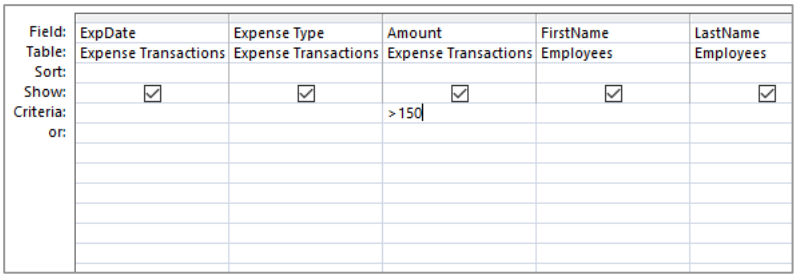
A relational query is filtered in the same way as a single table query by providing examples of the data in the criteria cells displayed in the query grid. Text field examples need to be enclosed in quotation marks, but Access will do this for you. Numeric and date fields can make use of operators such as greater than, less than, equal to, and so on.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Multi Table Queries_2.accdb...

1. Open the query ***Employee Expenses*** in ***Design View***
2. Click in the ***Criteria*** cell for ***Amount*** and type **>150**
3. On the ***Query Tools: Design*** tab, click on ***Run*** in the ***Results*** group to display all of the transactions greater than ***150***
4. On the ***Home*** tab, click on the top half of ***View*** in the ***Views*** group to return to ***Design View***, then delete the previous criteria and try each of the examples as shown (delete the previous criteria after each one)
5. Close the query – click on **[No]** to close without saving the design changes



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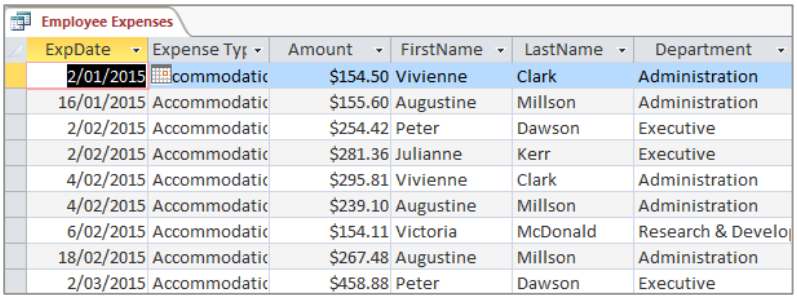

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Field:	Criteria:
Department	*Executive*
ExpDate	*>01/07/08*
ExpDate	*Between 01/06/08 And 30/06/08*

For Your Reference…

To ***filter*** a ***relational query***:

1. Open the query in ***Design View***
2. Type a relevant example or expression in the ***Criteria*** cell of the appropriate fields

Handy to Know…

- If you save a query as it is closed, the last criteria example used will be saved with the query. If you want to keep the ***Criteria*** cells clear, don't save the query.

FILTERING RELATED FIELDS

The real strength of ***related queries*** is not only being able to choose fields from different tables for the query, but also to be able to filter them and provide them with criteria values. While this works well for most fields, there are a few problems when trying to filter on the lookup fields that have been used to create the relationship between the tables.

Try This Yourself:

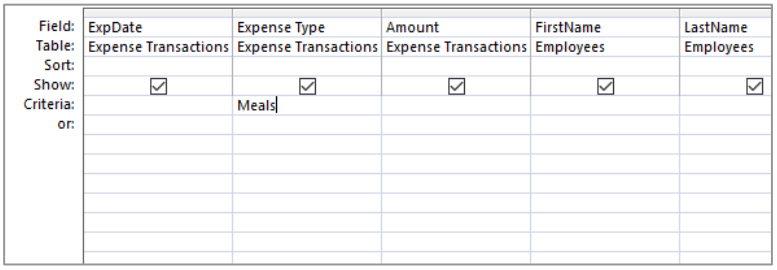
Same File

Continue using the previous file with this exercise, or open the file Multi Table Queries_2.accdb...

1. Open the query ***Employee Expenses*** in ***Design View***
2. Click in the ***Criteria*** cell for ***Expense Type*** and type **Meals**
3. On the ***Query Tools: Design*** tab, click on ***Run*** in the ***Results*** group

   An error message will appear indicating a data mismatch. This has occurred because Expense Type is actually a numeric field which looks up the Expense Type table using the ExpTypeNo field…
4. Click on **[OK]** to close the message
5. Select the value in ***Criteria*** for ***Expense Type*** and type **6**

   This is the ExpTypeNo for Meals…
6. On the ***Query Tools: Design*** tab, click on ***Run*** in the ***Results*** group to display all of the transactions for ***Meals***
7. Close the query – click on **[No]** to discard the changes



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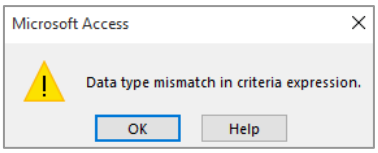

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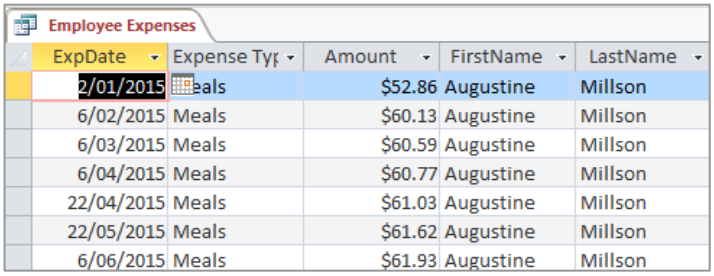


For Your Reference…

To ***filter related fields***:

1. Type examples into the ***Criteria*** cell of any field in the query grid
2. Take care to compensate for lookup fields

Handy to Know…

- Using incorrect syntax when entering criteria can generate a data type mismatch error. For instance, if you place numerical or date criteria in quotation marks, rather than cross hatch symbols (#), Access interprets the data as text, rather than numbers.

ADDING MORE TABLES AND FIELDS

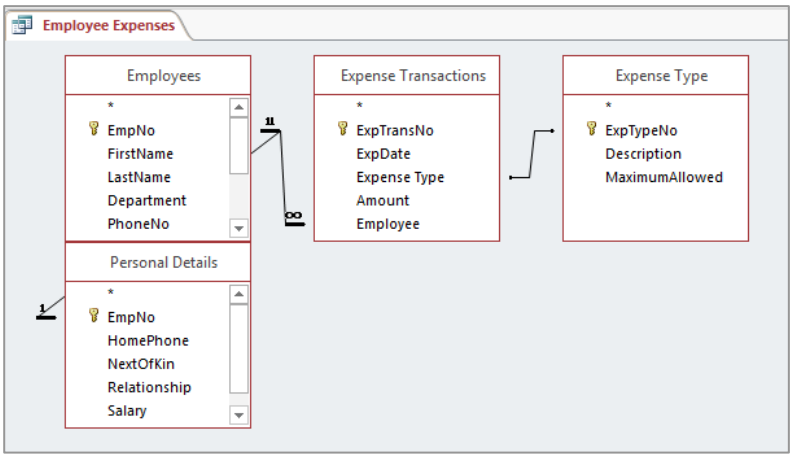
Query designs do not need to be static in design – you can add (or remove) tables and fields as dictated by your reporting needs. In our case study we have a *Personal Details* table that can be added to the design to provide us with extra fields for our employees, such as *Salary*.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Multi Table Queries_2.accdb...

1. Open the query ***Employee Expenses*** in ***Design View***
2. On the ***Query Tools: Design*** tab, click on ***Show Table*** in the ***Query Setup*** group to display the ***Show Table*** dialog box
3. Double-click on ***Personal Details*** to add it to the design, then click on **[Close]**
4. Double-click on ***Salary*** to add the field to the grid
5. Click on ***Save*** in the ***QAT*** to save the changes
6. Click in the ***Criteria*** cell for ***Salary*** and type **>=85000**
7. On the ***Query Tools: Design*** tab, click on ***Run*** in the ***Results*** group, to display expense transactions for employees with a salary greater than or equal to 85,000
8. Close the query – click on **[No]** to discard the criteria changes



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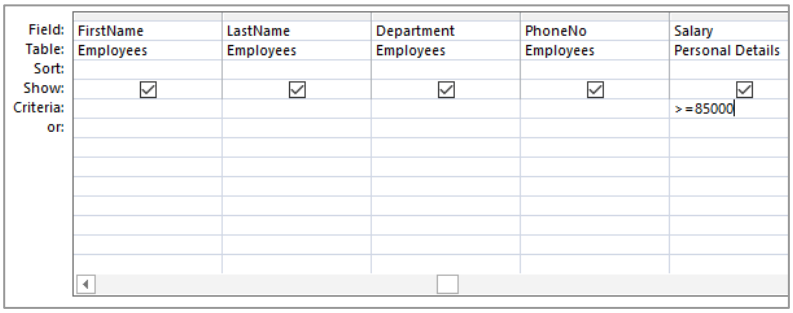

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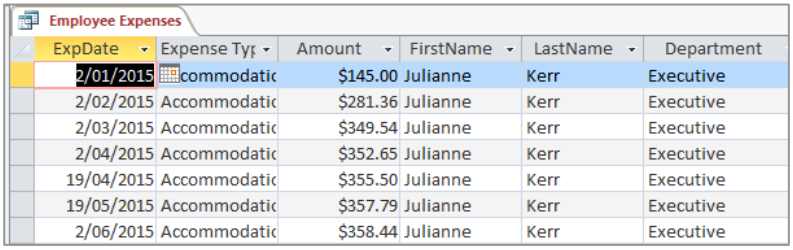


7

For Your Reference…

To ***add more tables to*** a ***query design***:

1. Open the query in ***Design View***
2. On the ***Query Tools: Design*** tab, click on ***Show Table*** in the ***Query Setup*** group
3. Double-click on the table(s) to add
4. Click on **[Close]**

Handy to Know…

- Save a query design after making a structural change to the design, and before you add criteria, to then be able to close the table later without the criteria but with the structural alteration.

UTILISING HIDDEN FIELDS

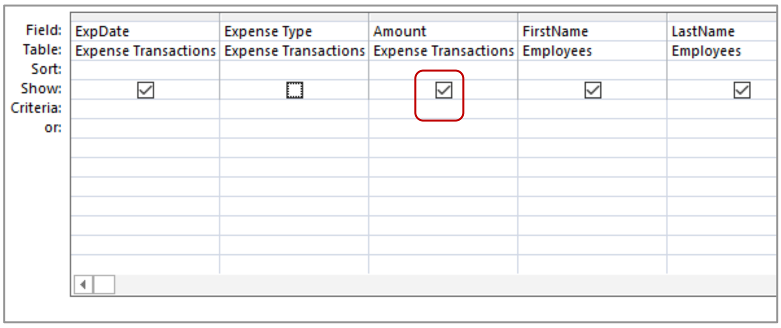
Earlier we encountered a problem when we tried to enter text into a field that was numeric even though, because of its lookup arrangement, it displayed text results. The problem with our solution was that we have to enter the criteria as a numeric code. Utilising a ***hidden field***, we can enter text values and have the correct result displayed without incurring a data mismatch error.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Multi Table Queries_3.accdb...

1. Open the query ***Employee Expenses*** in ***Design View***
2. In the query grid, click on the ***Show*** box for ***Expense Type*** so it appears without a tick – this will hide the field when the query is run
3. In the ***Field List***, double-click on ***Description*** in the ***Expense Type*** table to add it to the end of the query grid
4. Click on ***Save*** in the ***QAT*** to save these changes
5. Click in the ***Criteria*** cell for ***Description*** and type **Meals**
6. On the ***Query Tools: Design*** tab, click on ***Run*** in the ***Results*** group to display all of the *Meals* transactions
7. Close the query – click on **[No]** to discard the changes since the last save



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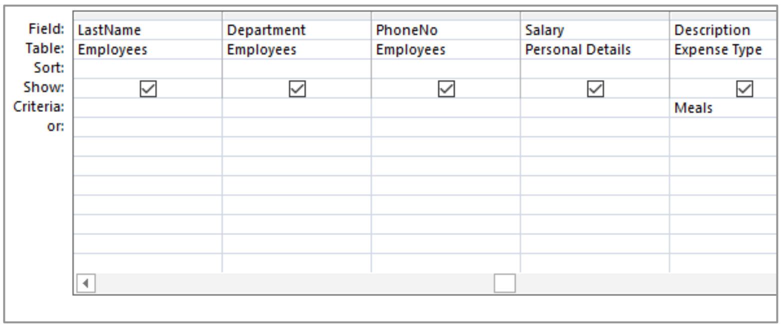

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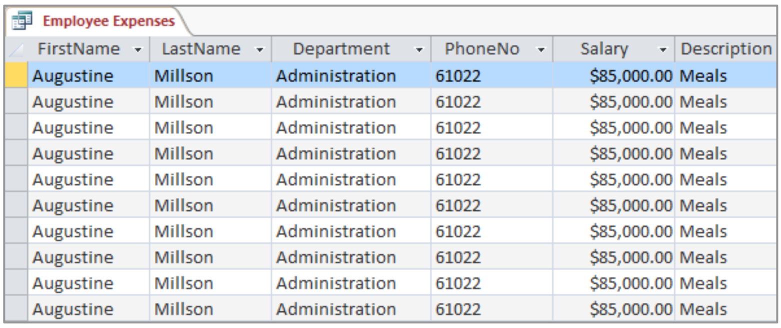


FirstName	LastName	Department	PhoneNo	Salary	Description
Augustine	Millson	Administration	61022	$85,000.00	Meals
Augustine	Millson	Administration	61022	$85,000.00	Meals
Augustine	Millson	Administration	61022	$85,000.00	Meals
Augustine	Millson	Administration	61022	$85,000.00	Meals
Augustine	Millson	Administration	61022	$85,000.00	Meals
Augustine	Millson	Administration	61022	$85,000.00	Meals
Augustine	Millson	Administration	61022	$85,000.00	Meals
Augustine	Millson	Administration	61022	$85,000.00	Meals
Augustine	Millson	Administration	61022	$85,000.00	Meals
Augustine	Millson	Administration	61022	$85,000.00	Meals

6

For Your Reference…

To ***hide*** a ***field from*** a ***query when it is run***:

- In the query grid, click on the ***Show*** box for the field so it appears without a tick

Handy to Know…

- Hiding a field from the query grid is better than removing it, as it still enables you to search the records based on that field.

UNDERSTANDING QUERY JOINS

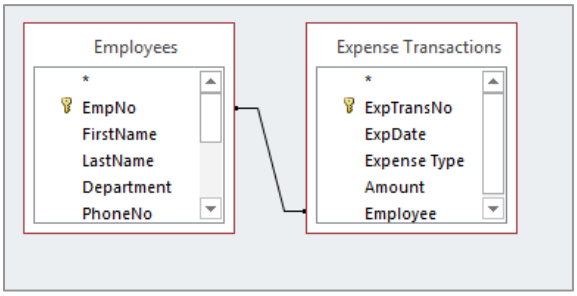
In addition to selecting specific fields and specifying criteria for a query, the data that is displayed in a multi-table query is also influenced by the type of ***join*** that has been specified between the tables. Basically there are three types of joins at your disposal: an ***inner join***, a ***left outer*** join and a ***right outer*** join. In Access these joins are numbered 1 to 3 respectively.

A Classic Join Example

The easiest way to understand the different joins is through the use of a simple example. Let's assume you have two tables, one for ***Employees*** and the other for their expense transactions. The ***Employee*** table would have one record per employee, while the ***Expense Transactions*** table could have many transactions per employee.

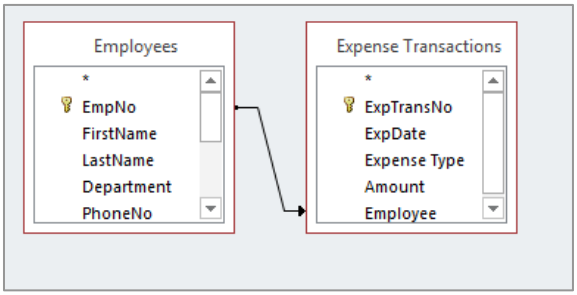
Join 1: An Inner Join

This is the default join type in Microsoft Access and is the one most commonly used. In this type of join the query will display only employees who have transactions and the transactions recorded against them. Employees who do not have any transactions will not be shown, nor will transactions that are orphaned and do not have an associated employee (there really shouldn't be any of these).



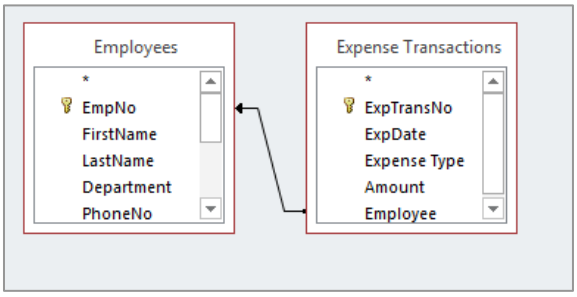
Join 2: An Outer Left Join

Let's suppose you want to see all employees, irrespective of whether they do or don't have transactions, as well as their transactions. An ***Outer Left Join*** achieves this. Again, orphaned transactions that do not have any associated employee will not appear.



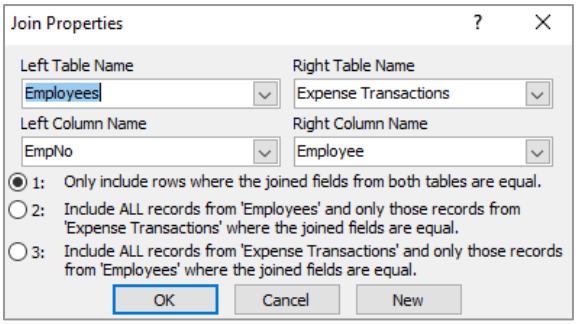
Join 3: An Outer Right Join

Let's suppose you want to see all of the transactions, both those that have associated employees and those that are orphaned, then use the ***Outer Right Join***. This join focuses on the transaction side of the join showing all transactions, but only employees from the left side that have transactions.



Join Properties

When you right-click on a join between tables you can open the ***Join Properties*** dialog box. In this dialog box you can specify the type of join to work with.



CREATING AN INNER JOIN

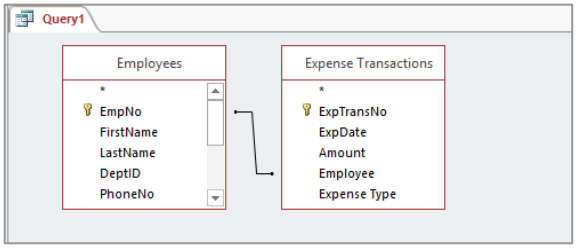
Inner Joins are the default join type and are automatically created for you when you have two joined tables in a query. Essentially an inner join shows only records from either table that are matched in the other table. Records in the left table that do not have matches in the right table won't appear, nor will records in the right table that aren't matched to records in the left table.

Try This Yourself:

Open File *Before starting this exercise you MUST open the file Multi Table Queries_4.accdb…*

1. Click on the ***Create*** tab, then click on ***Query Design*** in ***Queries***
2. Double-click on ***Employees*** and then on ***Expense Transactions***, then click on **[Close]**
3. Right-click on the line that joins both tables and select **Join Properties** to display the ***Join Properties*** dialog box
4. Ensure option ***1:*** is selected, then click on **[OK]**
5. Double-click on the ***EmpNo***, ***FirstName*** and ***LastName*** fields in the ***Employees*** table, and the asterisk (*) in the ***Expense Transactions*** table
6. On the ***Query Tools: Design*** tab, click on ***Run*** in the ***Results*** group to run the query and note the records
7. Click on the ***File*** tab, select ***Save As***, then click on ***Save Object As*** and click on **[Save As]**
8. Type **qryInnerJoin**, then click on **[OK]**
9. Close the query

2



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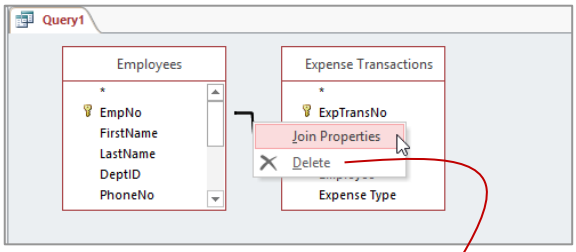
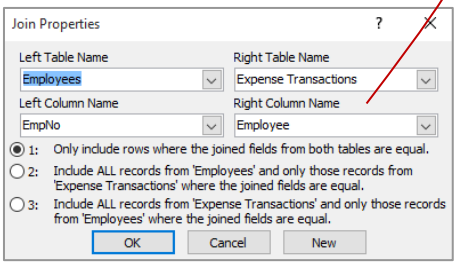
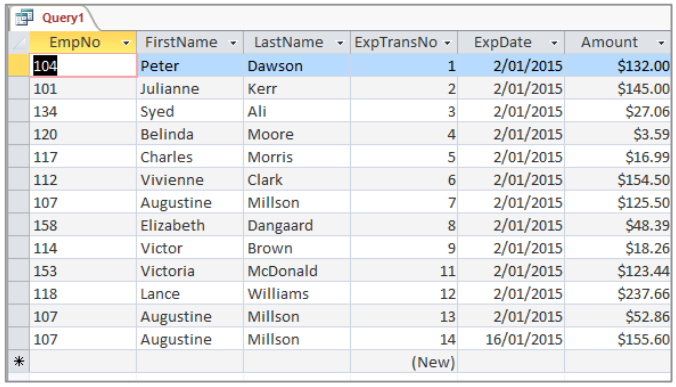






Query1

EmpNo	FirstName	LastName	ExpTransNo	ExpDate	Amount
104	Peter	Dawson	1	2/01/2015	$132.00
101	Julianne	Kerr	2	2/01/2015	$145.00
134	Syed	Ali	3	2/01/2015	$27.06
120	Belinda	Moore	4	2/01/2015	$3.59
117	Charles	Morris	5	2/01/2015	$16.99
112	Vivienne	Clark	6	2/01/2015	$154.50
107	Augustine	Millson	7	2/01/2015	$125.50
158	Elizabeth	Dangaard	8	2/01/2015	$48.39
114	Victor	Brown	9	2/01/2015	$18.26
153	Victoria	McDonald	11	2/01/2015	$123.44
118	Lance	Williams	12	2/01/2015	$237.66
107	Augustine	Millson	13	2/01/2015	$52.86
107	Augustine	Millson	14	16/01/2015	$155.60
*			(New)		

6

For Your Reference…

To ***create*** an ***inner join query***:

1. In query ***Design View***, right-click on the join line, then select **Join Properties**
2. Ensure option ***1:*** is selected and click on **[OK]**

Handy to Know…

- With an inner join query, which is the default join type, only records from the left table that have matches in the right table are joined. Orphans from the right table are not shown when the query is run.

CREATING A LEFT OUTER JOIN

With ***left outer joins*** the table on the left side of the join has precedence and all records of that table, irrespective of whether they have matching records in the right table, will appear. Records from the right table will only appear if they are matched to records in the left. With a left outer join it is the left table that is 'dominant'.

Try This Yourself:

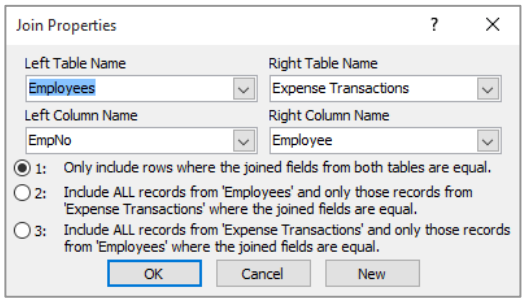
Same File

Continue using the previous file with this exercise, or open the file Multi Table Queries_5.accdb...

1. Open the query ***qryInnerJoin*** in ***Design View***
2. Click on the ***File*** tab, select ***Save As***, click on ***Save Object As***, then click on **[Save As]**
3. Type **qryLeftOuterJoin**, then click on **[OK]**
4. Right-click on the join line and select **Join Properties**
5. Click on option ***2:***, then click on **[OK]**
6. On the ***Query Design: Tools*** tab, click on ***Run*** in the ***Results*** group to run the query

   This time all employees, whether they have transactions or not, will be displayed…
7. Save and close the query

4



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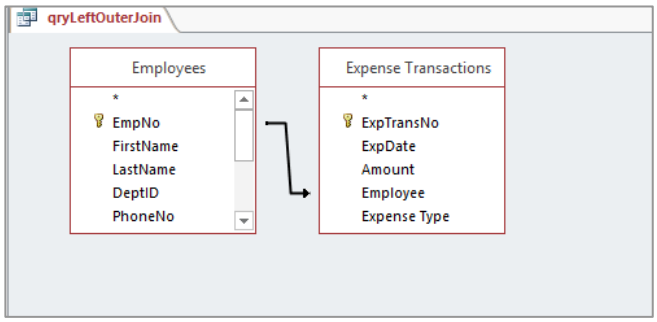

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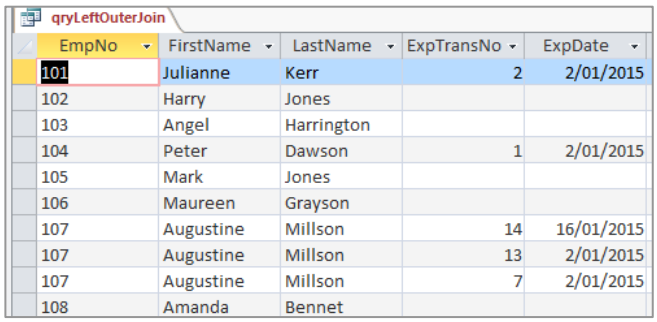


qryLeftOuterJoin

EmpNo	FirstName	LastName	ExpTransNo	ExpDate
101	Julianne	Kerr	2	2/01/2015
102	Harry	Jones		
103	Angel	Harrington		
104	Peter	Dawson	1	2/01/2015
105	Mark	Jones		
106	Maureen	Grayson		
107	Augustine	Millson	14	16/01/2015
107	Augustine	Millson	13	2/01/2015
107	Augustine	Millson	7	2/01/2015
108	Amanda	Bennet		

For Your Reference…

To ***create*** a ***left outer join query***:

1. In query ***Design View***, right-click on the join line, then select **Join Properties**
2. Click on option ***2:*** and click on **[OK]**

Handy to Know…

- Follow the arrow in a join between tables in a query to get an idea of what is happening. If an arrow points to the right table, then all of the records from the left will appear but only matching ones from the right will show up.

CREATING A RIGHT OUTER JOIN

In a ***right outer join*** the table on the right, which is usually the transaction table, is the dominant table. In this type of join, all of the transactional records will appear irrespective of whether they are orphaned (don't have a match on the left) or not. In a good database design there should never be unmatched transactions – so this type of query is ideal for tracking down data problems.

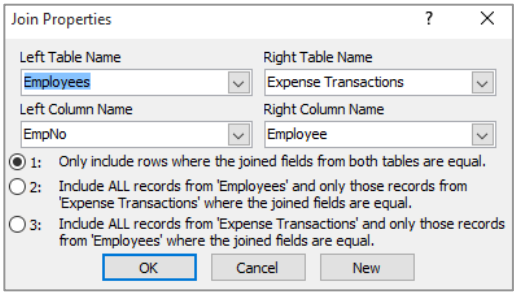
Try This Yourself:

Same File *Continue using the previous file with this exercise, or open the file Multi Table Queries_6.accdb...*

1. Open the query ***qryInnerJoin*** in ***Design View***
2. Click on the ***File*** tab, select ***Save As***, click on ***Save Object As***, then click on **[Save As]**
3. Type **qryRightOuterJoin**, then click on **[OK]**
4. Right-click on the join line, then select **Join Properties**
5. Click on option ***3:***, then click on **[OK]**
6. On the ***Query Tools: Design*** tab, click on ***Run*** in the ***Results*** group to run the query

   This time all transactions, whether they have associated employees or not, will be displayed…
7. Save and close the query

4



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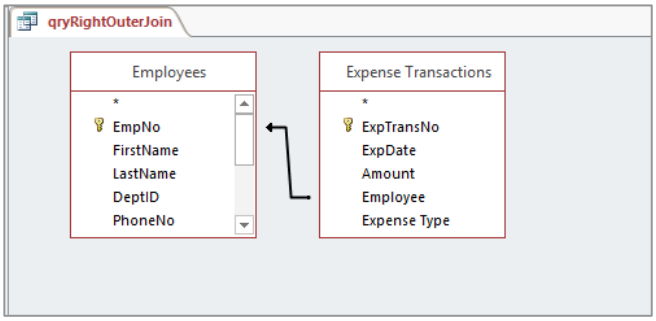

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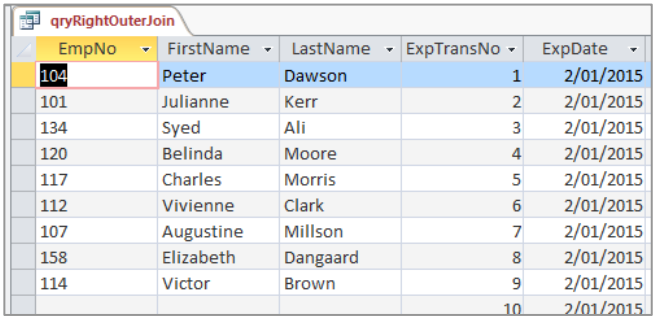


qryRightOuterJoin

EmpNo	FirstName	LastName	ExpTransNo	ExpDate
104	Peter	Dawson	1	2/01/2015
101	Julianne	Kerr	2	2/01/2015
134	Syed	Ali	3	2/01/2015
120	Belinda	Moore	4	2/01/2015
117	Charles	Morris	5	2/01/2015
112	Vivienne	Clark	6	2/01/2015
107	Augustine	Millson	7	2/01/2015
158	Elizabeth	Dangaard	8	2/01/2015
114	Victor	Brown	9	2/01/2015
			10	2/01/2015

For Your Reference…

To ***create*** a ***right outer join***:

1. In query ***Design View***, right-click on the join line, then select **Join Properties**
2. Click on option ***3:*** and click on **[OK]**

Handy to Know…

- Databases with sound rules of referential integrity should never present unmatched transactions. For example, in a good system you should not be able to delete an employee if there are still open transactions for that employee.

NOTES:

CHAPTER 4

CREATING AND USING REPORTS

INFOCUS

Reports in Access provide a way of formally presenting data from either tables or queries. In essence, reports are used to present raw data in a format that is more readable, understandable and better to look at.

In this session you will:

- ✓ gain an understanding of the reporting process in ***Access***
- ✓ learn how to create a basic report
- ✓ learn how to work with reports and switch between the various views
- ✓ learn how to preview and print a report
- ✓ learn how to change the layout of a report
- ✓ learn how to use the ***Report Wizard*** to create a report
- ✓ learn how to use the ***Report Wizard*** to create a grouped report
- ✓ learn how to use the ***Report Wizard*** to create a statistical report
- ✓ learn how to work with grouped reports.

UNDERSTANDING REPORTING IN ACCESS

Reports provide you with a means of more formally presenting, and even analysing, data from your tables and queries. Reports have traditionally been produced as printed documents but they can also be viewed on the screen or published to the web. Before creating a report, it is advisable to understand how they work and what they can actually do for you.

Creating Reports

All database systems, including Access, provide you with a ***report generator*** facility to design your reports. Reports themselves do not contain data, but are created as structural ***templates*** into which the data is placed when the report is run. The template basically defines *what to display* (e.g. which fields to use), *where to display it* (e.g. where the fields should appear on the page), and *how it should look* (e.g. font size, colour, etc).

When a report is first created it is based on either an existing table or an existing query. You base the report on a table if you wish to report on all of the data, or a query if you wish to report on just a subset of the data.

The Many Ways of Creating a Report

In Access you can create simple reports or very complex and intricate reports. So, as you'd expect, Access offers several ways for you to create reports. In Access, reports are created from the tools on the ***Create*** tab on the ribbon. Here you can create:

- A basic, no frills report using the ***Report*** tool – these reports appear almost instantly and require very little work on your part. All of the work is done for you.
- More intricate reports using the ***Report Wizard*** tool – the ***Report Wizard*** metaphorically holds your hand and asks you a series of questions which ultimately, when answered, result in a report.
- A complex, elaborate report using either the ***Blank Report*** tool or the ***Report Design*** tool – these options present you with a blank report canvas and you are required to do all of the work to lay out what you want, where you want it, and how it should look. This is the most difficult of the options to use as you have to do everything yourself.

Achieving a Balance

There is no right or wrong way to create reports – choose the method that achieves the results using the least amount of time and effort.

The beauty of the reporting tools in Access is that even after you have created a report using any of the techniques, the report can still be edited, modified and customised to suit specifically what you are after. So even if the basic report doesn't quite provide you with what you want or the ***Report Wizard*** hasn't quite done all it should, you can still change the report design yourself.

Many Access users create their reports using the ***Report*** tool or the ***Report Wizard*** tool, and then fine-tune the layout or the design to suit their needs.

CREATING A BASIC REPORT

The easiest and simplest way to create a basic report in Access is to use the ***Report*** tool which is located on the ***Create*** tab on the ribbon. All you need to do here is to select the table or the query in the ***Navigation*** pane as the basis for the report and then run the command.

Try This Yourself:

Open File

Before starting this exercise you MUST open the file Reports_1.accdb…

1. In the ***Navigation*** pane, click on the ***Employees*** table to select it

   This indicates the table to base the report on…

2. Click on the ***Create*** tab, then click on ***Report*** in the ***Reports*** group

   A report layout will instantly appear. The Layout View of the report allows you to make adjustments to the report template…

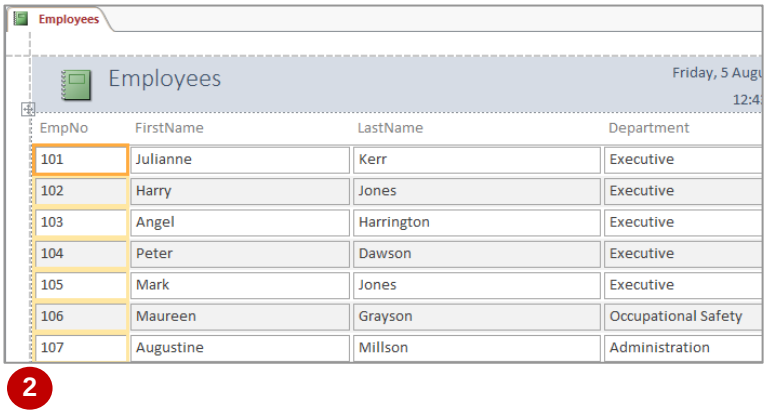
3. On the ***Report Layout Tools: Design*** tab, click on ***View*** in the ***Views*** group to see the report in ***Report View*** where the data is presented

   Data is presented in Layout View as well, but Report View is the finished view of the report…

4. Click on ***Save*** in the ***QAT*** to display the ***Save As*** dialog box

5. Type **rptEmployees** in ***Report Name***, then click on **[OK]** to save the design and layout

6. Close the report



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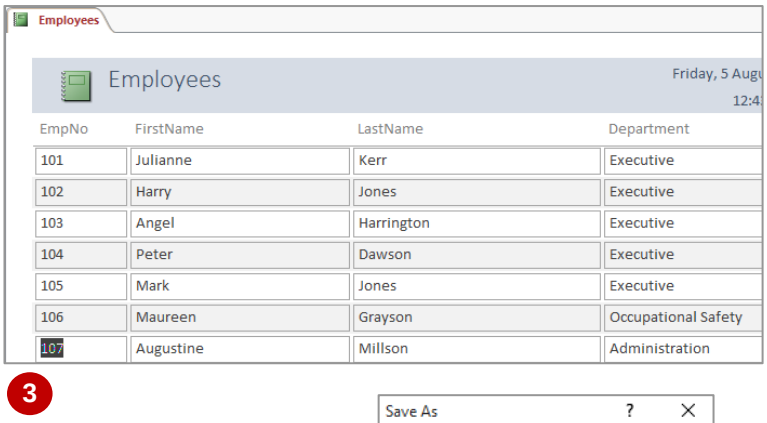

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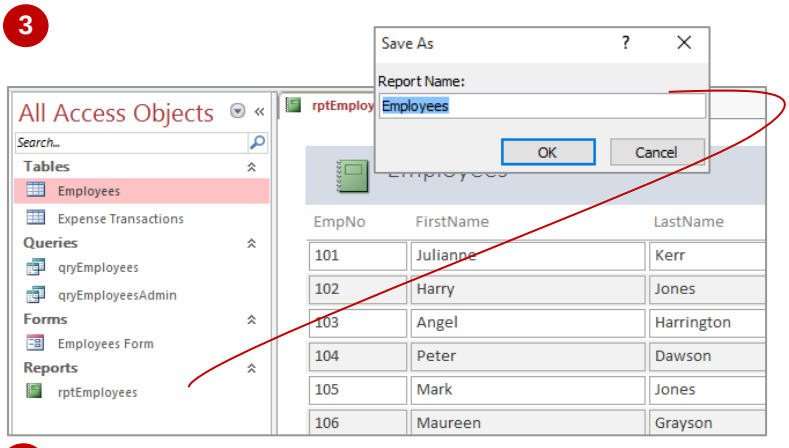


5

For Your Reference…

To ***create*** a ***basic report***:

1. Click on the table or query in the ***Navigation*** pane
2. Click on the ***Create*** tab, then click on ***Report*** in the ***Reports*** group

Handy to Know…

- When creating reports, ***Layout*** view allows you to make changes to the layout of a report, such as column widths, row heights, field placement etc. ***Report*** view is the polished view of the report.

WORKING WITH EXISTING REPORTS

Reports do not contain data – they are simply ***templates*** with field placeholders which determine where data will be placed. As a consequence there are several different views of a report – you can see its structure in both the ***Design*** and ***Layout*** views, and you can see data in ***Report***, ***Print Preview*** and ***Layout*** views.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Reports_2.accdb...

1. Double-click on the report ***rptEmployees*** to open it

   Report view shows you the report with data. No changes can be made to either the data or the report layout here…

2. On the ***Home*** tab, click on ***View*** in the ***Views*** group to see the report in ***Layout*** view where changes can be made

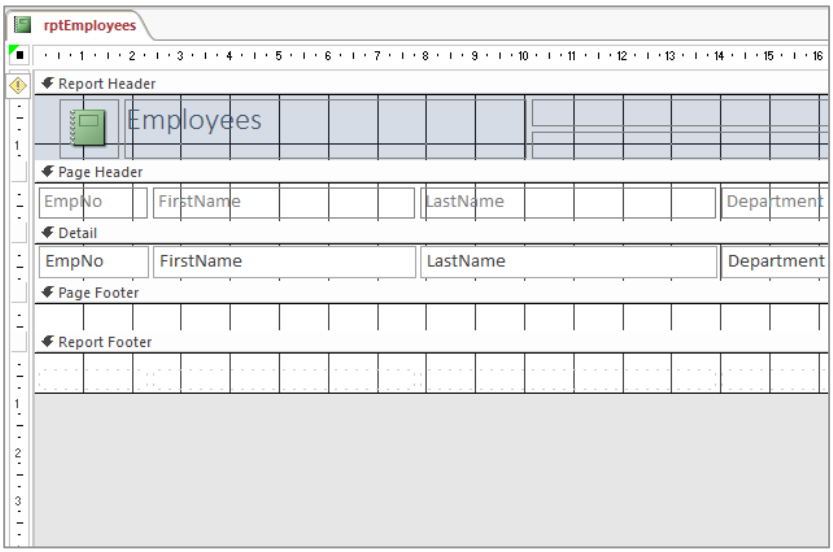
   The View tool toggles between Layout and Report views…

3. Click on the bottom half of ***View*** and select **Design View**

   Design view is the ultimate design and layout view where you can edit the fields, placements and even formats, and also make changes to report headers and footers…

4. Close the report

1



3

For Your Reference…

To ***change*** the ***report view***:

1. Open the report in any view
2. On the ***Home*** tab, click on the bottom half of ***View*** in the ***Views*** group and select the desired view

Handy to Know…

- Changes to report structure are made in either ***Layout*** or ***Design*** view. ***Layout*** view provides a view of the report with data in place. ***Design*** view provides access to more of the detailed areas of the report such as the header and footer.

PREVIEWING AND PRINTING A REPORT

Reports are commonly designed for and printed on paper using a printer. While you can print a report without directly running it, it is a good idea to use ***Print Preview*** to see how it will look before it is sent to the printer. Often you will find that the report is too wide or needs to be changed in some other way prior to a formal print run.

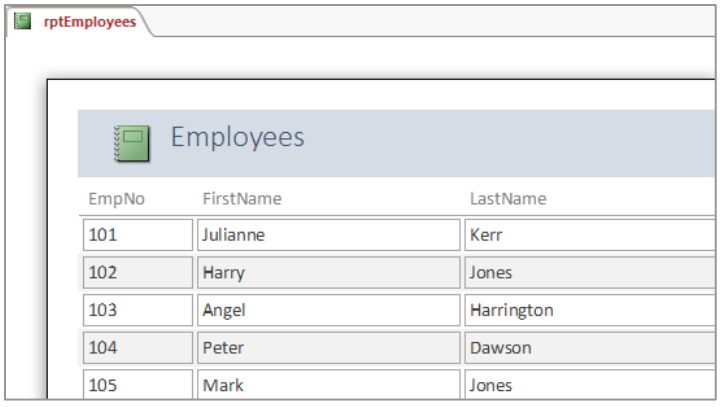
Try This Yourself:

Same File *Continue using the previous file with this exercise, or open the file Reports_2.accdb...*

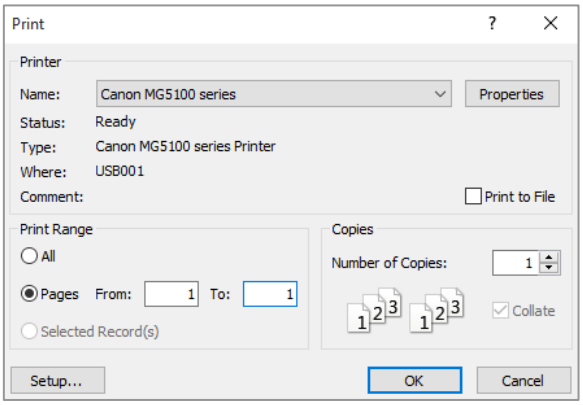
1. Right-click on ***rptEmployees*** and select **Print Preview** to see the report in preview mode
2. Click on ***Next Page*** and ***Previous Page*** at the bottom of the window several times to view the pages

   The report is too wide to fit on one piece of paper…
3. On the ***Print Preview*** tab, click on ***Landscape*** in the ***Page Layout*** group to turn the report sideways

   We still haven't got all columns on one page, but let's print just the first page to see how it looks…
4. Click on ***Print*** in the ***Print*** group to display the ***Print*** dialog box
5. Click on ***Pages*** in ***Print Range*** and type **1** in both ***From*** and ***To***
6. Click on **[OK]** to print the first page of the report
7. Close the report



1



5

For Your Reference…

To ***preview*** and ***print*** a ***report***:

1. Right-click on the report in the ***Navigation*** pane and select **Print Preview** to see the report in preview mode
2. On the ***Print Preview*** tab, click on ***Print*** in the ***Print*** group to print the report

Handy to Know…

- Basic reports seldom print well without a bit of editing. Typically there may be too many columns or rows to fit neatly on a page.

CHANGING THE REPORT LAYOUT

The ***Layout*** view provided for reports in Access allows you to make adjustments to the layout of the report. These adjustments may be required for aesthetic purposes, to make the report more visually appealing, or for practical purposes such as trying to squeeze the report onto one page. In ***Layout*** view you can adjust column widths and instantly see whether they will work or not.

Try This Yourself:

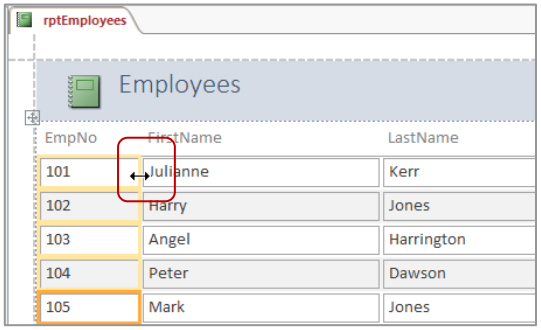
Same File

Continue using the previous file with this exercise, or open the file Reports_3.accdb...

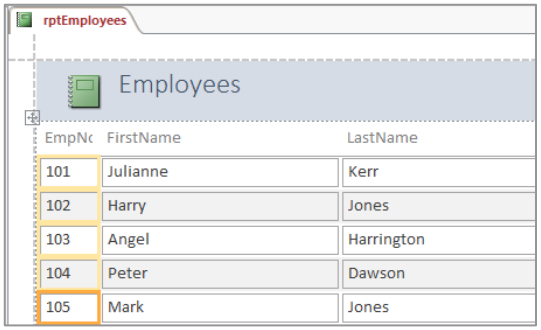
1. Right-click on ***rptEmployees*** and select ***Layout View***
2. Point to the right border of the orange square surrounding ***Emp No 101***

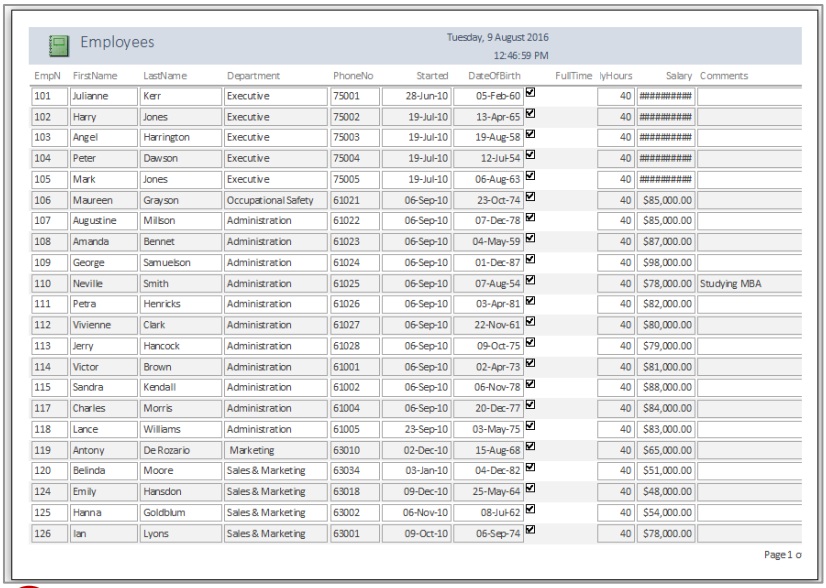
   The pointer should change to a double-headed arrow…
3. Hold down the left mouse button and drag the border left to make the column narrower
4. Click in the ***FirstName*** column, then repeat steps ***2*** and ***3*** to make this column narrower
5. On the ***Report Layout Tools: Design*** tab, click on the bottom half of ***View*** in the ***Views*** group, select **Print Preview**, then click on ***One Page*** in the ***Zoom*** group to see if the ***Comments*** fit on the page
6. Click on ***Close Print Preview*** in the ***Close Preview*** group, then repeat steps ***2*** and ***3*** with the other columns, until the ***Comments*** column is on the page
7. Save and close the report

2



3





6

For Your Reference…

To ***adjust column width*** in a report:

1. Open the report in ***Layout*** view
2. Click in the column to change
3. Point to the right border of the orange square, hold down the left mouse button and drag left to narrow the column

Handy to Know…

- The grey dotted lines that appear in ***Layout*** view of a report indicate whether the page will break when printed. These dotted lines are based on the current printer settings on your computer and are very useful when trying to resize a page of the report.

USING THE REPORT WIZARD

The ***Report Wizard*** will guide you through the process of creating more formal reports from the data in your data table. The ***Report Wizard*** consists of a number of screens that prompt you for the information required to generate a report. Some of the screens may seem cryptic to begin with, but you will soon learn what is required and be able to generate reports quickly and efficiently.

Try This Yourself:

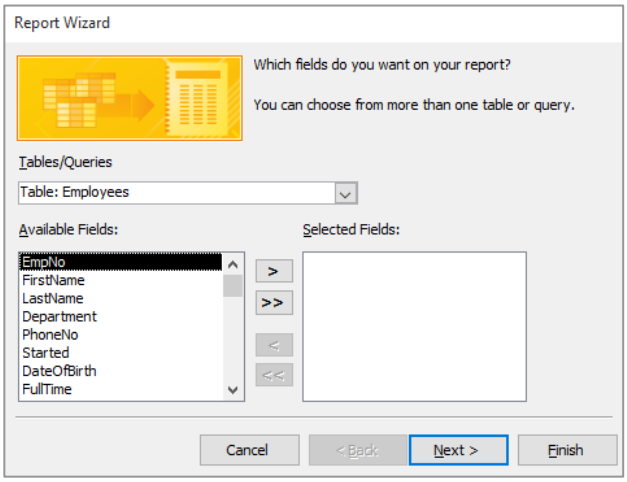
Same File *Continue using the previous file with this exercise, or open the file Reports_4.accdb...*

1. In the ***Navigation*** pane, click on the ***Employees*** table to specify the table to report on
2. Click on the ***Create*** tab, then click on ***Report Wizard*** in the ***Reports*** group to start the ***Report Wizard***
3. Double-click on ***EmpNo***, ***FirstName***, ***LastName***, ***Department*** and ***PhoneNo*** in ***Available Fields*** to add them to the ***Selected Fields*** list
4. Click on **[Next]** to proceed to the next screen. Continue working through the screens using the settings as shown
5. Once you have specified the title in the last screen of the wizard, click on ***Preview the report***, then click on **[Finish]** to build the report

   Spend a moment previewing the report…
6. Close the report

   The new report is now listed in the Navigation pane

2



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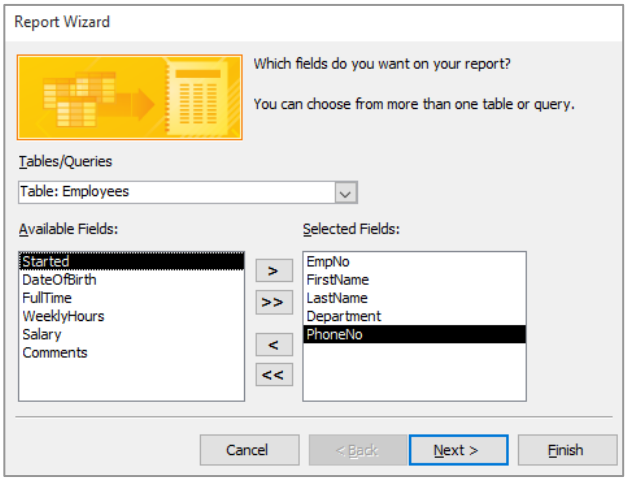


3

Screen	Settings	Click on…
Grouping	No change	**[Next]**
Sort Order	1. LastName, Ascending	**[Next]**
Layout	Tabular & Portrait	**[Next]**
Title	Employee Phone Listing	

For Your Reference…

To ***create*** a ***report using*** the ***Report Wizard***:

1. Click on the table or query
2. Click on the ***Create*** tab, then click on ***Report Wizard*** in the ***Reports*** group
3. Complete the steps of the ***Wizard***

Handy to Know…

- When creating a report using the ***Report Wizard***, if you have made a mistake in any of the screens or would simply like to review your work, click on **[Back]** to move back through previous screens.

CREATING A GROUPED REPORT

By creating a ***grouped report*** you can present data so that it is grouped according to one or more fields. For example, if you create a grouped report listing all employees by department, the departments will be listed in alphabetical order and the employees will be listed in alphabetical order within each department.

Try This Yourself:

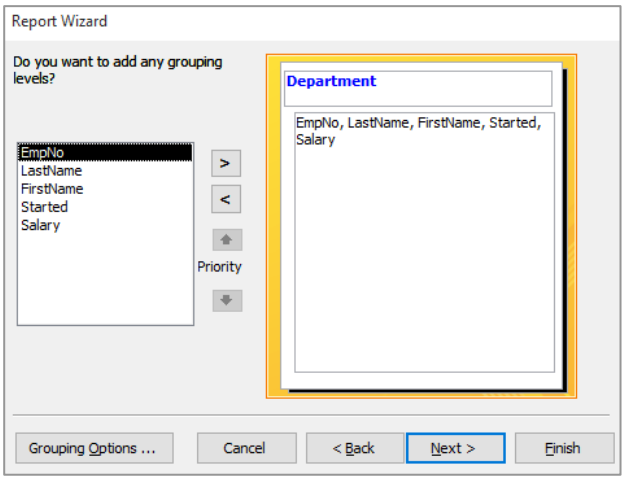
Same File

Continue using the previous file with this exercise, or open the file Reports_5.accdb...

1. In the ***Navigation*** pane, click on the ***Employees*** table
2. Click on the ***Create*** tab, then click on ***Report Wizard*** in the ***Reports*** group to start the ***Wizard***
3. Double-click on ***Department***, ***EmpNo***, ***LastName***, ***FirstName***, ***Started*** and ***Salary***, then click on **[Next]**

   In this screen you are required to specify how to group the records…
4. Double-click on ***Department*** as the grouping level
5. Click on **[Next]** and complete the remaining wizard screens as shown
6. Click on **[Finish]** to build the report
7. Close the report

4



5

Screen	Settings	Click on…
Sort Order	1. LastName, Ascending	**[Next]**
Layout	Stepped & Portrait	**[Next]**
Title	Employee Salary Listing	

6

For Your Reference…

To ***create*** a ***grouped report***:

1. Click on the ***Create*** tab, click on ***Report Wizard*** and create a report, selecting the field to be grouped on as the first field
2. Select this field on the ***Grouping*** screen
3. Complete the wizard and save the report

Handy to Know…

- When creating a grouped report, you may find that you need to make minor adjustments to column widths in ***Layout View*** to be able to see all of the grouping column.

CREATING A STATISTICAL REPORT

One great feature of reports is the ability to summarise the data in the database. For example, reports allow you to calculate the total (sum), minimum, maximum, average, and number of records (count) for numerical fields in a database. You can also count non-numerical fields. These ***statistical reports*** assist with analysis of the data in the database.

Try This Yourself:

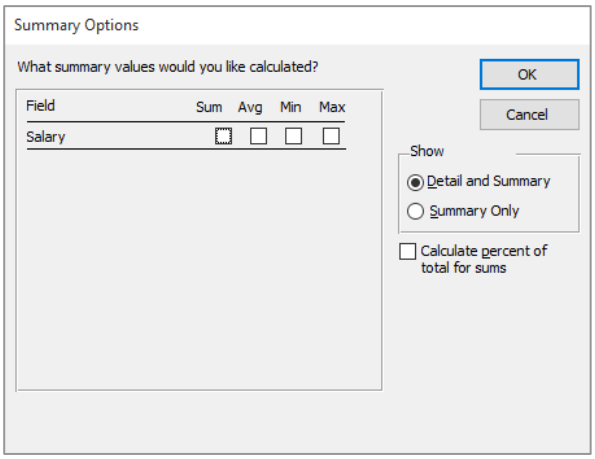
Same File

Continue using the previous file with this exercise, or open the file Reports_6.accdb...

1. In the ***Navigation*** pane, click on the ***Employees*** table, click on the ***Create*** tab and click on ***Report Wizard*** in the ***Reports*** group
2. Double-click on ***Department*** and ***Salary***, then click on **[Next]**
3. Double-click on ***Department*** as the ***Grouping*** level, then click on **[Next]**
4. Click on **[Summary Options]** to display the ***Summary Options*** dialog box
5. Click in the tick boxes for ***Sum***, ***Avg***, ***Min*** and ***Max***, then click on ***Summary Only*** in ***Show***
6. Click on **[OK]** to return to the Wizard, then click on **[Next]** and complete the settings as shown
7. Click on **[Finish]** to build the report

   We will fix the hash signs in the next exercise…
8. Close the report

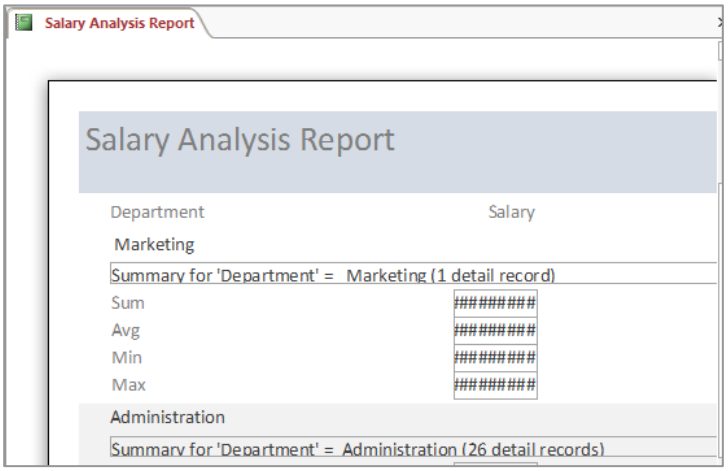
4



6

Screen	Settings	Click on…
Layout	Stepped & Portrait	**[Next]**
Title	Salary Analysis Report	

7



For Your Reference…

To ***create*** a ***statistical summary report***:

1. Create a grouped report using the wizard
2. Click on **[Summary Options]** on the sorting screen
3. Click on the statistics required then click on **[OK]** and finish creating the report

Handy to Know…

- When a report displays hash signs (####) in lieu of numbers, it is because the column size in the report isn't large enough to display the values in the fields.

WORKING WITH GROUPED REPORTS

If a column is not wide enough to display values, Access will substitute the values with cryptic signs like the hash ***(#)*** symbol. This can happen when using the statistical functions (***sum***, ***avg***, etc.) on the values that involve many numbers, such as currency. To correct this problem you will need to access either ***Layout View*** or ***Design View*** and modify the column widths.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Reports_7.accdb...

1. In the ***Navigation*** pane, double-click on ***Salary Analysis Report*** to run it

   Here you can see the hash signs replacing numbers…

2. Switch to **Design View**

3. In ***Department Footer***, click on ***=Sum([Sal***, hold down Shift and click on ***=Avg([Sal***, ***=Min([Sal***, ***=Max([Sal*** and ***=Sum([Sal*** (in ***Report Footer***)

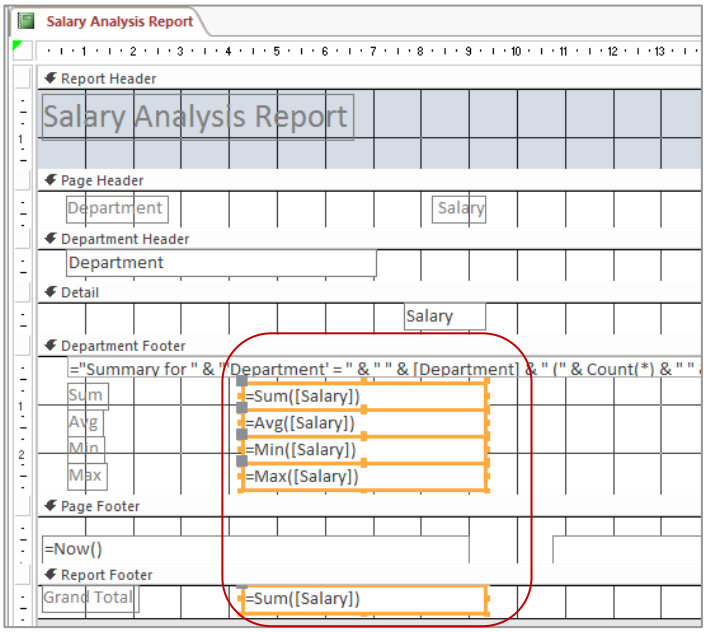
   You should have selected five fields…

4. Point to the left border of one of the selected fields, click and drag to the left until the fields are about 3 times as long

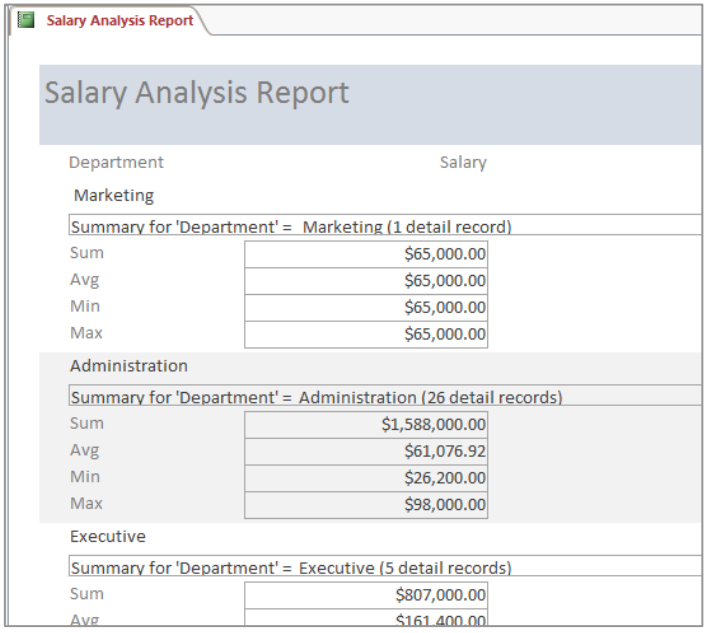
5. Click on the ***Home*** tab, click on the bottom half of ***View*** in the ***Views*** group, then select **Report View** to run the report – this time the values are displayed

6. Save and close the report

3



5



For Your Reference…

To ***modify the layout*** of a ***grouped report***:

1. Open the report in either ***Report Layout*** or ***Report Design*** view
2. Make the changes to the layout as required

Handy to Know…

- You can adjust field widths either through ***Report Design*** view or in ***Report Layout*** view. However, ***=Sum*** (that sums the footer) is easier to access in ***Report Design*** view.

CONCLUDING REMARKS

Congratulations!

You have now completed Microsoft Access 2016 - Simple Queries. Microsoft Access 2016 - Simple Queries was designed to get you to the point where you can competently perform a variety of operations.

We have tried to build up your skills and knowledge by having you work through specific tasks. The step by step approach will serve as a reference for you when you need to repeat a task.

Where To From Here?

The following is a little advice about what to do next:

- Spend some time playing with what you have learnt. You should reinforce the skills that you have acquired and use some of the application's commands. This will test just how much of the concepts and features have stuck! Don't try a big task just yet if you can avoid it - small is a good way to start.
- Some aspects of the course may now be a little vague. Go over some of the points that you may be unclear about. Use the examples and exercises in these notes and have another go - these step-by-step notes were designed to help you in the classroom and in the work place!

Here are a few techniques and strategies that we've found handy for learning more about technology:

- read computer magazines - there are often useful articles about specific techniques
- if you have the skills and facilities browse the Internet, specifically the technical pages of the application that you have just learnt
- take an interest in what your work colleagues have done and how they did it - we don't suggest that you plagiarise but you can certainly learn from the techniques of others
- if your software came with a manual (which is rare nowadays) spend a bit of time each day reading a few pages. Then try the techniques out straight away - over a period of time you'll learn a lot this way
- and of course, there are also more courses and books for you to work through.

Hungry for More?

We live in an ever-changing world where we all need to review and upgrade our skills.

If you have received this course book on a training course why not ask the tutor or trainer for other courses that may be of benefit to you. If you are attending a college ask for one of their brochures.

Alternatively, if you've enjoyed using this course book you can find others that cover a wide range of topics at our web site www.watsoniapublishing.com.

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