CREATING A NEW DATABASE FILE

In Microsoft Access 2016 all elements of your database; tables, reports, forms, and the like, are stored in one file with the file extension ***accdb***. This is what is commonly referred to as the database file – not to be confused with the tables where your data is stored. Before you can create tables, or reports, or forms, or any other object, you need to create a new database file.

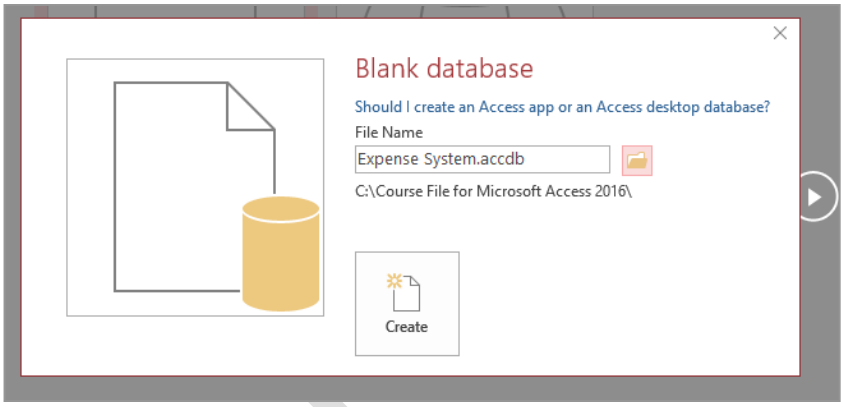
Try This Yourself:

Before you begin, ensure that Access has started...

1. Click on the ***File*** tab to display the ***New*** area in the ***Backstage***
2. Click on the ***Blank desktop database*** template and type **Expense System** in ***File Name***

   We'll save it where the other course files are located…
3. Click on **[Browse]** to display the ***New Database*** dialog box, then locate and click on the ***Course Files for Microsoft Access 2016*** folder and click on **[OK]**

   The course files folder is now where the database will be saved…
4. Click on **[Create]** to create the new database
5. Click on ***Close*** to close the automatic table (***Table1***) that has appeared



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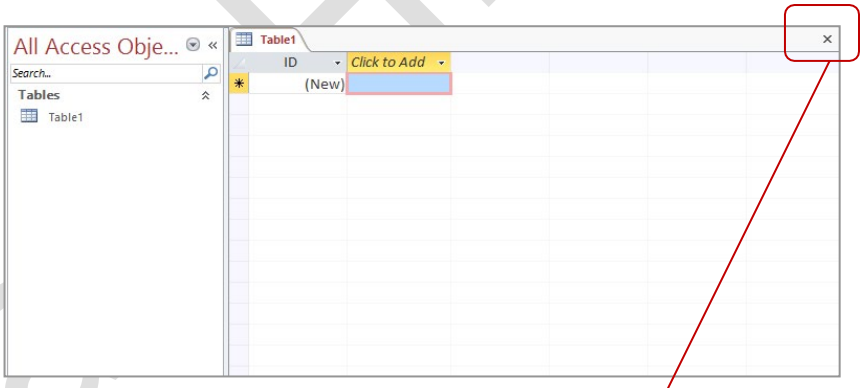

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Note: Be sure to click on the Close button for the database object when closing tables, queries, forms etc – if you click on the Close button in the very top right corner, you will close Access

For Your Reference…

To ***create*** a ***new database file***:

1. Click on the ***File*** tab and click on **New**
2. Click on ***Blank database***, type the ***File Name***, click on **[Browse]** and choose a save location
3. Click on **[OK]** then click on **[Create]**

Handy to Know…

- All new Access 2016 database files will be saved in the same format as Access 2007 and 2010 files (***.accdb***). If you need to provide the file to other users who may be using earlier versions, you can save it as an Access 2003 or earlier file (***.mdb***), but the file may lose some functionality.

CREATING LOOKUP TABLES

The ***lookup table*** holds the records that will be *looked up* by the transaction table. In this example, the lookup table holds *Employee* records. Creating a lookup table involves creating the fields in the table and specifying their size and type. The fields will hold the employee details that are needed for our database but are not relevant to specific expense transactions.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Relational Databases_1.accdb...

1. Click on the ***Create*** tab, then click on ***Table Design*** in the ***Tables*** group to display a new table
2. Type **EmpNo** in ***Field Name***, then press Tab to move to ***Data Type***
3. Click on the drop arrow for ***Data Type*** and select **Short Text**, if necessary, then press Tab to move to ***Description***
4. Type **Records the employee number**
5. In the ***Field Properties*** at the bottom of the ***Table1*** window, select the value in ***Field Size*** and type **6**
6. Click in the row under ***EmpNo*** to start a new field, then repeat steps ***2*** to **5** to create the additional fields with ***Field Sizes***, as shown

Leave the table design on the screen for the next exercise

1

Table1

Field Name	Data Type	Description (Optional)

4

Table1

Field Name	Data Type	Description (Optional)
EmpNo	Short Text	Records the employee number

6

Table1

Field Name	Data Type	Description (Optional)
EmpNo	Short Text	Records the employee number
FirstName	Short Text	Records the employee's first name
LastName	Short Text	Records the employee's last name
Department	Short Text	Records the employee's department
Started	Date/Time	Records the employee's start date
DateOfBirth	Date/Time	Records the employee's birthdate
Fulltime	Yes/No	Records whether the employee is fulltime
WeeklyHours	Number	Records the weekly hours of employment
Comments	Long Text	Records comments about the employee

Field Sizes to change:

FirstName	15
LastName	25
Department	25

For Your Reference…

To ***create*** a ***new table***:

1. Click on the ***Create*** tab, then click on ***Table Design*** in the ***Tables*** group
2. Type the ***Field Name***, select a ***Data Type*** and type the ***Description*** for each field

Handy to Know…

- When you click on a field in the table ***Design*** window, the ***Properties*** for that field are displayed in the lower half of the window. The number and type of properties that you see will vary depending on the data type of the field.

DEFINING A PRIMARY KEY

For a lookup database to be useful, it must be able to retrieve data quickly and easily. In addition, it must be able to pull data from different tables together quickly to provide information. To make this possible, each table should include a field or set of fields that makes each record in the table unique. This field or set of fields is known as the ***primary key***.

Try This Yourself:

Before starting this exercise, ensure that the table design from the previous exercise is displayed...

A primary key is indicated by a key symbol. Currently, this table does not have a primary key assigned…

1. In table ***Design View***, click on ***EmpNo*** in ***Field Name*** to select the field
2. On the ***Table Tools: Design*** tab, click on ***Primary Key*** in the ***Tools*** group

A small key icon will appear to the left of the selected field to indicate that it is the primary key field.

Leave the table design on the screen for the next exercise

Table1

Field Name	Data Type	Description (Optional)
EmpNo	Short Text	Records the employee number
FirstName	Short Text	Records the employee's first name
LastName	Short Text	Records the employee's last name
Department	Short Text	Records the employee's department
Started	Date/Time	Records the employee's start date
DateOfBirth	Date/Time	Records the employee's birthdate
Fulltime	Yes/No	Records whether the employee is fulltime
WeeklyHours	Number	Records the weekly hours of employment
Comments	Long Text	Records comments about the employee

1

Table1

Field Name	Data Type	Description (Optional)
EmpNo	Short Text	Records the employee number
FirstName	Short Text	Records the employee's first name
LastName	Short Text	Records the employee's last name
Department	Short Text	Records the employee's department
Started	Date/Time	Records the employee's start date
DateOfBirth	Date/Time	Records the employee's birthdate
Fulltime	Yes/No	Records whether the employee is fulltime
WeeklyHours	Number	Records the weekly hours of employment
Comments	Long Text	Records comments about the employee

2

For Your Reference…

To ***define*** a ***primary key for*** a ***table***:

1. In table ***Design View***, click on the field that will be used as the primary key
2. On the ***Table Tools: Design*** tab, click on ***Primary Key*** in the ***Tools*** group

Handy to Know…

- Once you have nominated a field as the primary key, Access will only allow you to enter unique values in that field. Duplicate values or empty fields (known as nulls) will not be accepted. ***AutoNumber*** field types are ideal for primary keys because they are automatically created and are always unique.

SAVING AND CLOSING A TABLE

Unlike data that is saved as you move away from a field, tables are objects that must be saved if you want to retain any changes that you make to the design. You can either save the table as you work or save it as you close it. One advantage of this process is that if you want to return to the previous settings, you can simply close the table without saving it.

Try This Yourself:

Before starting this exercise, ensure that the table design from the previous exercise is displayed...

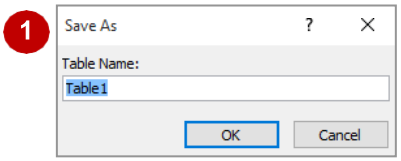
1. Click on the ***File*** tab, then click on **Save** to display the ***Save As*** dialog box

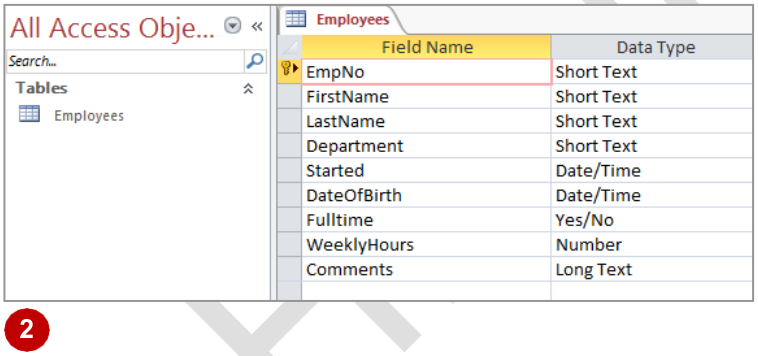
   We selected Save, not Save As, because the Save As options relate to the database as a whole and we are only saving an object within the database at this point. Unlike larger Save As dialog boxes found in other applications, this box is relatively small. This is because the table structure is saved as part of the database file so there is no need to specify a file location for database objects…

2. Type **Employees** in ***Table Name***, then click on **[OK]**

   The table's name will now appear in the Navigation pane…

3. Click on ***Close*** to close the table





For Your Reference…

To ***save*** a ***table design***:

1. Click on the ***File*** tab to display the ***Backstage***, then click on **Save**
2. Type a ***Table Name*** and click on **[OK]**

Handy to Know…

- If you try to close a table that has been modified but not saved, Access will prompt you to save the changes and provide a dialog box so that you can choose **[Yes]** or **[No]**.

CREATING THE EXPENSE TYPE TABLE

The relational database in our case study actually requires two lookup tables. The first is used for the *Employees* entity, while the second is used for the *Expense Type* entity. In the *Expense Type* lookup table, information is entered about types of transactions which can be then later looked up from the transactions table.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Relational Databases_2.accdb...

1. Click on the ***Create*** tab, then click on ***Table Design*** in the ***Tables*** group to open a new table
2. Type the fields as shown (set the ***Field Size*** for the ***Description*** field to ***30***)
3. Click on ***ExpTypeNo*** in ***Field Name*** to select the field, then on the ***Table Tools: Design*** tab, click on ***Primary Key*** in the ***Tools*** group to make this field the primary key
4. Click on ***Save*** in the ***Quick Access Toolbar*** (***QAT***) to display the ***Save As*** dialog box
5. Type **Expense Type** in ***Table Name***, then click on **[OK]**

   The new table is listed in the Navigation pane and the object name appears in the tab at the top of the design window…
6. Click on ***Close*** to close the table

Table1

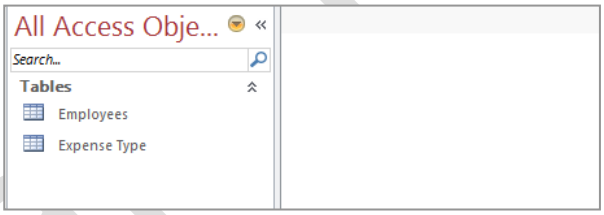
Field Name	Data Type	Description (Optional)
ExpTypeNo	AutoNumber	Records the number of the expense type
Description	Short Text	Records the description of the expense
MaximumAllowed	Currency	Records the maximum amount allowed

2

Table1

Field Name	Data Type	Description (Optional)
ExpTypeNo	AutoNumber	Records the number of the expense type
Description	Short Text	Records the description of the expense
MaximumAllowed	Currency	Records the maximum amount allowed

3



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For Your Reference…

To ***create*** an ***expense type table***:

1. On the ***Create*** tab, click on ***Table Design*** in the ***Tables*** group
2. Specify the fields and the primary key, then click on ***Save*** in the ***QAT***

Handy to Know…

- The ***AutoNumber*** field type provides an automatic and unique number for each transaction. It is ideal for tasks where you need to have a new and unique number for each transaction record that is entered into the table.

CREATING THE TRANSACTIONS TABLE

Once you have created the lookup tables for your relational database, you can turn your attention to creating the transaction table or tables. There is nothing different or special about creating a transaction table from creating a lookup table – you still need to enter and define the fields, identify a primary key and name the table.

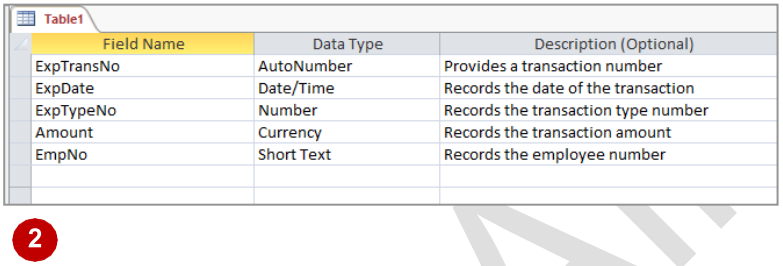
Try This Yourself:

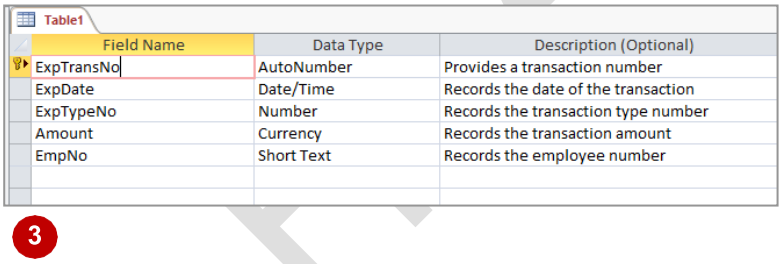
Same File

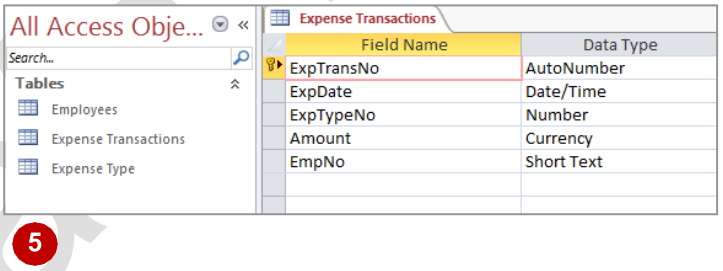
Continue using the previous file with this exercise, or open the file Relational Databases_3.accdb...

1. Click on the ***Create*** tab, then click on ***Table Design*** in the ***Tables*** group to open a new table
2. Type the fields as shown (set the ***Field Size*** for the ***EmpNo*** field to ***6***)
3. Click on ***ExpTransNo*** in ***Field Name*** to select the field, then on the ***Table Tools: Design*** tab, click on ***Primary Key*** in the ***Tools*** group to make this field the primary key
4. Click on ***Save*** in the ***QAT*** to display the ***Save As*** dialog box
5. Type **Expense Transactions** in ***Table Name***, then click on **[OK]**

   The new table is listed in the Navigation pane and the object name appears in the tab at the top of the design window…
6. Close the table







For Your Reference…

To ***create*** a ***transaction table***:

1. On the ***Create*** tab, click on ***Table Design*** in the ***Tables*** group
2. Specify the fields and the primary key, then click on ***Save***

Handy to Know…

- When one table (e.g. *TableA*) links to an ***Autonumber*** field in a lookup table (e.g. *TableB*), that field should be defined as ***numeric*** in *TableA* as this allows you to enter the correct number for the item in the lookup table.

CREATING THE DETAILS TABLE

In our case study database specification we required a table that will hold personal details of the employees in our system. This table is like an addendum to the main ***Employees*** table – it is neither a lookup table nor a transaction table. It is generally best to create these details tables last.

Try This Yourself:

Same File *Continue using the previous file with this exercise, or open the file Relational Databases_4.accdb...*

1. Click on the ***Create*** tab, then click on ***Table Design*** in the ***Tables*** group to create a new table
2. Create the fields with ***Field Sizes***, as shown
3. Click on ***EmpNo*** in ***Field Name*** to select the field, then on the ***Table Tools: Design*** tab, click on ***Primary Key*** in the ***Tools*** group to make this field the primary key
4. Click on ***Save*** in the ***QAT*** to display the ***Save As*** dialog box
5. Type **Personal Details** in ***Table Name***, then click on **[OK]**
6. Close the table

Table1

Field Name	Data Type	Description (Optional)
EmpNo	Short Text	Records the employee number
HomePhone	Short Text	Records the emplyee's home contact number
NextofKin	Short Text	Records the employee's immediate next of kin
Relationship	Short Text	Records the employees relationship to next of kin
Salary	Currency	Records the employee's salary
Comments	Long Text	Records comments regarding details

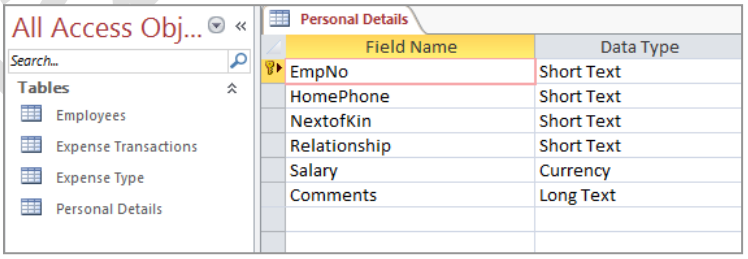
2 **Field Sizes to change:**

EmpNo	6
HomePhone	12
NextOfKin	20
Relationship	20

Table1

Field Name	Data Type	Description (Optional)
EmpNo	Short Text	Records the employee number
HomePhone	Short Text	Records the emplyee's home contact number
NextofKin	Short Text	Records the employee's immediate next of kin
Relationship	Short Text	Records the employees relationship to next of kin
Salary	Currency	Records the employee's salary
Comments	Long Text	Records comments regarding details

3 *Note: In reality, NextOfKin should probably be two fields (for first and last name), but we have kept it short for the purposes of this case study.*



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For Your Reference…

To ***create*** a ***details table***:

1. Click on the ***Create*** tab, then click on ***Table Design*** in the ***Tables*** group
2. Type the field names, field types and field descriptions, then set a primary key
3. Save and close the table

Handy to Know…

- A phone number field should be defined as a *text* field even though it consists of numbers because telephone numbers are not used in calculations.

OPENING AN EXISTING TABLE

Tables exist within a database file as database ***objects***. When you work with a table you usually work with its data – this is done in a special table view known as ***Datasheet*** view. If you want to modify the structure of a table or one of its fields you must work with the table in ***Design*** view.

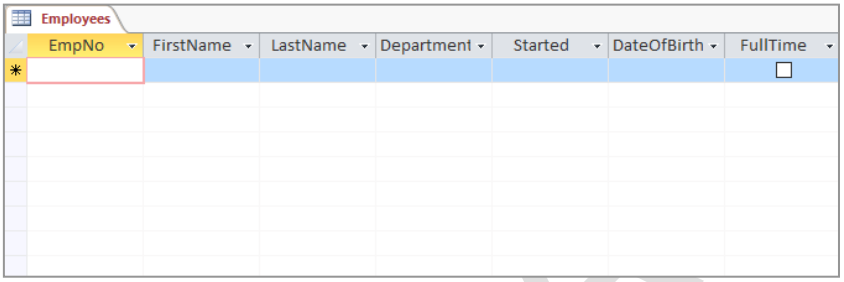
Try This Yourself:

Open File

Before starting this exercise you MUST open the file Modifying Tables_1.accdb…

1. In the ***Navigation*** pane, double-click on the ***Employees*** table to open the table in ***Datasheet*** view
2. On the ***Home*** tab, click on the top half of ***View*** in the ***Views*** group to switch to ***Design*** mode

   Note that the picture on the View tool changes to indicate the view you will be toggled to…
3. Click on ***View*** again to toggle back to ***Datasheet*** view
4. Click on ***Close*** to the right of the table to close it
5. In the ***Navigation*** pane, right-click on the ***Employees*** table to display the shortcut menu
6. Select **Design View** to display the table in ***Design*** view
7. Close the table



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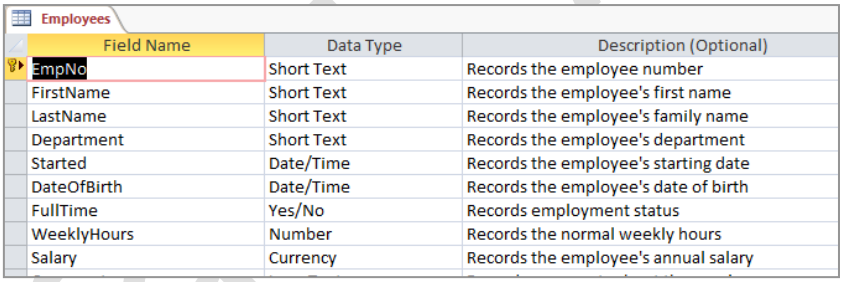

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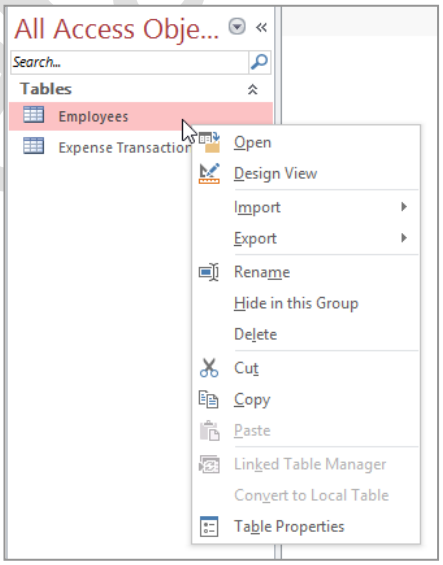


For Your Reference…

To ***open*** an ***existing table***:

- Double-click on the table in the ***Navigation*** pane, or

  Right-click on the table to see a shortcut menu and select the appropriate command

Handy to Know…

- There is no right or wrong way to open a table. Choose either the ***Navigation*** pane double-click method or the right-click method as suits.

ADDING FIELDS TO AN EXISTING TABLE

Your database design may have been perfect when you first created it, but after reviews with end-users and managers, and even after some additional reflection or brain waves, it may become necessary to tweak the field structure. Fortunately, modern database applications like Access allow you to add fields to an existing table with minimal effort.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Modifying Tables_1.accdb...

1. In the ***Navigation*** pane, right-click on the ***Employees*** table and select **Design View** to display the table in ***Design*** view
2. Click on the ***Started*** field then, on the ***Table Tools: Design*** tab, click on ***Insert Rows*** in the ***Tools*** group to add a new field row
3. Enter the details as shown and change the ***Field Size*** property to ***30***
4. Repeat steps ***2*** and ***3*** to add a ***PhoneNo*** field as shown, with a ***Field Size*** of ***15***
5. Click on ***Save*** in the ***Quick Access Toolbar*** to save the design changes
6. Click on ***Close*** to close the table

Employees

Field Name	Data Type	Description (Optional)
EmpNo	Short Text	Records the employee number
FirstName	Short Text	Records the employee's first name
LastName	Short Text	Records the employee's family name
Department	Short Text	Records the employee's department
Started	Date/Time	Records the employee's starting date
DateOfBirth	Date/Time	Records the employee's date of birth
FullTime	Yes/No	Records employment status
WeeklyHours	Number	Records the normal weekly hours
Salary	Currency	Records the employee's annual salary
Comments	Long Text	Records comments about the employee

2

Employees

Field Name	Data Type	Description (Optional)
EmpNo	Short Text	Records the employee number
FirstName	Short Text	Records the employee's first name
LastName	Short Text	Records the employee's family name
Department	Short Text	Records the employee's department
Location	Short Text	Records the employees location
Started	Date/Time	Records the employee's starting date
DateOfBirth	Date/Time	Records the employee's date of birth
FullTime	Yes/No	Records employment status
WeeklyHours	Number	Records the normal weekly hours
Salary	Currency	Records the employee's annual salary
Comments	Long Text	Records comments about the employee

3

Employees

Field Name	Data Type	Description (Optional)
EmpNo	Short Text	Records the employee number
FirstName	Short Text	Records the employee's first name
LastName	Short Text	Records the employee's family name
Department	Short Text	Records the employee's department
PhoneNo	Short Text	Records the employee's phone number
Location	Short Text	Records the employees location
Started	Date/Time	Records the employee's starting date
DateOfBirth	Date/Time	Records the employee's date of birth
FullTime	Yes/No	Records employment status
WeeklyHours	Number	Records the normal weekly hours
Salary	Currency	Records the employee's annual salary
Comments	Long Text	Records comments about the employee

4

For Your Reference…

To ***add another field*** to a ***table***:

1. Click on the field above which you wish to insert the new field
2. On the ***Table Tools: Design*** tab, click on ***Insert Rows*** in the ***Tools*** group

Handy to Know…

- Some words are reserved for key operations in Access and can't be used for field names. One such word is ***Date*** – Access will warn you if you attempt to use a reserved word as a field name.

UNDERSTANDING FIELD PROPERTIES

Fields in a table structure have specific characteristics that can be modified to adjust how the field is displayed on the screen, what it is named, and even what can be entered into it.

These characteristics are known as ***properties*** and appear at the bottom of the ***Design*** view screen when a field is selected. They can become very powerful tools when used correctly.

Field Properties

The ***properties*** of fields vary depending upon the data type of the field. For example, you can't change the width of a numeric field, but you can for a text field. The list of properties, therefore, should be watched carefully to see just what is available to you.

The following list shows the more common field properties that appear when you click on a field in ***Design*** view. If one of the properties below fails to appear when a field is clicked, then that property is not available to the data type of the selected field.

Field Size	Limits the size of ***Short Text*** fields. It can be set from 1 to 255. Be careful changing the size of fields if records have already been entered into the table.
New Values	Appears only for ***AutoNumber*** fields and allows you to specify the increment value between new numbers.
Format	Allows you to change how numbers and dates are displayed. If you have formatted numbers in Microsoft Excel, then the formats used here will be familiar to you.
Input Mask	Allows you to force data entry into predefined formats, such as phone numbers (e.g. *(03) 9851 4000*) where brackets, spaces, dashes etc are used for the data.
Caption	Captions are used in forms and reports in lieu of the normal field name. Captions are handy when you have used truncated or abbreviated field names (e.g. *EmpNo* can be made to appear as *Employee Number*).
Decimal Places	Allows you to specify the number of decimal places for numeric fields.
Default Value	Allows you to specify a default value that will appear in the field whenever a new record is created. This can be standard text or, in the case of dates, can be an *expression* (i.e. a formula) that displays the current date.
Validation Rule	Allows you to specify a rule for the data to ensure that data is entered correctly. For example, you can specify a rule that a number has to be greater than 1,000 or that the date must be today or later etc.
Validation Text	Displays a message to the user when data entered into a field with a validation rule doesn't match what the validation rule requires.
Required	Ensures that data is entered into the field. Access will not move off the record until data has been entered into the field.
Allow Zero Length	If nothing is entered into a text field it is deemed to be of *null* length. If you wish to enter an empty string (" ") you must select this property. Note that this is an advanced concept.
Indexed	Indexes are used to list data in a specific order, speed up searching, and/or restrict the entry of duplicate values. They will be explained in greater detail later.
Smart Tags	*Smart Tags* are used to obtain specific data for the field. They can be used to obtain stock quotes, exchange rates, etc. Again, they are an advanced concept.
Text Align	Allows you to determine where in a column (left, centre or right) data will appear.

CHANGING FIELD SIZE

By rights you should have determined the appropriate size of a field during the design phase. However, you can alter the size of a field at any time in ***Design*** view. To change the field size all you need to do is to specify a new value in the ***Field Size*** property of the relevant field.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Modifying Tables_2.accdb...

1. In the ***Navigation*** pane, right-click on the ***Employees*** table and select **Design View** to display the table
2. Click on the ***Location*** field, then double-click on ***30*** in ***Field Size*** in the ***Field Properties*** pane at the bottom of the window
3. Type **40** and press Enter to increase the size
4. Click on the ***PhoneNo*** field, then double-click on ***15*** in ***Field Size***
5. Type **6** and press Enter
6. Save and close the table

Employees

Field Name	Data Type	Description (Optional)
EmpNo	Short Text	Records the employee number
FirstName	Short Text	Records the employee's first name
LastName	Short Text	Records the employee's family name
Department	Short Text	Records the employee's department
PhoneNo	Short Text	Records the employee's phone number
Location	Short Text	Records the employees location
Started	Date/Time	Records the employee's starting date
DateOfBirth	Date/Time	Records the employee's date of birth
FullTime	Yes/No	Records employment status
WeeklyHours	Number	Records the normal weekly hours
Salary	Currency	Records the employee's annual salary
Comments	Long Text	Records comments about the employee

1

2

Field Properties

General | Lookup

Field Size	30
Format	
Input Mask	
Caption	
Default Value	
Validation Rule	
Validation Text	
Required	No
Allow Zero Length	Yes
Indexed	No
Unicode Compression	Yes
IME Mode	No Control
IME Sentence Mode	None
Text Align	General

3

Field Properties

General | Lookup

Field Size	40
Format	
Input Mask	
Caption	
Default Value	
Validation Rule	
Validation Text	
Required	No
Allow Zero Length	Yes
Indexed	No
Unicode Compression	Yes
IME Mode	No Control
IME Sentence Mode	None
Text Align	General

For Your Reference…

To ***change*** the ***size*** of a ***field***:

1. In ***Design*** view, click on the field to select it
2. Double-click on the value for ***Field Size*** in ***Field Properties***
3. Type a new value and press Enter

Handy to Know…

- Generally you won't have too many problems if you increase field size. However, if you decrease field size and there are records in the table you may find you will lose some data.

CHANGING FIELD NAMES

There is much debate regarding the naming of fields. Again, field names are something that should really be sorted out before the structure is created and then they should be rigidly adhered to. However, if you have to you can easily change the name of a field in ***Design*** mode.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Modifying Tables_3.accdb...

1. In the ***Navigation*** pane, right-click on the ***Employees*** table and select **Design View** to display the table
2. Double-click on the ***Location*** field to place its name in edit mode
3. Type **EmployeeLocation** and press Enter

   This name reflects a traditional approach to field naming, where spaces are excluded and multi-word names have each word beginning with a capital letter…
4. Save and close the table

Employees

Field Name	Data Type	Description (Optional)
EmpNo	Short Text	Records the employee number
FirstName	Short Text	Records the employee's first name
LastName	Short Text	Records the employee's family name
Department	Short Text	Records the employee's department
PhoneNo	Short Text	Records the employee's phone number
Location	Short Text	Records the employees location
Started	Date/Time	Records the employee's starting date
DateOfBirth	Date/Time	Records the employee's date of birth
FullTime	Yes/No	Records employment status
WeeklyHours	Number	Records the normal weekly hours
Salary	Currency	Records the employee's annual salary
Comments	Long Text	Records comments about the employee

2

Employees

Field Name	Data Type	Description (Optional)
EmpNo	Short Text	Records the employee number
FirstName	Short Text	Records the employee's first name
LastName	Short Text	Records the employee's family name
Department	Short Text	Records the employee's department
PhoneNo	Short Text	Records the employee's phone number
EmployeeLocation	Short Text	Records the employees location
Started	Date/Time	Records the employee's starting date
DateOfBirth	Date/Time	Records the employee's date of birth
FullTime	Yes/No	Records employment status
WeeklyHours	Number	Records the normal weekly hours
Salary	Currency	Records the employee's annual salary
Comments	Long Text	Records comments about the employee

3

For Your Reference…

To ***change*** the ***name*** of a ***field***:

1. In ***Design*** view, double-click on the field to place it into edit mode
2. Type the new name and press Enter

Handy to Know…

- Rather than changing the column heading, and therefore the field name, you can use the ***Caption*** property in ***Table Design*** view. This provides an alternative name for a field when it is displayed in a table.

CHANGING DECIMAL PLACES

Numbers can be used in databases for a variety of reasons. They can record values, sizes, areas, volumes, temperatures and so on. Each field containing a number may require specialised formatting. While some formats are taken from the data type, such as ***Currency***, other numbers may require adjustment of decimal places to correctly represent their value.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Modifying Tables_4.accdb...

1. In the ***Navigation*** pane, right-click on the ***Employees*** table and select **Design View** to display the table
2. Click on the ***WeeklyHours*** field to display its properties in the ***Field Properties*** pane
3. Click on the value in ***Decimal Places***, then click on the drop arrow and select ***1***

   The drop arrow appears at the very right end of the field in the Field Properties pane…
4. Save and close the table

Employees

Field Name	Data Type	Description (Optional)
EmpNo	Short Text	Records the employee number
FirstName	Short Text	Records the employee's first name
LastName	Short Text	Records the employee's family name
Department	Short Text	Records the employee's department
PhoneNo	Short Text	Records the employee's phone number
EmployeeLocation	Short Text	Records the employees location
Started	Date/Time	Records the employee's starting date
DateOfBirth	Date/Time	Records the employee's date of birth
FullTime	Yes/No	Records employment status
WeeklyHours	Number	Records the normal weekly hours
Salary	Currency	Records the employee's annual salary
Comments	Long Text	Records comments about the employee

2

3

General | Lookup

Field Size	Long Integer
Format	
Decimal Places	1
Input Mask	
Caption	
Default Value	0
Validation Rule	
Validation Text	
Required	No
Indexed	No
Text Align	General

For Your Reference…

To ***change decimal places***:

1. In ***Design*** view, click on the field to format
2. In the ***Field Properties*** pane, click on the value in ***Decimal Places***, click on the drop arrow and select the number of decimal places you require

Handy to Know…

- Some data types, such as ***Currency***, have a predefined number of decimal places.

CHANGING DATE FORMATS

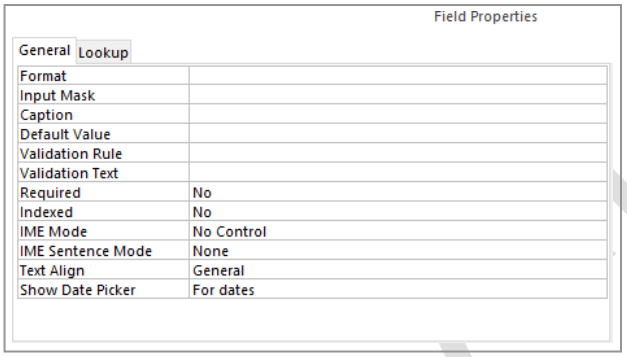
Dates may be stored in tables for a variety of reasons. They may include dates of birth, starting dates, expiry dates, or the dates of milestones. Access allows you to display dates in a variety of formats – depending on the needs of your application. You can choose between ***Long Date***, ***Medium Date***, ***General Date***, ***Short Date***, and various time-only formats.

Try This Yourself:

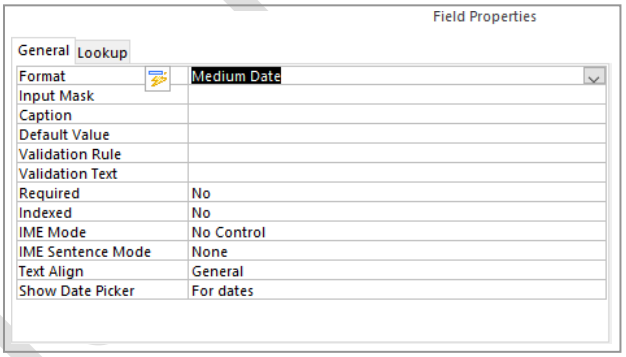
Same File *Continue using the previous file with this exercise, or open the file Modifying Tables_5.accdb...*

1. In the ***Navigation*** pane, right-click on the ***Employees*** table and select **Design View** to display the table
2. Click on the ***Started*** field to display the ***Field Properties***
3. In the ***Field Properties*** pane, click in ***Format***, then click on the drop arrow and click on ***Medium Date***
4. Repeat steps ***2*** and ***3*** for the ***DateOfBirth*** field
5. Save and close the table

2



3



For Your Reference…

To ***change*** the ***date format*** of a ***field***:

1. In ***Design*** view, click on the field to format
2. Click on ***Format*** in the ***Field Properties*** pane, then click on the drop arrow
3. Select the date format

Handy to Know…

- Terms such as ***long date*** and ***medium date*** can be rather meaningless to most people. In the ***Field Properties*** pane, the sample to the right of the list of date formats can be used as a guide to see how date formats will appear.

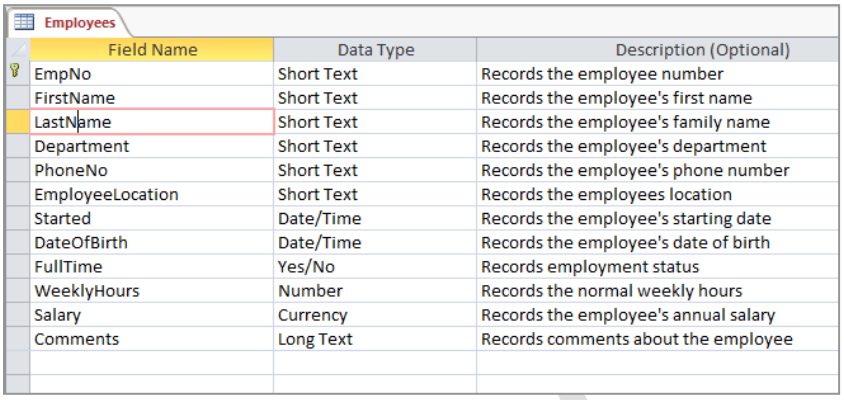
INDEXING FIELDS

Because indexes help to speed up data retrieval, you can create ***indexes*** on fields that you expect to sort or search on frequently. Indexes can also be used to prevent duplicate data from being typed into the table. When you specify that a field should be indexed, you can specify it as ***Duplicates OK*** or ***No Duplicate***s depending upon the requirements of the field being indexed.

Try This Yourself:

Same File *Continue using the previous file with this exercise, or open the file Modifying Tables_6.accdb...*

1. Ensure the ***Employees*** table is displayed in **Design View**
2. Click on the ***LastName*** field to display the ***Field Properties*** pane
3. Click on ***Indexed***, then click on the drop arrow
4. Select **Yes (Duplicates OK)** if it isn't already selected
5. Click on the ***PhoneNo*** field to display its properties
6. Click on ***Indexed***, click on the drop arrow and select **Yes (No Duplicates)**
7. Save and close the table



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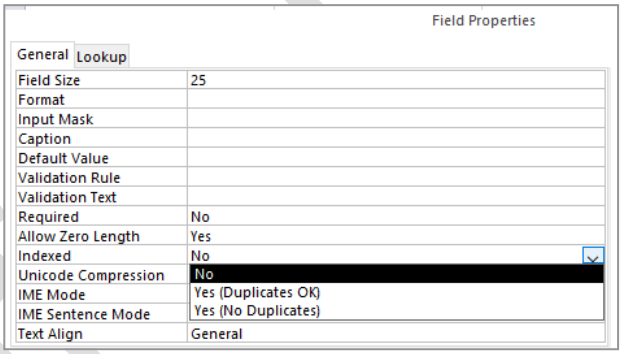


For Your Reference…

To ***create*** an ***index*** on a ***field***:

1. In ***Design*** view, click on the field to index
2. Click on ***Indexed*** in the ***Field Properties*** pane, then click on the drop arrow
3. Select the required indexing option

Handy to Know…

- You can specify an index for a ***LastName*** field as ***Duplicates OK*** because there might be more than one employee with the same last name. A ***PhoneNo*** field, however, should be indexed as ***No Duplicates*** because every employee should have a different phone number.

DELETING FIELDS FROM A TABLE

Like adding fields to a table, deleting fields really shouldn't be necessary if the designing has gone to plan. However, if you need to delete a field from a table it can be done with relative ease.

You do need to be aware that deleting a field from a table that has records in it will result in data loss. Therefore before deleting fields in an existing table you should make adequate backups.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Modifying Tables_7.accdb...

1. In the ***Navigation*** pane, right-click on the ***Employees*** table and select **Design View**
2. Click on the ***EmployeeLocation*** field to select it
3. On the ***Table Tools: Design*** tab, click on ***Delete Rows*** in the ***Tools*** group

   The field is deleted from the table structure…
4. Save and close the table

Employees

Field Name	Data Type	Description (Optional)
EmpNo	Short Text	Records the employee number
FirstName	Short Text	Records the employee's first name
LastName	Short Text	Records the employee's family name
Department	Short Text	Records the employee's department
PhoneNo	Short Text	Records the employee's phone number
EmployeeLocation	Short Text	Records the employees location
Started	Date/Time	Records the employee's starting date
DateOfBirth	Date/Time	Records the employee's date of birth
FullTime	Yes/No	Records employment status
WeeklyHours	Number	Records the normal weekly hours
Salary	Currency	Records the employee's annual salary
Comments	Long Text	Records comments about the employee

2

Employees

Field Name	Data Type	Description (Optional)
EmpNo	Short Text	Records the employee number
FirstName	Short Text	Records the employee's first name
LastName	Short Text	Records the employee's family name
Department	Short Text	Records the employee's department
PhoneNo	Short Text	Records the employee's phone number
Started	Date/Time	Records the employee's starting date
DateOfBirth	Date/Time	Records the employee's date of birth
FullTime	Yes/No	Records employment status
WeeklyHours	Number	Records the normal weekly hours
Salary	Currency	Records the employee's annual salary
Comments	Long Text	Records comments about the employee

3

For Your Reference…

To ***delete*** a ***field*** from a ***table***:

1. In ***Design*** view, click on the field to delete
2. On the ***Table Tools: Design*** tab, click on ***Delete Rows*** in the ***Tools*** group

Handy to Know…

- If you accidentally delete a field that you need, close the table without saving the changes. Deletions only come into effect when the table is saved.

COPYING A TABLE WITHIN A DATABASE

When you make structural changes to a table which can involve data loss, it is a good idea to make a back-up of the table first. You could back up the entire database file using conventional file copy operations in File Explorer, however, a quicker and easier way is simply to make a duplicate copy of the table within the database file itself.

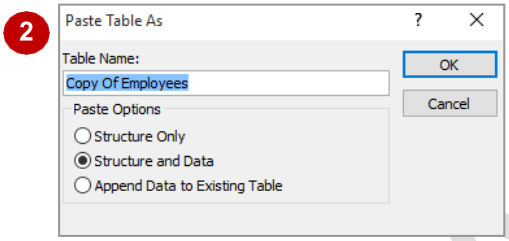
Try This Yourself:

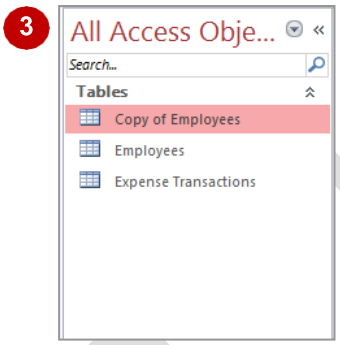
Same File — *Continue using the previous file with this exercise, or open the file Modifying Tables_8.accdb...*

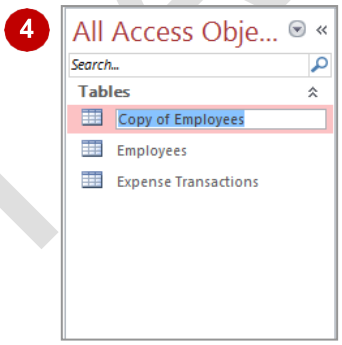
1. In the ***Navigation*** pane, right-click on the ***Employees*** table and select **Copy** to copy the table to the clipboard
2. On the ***Home*** tab, click on the top half of ***Paste*** in the ***Clipboard*** group to display the ***Paste Table As*** dialog box

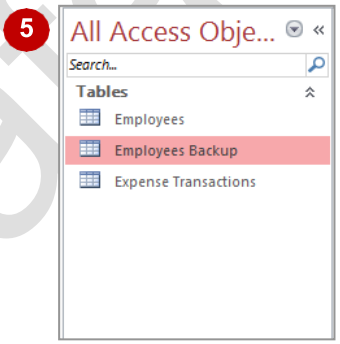
   This dialog box allows you to determine what to copy and how to name it…
3. Ensure ***Structure and Data*** is selected, then click on **[OK]** to paste a copy of the table

   Let's give it a more descriptive name…
4. Right-click on the ***Copy of Employees*** table and select **Rename** to place the name in edit mode
5. Type **Employees Backup**, then press Enter









For Your Reference…

To ***copy*** a ***table within*** a ***database file***:

1. In the ***Navigation*** pane, right-click on the table and select **Copy**
2. On the ***Home*** tab, click on the top half of ***Paste***
3. Complete the dialog box options and click on **[OK]**

Handy to Know…

- Your database file will grow in size if you add copies of your tables. If you have a number of tables in the database file it may be more effective to make a backup copy of the *database file* rather than the tables.

DELETING A TABLE FROM A DATABASE FILE

Tables are simply objects stored within a database file. As such you can create them, modify them, and even delete them if so required. In general terms the only time you should really need to delete a table is when you no longer require copies of tables made for back-up and data protection purposes.

Try This Yourself:

Same File

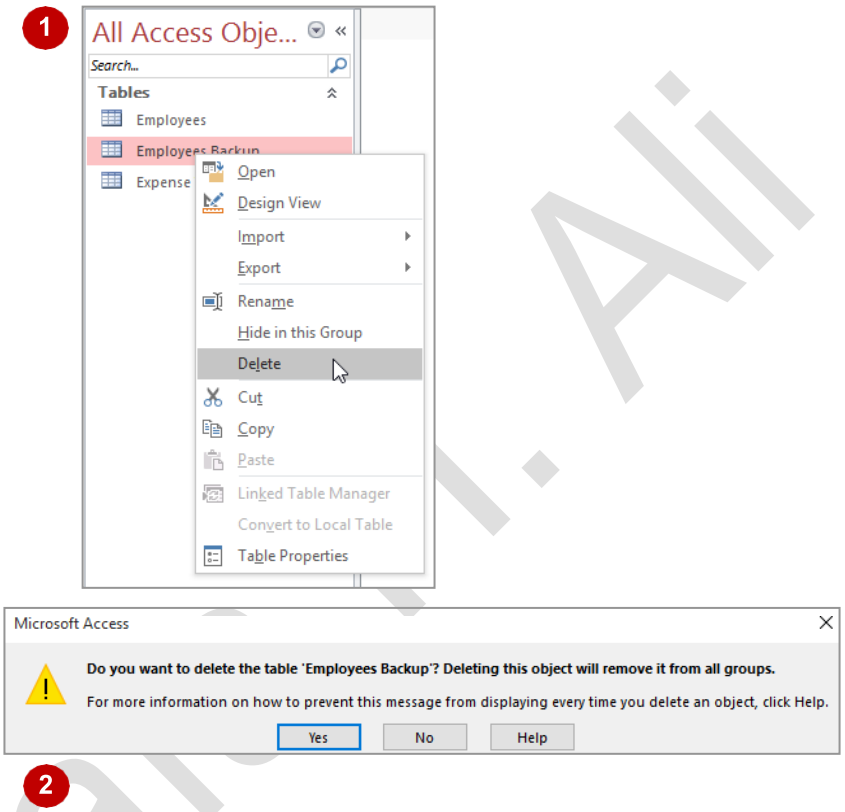
Continue using the previous file with this exercise, or open the file Modifying Tables_9.accdb...

1. In the ***Navigation*** pane, right-click on the ***Employees Backup*** table and select **Delete**

   A deletion warning message will display…

2. Click on **[Yes]** to delete the table

   The deleted table will no longer appear in the Navigation pane



For Your Reference…

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

1. In the ***Navigation*** pane, right-click on the table and select **Delete**
2. Click on **[Yes]** to delete the table

Handy to Know…

- Deletion of a table is final – there's no way back. It is a good idea therefore to make a back-up copy of the database file before deleting tables (or indeed, other objects) from the database.

UNDERSTANDING TABLE RELATIONSHIPS

In a relational system the database is normally made up of several tables that store your data. Where multiple tables exist they are linked or joined together, thereby forming a ***relationship*** which allows the system to add, update or report on the data contained in the tables as though they were one entity.

Types of Relationships

There are three types of relationships that can exist between tables:

- ***one-to-one***, where each record in a table is related to only one other record in another table – this is a rare form of relationship.
- ***one-to-many***, where one record in a table is related to many others in another table – this is the most common form of relationship and usually exists where one table is used to look up key values. In this type of relationship, the table with many records is often referred to as the ***transaction table***, while the other table is known as the ***lookup table*** as it is used by the transaction table to lookup some data, usually a name, or a title, or something similar.
- ***many-to-many***, where many records in one table can be related to many records in another table – this is extremely rare and very problematic.

Referential Integrity

Referential integrity is probably the most significant benefit of relating tables.

Let's consider two of the tables in our system, ***Expense Transactions*** and ***Employees***. These tables can be related using a ***one-to-many*** relationship – there can be many expense transaction records for each employee.

Since we need to know which employee raised a claim, it would be imprudent of our database if it let us create a new expense transaction without information about the employee.

If we enforce ***referential integrity*** in the one-to-many relationship between the ***Expense Transactions*** and ***Employees*** table it will not be possible to enter a new expense record without assigning it to an employee record that exists in the ***Employees*** table.

Referential integrity has some further options. For example if the ***EmpNo*** number for an employee changed it would be handy if Access would automatically update the number in all of the related tables – this can be done by activating ***Cascade Update***.

Similarly, if we delete an employee from the ***Employees*** table, we may wish to delete all of the expense transaction records for that employee from the system. This can be done by activating the ***Cascade Delete*** option – however, you should treat this with care and really examine the needs of your business before activating ***Cascade Delete***. It is possible that you need to retain the expense records for a certain period of time, even if the employee has left.

Relationships as Data Protection

All of this theory is a lot of information to process. Look carefully at your data and you'll notice that these are only rules to protect your data and ensure that it remains updated and consistent. They also ensure that you don't accidentally delete records that you need to keep.

UNDERSTANDING LOOKUP RELATIONSHIPS

The most common reason for relating tables in a database file is for ***lookup*** purposes. ***Lookups*** are used when the details from single entity tables are required to be displayed in transaction tables, usually to assist in data entry or reporting. In our case study the expenses table uses the employee number, but to assist in data entry we need to display (i.e. ***lookup***) the employee name.

One-To-Many Relationships

Lookup databases have a ***one-to-many*** relationship.

In this type of relationship the lookup table contains unique records and forms the *one* side in the ***one-to-many*** relationship. The transaction table forms the *many* side in the ***one-to-many*** relationship because there may be many transactions for each record or entity from the lookup table.

Lookups are done from the transaction table into the lookup table.

In our case study we have two lookup requirements from the ***Expense Transactions*** table: one for employees and the other for expense types.

With employees, the ***Employees*** table is the lookup table – there is only one record here for each employee. The ***Expense Transactions*** table is the transaction table – there may be many records for each of the employees in the ***Expense Transactions*** table.

With expense types, the ***Expense Types*** table is the lookup table – there is only one record here for each type of expense that can be incurred. The ***Expense Transactions*** table is again the transaction table – there may be many records for each of the types in the ***Expense Type*** table.

Table relationships are made possible by the use of the ***primary key*** in the lookup table. The role of the primary key is to keep records in order and to facilitate a fast search mechanism so that lookups appear almost instantaneously. The primary key is referenced from the transaction table using a ***lookup field***, often with a similar name to that of the primary key in the lookup table. The value in the lookup field is used to search the primary key field in the lookup table and once found, data from other fields of the found record can be used.

For example, with employees in our case study, the primary key of the ***Employees*** table is ***EmpNo*** and is used in that table to uniquely identify employees. For the relationships to work with ***Expense Transactions***, there is a field called ***Employee***. The value in the ***Employee*** field in the ***Expense Transactions*** table is used to look up the primary key field ***EmpNo*** in ***Employees*** for the correct employee. Once a match is made other details such as first name, last name etc. from ***Employees*** can be used for reports and displays such as drop-lists as shown above.

LOOKING UP THE EMPLOYEES TABLE

Once you have created a transaction and a lookup table, you can connect the two tables to form a relationship between them. One of the easiest ways to do this is to use the ***Lookup Wizard*** to create a ***Lookup Column*** in the transaction table. The wizard enables you to nominate the fields from the lookup table that you want displayed with your transaction data.

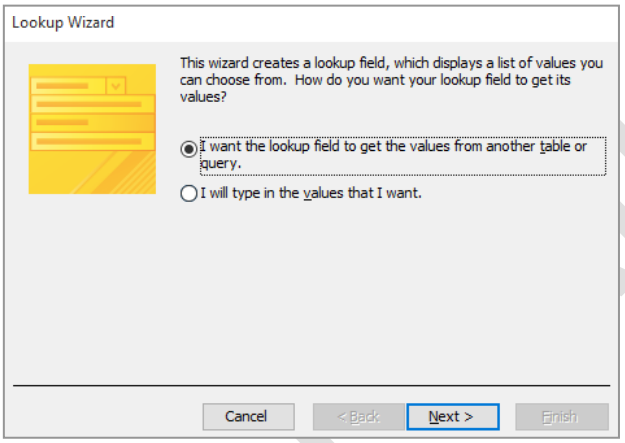
Try This Yourself:

Open File *Before starting this exercise you MUST open the file Creating Relationships_1.accdb…*

1. Open the table ***Expense Transactions*** in **Design View**
2. Click on ***Short Text*** in ***Data Type*** for ***EmpNo***, then click on the drop arrow and select **Lookup Wizard** to start the ***Lookup Wizard***
3. Work through the wizard, making the selections as shown
4. Click on **[Finish]** to complete the wizard, then click on **[Yes]** to save the changes

   Notice the EmpNo field is now called Employee…
5. Click on the ***Employee*** field, then click on the ***Lookup*** tab in the ***Field Properties*** pane to see the settings that have been created
6. Close the table

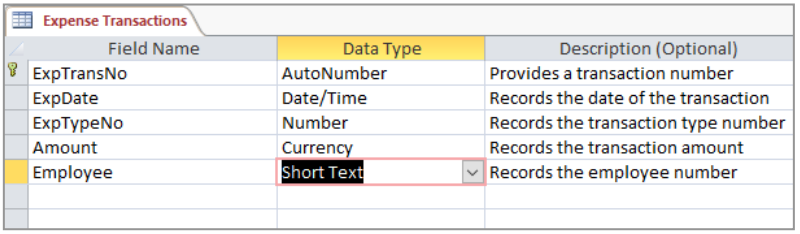
2



3

Screen	Task	Then
1	Select ***I want the lookup field to get the values from another table or query***	[Next]
2	Select ***Table:Employees***	[Next]
3	Double-click on ***LastName*** then on ***FirstName*** in ***Available fields***	[Next]
4	Select ***LastName*** for the first sort column, then ***FirstName*** for the second sort column, ensuring that both are set to ***Ascending*** order	[Next]
5	Ensure that ***Hide key column*** appears with a tick	[Next]
6	Type **Employee** as the label for the lookup field	

4



For Your Reference…

To ***connect*** to a ***lookup table***:

1. Open the transaction table in ***Design View*** and click in the first blank row
2. Click on ***Modify Lookups*** in the ***Tools*** group
3. Follow the steps of the wizard and specify the relevant field details

Handy to Know…

- Relationships between tables can be done through the ***Lookup Wizard*** or you can create them manually in the ***Relationships*** pane.

LOOKING UP THE EXPENSE TYPES TABLE

The second example of a lookup required in our case study database is one that looks up expense type details. The looking up is done from the transactions table and uses the expense type number as a lookup key. The wizard provides the quickest and easiest way of creating the lookup.

Try This Yourself:

Same File

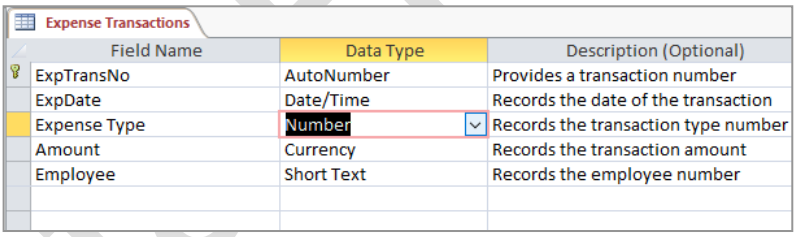
Continue using the previous file with this exercise, or open the file Creating Relationships_2.accdb...

1. Open the table ***Expense Transactions*** in **Design View**
2. Click on ***Number*** in ***Data Type*** for ***ExpTypeNo***, then click on the drop arrow and select **Lookup Wizard** to start the ***Lookup Wizard***
3. Work through the wizard, making the selections as shown
4. Click on **[Finish]** to complete the wizard, then click on **[Yes]** to save the changes

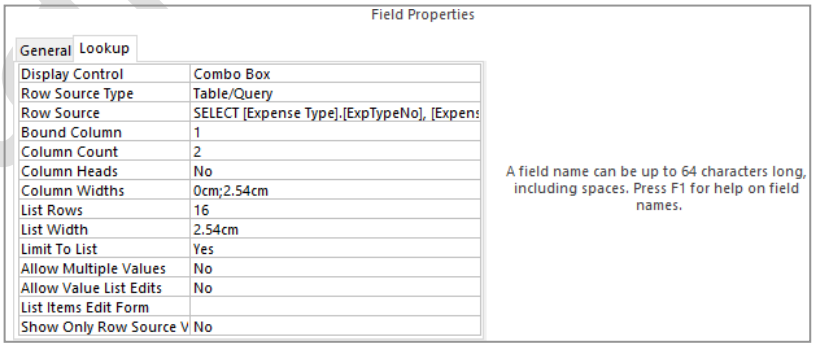
   Notice the ExpTypeNo field has been changed to Expense Type…
5. Click on the ***Expense Type*** field, then click on the ***Lookup*** tab in the ***Field Properties*** pane to see the settings that have been created
6. Close the table

3

Screen	Task	Then
1	Select ***I want the lookup field to get the values from another table or query***	[Next]
2	Select ***Table: Expense Type***	[Next]
3	Double-click on ***Description*** in ***Available fields***	[Next]
4	Ignore the sort order settings	[Next]
5	Ensure that ***Hide key column*** appears ticked	[Next]
6	Type **Expense Type** as the label for the lookup field	



4



5

For Your Reference…

To ***connect*** to a ***lookup table***:

1. Open the transaction table in ***Design View***, then click in a blank row
2. Change the relevant field to a ***Lookup*** field
3. Follow the steps of the wizard and specify the relevant field details

Handy to Know…

- The lookup operation is performed in Access using ***SQL*** programming code. The code that does this is in the ***Row Source*** field of the ***Lookup*** tab in ***Field Properties***. It's worth having a look at this code to see how it is written.

VIEWING TABLE RELATIONSHIPS

Table relationships can be viewed and edited using the ***Relationships*** window. This window gives you a better understanding of how tables are related or joined together. It also lists all of the fields in each table so that you can locate content easily. The ***Relationships*** window can be used to document part of your database design by printing it as a report.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Creating Relationships_3.accdb...

1. Click on the ***Database Tools*** tab, then click on ***Relationships*** in the ***Relationships*** group

   The existing relationships between tables will be shown.

2. On the ***Relationship Tools: Design*** tab, click on ***Show Table*** in the ***Relationships*** group to display the ***Show Table*** dialog box

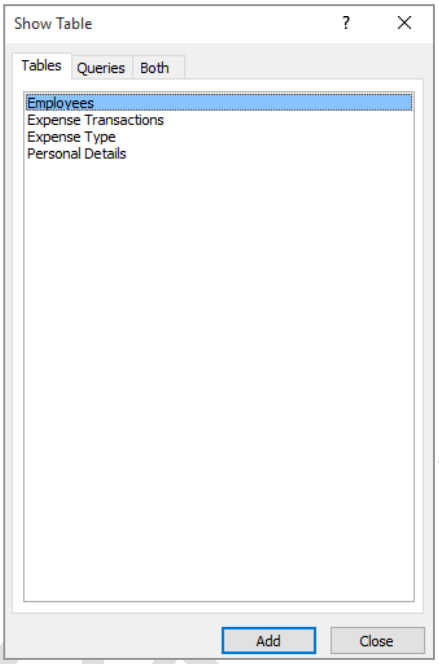
3. Double-click on ***Personal Details*** to add the table, then click on **[Close]**

   The lines that appear are join lines showing the table relationships…

4. Use the mouse to drag the tables into position as shown

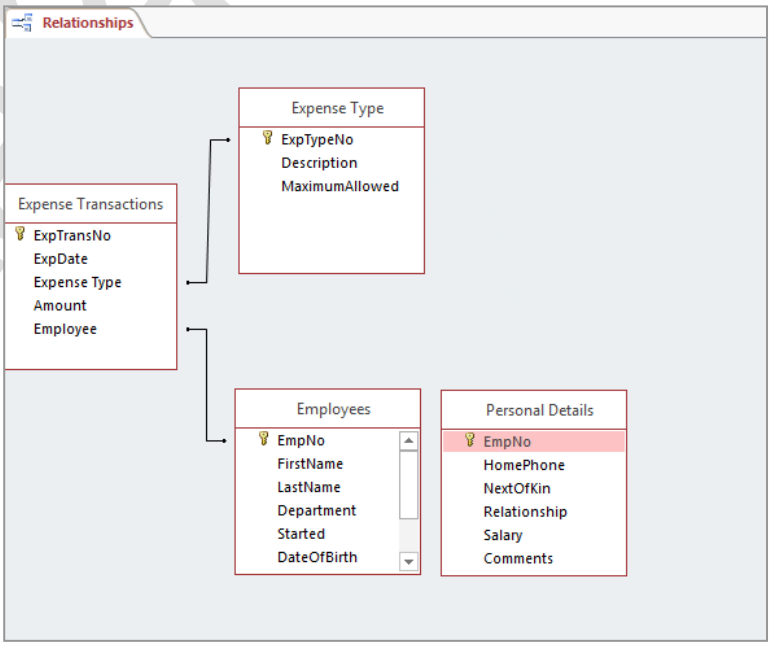
5. Save and close the ***Relationships*** window

2



IMPORTANT: Additional tables may display such as the MSysNavPaneGroups table. These are hidden system objects that keep track of the way database objects are grouped. To continue with the exercise, hide them by right-clicking on the Navigation pane, selecting Navigation Options, then clicking on Show Hidden Objects and Show System Objects so they both appear unticked. If this doesn't work, right-click on the table and select Hide.

4



For Your Reference…

To ***view table relationships***:

1. Click on the ***Database Tools*** tab
2. Click on ***Relationships*** in the ***Relationships*** group

Handy to Know…

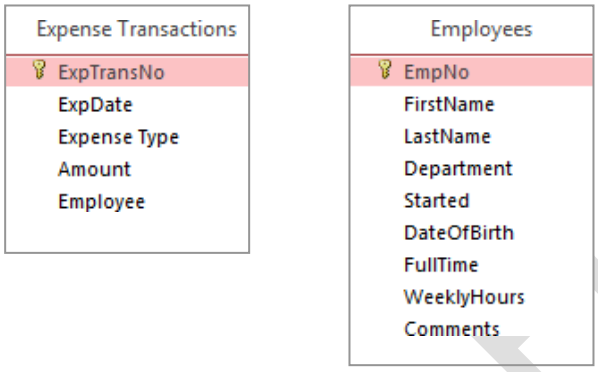
- If you need a hard copy of the table relationships, click on the ***Relationship Tools: Design*** tab and click on ***Relationship Report*** in the ***Tools*** group. Click on the ***File*** tab to display the ***Backstage***, select **Print** and click on ***Quick Print*** to print the report.

UNDERSTANDING TABLE JOINS

While the actual process of joining tables in a relational database in Microsoft Access is easy, a reasonable degree of thought should be devoted before making the joins. In our case study we have four tables which will need to be joined. A little understanding of what ***types of joins*** we need and why we are using them is useful before proceeding much further.

While the ***Relationships*** window is open, the quickest way to create a relationship is to drag the mouse from one field in a table to another field in a different table. The process is very simple and easy to do.

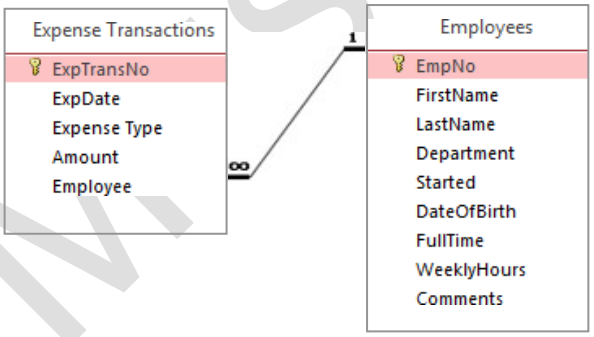
For example, in the design of our *Expenses System* we have a transaction table that contains expense transactions (***Expense Transactions***) and another that contains details about our employees (***Employees***).



This structure ensures that we don't re-enter employee details every time an employee has an expense to claim for – instead, we use the ***EmpNo*** number as a code to look up the employee details in the ***Employees*** table.

Let's stop and consider what we are doing. With this relationship we are telling Microsoft Access that there will be ***one*** employee record in ***Employees*** and ***many*** in ***Expense Transactions***. The two tables are related by the common field of ***EmpNo***. In the ***Employees*** table the ***EmpNo*** field is the ***primary key*** – it is unique, there can only be one ***EmpNo*** number for each employee (remember, it appears with a key icon because it is the primary key).

From a design perspective we are creating a one-to-many relationship. To do this, the link field in the *one* table must be the ***primary key***. The link field in the *many* table becomes known as the ***foreign key***.



*When a join is created in Microsoft Access, a line appears between the related fields in the two tables. The symbols on the line tell you what type of join it is. The infinity symbol indicates that the Expense Transactions table is a **many** table, while the one symbol indicates that the Employees table is a **one** table.*

We have several other issues to consider here.

Should we enforce ***referential integrity***? If we want to stop an expense record being created that is not linked to an existing employee, then the answer is *yes*.

If we opt for referential integrity, do we want all of the ***EmpNo*** numbers in expenses to update when we change the ***EmpNo*** in ***Employees***? If the answer is *yes* we must activate ***Cascade Update***.

Again, if we want all of the expenses for an employee to be deleted when we delete the employee from the ***Employees*** table, we must activate ***Cascade Delete***.

Naturally, these questions will need to be asked for all of the joins that we create between all of the tables in the system.

EDITING THE EMPLOYEE TABLE JOIN

Joins created using the Lookup Wizard use the common join settings. They do not however have any referential integrity settings in place. If you want to establish integrity between the tables you will need to edit the join in the ***Relationships*** window. In our case study we want to ensure that updates are reflected from the ***Employees*** table.

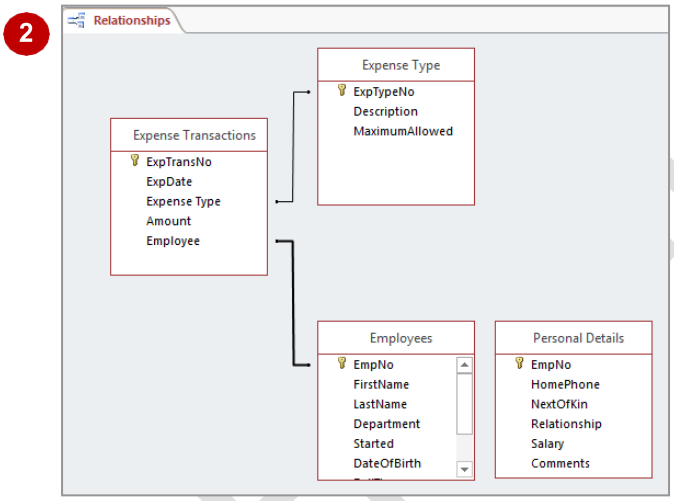
Try This Yourself:

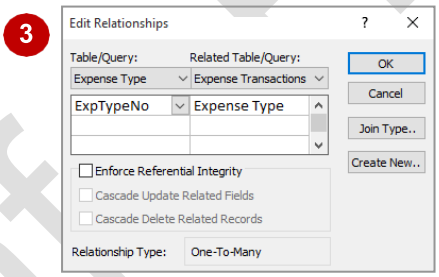
Same File

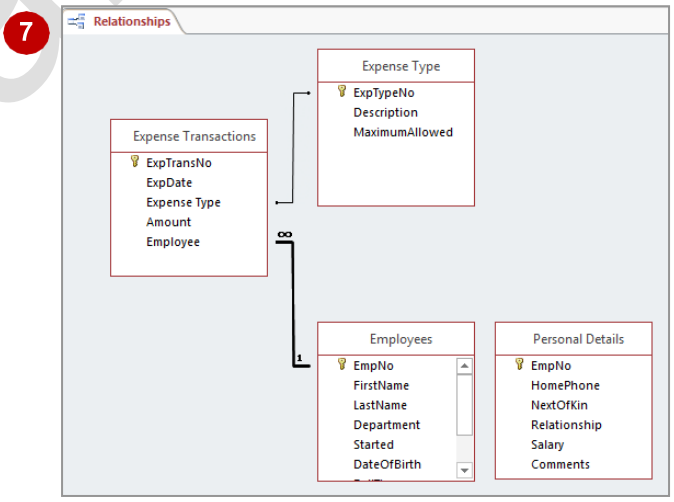
Continue using the previous file with this exercise, or open the file Creating Relationships_4.accdb...

1. On the ***Database Tools*** tab, click on ***Relationships*** in the ***Relationships*** group
2. Click on the join line between the ***Expense Transactions*** and ***Employees*** tables to select it – it should appear slightly thicker
3. On the ***Relationship Tools: Design*** tab, click on ***Edit Relationships*** in the ***Tools*** group to display the ***Edit Relationships*** dialog box
4. Click on ***Enforce Referential Integrity*** until it appears with a tick
5. Click on ***Cascade Update Related Fields*** until it appears with a tick
6. Ensure ***Cascade Delete Related Fields*** appears without a tick
7. Click on **[OK]** to apply the changes

   The symbols on the join indicate a one-to-many relationship…
8. Close the ***Relationships*** window







For Your Reference…

To ***edit relationship joins***:

1. Click on the join line to select it
2. On the ***Relationship Tools: Design*** tab, click on ***Edit Relationships*** in the ***Tools*** group
3. Make the changes as appropriate

Handy to Know…

- In a one-to-many relationship where referential integrity is enforced, you cannot enter a record into the *many* (transaction) table unless the related (linked) field has been entered into the *one* (lookup) table as a record. The integrity of the relationship is thereby enforced (watched).

EDITING THE EXPENSE TYPE TABLE JOIN

We should also set the referential integrity options for the join between the ***Expense Transactions*** and ***Expense Type*** tables. Since these tables form a one-to-many type of relationship, referential integrity will ensure that we can't enter a record in the transactions table without a relevant entity in the lookup table.

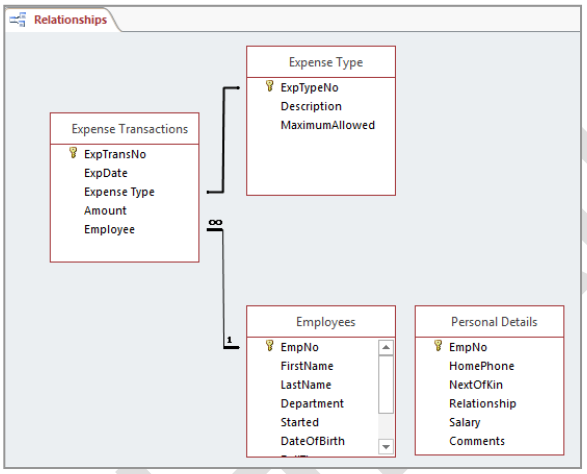
Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Creating Relationships_5.accdb...

1. On the ***Database Tools*** tab, click on ***All Relationships*** in the ***Relationships*** group
2. Click on the join line between the ***Expense Transactions*** and ***Expense Type*** tables to select it – it should appear slightly thicker
3. On the ***Relationship Tools: Design*** tab, click on ***Edit Relationships*** in the ***Tools*** group to display the ***Edit Relationships*** dialog box
4. Click on ***Enforce Referential Integrity*** until it appears with a tick
5. Click on ***Cascade Update Related Fields*** until it appears with a tick
6. Ensure ***Cascade Delete Related fields*** appears without a tick
7. Click on **[OK]** to apply the changes
8. Close the ***Relationships*** window

2



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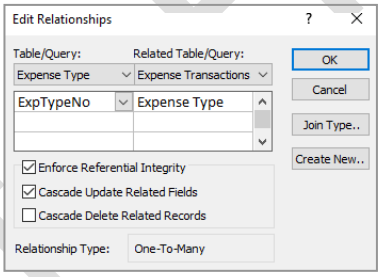

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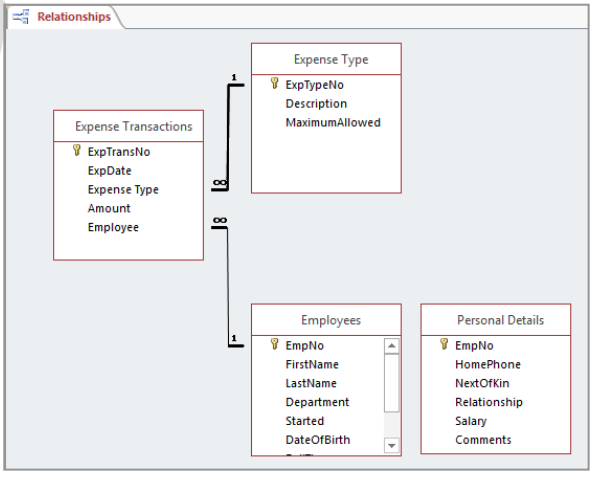


For Your Reference…

To ***edit relationship joins***:

1. Click on the join line to select it
2. On the ***Relationship Tools: Design*** tab, click on ***Edit Relationships*** in the ***Tools*** group
3. Make the changes as appropriate

Handy to Know…

- If you want linked transactions to be deleted when a record is deleted in a lookup table, tick ***Cascade Delete*** in the ***Edit Relationships*** dialog box – but do not tick it if you want to keep the transactions (e.g. for accounting purposes).

CREATING A NEW JOIN

Not all tables are joined using the Lookup Wizard. Indeed, once you are proficient with the way joins work, you'll probably find yourself manually creating your own joins. In our case study we need to establish a join between the ***Employees*** table and the ***Employee Details*** table – this will be a one-to-one join type.

Try This Yourself:

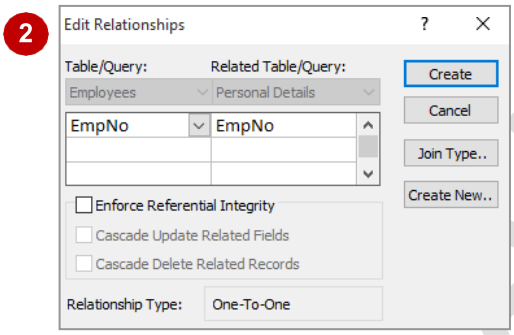
Same File *Continue using the previous file with this exercise, or open the file Creating Relationships_6.accdb...*

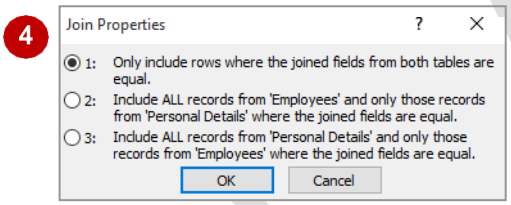
1. On the ***Database Tools*** tab, click on ***Relationships*** in the ***Relationships*** group
2. Click on ***EmpNo*** in the ***Employees*** table, then drag and drop the field on ***EmpNo*** in the ***Personal Details*** table

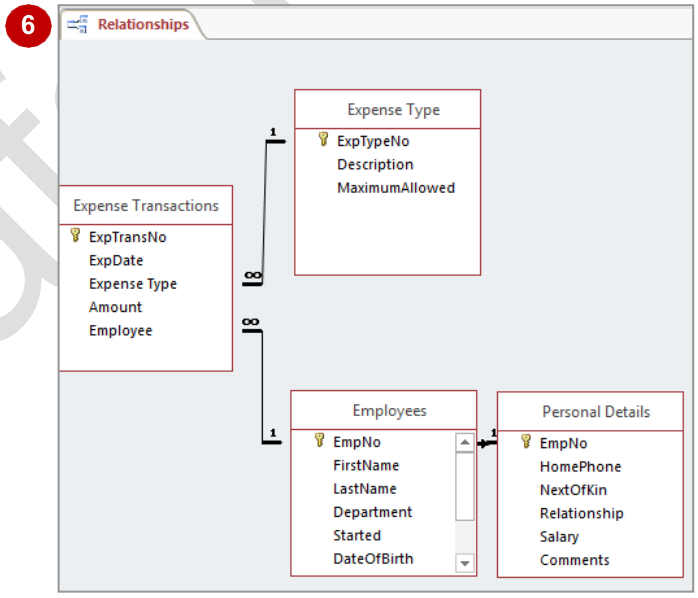
   This will open the Edit Relationships dialog box…
3. Ensure that the three referential integrity boxes appear with a tick
4. Click on **[Join Type]** to see the ***Join Properties*** dialog box
5. Click on option ***2:*** to create a *left outer* join where ***ALL*** employee records will be displayed

   Employees is the dominant table and we always want to see the records here…
6. Click on **[OK]** to return to the ***Edit Relationships*** dialog box, then click on **[Create]** to create the join

   You might need to move the tables slightly to see the join…
7. Save and close the ***Relationships*** window







For Your Reference…

To ***create*** a ***new join between tables***:

1. Drag one joining field onto the other
2. Choose the appropriate degree of referential integrity required
3. Click on **[Join Type]** and specify the desired type of join

Handy to Know…

- When creating a new join manually, the default join type, where only rows that appear in both tables are included, is known as an ***inner*** join. If you want to see all records in the main table, irrespective of whether there is a related record in the linked table, create a ***left outer*** join.

CREATING A RELATIONSHIP REPORT

Once all of your table relationships are created and have been refined the way you want, it is a good idea to document these relationships. The ***Relationships*** window allows you to produce a ***Relationship Report*** which is, in reality, a print preview version of the relationships window. For documentation purposes, you can then print this to either paper or a file.

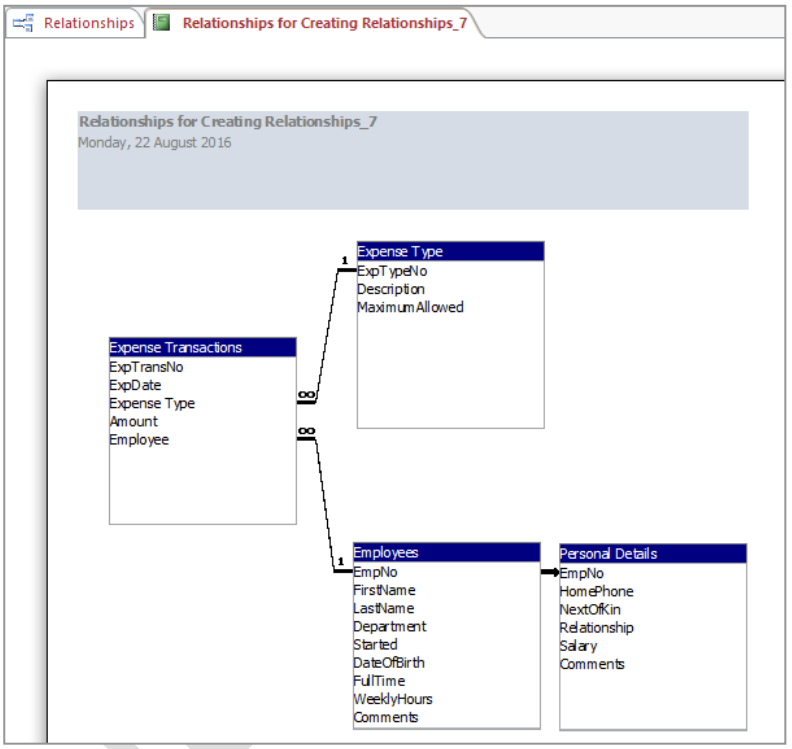
Try This Yourself:

Same File

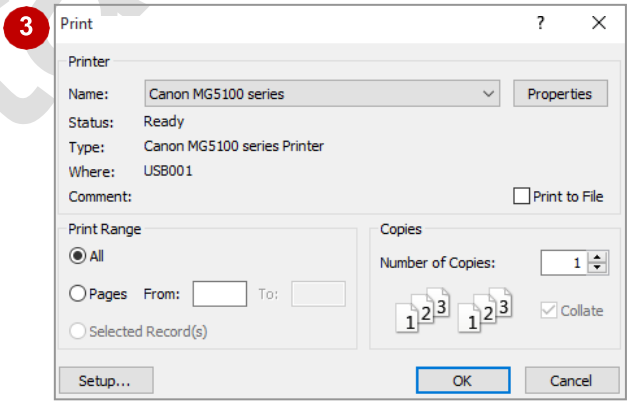
Continue using the previous file with this exercise, or open the file Creating Relationships_7.accdb...

1. On the ***Database Tools*** tab, click on ***Relationships*** in the ***Relationships*** group
2. On the ***Relationship Tools: Design*** tab, click on ***Relationship Report*** in the ***Tools*** group to create a report of the relationships

   The report appears as another tab in the database window…
3. On the ***Print Preview*** tab, click on ***Print*** in the ***Print*** group to display the ***Print*** dialog box
4. Ensure that your printer is online and ready to print, then click on **[OK]**
5. Close the ***Relationships for…*** window without saving it
6. Close the ***Relationships*** window



2



For Your Reference…

To ***produce*** a ***relationship report***:

1. Click on the ***Database Tools*** tab and click on ***Relationships*** in the ***Relationships*** group
2. On the ***Relationship Tools: Design*** tab, click on ***Relationship Report*** in the ***Tools*** group

Handy to Know…

- A relationship report is actually created as an Access form. Even though you can save the report, there is little point in doing so unless you want to keep the current version of the relationships for your records. It takes so little time to create a new report, it's just not worth the bother.

TYPING RECORDS IN A TABLE

The easiest way to enter data is directly into an open table. When you open a table you are shown the ***Datasheet*** view by default. Access always displays the records in the table plus one additional row at the bottom of the table. This is the ***new record*** row where a new record can be entered. The total number of records, shown in the status bar, will increase as you add data.

Try This Yourself:

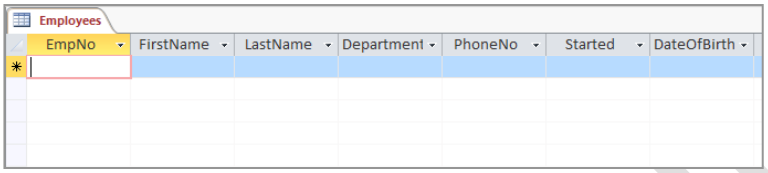
Open File

Before starting this exercise you MUST open the file Adding Records_1.accdb…

1. In the ***Navigation*** pane, double-click on the ***Employees*** table to open it

   The table will appear empty because no records have yet been entered. To enter a record, you type the data into each field and press Enter *to move between the fields…*

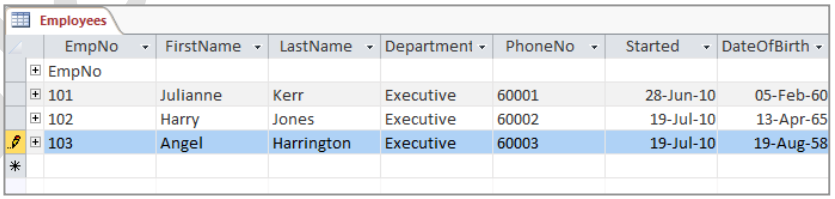
2. Type the data as shown – use the mouse to click the check box for ***FullTime*** and press Enter to move through the fields
3. Check that your data matches that shown
4. Close the table



1

2

	Record 1	Record 2	Record 3
EmpNo:	101	102	103
FirstName:	Julianne	Harry	Angel
LastName:	Kerr	Jones	Harrington
Department:	Executive	Executive	Executive
PhoneNo:	60001	60002	60003
Started:	28/6/2010	19/7/2010	19/7/2010
DateOfBirth:	5/2/1960	13/4/1965	19/8/1958
FullTime:	☑	☑	☑
WeeklyHours	40	40	40
Salary:	$250,000	$140,000	$145,000
Comments:			



3

For Your Reference…

To ***add*** a ***record*** to a ***table***:

1. Double-click on the table in the ***Navigation*** pane to open it in ***Datasheet*** view
2. Type the data into each field, pressing Enter to move across fields

Handy to Know…

- When entering data, long entries will appear truncated on the screen, but the complete data is stored in the field.
- Records are saved automatically when you move to the next field or record.
- To correct an error when adding a record, simply type over it.

ADDING RECORDS USING A FORM

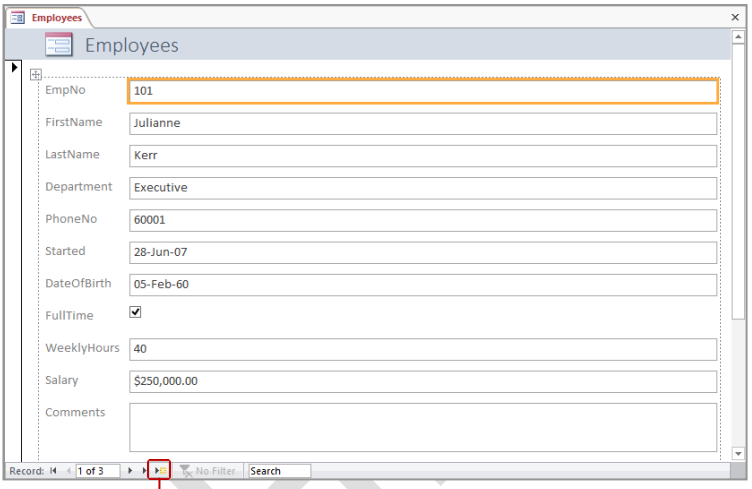
Records can also be added to a table using a form. A form normally displays the details for one record on the screen at a time. It is like a card in a manual card file system. In Access you can create quite sophisticated forms for data entry and data display. You can also create a simple form for immediate data entry purposes using the ***Form*** command.

Try This Yourself:

Same File *Continue using the previous file with this exercise, or open the file Adding Records_2.accdb...*

1. In the ***Navigation*** pane, click on the ***Employees*** table to ensure it is selected
2. Click on the ***Create*** tab, then click on ***Form*** in the ***Forms*** group to display the first record of data in a form layout

   The form layout is like a structure. We need to be in Form view to work with the data…
3. On the ***Form Layout Tools: Design*** tab, click on the top half of ***View*** in the ***Views*** group to display the form in ***Form*** view
4. Click on ***New (blank) record*** in the bar at the very bottom of the form to display a new record – a yellow dotted square appears on this tool
5. Type the three records, as shown, pressing Tab to move down the fields
6. Close the form – since the form is a new object you will be asked if you wish to save it
7. Click on **[No]**



3 *The **New (blank) record** tool*

	Record 4	Record 5	Record 6
EmpNo:	104	105	106
FirstName:	Peter	Mark	Maureen
LastName:	Dawson	Jones	Grayson
Department:	Executive	Executive	Administration
PhoneNo:	60004	60005	61021
Started:	19/7/2010	19/7/2010	6/9/2010
DateOfBirth:	12/7/1954	6/8/1963	23/10/1974
FullTime:	☑	☑	☑
WeeklyHours	40	40	40
Salary:	$140,000	$132,000	$85,000
Comments:			

5

For Your Reference…

To ***add records*** using a ***default form***:

1. Click on the table in the ***Navigation*** pane
2. Click on the ***Create*** tab, then click on ***Form*** in the ***Forms*** group
3. Click on the ***Home*** tab and click on ***View*** in the ***Views*** group

Handy to Know…

- When you click on ***Form*** on the ***Create*** tab, a default form is built from the table ***design*** and appears in ***Layout*** view, which allows you to change the layout of the form. You switch to ***Form*** view to work with the data, much the same as you switch to ***Datasheet*** view to work with data in a table.

SAVING A FORM LAYOUT FOR REUSE

Default Forms are quick and easy forms created by Access to facilitate either data viewing or data entry. You can, if you wish, save default forms for future use. When you save a default form, a new form object is created which will appear in the ***Navigation*** pane. It can then be opened any time it is required.

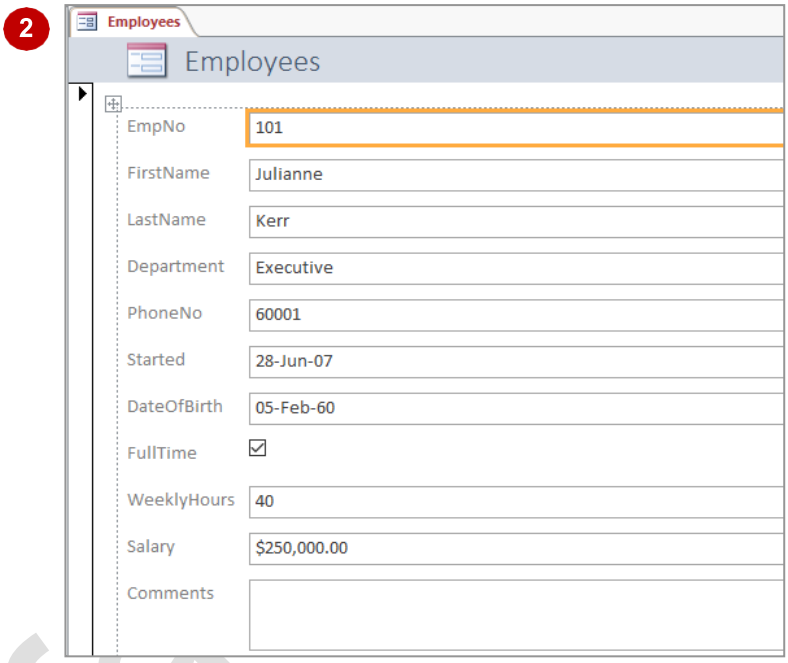
Try This Yourself:

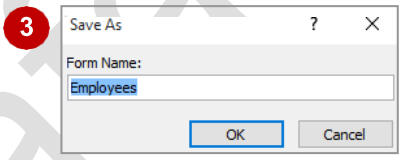
Same File *Continue using the previous file with this exercise, or open the file Adding Records_3.accdb...*

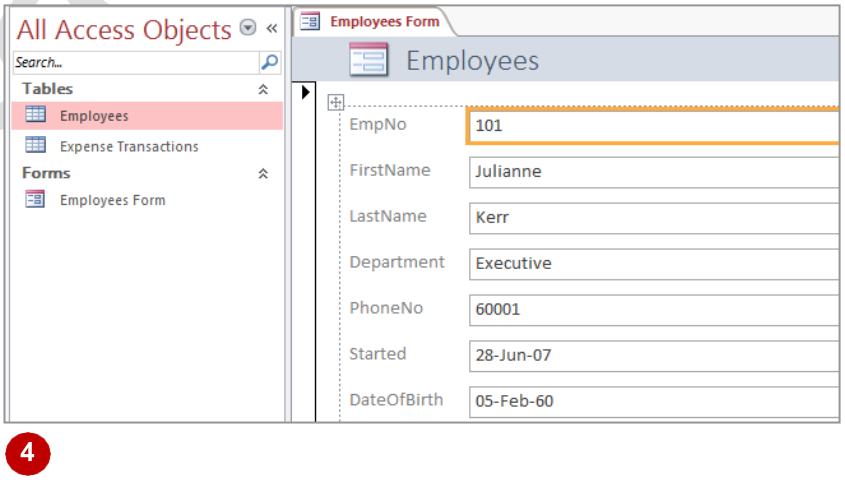
1. In the ***Navigation*** pane, click on the ***Employees*** table to select it
2. Click on the ***Create*** tab, then click on ***Form*** in the ***Forms*** group to display the first record of data in a form layout

   We won't make any changes here (even though we could)…
3. Click on the ***File*** tab to display the ***Backstage***, then click on **Save** to display the ***Save As*** dialog box
4. Type **Employees Form** in ***Form Name***, then click on **[OK]**

   The form will now appear in the Navigation pane, under the Forms header…
5. Close the form







For Your Reference…

To ***save*** a ***default form*** for ***reuse***:

1. Click on the table to select it, then click on the ***Create*** tab and click on ***Form*** in the ***Forms*** group
2. Click on the ***File*** tab and click on **Save**
3. Type a ***Form Name*** and click on **[OK]**

Handy to Know…

- Access uses headers (e.g. *Tables*, *Forms*, *Reports* etc.) in the ***Navigation*** pane to group the different objects, making it easier to differentiate and locate items quickly. This is particularly useful if two or more objects share the same name (e.g. ***Employees***).

ADDING RECORDS USING AN EXISTING FORM

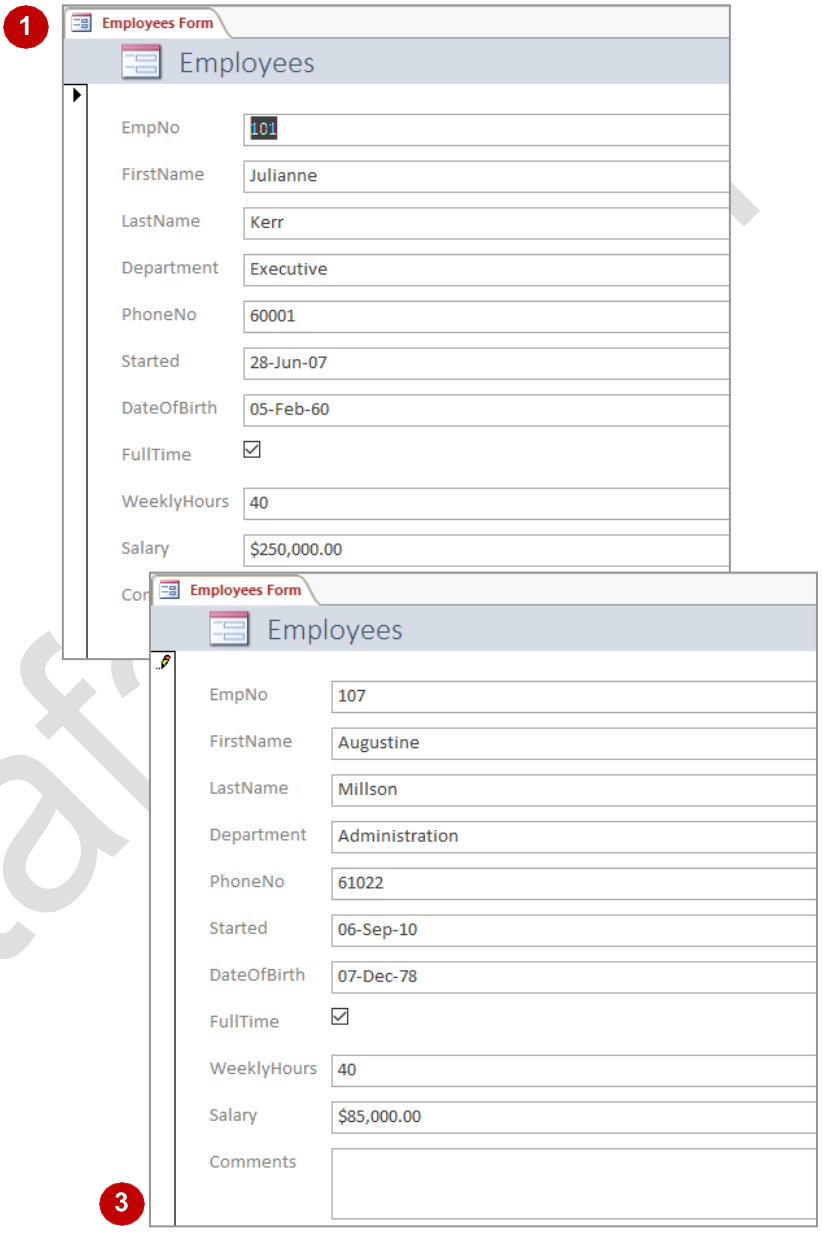
Forms appear in the ***Navigation pane*** and are used to display data and make changes to data, including adding new records. It doesn't matter whether your form was created from a default form or from scratch, you use it in exactly the same way. To add a record using an existing form you open it, click on the new record button and start typing.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file Adding Records_4.accdb...

1. In the ***Navigation*** pane, double-click on ***Employees Form*** to open the form in ***Form*** view
2. Click on ***New (blank) record*** in the bar at the very bottom of the form to display a new record
3. Complete the new record as shown
4. Click on ***Close*** to close the form



For Your Reference…

To ***add records using*** an ***existing form***:

1. Double-click on the form in the ***Navigation*** pane
2. Click on ***New (blank) record*** and enter the desired data

Handy to Know…

- The navigation buttons at the bottom of the form can be used to display different records in the table.

ADDING ADDITIONAL RECORDS

Records can be added to a table directly by typing in the new record line of the opened table, or by using a form. The choice is entirely yours. In this section you'll have the opportunity to add more records using whichever technique you prefer, and to practise moving between the fields and records in a ***datasheet*** or ***form***.

Sub Heading

Ensure you have completed the previous exercises and continue using the previous file, then open either the ***Employees*** table or the ***Employees Form*** and enter the data as shown below. It doesn't matter in which order you type records. When a table is opened the records are always sorted according to the primary key. You can select or tick a checkbox using the keyboard rather than the mouse. Simply press Tab to move to the checkbox then press Space to toggle on and off

	Record 8	Record 9	Record 10	Record 11	Record 12	Record 13
EmpNo:	108	109	110	111	112	113
FirstName:	Amanda	George	Neville	Petra	Vivienne	Jerry
LastName:	Bennet	Samuelson	Smith	Henricks	Clark	Hancock
Department:	Administration	Administration	Administration	Administration	Administration	Administration
PhoneNo:	61023	61024	61025	61026	61027	61028
Started:	6/9/2010	6/9/2010	6/9/2010	6/9/2010	6/9/2010	6/9/2010
DateOfBirth:	4/5/1959	1/12/1987	7/8/1954	3/4/1981	22/11/1961	9/10/1975
FullTime:	☑	☑	☑	☑	☑	☑
WeeklyHours	40	40	40	40	40	40
Salary:	$87,000	$98,000	$78,000	$82,000	$80,000	$79,000
Comments:			Studying MBA			

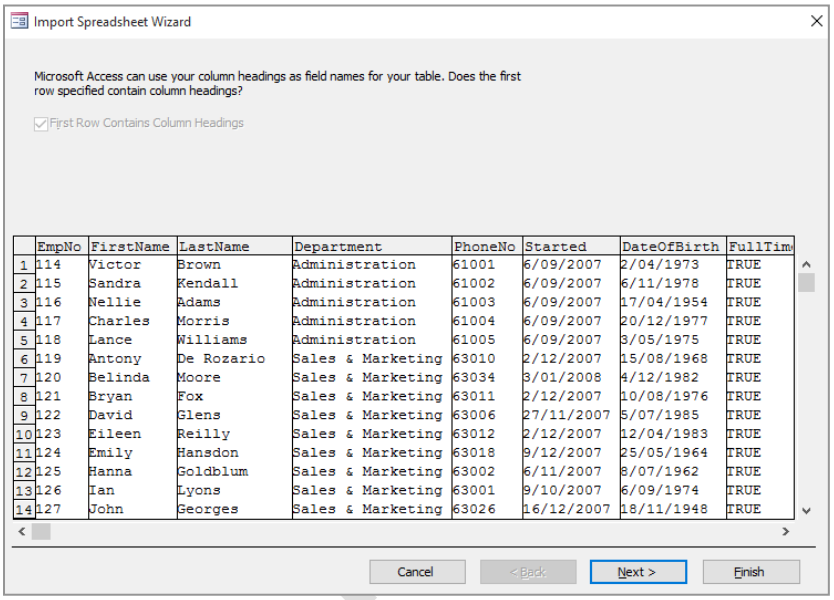
IMPORTING FROM MICROSOFT EXCEL

Access can import data from a wide variety of applications, including Microsoft Excel. The key to importing successfully, is ensuring that the structure that you import from has the same field names as the table into which the data is to be placed. In our case study we are assuming that *Alpheius Global Enterprises* already has an employee data list in an Excel spreadsheet format.

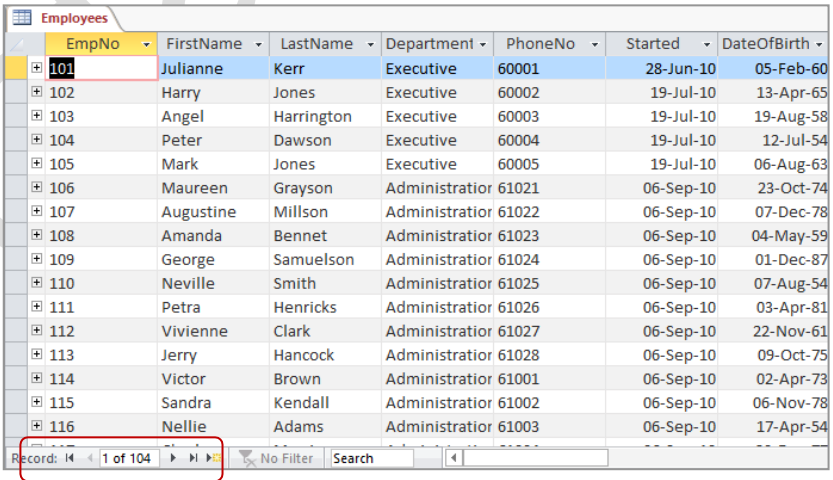
Try This Yourself:

Same File — *Continue using the previous file with this exercise, or open the file Adding Records_5.accdb...*

1. Click on the ***Employees*** table to select it
2. Click on the ***External Data*** tab, then click on ***Excel*** in the ***Import & Link*** group to display the ***Get External Data*** dialog box
3. Click on **[Browse]**, locate the file ***Employee List.xlsx*** in ***C:\Course Files for Microsoft Access 2016***, then click on **[Open]**
4. Click on ***Append a copy of the records to the table Employees***, then click on **[OK]** to start the ***Import Spreadsheet Wizard***
5. Click on **[Next]** until you arrive at the last screen
6. Click on **[Finish]**, then click on **[Yes]** and **[Close]** to complete the operation
7. Double-click on the ***Employees*** table to open it and see the data
8. Click on ***Close*** to close the table



4



7 *The Record count indicates that the table now contains 104 records*

For Your Reference…

To ***import records*** from ***Microsoft Excel***:

1. Click on the ***External Data*** tab, then click on ***Excel*** in the ***Import & Link*** group
2. Browse for the file to import, click on **[OK]**, then follow the wizard to complete the import

Handy to Know…

- The ***Import Wizard*** is by far the easiest way to import data and provides useful prompts along the way. Study each step carefully to see what options are available to you.
- Importing can mess up data in a table – it is a good idea to make a backup of a table before importing into it.