

ECDL[®]

European Computer Driving Licence[®]

Database Software BCS ITQ Level 2

Using Microsoft[®] Access[®] 2013

Syllabus Version 5.0

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Section 1

Databases

By the end of this section you should be able to:

Start Access

Recognise the Screen Layout

Use the Ribbon and Quick Access Toolbar

Use Help

Open an Existing Database

Close a Table and Database

Exit Access

Work through the **Driving Lessons** in this section to gain an understanding of the above features.

For each **Driving Lesson**, read all of the **Park and Read** instructions and then perform the numbered steps of the **Manoeuvres**. Complete the **Revision** exercise(s) at the end of the section to test your knowledge.

Driving Lesson 1 - Database Principles

P Park and Read

A database is a structured collection of data stored in a computer system, such as a telephone directory, address book, etc. Each item of data, e.g. a single telephone number, may not mean anything in itself, but as part of a database, the data can provide information.

A database management system is a computer program that allows a user to create, maintain and process database files.

An Access database can consist of a number of related items.

All data in databases is held in the form of **TABLES**, each table holding information on a single subject. Many tables may be linked together in a variety of ways to create larger and more powerful databases as the need arises.

Each line of a table represents a separate **RECORD**, consisting of items of data that belong together such as name, address and telephone number for a single individual.

Each item of data within a record is held in a separate column of the table, known as a **FIELD**. Each field should only contain one element of data. Different types of field can exist, e.g. text, number, date, etc.

Data can be presented in a **FORM** or a **REPORT**. Forms generally show one record from a table on the screen, usually in a neat and easy to read manner. Reports are usually presented so that they can be printed. They allow simple calculations to be made on the numerical data.

QUERIES allow questions to be asked of the data and display only the information required. Queries can include data from more than one related table and once saved, they can also be used as the basis of a form or a report.

Large scale databases are used by various organisations: by banks to keep records of accounts, by hospitals to keep patient details, by government departments e.g. the DVLA to keep records, and by airlines and travel agencies to maintain booking systems. These are just a few examples of where databases are used to manage large quantities of data.

Various types of people work with databases:

Database specialist/designer	Designs and creates a database suited to the needs of an organisation.
Database administrator	Controls the access to different data for specific users and recovers a database after major errors or "crashes".
Database user	Enters and maintains (updates) data and retrieves information.

Driving Lesson 2 - Starting Access

P Park and Read

Access is an extremely useful database application (or “app”) with lots of features to help you design, create and manage professional database systems. There are numerous ways to start the Access program but the following method is recommended for beginners.



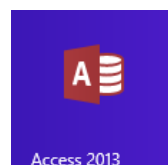
Manoeuvres

1. Display the *Windows 8 Start Screen* if it is not already open.



If you are using an earlier version of Windows, click once on the **Start** button (located towards the bottom left of the screen on the **Taskbar**). Click **All Programs** to show a list of available apps.

2. Locate the tile for the database app **Access 2013**. You may need to scroll horizontally (left to right) to find it.



You can also type **Access** on the **Start Screen** to search for the Access app.

3. Click the tile once. The *Windows Desktop* is displayed and Access starts.
4. Leave Access open for the next lesson.

Section 2

Tables

By the end of this section you should be able to:

Use the Mouse and Keyboard to Move

Create a New Database & Table

Format and Edit Field Properties

Define a Primary Key

Create Index Fields

Enter Data in a Table

Create Validation Rules and Text

Print All and Parts of a Table

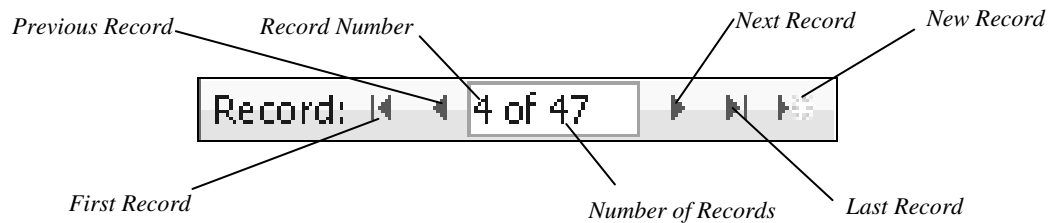
Work through the **Driving Lessons** in this section to gain an understanding of the above features.

For each **Driving Lesson**, read all of the **Park and Read** instructions and then perform the numbered steps of the **Manoeuvres**. Complete the **Revision** exercise(s) at the end of the section to test your knowledge.


Driving Lesson 10 - Moving Using the Mouse

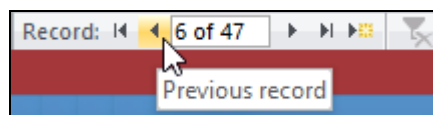
P Park and Read

To view more of a table, the **Scroll Bars** at the bottom and right edges of the screen can be used. To move quickly through the records, there are five **Navigation** buttons at the bottom of the **Datasheet View**.

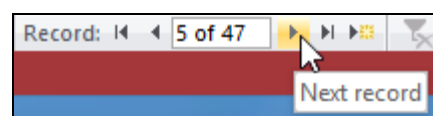


Manoeuvres

1. Start **Access**. Open the **Geography** database, (it may be available from the list of **Recent** databases), then the **Country** table. The table is shown in **Datasheet View**, with all the information contained in the table displayed in a grid.
2. The table data is arranged in rows and columns. Each row (**Record**), contains data about a specific country. Each column (**Field**) contains the same type of data, e.g. capital city or currency. The **Country** field is the first column, listing all the countries in the database.
3. Move the mouse pointer over the middle of the **Region** field of **Brazil (South America)**.
4. The mouse pointer should be a . Click the mouse.
5. The cell will be highlighted to show it is the active cell and it will contain a flashing cursor. Use the mouse to click and drag over part of the field. The letters will be highlighted when selected, ready to be edited if necessary.
6. Click **Previous record** from the **Navigation** buttons as shown, to move to the record above the current one.

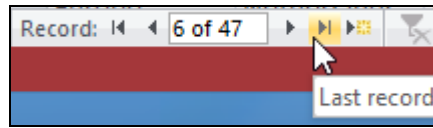


7. Record **5** is shown. Click the **Next record** button.

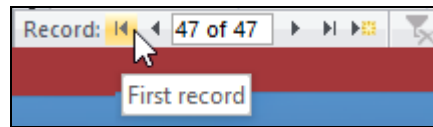



8. Record **6** is shown. Click the **Last record** button.

Driving Lesson 10 - Continued



- Record **47** is shown. Click the **First record** button to move to the top of the table.




- Click the **Go To** button, , in the **Find** group on the **HOME** tab. The navigation options **First**, **Previous**, **Next** and **Last** are available here.
- Click **Next** to select the second record.
- If there is a horizontal scroll bar below the data table, click the **Right** arrow in the to scroll right by one column.



The horizontal scroll bar will only be present if the current table will not fit in the **Access Window**. Reduce the width of the window if necessary to see the scroll bar. One way is to drag the right edge of the **Navigation Pane** to the right, making it wider. Don't forget to return it to its normal size afterwards.



Notice that there are buttons at the right of the **Status Bar** (below the scroll bar) which allow the current view to be changed.

- Click the **Left** arrow of the scroll bar to view the first column again.
- Use the **Up** and **Down** arrows on the vertical scroll bar to move up and down the table.
- Move the mouse pointer to the left edge of the **Capital** field of **Australia**. The mouse pointer should change to  (this may take some practise).

South America	Buenos Aires
Australasia	Canberra
Europe	Vienna

- Click the mouse. This will select the entire field.
- Practise moving around the table using the various methods described then leave the table on screen for the next lesson.

Driving Lesson 11 - Moving Using the Keyboard

Park and Read

The keyboard, instead of the mouse, may be used to move about the table. The following keys are used to move from field to field and record to record. Note that many of these movements only work when the entire field is selected.

→	moves one column to the right.
←	moves one column to the left.
↓	moves one record down.
↑	moves one record up.
Page Down key	moves one screen down.
Page Up key	moves one screen up.
End key	moves to end of record.
Home key	moves to start of record.
Tab key	moves one column to the right.
< Shift Tab > key	moves one column to the left.
< Ctrl Home > key	moves to the top left of the table.
< Ctrl End > key	moves to the bottom right of the table.



*When two keys are mentioned such as **Ctrl** and **End**, the first key (Ctrl) should be held down while the other key (End) is pressed and released.*

Using the keys mentioned moves the cursor around the table by one whole record or field when the whole field is selected. Pressing <**F2**> toggles between having the whole field selected and having the cursor active within the field.

When the cursor is active within a field, some movement keys will move within the field content.

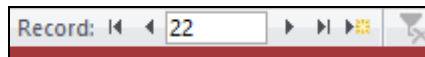


Manoeuvres

1. Click in the middle of **Brussels**, the capital field for record **5**, **Belgium**.

Driving Lesson 11 - Continued

2. Press →. The cursor moves to the next character in the field.
3. Press <F2> to select the whole field then press → again. Now the next field to the right is selected.
4. Press <Ctrl Home> to move to the top of the table, first record, first field.
5. Press → to move to the next field, the **Region** field.
6. Keep pressing → to move right to the last field, **Language**. Press → again and the cursor moves to the first field on the next record.
7. Press the <Page Down> key to move down by one screen.
8. Press <End> to move to the end of a record.
9. Move to the top of the table by pressing <Ctrl Home>.
10. Press <F2>. The flashing cursor is now visible. The content of the cell could now be edited. Press <F2> again to select the field.
11. Click in the record number box of the navigation buttons, remove the content and replace the entry it with **22**.



12. Press <Enter>. The 22nd record (Italy) is selected.
13. Click in the **Search** field next to the navigation buttons and type in **Lisbon**.



14. By the time you have finished typing, the **Capital** field for record 37, **Portugal** is highlighted.
15. Click anywhere in the table and press <F2>. Practise moving about the table using the keyboard. Be careful, any changes to the data will be automatically saved.
16. Close the table and then close the database without saving any layout changes, if prompted.



A common technique is to use the keys for moving from one record or field to the next and to use the mouse for moving from one area of the table to another.

Driving Lesson 12 - Creating a New Database: Designing and Planning


P Park and Read

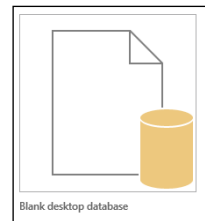
A well-designed database is the key to efficient management of information. Spending time at the design stage can save problems later. It is important to decide exactly what information is needed and how that information is to be used. It is a good idea to think “backwards” when designing databases, i.e. decide what information is needed from the database and then design the tables, etc. to achieve those aims.

The next step is to create a new blank database to contain the tables, forms, etc., that will be created later.



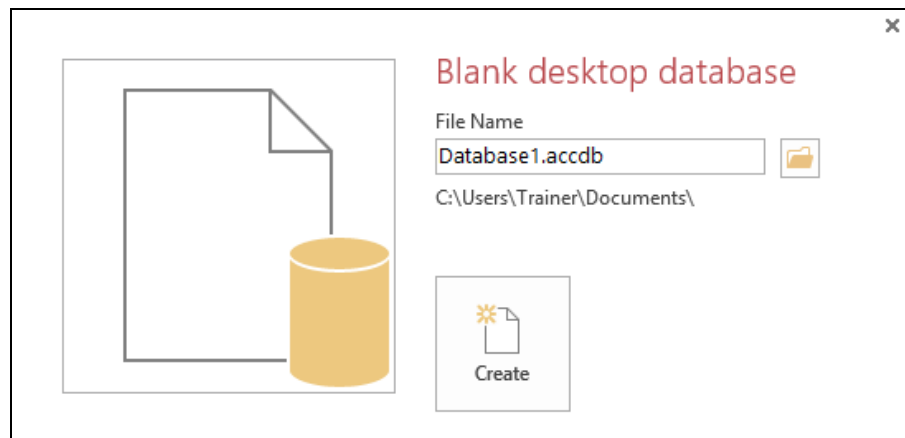
Manoeuvres


1. Click the **FILE** tab  from the blank Access screen to display the **New** database screen. One of the templates available will be the **Blank desktop database**.



This option is also available from the Access start up screen.

2. Select **Blank desktop database** to display the following dialog box.



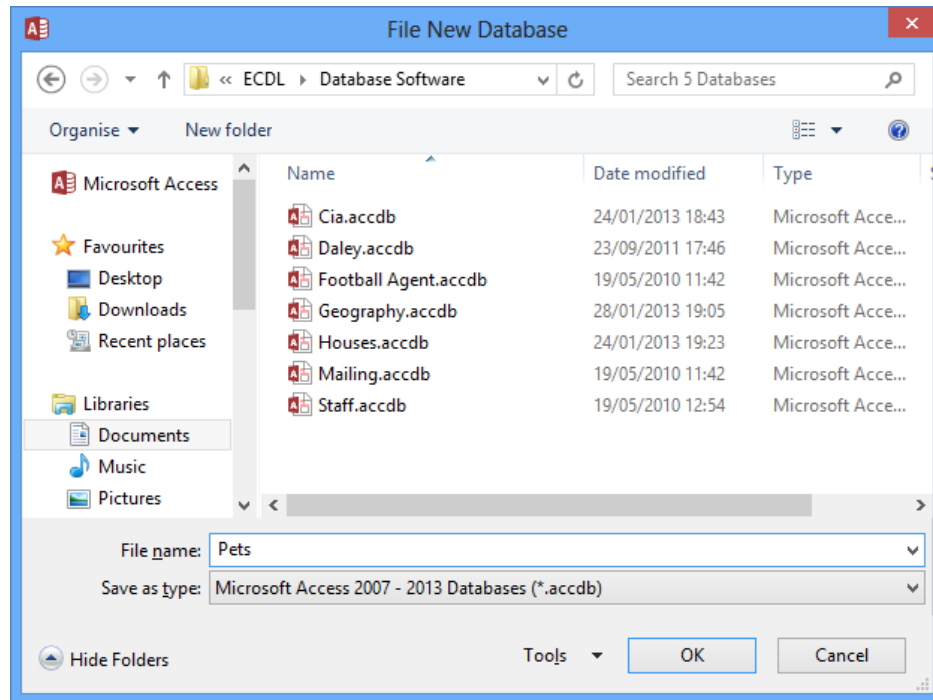
3. Use the  button to browse for a location to put your new database. The **File New Database** dialog box is displayed.
4. The contents of the **Documents** library will probably be displayed on the right. Locate the data folder containing the supplied data for this guide by double clicking **DATA FILES**, then **ECDL**, then **Database Software**.



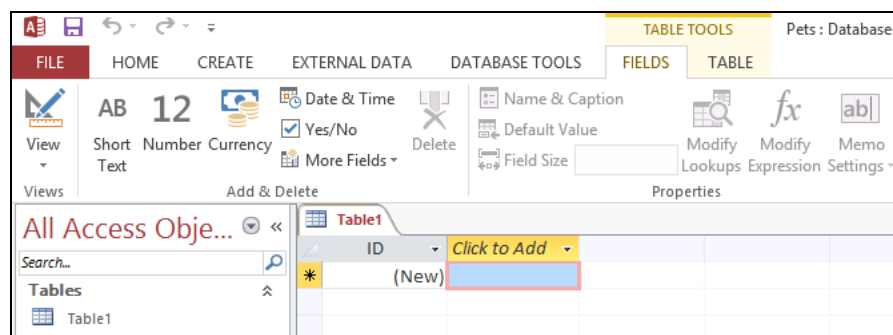
If your data files are stored in a different location, or you want to place your new databases somewhere else then this path will need to be changed.

Driving Lesson 12 - Continued

- In the **File name** box, enter **Pets**.



- Click **OK**, then in the **Blank desktop database** dialog box, click **Create**. An empty **Pets** database is created in the folder.
- The **Access Database Window** is now visible with the database name in the **Title Bar** at the top.



The **Search** bar in the **Navigation Pane** is optional. Right click **All Access Objects** and click **Search Bar** to toggle it on or off.

- The opening view shows a new table (Table1) in **Datasheet** view. The table could be used as the first table in this database, but the next lesson will demonstrate a more general method of adding new tables. First close the default table, **Table1** by right clicking on the **Table1** tab, and selecting **Close** from the shortcut menu.
- Leave the database open for the next exercise.

Driving Lesson 13 - Creating a Table Structure

P Park and Read

The table is the basic building block of a database. Every database must have at least one table. There may be many tables within a database, but each table should contain data related to a single subject, e.g. a products table, a customers table and an orders table. When designing a table **Field Names** and **Data Types** are created. These are the first things to be decided. Each field in a table should only contain a single element of data.

There are many different types of data that can be stored in an *Access* table. The commonly used ones are:

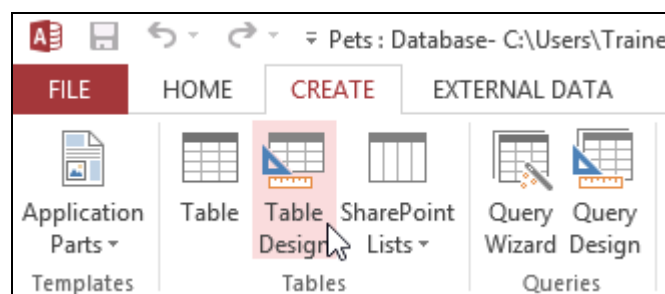
Text (Short/Long)	which allows text and numbers to be stored
Number	which allows only numbers to be stored
Date/Time	stores date and time formats
Currency	inserts a currency sign and decimal point.
Yes/No	can only contain a 1 or a 0 but can be displayed as True/False, On/Off or Yes/No .

Creating the fields in a database table is an important process, as this defines what data is stored. Suppose a table of sales records is created that does not include a field for region. If six months later an analysis of sales by region is required, it will not be possible.



Manoeuvres

1. On the new **Database** screen, display the **CREATE** tab and click the **Table Design** button.



2. A new blank table (**Table1**) will be opened in **Design View**. This table will not be named until it is saved.

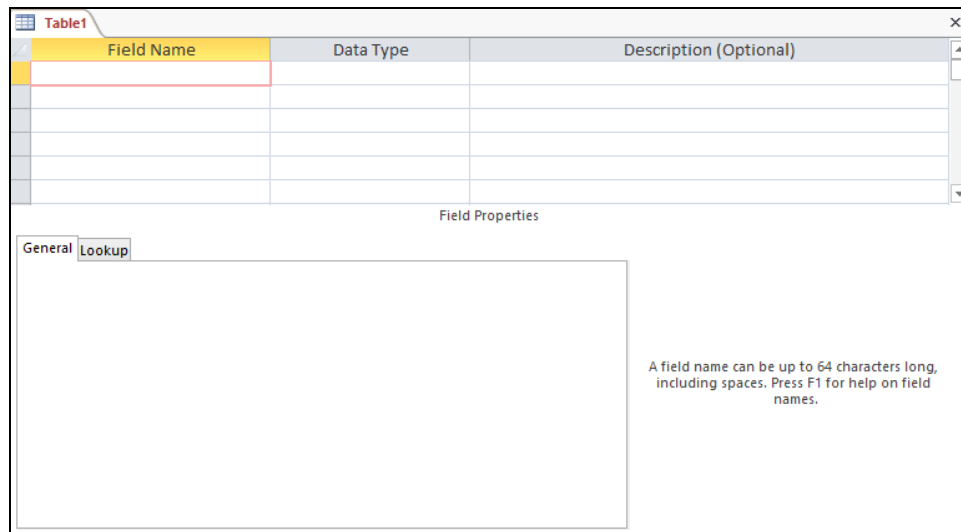


Design View is the view that allows the structure of the table (or any other object) to be defined or amended.

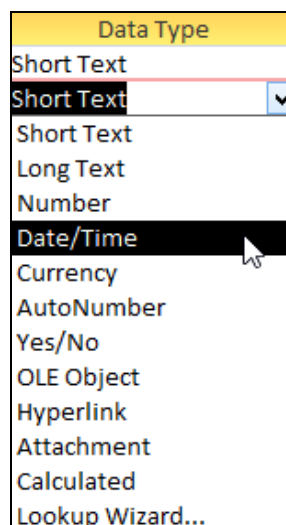


Datasheet View allows the actual data in a table to be seen and maintained.

Driving Lesson 13 - Continued




3. This is where the **Field Names** are entered and where the type of data in the field is defined – **Data Type**. The cursor should be in the first row in the first column, under **Field Name**. In this position, type **Animal**. Press **<Tab>** to move to the next column.
4. The words **Short Text** appears in the **Data Type** column. A field with this **Data Type** will accept content of up to 255 characters or numbers. Press **<Tab>** to select the default setting.
5. The cursor is now in the **Description** column, this column is optional. Enter the text **Type of animal** into this column and then press **<Tab>**.
6. The cursor is now in the next row down, in the **Field Name** column. Enter the words **Date Sold** for the new field and press **<Tab>**.
7. In the **Data Type** column, click the drop down button beside **Short Text**. A list of all possible data types is shown. Move the cursor over the **Date/Time** option.

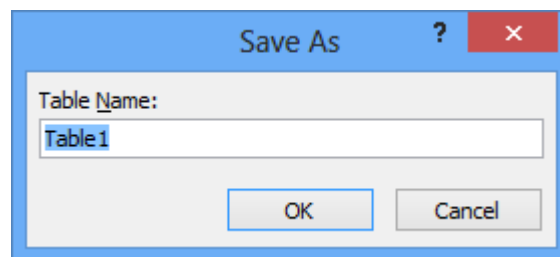


Driving Lesson 13 - Continued

8. Click to select this option, then press <Tab>.
9. In the **Description** column enter **Date animal was sold** then press <Tab>.
10. In the next **Field Name**, type **Price** <Tab> and in **Data Type** select **Currency** <Tab>. The description is **Price of animal**. Press <Tab>.
11. The next **Field Name** is **Number Sold**, the **Data Type** is **Number** and the **Description** is **Number of animals sold**.
12. The last **Field Name** is **Delivery**, the **Data Type** is **Yes/No** and the **Description** is **Delivery charge?** This table structure is now complete.

Field Name	Data Type	Description (Optional)
Animal	Short Text	Type of animal
Date Sold	Date/Time	Date animal was sold
Price	Currency	Price of animal
Number Sold	Number	Number of animals sold
Delivery	Yes/No	Delivery charge?

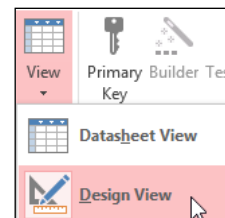
13. Right click on the **Table 1** tab and click  **Save** or use the key press <Ctrl S> to display the **Save As** message.



14. Enter the **Table Name** as **Pet Details**, then click **OK**. A message appears regarding **Primary Keys**. These are dealt with at a later stage. For now, click **No** to save the table without a primary key.
15. On the **Design** tab, click the drop down arrow on the **View** button.
16. Click on **Datasheet View**. The table is now ready to accept data. This will be done at a later stage.



Note that **Datasheet View** was the default alternative view and could have been selected just by clicking the **View** button.



17. Switch back to **Design View**, , for the next lesson.

Driving Lesson 14 - Format Field Property

P Park and Read

When designing tables and applying a data type, the data being entered can be customised by having certain properties attributed to it, e.g. the length of text allowed, the date formatting, or the initial **Default Value**. **Field Properties** are applied in **Design View**.

Manoeuvres

1. The **Design View** of the **Pet Details** table should be open from the previous Driving Lesson, if not, open it.
2. Place the cursor in the **Field Name** column for the **Animal** row. The **Field Properties** will appear in the bottom left area of the window.

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


3. Click in the **Field Size** property from the **General** tab. Helpful information is given on the right.
4. The field does not need to be so large. Delete the existing value with and type in **20**. The field will now only allow 20 characters to be entered into it.
5. Click in the **Date Sold** field. The **Field Properties** are different for this type of field.

Field Properties	
General	Lookup
Format	
Input Mask	
Caption	
Default Value	
Validation Rule	
Validation Text	
Required	No
Indexed	No
IME Mode	No Control
IME Sentence Mode	None
Text Align	General
Show Date Picker	For dates

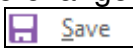

Driving Lesson 14 - Continued

6. Click in the **Format** property for this field. Click the drop down arrow to reveal the choices for the date format. Click on **Medium Date**.

General		Lookup
Format	▼	
Input Mask	General Date	12/11/2015 17:34:23
Caption	Long Date	12 November 2015
Default Value	Medium Date	12-Nov-15
Validation Rule	Short Date	12/11/2015
Validation Text	Long Time	17:34:23
Required	Medium Time	05:34 PM
Indexed	Short Time	17:34
IME Mode	No Control	
IME Sentence Mode	None	
Text Align	General	
Show Date Picker	For dates	

7. If a **Property Update Options Smart Tag**  appears at this stage, ignore it. The format of the date in the table is as shown in the drop down list. No matter how the date is entered, i.e. 1/2/7 or 1 Feb 2007, it will be displayed as 01-Feb-07.
8. The **Price** field requires no changes. Click the **Number Sold** field. Use the **Field Size** drop down list to change the size to **Integer**.


General		Lookup
Field Size	Long Integer ▼	
Format	Byte	
Decimal Places	Integer	
Input Mask	Long Integer	
Caption	Single	
Default Value	Double	
Validation Rule	Replication ID	
Validation Text	Decimal	
Required	No	
Indexed	Yes (Duplicates OK)	
Text Align	General	

9. Click the **Format** drop down arrow. Look at the options available but do not make a selection (**General Number** is used by default).
10. Click in the **Default Value** property and type **1**. This value will always appear by default in the **Number Sold** field when new records are added, although it can be easily overwritten.
11. Access has automatically defined this field as **Indexed**. This is not required. Cancel it by clicking the **Indexed** property and then use the drop down list to change the setting to **No**. **Indexes** are covered in a later exercise.
12. Save the changes to the table by right clicking on the **Pet Details** tab and clicking  or by pressing **<Ctrl S>**. By default, the table is saved with its existing name.
13. Use the  button on the **Ribbon** to switch to **Datasheet View**.

Driving Lesson 15 - Entering Data in a Table

P Park and Read

When a table structure has been defined, the next stage is to add data to the table. Data is automatically saved as it is entered. Data can be entered in

Datasheet View (the **Datasheet** view button, , will switch to this view).

Manoeuvres


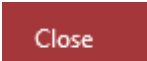
1. The **Pet Details** table should be open from the previous Driving Lesson.
2. The empty table is visible. The field names are as defined in a previous Driving Lesson. The **Number Sold** field will have a default value of **1**, as defined by the **Field Properties**.
3. In the **Animal** column, type the word **Dog** and press <Enter> to move to the next field.
4. Enter the date it was sold as **24/2/07** and press <Enter>.
5. Enter the price as **29.95** (do not enter any pound signs - this will be formatted automatically). Press <Enter>.
6. Leave the number sold as **1** and press <Enter>. Click the box in **Delivery** to indicate **Yes** and press <Enter>. The cursor will now be in a position (under Dog) to enter the next line of data.
7. Type the following data, exactly as displayed, into the table, remembering to press <Enter> after each entry. Make sure the **Number Sold** is changed from **1** to the value shown here. Leave the **Delivery** box blank to indicate **No**. Note that no matter how the data is entered it will be displayed as defined by the **Field Property**.

Animal	Date Sold	Price	Number Sold	Delivery
<i>Toad</i>	<i>25/3/07</i>	<i>1.5</i>	<i>6</i>	<i>Y</i>
<i>Cat</i>	<i>9/4/07</i>	<i>17.95</i>	<i>2</i>	<i>N</i>
<i>Goldfish</i>	<i>1 May 07</i>	<i>2.25</i>	<i>11</i>	<i>N</i>
<i>Snail</i>	<i>22/6/07</i>	<i>1.1</i>	<i>34</i>	<i>Y</i>

8. Right click on the tab for the **Pets Details** table and click .



There is no prompt to save, the data that was entered into the table is saved automatically.

9. Click the **FILE** tab  and select  to close down the **Pets** database.

Driving Lesson 16 - Defining a Primary Key

P Park and Read

A database will often contain more than one table. In fact, it is desirable to have many small tables in a database rather than one large one, as this improves the efficiency of the database.


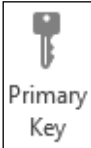
For these databases in particular, it is usual to use **Primary Key** fields. A primary key field is one that **uniquely** identifies each individual record in a table. This is often a number such as a serial number or ID number. Duplicate values are not allowed in a primary key field.

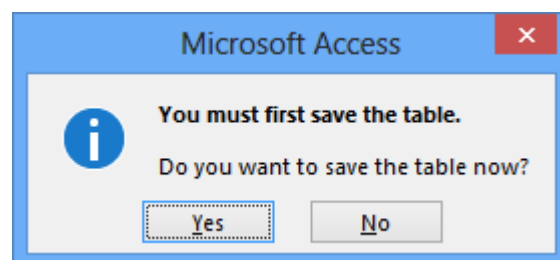
For those tables without a natural unique field (such as transaction records) it is common to add an extra field such as a sequential record number so that a **Primary Key** can be applied to it.

It is common to have the table records sorted on the **Primary Field**. This is done automatically. Using a primary key field allows tables to be linked together and also improves the efficiency of data retrieval and editing.



Manoeuvres

1. Open the database **Daley** from the supplied data files.
2. Right click the **Vehicles** table on the **Navigation Pane** and click  **Design View** to open the table in **Design View**.
3. The field name **Reg No** should be highlighted. If not, click on it.
4. Click the **Primary Key** button on the **DESIGN** tab to make this field the **Primary Key**. 
5. Switch to **Datasheet View** using the **View** button. The following dialog box appears.



6. Click **Yes** to save the table. The table will open with the records sorted in alphabetical order of **Reg No**.
7. Close the table.
8. Close the database.