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About This Book

The assignments in this book were written specifically for Microsoft Access 2010 and Access 2007, but all of the tasks in the book can be completed using Access 2003. However, as Access 2003 doesn't use the Ribbon system, there will be instances where references are made to commands that don't exist in Access 2003. It is a 'learning through practice' book with lots of practical assignments for the student. No previous knowledge of databases is needed, as the assignments start at a very basic level. The book contains four sections:

- Section 1: Beginners Database Assignments
- Section 2: Intermediate Database Assignments
- Section 3: Advanced Database Assignments
- Section 4: Introduction to Relational Databases

There are 10 practical database assignments, which are graded by level of difficulty. Each assignment introduces new concepts and, with the exception of Assignment 1, enables you to consolidate what you have learned in previous assignments.

Students who have no previous database experience should start at Section 1. Students already familiar with Microsoft Access will be able to use this book as an independent study guide and may wish to start at Section 2. However, these students can practise and consolidate existing database skills by completing Section 1.

By completing all the assignments contained in Sections 1, 2 and 3 together with the first part of the assignment in Section 4, you will have covered all the necessary course material required to successfully complete the NFQ Level 5 Database Methods Module. Students who are studying NFQ Level 6 Relational Databases or who simply wish to learn about relational databases should also complete all of Section 4 of *Step by Step Databases*.

Teachers have the option of downloading the records for each database assignment from the Gill & Macmillan website. This cuts out the data entry phase and saves time in the classroom. Full solutions for each of the 10 database assignments are also available online, as well as project guidelines and sample exams.

New versions of Microsoft Access will be introduced over time. Because the assignments in this workbook deal more with the principles of databases than the features of Microsoft Access, I am confident that except for a few minor inconsistencies, they will also work with future versions of Microsoft Access.

The following symbols are used throughout the book.



Tip



Note



Rule



**Cross-
reference**



Shortcut



Hint



**Important
Point**



**Theory
Section**

Introduction

WHAT IS A DATABASE?

We all use databases in everyday life, sometimes without even being aware of it. The most common example of a database is the telephone directory. These days, search engines are running in a close second place. If you have used Google or Bing, then you have used a database. If you use the Internet to buy products and services online, then you have used a database. When you search for a song on iTunes or for a book on Amazon, a database does the searching in the background. Whether you like it or not, your details are stored in at least one database. The following is a list of databases that you may find yourself in:

- Customer database for a bank.
- Loyalty card database for a supermarket.
- National database of PPS numbers.
- National database of registered vehicles.
- Database of any company from which you bought goods or services online.

The main function of a database is to store data. The data is stored in a particular order and is divided into sections. For example, in the telephone directory, the stored data is in alphabetical order of name and is divided into three sections – name, address and phone number, as shown in Table 0.1.

Each entry in the telephone directory has three sections

Name	Address	Phone Number
Dunne, Adam	27 Killiney Towers	2682931
Dunne, Aileen	7 Park Drive	2076878
Dunne, Alan	32 Mount Anville Grove	2271883

Data in the telephone directory is in ascending alphabetical order of name

Table 0.1

So, a database allows us to store data:

- With a specific structure.
- In a particular order.

ADVANTAGES OF COMPUTERISED DATABASES

Computerised databases offer great flexibility in the way you view data and also allow you to find specific data in a matter of seconds. Data can also be sorted into different orders (in ascending or descending alphabetical order or in ascending or descending numerical order).

The main differences between a database recorded on paper and a computerised database are summarised in Table 0.2.

	Database Recorded on Paper	Computerised Database
Data in a structured format	✓	✓
Data in a particular order	✓	✓
Find specific data quickly	✗	✓
View data in different orders	✗	✓
Quickly perform calculations on groups of data	✗	✓

Table 0.2

From Table 0.2, it can be seen that computerised databases offer greater flexibility than databases stored on paper.

This book introduces the learner to computerised databases using Microsoft Access. The learner will be guided through a series of graded assignments. Each assignment introduces new concepts and tasks while building on concepts and tasks learned in previous assignments. For the remainder of the book, the term 'database' will be used when referring to a computerised database.

WHAT A DATABASE CAN DO FOR YOU

If, in the course of your work, you need to keep track of large amounts of data and that data is constantly changing or being updated, then a database will save time and reduce errors. For example, a school principal could use a database to store information about students and subjects. This database could produce reports on students currently in the college and the subjects they are studying. This information can be used by the school principal when making decisions such as how many teachers should be employed, how many classrooms are needed and how many exam scripts are required for each subject.

Mail Merge is an important feature of Access. It is used by direct mail and marketing companies to create customised letters for customers stored in a database. The letters are sent to customers to promote products and services offered by a company. Many companies now communicate with their customers by linking their customer database with an email application. This is much cheaper than using surface mail.

Companies such as the National Car Testing Service (NCTS) would find it very difficult to keep track of all the data they need to process without the help of a database. Using a database, NCTS can determine which vehicles are due to be tested in the next month. The database generates customised test notifications that inform each vehicle owner of their forthcoming test.

With the growth of e-commerce, where products and services are sold via the Internet, databases are becoming more and more important. All e-commerce sites, such as iTunes and Amazon, rely on powerful databases to store details of their products and orders made by customers. Without databases, these companies would not be able to function efficiently.

In the course of business, people make decisions. The quality of the decision depends on the information on which the decision is based. Business decisions based on accurate database Reports, which are available at the click of a button, will be better decisions.

An important point to note is that the database is only as good as the information it stores. If you don't update the database by entering new data as it occurs, the Reports produced by the database will be inaccurate.

STRUCTURE OF A DATABASE

A database consists of objects. There are four main object types that can be used in an Access database: Tables, Queries, Forms and Reports. Access displays a list of the objects in your database in the Navigation Pane (Figure 0.2). Each object carries out a different function within the database and should be given a unique name. The database itself must also have a name. At the very least, a database must have a Table so that it can store data. The number of objects in a database depends on the complexity of the database. More complex databases will have more objects.

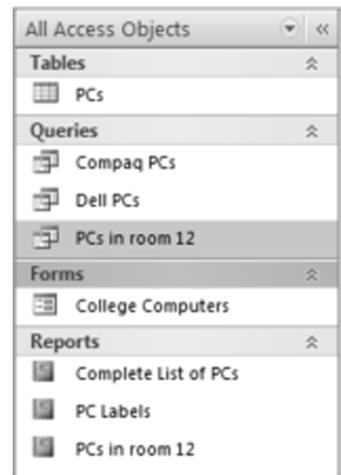


Figure 0.2: The Navigation Pane

CREATING A DATABASE

Before you can create objects such as Tables and Forms, you must create a database to store the objects. The database is like a container. Initially it is empty, but as you work through the assignments you will add Tables, Forms, Queries and Reports to each database you create. It is important to note that you must name your database before you start adding objects to it.

The way in which a database is named differs from other popular applications such as word processing and spreadsheets. You can create a new word processing

document and start working on it before you save it. You may have two or three pages of typed text before you click the Save button.

Access, on the other hand, will not allow you to work with your database unless you give it a name. If you forget to name your database, Access names it for you! (Normally Access will assign the name **Database1.accdb** to your database.)



Access uses the *.accdb* file extension, which is an abbreviation of Access database. Earlier versions of Access used the *.mdb* file extension.

Database Example

I will use an example of a tennis club database to explain each of the four objects in an Access database. To keep things simple, the club has only six members. Figure 0.3 shows the Navigation Pane, which lists the objects in the database. Data relating to the tennis club is stored in the *Club Members* Table.

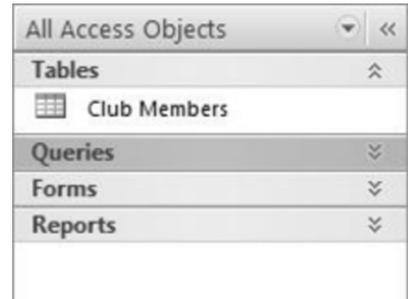


Figure 0.3: Tennis club database



TABLES

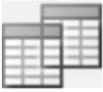
The Table is the most important object in the database. The function of the Table is to store data. Data stored in the Table must be broken down into smaller pieces of data, called fields. This is shown in Table 0.3.

Data stored in the Table is divided into columns, which in database terminology are called fields. The field names are in the top row of the Table.

Member No	Firstname	Surname	Gender	Phone	Date of Birth
1	Paul	Moore	Male	2036558	20/06/1982
2	Deirdre	O Connell	Female	5440291	15/10/1988
3	Konrad	Frejek	Male	8795412	03/01/1987
4	Ross	Mooney	Male	4590298	28/02/1986
5	Cathy	Duffy	Female	8701593	21/08/1985
6	Geraldine	Abbey	Female	3390217	12/12/1989

All the information relating to one club member is called a record

Table 0.3



QUERIES

A Query allows us to find specific records in the Table. For example, a Query could find all records of female club members, as shown in Table 0.4 and Table 0.5.

Member No	Firstname	Surname	Gender	Phone	Date of Birth
1	Paul	Moore	Male	2036558	20/06/1982
2	Deirdre	O Connell	Female	5440291	15/10/1988
3	Konrad	Frejek	Male	8795412	03/01/1987
4	Ross	Mooney	Male	4590298	28/02/1986
5	Cathy	Duffy	Female	8701593	21/08/1985
6	Geraldine	Abbey	Female	3390217	12/12/1989

Table 0.4: The Table stores records of all club members

Member No	Firstname	Surname	Gender	Phone	Date of Birth
2	Deirdre	O Connell	Female	5440291	15/10/1988
5	Cathy	Duffy	Female	8701593	21/08/1985
6	Geraldine	Abbey	Female	3390217	12/12/1989

Table 0.5: The Query displays only female club members

In the example, the Query has searched through the Table, record by record. Each time it finds a female club member, that record is extracted from the Table and displayed in a separate list. The completed Query displays three female club members.



FORMS

The main function of a Form is to provide a convenient method of entering data into the Table. A Form can also be used to edit or add to data already stored in the Table. The Form is linked to the Table. When you enter data in the Form, it filters down into the Table.

Club Members

Membership Details

Member No: 1 Gender: Male

Firstname: Paul Phone: 2036558

Surname: Moore Date of Birth: 20/06/1982

Member No	Firstname	Surname	Gender	Phone	Date of birth
1	Paul	Moore	Male	2036558	20/06/1982

Figure 0.4: Data is transferred from the Form to the Table

Table

In Figure 0.4, Paul Moore's record has been entered in the Form. Because the Form is linked to the Table, Paul's record filters down to and is stored in the Table. The arrows indicate how data is transferred from the Form to the Table. The function of the Form is to facilitate data entry. The function of the Table is to store data.



REPORTS

People in business base their decisions on data they receive while they are at work. This data can come from lots of different sources, such as business transactions, news reports and colleagues. Many business decisions are based on data retrieved from databases. The reporting facility in Access provides a means of presenting data so that it can be easily interpreted by the decision maker. In an Access Report, data can be summarised, formatted and presented in a way that makes it easy to understand. In the tennis club database, we could use a Report to create a member contact list, as shown in Figure 0.5.

Member Contact List

Name	Phone
Geraldine Abbey	3390217
Cathy Duffy	8701593
Konrad Frejek	8795412
Ross Mooney	4590298
Paul Moore	2036558
Deirdre O'Connell	5440291

Number of Members: 6

Data from a Table or Query can be formatted and displayed in a Report

Report functions can be used to perform calculations on the data displayed in the Report

Figure 0.5: An Access Report

STEPS IN CREATING A DATABASE

Regardless of how complex a particular database assignment is, the first four steps will always be as follows:

1. Create and name the database.
2. Create a Table to store the data.
3. Create a Form to enter the data.
4. Enter data using the Form.

Once the data has been entered, it can be analysed and summarised using Queries and Reports.

USING DATABASE OBJECTS

Each object in the database can be viewed in three ways.

 **Design View** 1. First, you can look at how an object is designed. Use this option if you want to change the format or layout of a Table, Form, Query or Report. Design view is generally used when you first create an object. When you are in design view, you will only see the structure of the object. You cannot view or enter data in design view.

 **Layout View** 2. Layout view only applies to Forms and Reports. This view allows you to change the design of an object while viewing the data in the object. For example, you could adjust the column widths in a Report while viewing the data displayed in the Report. Layout view is useful for fine tuning the design of a Form or Report.

3. Finally, once an object has been designed and fine tuned, you will want to use the object. Each object has its own specific view (Table 0.6).

Table	Query	Form	Report
 Datasheet View	 Datasheet View	 Form View	 Report View

Table 0.6

Opening a Table in datasheet view displays the records stored in the Table. Query datasheet view displays the records found by the Query. Opening a Form in Form view allows you to enter and edit data. Report view displays the data contained in a Report.



Figure 0.6: Tabbed objects in Access

The name of each object that is currently open is displayed in a separate tab. In Figure 0.6, the *College Computers Form*, *PCs in room 12 Query*, *PC Labels Report* and *PCs Table* are open. You can quickly switch between objects by clicking the tabs. Access uses different icons to represent Tables, Queries, Forms and Reports. These icons, which are displayed in each of the tabs in Figure 0.6, are explained in Table 0.7.

Icons Used in Access			
Table	Query	Form	Report
			

Table 0.7: Icons used to represent Tables, Queries, Forms and Reports



ACCESS WIZARDS

Each time you create a new object in Access, you have the option of either:

1. Getting help from a wizard.
2. Doing all the work yourself by creating the object in design view.

Most of the wizards in Access are very good and can save you a lot of time by doing the basic set-up of an object for you, giving you more time to work on the finer details. However, some of the wizards are a little confusing, particularly for new database users. As you work through the assignments in this book, you will learn how to create Tables, Queries, Forms and Reports. Each time you are required to create an object, I will recommend whether you should get help from a wizard or create the object in design view.

THE NAVIGATION PANE

The Navigation Pane, which appears on the left of the screen, allows you to access and manage the objects in your database. The Navigation Pane has a separate section for Tables, Queries, Forms and Reports, as seen in Figure 0.7. Each section can be expanded to display a list of objects by clicking the double down arrow.

To see a full list of Reports, click the double down arrow

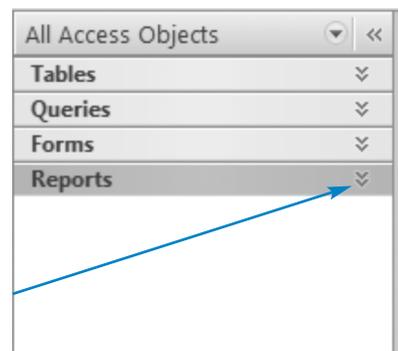


Figure 0.7: The Navigation Pane

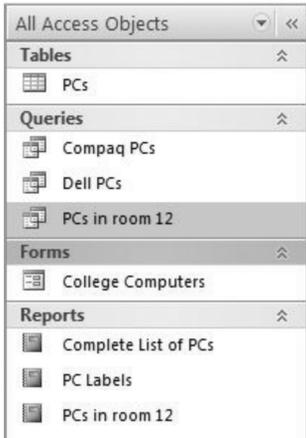


Figure 0.8

Figure 0.8 is an example of the Navigation Pane displaying all Access objects. The Navigation Pane can be hidden by clicking the << symbol displayed at the top right-hand side of the Navigation Pane. This makes the full screen available for your database.

THE RIBBON

In Access 2007, the menus and toolbars were replaced by the Ribbon, which helps you quickly find the commands that you need to complete a task.



Figure 0.9: In Access 2007, commands in the Ribbon are organised into four basic groups

In Access 2010, Microsoft updated the Ribbon to include the File tab (Figure 0.10).

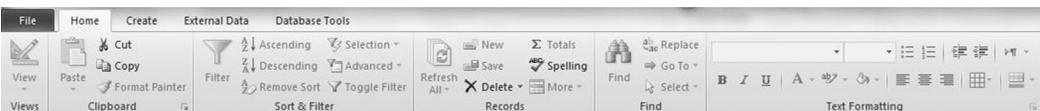


Figure 0.10: As Access users were confused by the Office button, the File tab was added to the Ribbon in Access 2010

Using the Ribbon is very intuitive. Commands in the Ribbon are organised into four basic groups: Home, Create, External Data and Database Tools (Figure 0.9 and Figure 0.10). As objects in the database are opened, additional groups of commands are displayed in the Ribbon. For example, when you open a Table, the Datasheet group is added to the four existing groups in the Ribbon. Groups are also added to the Ribbon as you change the way you view an object.



Figure 0.11: The Ribbon when an Access Form is opened in design view

In Figure 0.11, three additional groups appear in the Ribbon when you open a Form in design view. The additional Design, Arrange and Format groups contain commands to help you design and format your Access Form.

A specific group of commands in the Ribbon can be selected by clicking the appropriate tab. Each group in the Ribbon is divided into sections of related buttons. Figure 0.10 displays the commands in the Home section of the Ribbon, which is displayed by default. It contains the Views, Clipboard, Sort & Filter, Records, Find and Text Formatting sections. Commands in the Home section of the Ribbon can be used for formatting, copying and pasting, finding and editing records as well as sorting records in your database.

If you like using shortcut key combinations, you can access Ribbon commands by pressing *ALT* on the keyboard. Once you press *ALT*, letters representing each Ribbon group are displayed together with the letter *F*, which represents the Office button (Access 2007) or File tab (Access 2010). This is displayed in Figure 0.12 and Figure 0.13. The buttons in the Quick Access Toolbar are represented by numbers.

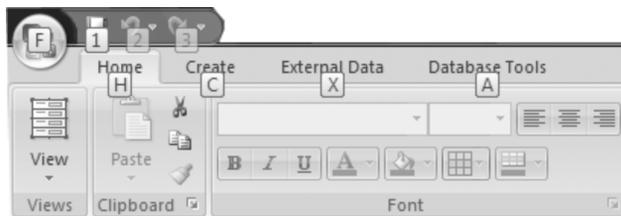


Figure 0.12: Keyboard shortcuts in Access 2007

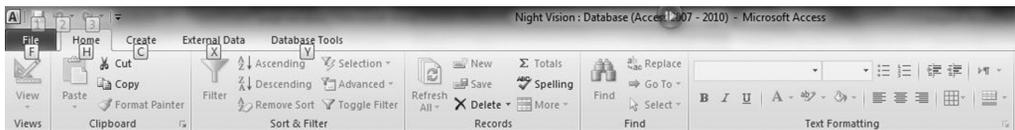


Figure 0.13: Keyboard shortcuts in Access 2010

Shortcut key combinations for the commands in a specific Ribbon group can be displayed by typing the appropriate letter on the keyboard. For example, pressing *H* displays the shortcut key combinations for the Home group, as shown in Figure 0.14.

The Recent Documents panel can be used to quickly open the databases you have recently been working on.

The Office button caused confusion amongst computer users who were accustomed to managing their documents via the File command. The confusion was so great that in Access 2010, Microsoft replaced the Office button with the File tab. Clicking the File tab displays the options shown in Figure 0.16.

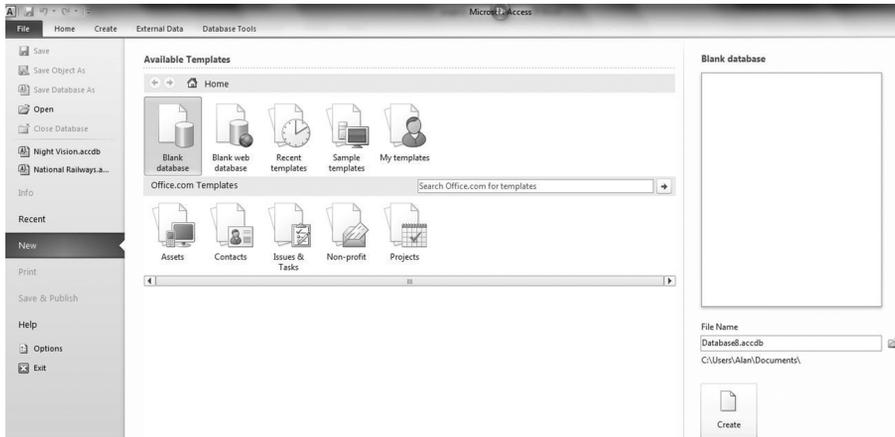


Figure 0.16: In Access 2010, file management tasks are grouped under the File tab

QUICK ACCESS TOOLBAR

The Quick Access Toolbar (Figure 0.17) contains frequently used commands. It appears to the right of the Office button and is used to quickly access buttons for common tasks, such as opening an existing database or creating a new database. The *Undo* and *Redo* buttons also appear in the Quick Access Toolbar.

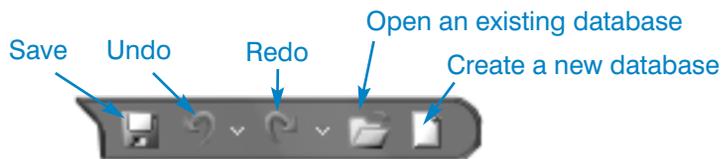


Figure 0.17: The Quick Access Toolbar

Because the Quick Access Toolbar is always visible, adding buttons that you frequently use to this toolbar makes the buttons readily available.

POP-UP MENUS

Pressing the right mouse button will display a pop-up menu in Access. Different pop-up menus will appear depending on where the mouse pointer is on the screen. Right

clicking on an object name in the Navigation Pane displays the menu shown in Figure 0.18.

Using the options displayed in Figure 0.18, you can open the object or view it in design or layout view. You could also rename, delete, cut, copy, hide or export the object to another database as well as viewing the properties of the object.

Pop-up menus can also be used in design view. For example, right clicking the Form title when in design view displays a list of options that can be used to format the Form title.

In datasheet view, Form view and Report view, pop-up menus have options to sort and filter data.

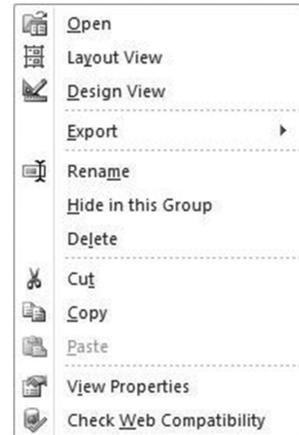


Figure 0.18

GETTING HELP IN ACCESS

Access contains a powerful help feature that can be accessed either by clicking the question mark in the top right-hand corner of the screen or by pressing *F1* on the keyboard.

To search for help on a particular aspect of Access, type your search term into the search box and then click the *Search* button. Figure 0.19 is an example of using the help feature to find information on the Ribbon.

In Figure 0.19, Access is displaying the top 100 articles related to the Ribbon. To read an article, simply click the article title.



Figure 0.19: An example of searching for help on the Ribbon

ACCESS SECURITY WARNINGS

Each time you open an Access database, you will see a security warning (Figure 0.20).



Figure 0.20: Security warning upon opening an Access database

The following items in an Access database can pose security risks:

1. Action queries: A Query which finds and updates records.
2. Macros: A computer program generated by Access.
3. VBA code: A computer program written by a database programmer.

This book does not deal with VBA code. However, action queries and macros are introduced in Section 4 of the book. When working through the assignments in Sections 1, 2 and 3 it is perfectly safe to ignore the security warnings as long as you are opening a database assignment that you created yourself. The best way to do this is to click the X that appears to the right of the warning (Figure 0.20).

LIMITS OF ACCESS

Access is a great database application designed to work on PCs, laptops and tablets and on network servers. It works really well for standard record-keeping and reporting in an office. In general, Access functions efficiently as long as the database is smaller than 2 gigabytes. (You'd need a huge amount of records for the database to get this big!) However, for database applications that need to store digital content (e.g. photos, videos, music) or keep track of huge volumes of orders on a commercial website, Access may not be the best choice. More powerful databases, such as Oracle, are generally used for these types of business applications.

ACCESS VS. EXCEL

Many students find it difficult to understand the difference between a database and a spreadsheet. Databases are great for storing large amounts of data and then retrieving that data very quickly. Spreadsheets are all about numbers and calculations. To use an analogy, a database is a bit like a computerised telephone directory and a spreadsheet is like a computerised pocket calculator.



SECTION 1

Beginners Database Assignments



Assignment 1: College of E-Commerce Database

• Tables	1
• Creating a Table	2
• Primary Key	3
• Forms	4
• Structure of a Form	5
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Tip



Note



Rule



**Cross-
reference**



Shortcut



Hint



**Important
Point**



**Theory
Section**

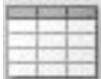
1 College of E-Commerce Database

SCENARIO

The College of E-Commerce runs night classes in a number of different subjects ranging from Administration to Web Design. In Assignment 1 you will create a database to store and update data relating to students currently attending the college.

By completing this assignment, you will learn how to:

- Create a database.
- Create a Table to store data.
- Create a Form to enter data.
- Enter data using a Form.
- Make basic changes to Form design.
- Use a Form to find, edit and delete records.



TABLES

The Table is the most important object in a database. Its task is to store data. A database cannot function without a Table. The Table is divided into columns and rows. The columns are called *fields* and the rows are called *records*. All records in the Table must have the same number of fields. A record is a collection of data about a single item. In Table 1.1, each record stores data about an individual student. Table 1.1 displays the data that you will enter in the College of E-Commerce database later on in this assignment.

All the information relating to one student is called a **record**

Student Code	Student Name	Age	Course	Date Started	Teacher
BS001	Peter Dunne	18	Admin	02/09/2014	Tadhg Allen
BS002	Mark Connolly	17	Admin	02/09/2014	Tadhg Allen
BS003	Dave O Neill	21	Finance	02/09/2014	Gerry Browne
BS004	Maura Keegan	18	Finance	02/09/2014	Gerry Browne
BS005	Ann Murphy	20	Admin	02/09/2014	Tadhg Allen
CP001	Enda Doyle	19	Web Design	09/09/2014	Noelle Duffy
CP002	Seamus Lowry	18	Database	09/09/2014	Liam Kearney
CP003	Tetyna Maryshko	18	Database	09/09/2014	Liam Kearney
CP004	Christine O Donnell	20	Web Design	09/09/2014	Noelle Duffy
CP005	Martin Murray	19	Database	09/09/2014	Liam Kearney

The data is divided into six columns, each of which is called a **field**

Table 1.1

Tables are the most important part of any database. The Table stores data. Before data can be stored in a Table, it must be organised so that each record has the same structure. In Table 1.1 the data has been divided into six columns, which are called fields.

CREATING A TABLE

The top row of the Table contains the field names: Student Code, Student Name, Age, Course, Date Started and Teacher. Rows of records appear below the field names. All the data relating to a specific student is called a record.

The fields define the structure of the Table. Before we can enter data in the database, each field must be set up in the Table. When setting up a field, you must name the field and specify what type of data you intend to store in that field. Field names and data types for the *Student Details* Table are displayed in Table 1.2.



Field Name	Data Type
Student Code	Text
Student Name	Text
Age	Number
Course	Text
Date Started	Date/Time
Teacher	Text

Table 1.2

Selecting a Data Type

Table 1.2 contains three different data types: Text, Number and Date/Time.

1. Text Data Type

The Text data type is used to store letters and combinations of letters and numbers. Common examples would be a person's name and car registration number. Phone numbers including area codes, e.g. (021) 6689017, are also stored in Text fields. This is because brackets cannot be entered in Number fields. Numbers with leading zeros, e.g. 00200102, will also need to be stored in Text fields, as Access removes the leading zeros when they are entered in a Number field.

2. Number Data Type

The Number data type is used to store numbers. In later assignments, you will learn about the Byte, Integer, Long Integer and Single Number types. It is important to note that Access will not allow you to enter letters or symbols in a field with a Number data type.

3. Date/Time Data Type

The Date/Time data type is used to store dates and times. When entering dates, the days, months and years are separated using the forward slash (/). When entering times, hours, minutes and seconds are separated using the colon (:).

You will learn more about data types in later assignments.



PRIMARY KEY

Each time you create a new Table, Access automatically sets up a primary key field. A primary key field differs from other fields in the Table in a number of important ways.

1. Once a field has been identified as the primary key field, Access will not allow you to duplicate data in that field. For example, if the *Order Number* field is the primary key field, each unique order number can only be entered once. If you attempt to enter an order number that is already stored in the Table, Access will display an error message.

2. While the fields define the structure of each record in the Table, the primary key determines the order of records in the Table. Records in the Table are automatically stored in ascending order of the primary key field, even if they are not entered in this order.

Access will not allow you to complete data entry of a record unless you have entered data in the primary key field. The primary key allows Access to uniquely identify each record. This is particularly important in large databases. For example, in a customer database, the primary key allows Access to distinguish between two customers who have the same first name and surname. Sometimes the primary key will occur naturally in the data. For example, in a database that stores details of cars for sale, the obvious candidate for the primary key field is the car registration number. This is because each car has its own unique registration number. In many databases, the database designer has to make up the primary key to ensure that each record can be uniquely identified. For example, your bank account number is a primary key generated by the bank's database. It ensures that each customer's bank account has a unique identification code. This is particularly important in cases where some customers have the same name. Other common examples of primary keys are PPS numbers, club membership numbers, credit card numbers, medical card numbers and order numbers.



FORMS

The Form is an important object in the database. Its main function is data entry. As data is entered in the Form, Access transfers it to the Table record by record. An example of this is shown in Figure 1.1.

Student Code	Student Name	Age	Course	Date Started	Teacher
BS001	Peter Dunne	18	Admin	02/09/2014	Tadhg Allen

Figure 1.1:

Each record entered in the Form is automatically transferred to the Table

In Figure 1.1, Peter Dunne's record has been entered in the Form. As the Form is linked to the *Student Details* Table, Access automatically transfers this data from the Form and stores it in the *Student Details* Table.



Data is transferred from the Form to the Table record by record and not field by field. This means that the record that you are currently entering in the Form is not actually transferred to the Table until you move on to the next record, either by

pressing the *Tab* or *Enter* key on the keyboard or by clicking the *Next Record* button in the Form.

An Access Form may be thought of as a digital version of a paper form such as a job application form. Forms make the task of data entry easier, quicker and more accurate for a number of reasons:

- Rather than typing data, it can often be selected from a list, e.g. selecting the flight destination from a drop-down list when booking a flight on the Internet.
- Forms can be made attractive and easier to use through the use of formatting.
- Titles, images and explanatory text can be added to a Form.

As well as entering data, Forms can also be used to edit records that are stored in the Table. Later on in this assignment you will use a Form to edit and delete records.



Students new to databases often enter data directly in the Table. It is more efficient to use the Form for data entry, as it was specifically set up for this purpose.

STRUCTURE OF A FORM

Forms created using the Form Wizard have two sections: the Form header and detail section.

1. The Form Header



Figure 1.2

The Form header (Figure 1.2) normally contains the Form title. Other items, such as company logos and graphics, can also be added to the Form header.

2. The Detail Section

Student Code	Student Code
Student Name	Student Name
Age	Age
Course	Course
Date Started	Date Started
Teacher	Teacher

Figure 1.3

The detail section (Figure 1.3) is the main section of the Form. It normally contains all the fields that are included in the Form. The detail section is used for data entry and is the most important section of the Form.

A third section, called the Form footer, can also be added to the Form. The Form footer appears at the bottom of the Form and can be used to display summary information. It could also be used to display the date or time.

VIEWING AN ACCESS FORM

There are three ways to view an Access Form: Form view, design view and layout view.



1. Form View

Use this view to enter new records and edit existing records.

Figure 1.4 displays the *Student Registration* Form in Form view. Data relating to Peter Dunne has been entered using the Form.

Student Code	BS001
Student Name	Peter Dunne
Age	18
Course	Admin
Date Started	02/09/2014
Teacher	Tadhg Allen

Figure 1.4



2. Design View

Use this view to change the design, layout and formatting of your Form.

Figure 1.5 displays the *Student Registration* Form in design view. Field names appear instead of data when you are in design view. For example, Student Code is displayed instead of BS001 and Student Name is displayed instead of Peter Dunne.

Form Header	
Student Registration	
Detail	
Student Code	Student Code
Student Name	Student Name
Age	Age
Course	Course
Date Started	Date Started
Teacher	Teacher
Form Footer	

Figure 1.5



3. Layout View

Use this view to change the design of your Form while viewing the data.

Student Code	BS001
Student Name	Peter Dunne
Age	18
Course	Admin
Date Started	02/09/2014
Teacher	Tadhg Allen

Field List

Fields available for this view:

- Student Details
 - Student Code
 - Student Name
 - Age
 - Course
 - Date Started
 - Teacher

Figure 1.6

Figure 1.6 displays the *Student Registration* Form in layout view. Layout view is a combination of Form view and design view. In layout view, you can make changes to the design of the Form while viewing the data. However, in layout view you cannot see the detailed structure of the Form, which is displayed in design view. Although you can see existing data in layout view, you cannot enter new data.

STRUCTURE OF AN ACCESS FORM

An Access Form has two main sections: the Form header and the detail section (Figure 1.7).

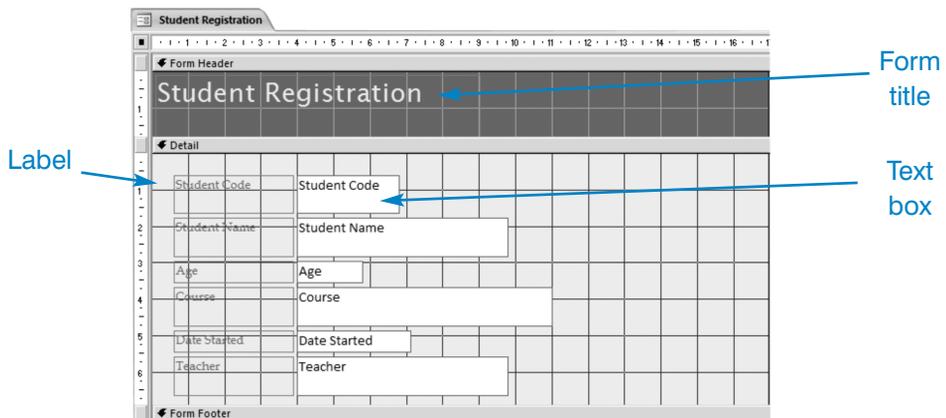
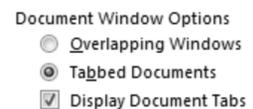
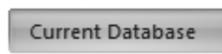
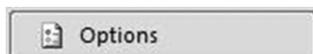
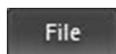


Figure 1.7:
Design view of the *Student Registration* Form, created later on in this assignment

Figure 1.7 displays the *Student Registration* Form in design view. You will create this Form later on in this assignment. The Form title is displayed in the Form header. The detail section displays a series of labels and text boxes. Each label/text box combination represents a specific field in the Table.



Before starting this assignment, ensure that Access is set up to display Tables, Forms, Queries and Reports as tabbed documents.



- Click the File tab in the top left-hand corner of the screen.
- Select Options.
- Select Current Database from the list of options.
- In Document Window Options, select Tabbed Documents.



If you are using Access 2007, click the Office button, select Access Options and then select Current Database from the Access Options list. In Document Window Options, select Tabbed Documents and tick the Display Document Tabs check box.

DATABASE SET-UP

Setting up the College of E-Commerce database is completed in five distinct stages.

1. Create a new database.
2. Create the Table.
3. Create the Form.
4. Fine tune the Form layout.
5. Enter data.

Create a New Database

1. To start Microsoft Access, click the *Start* button and select *Programs* or *All Programs*. In the Microsoft Office group, select Microsoft Office Access.



2. Click the *Blank Database* button, which appears in the top left-hand corner of the screen.

3. Enter *College of E-Commerce* as the file name (Figure 1.8).

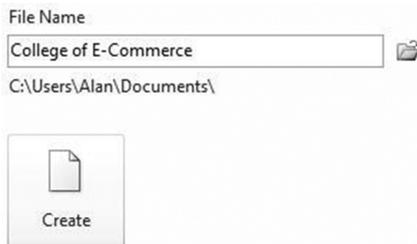


Figure 1.8: Creating a new database

4. Click the folder icon (Figure 1.8) and select the folder where the new database will be saved. (It will be a different folder to the one displayed in Figure 1.8.)
5. Click *OK* and then click the *Create* button. A new database opens, with a Table already set up.



Remember to name your database when you create it. If you forget to enter a name for your database, Access will name it *Database1.accdb*. If you want to open this database at a later stage, you may not remember the name that Access gave it.



All Access databases are automatically saved with the file extension *.accdb*, which is an abbreviation of *Access Database*.



Create the Table

Each time you create a new database in Access, a new blank Table is displayed in datasheet view (Figure 1.9). Note that Access has already set up an ID field. This is the primary key field.

1. Click the *Save* button, either in the Quick Access Toolbar or in the Office Menu. Alternatively, right click the tab for *Table1* and select *Save* from the pop-up menu. The *Save As* dialog box is displayed (Figure 1.9).

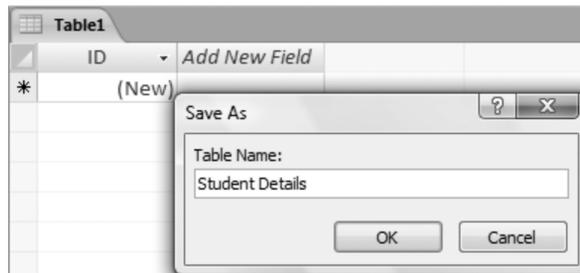


Figure 1.9: *Student Details* has been entered as the Table name

2. Enter *Student Details* as the Table name in the *Save As* dialog box, as shown in Figure 1.9.
3. Click *OK* to name and save the Table.



4. In the Home section of the Ribbon, click the *Design View* button.

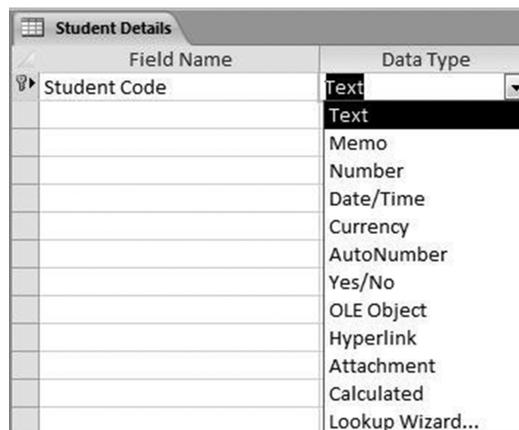


Figure 1.10: Design view of the *Student Details* Table

5. Change the field name of the *ID* field to *Student Code*, as shown in Figure 1.10. Select *Text* from the list of data types for the *Student Code* field.

6. Set up the remaining fields and select the data types, as shown in Figure 1.11.

Student Details	
Field Name	Data Type
Student Code	Text
Student Name	Text
Age	Number
Course	Text
Date Started	Date/Time
Teacher	Text

Figure 1.11: Field names and data types in the *Student Details* Table



7. Right click the tab for the *Student Details* Table and select Save from the menu.

8. Close the *Student Details* Table.



Create the Form

1. In the Create section of the Ribbon, select *Form Wizard* from the More Forms drop-down list (Figure 1.12).



In Access 2007, the Form Wizard is in the More Forms drop-down list.

2. Add all fields in the *Student Details* Table to the Form by clicking the double arrow. Fields that have been added to the Form will appear in the Selected Fields box (Figure 1.12).

The Form Wizard dialog box is shown with the following details:

- Which fields do you want on your form?** (You can choose from more than one table or query.)
- Tables/Queries:** Table: Student Details
- Available Fields:** (Empty list)
- Selected Fields:** Student Code, Student Name, Age, Course, Date Started, Teacher
- Buttons: Cancel, < Back, Next >, Finish

The Form is linked to the *Student Details* Table

All the fields in the *Student Details* Table have been added to the Form

Figure 1.12: All fields in the *Student Details* Table have been added to the Form

3. Click the *Next* button.
4. Accept Columnar as the Form layout by clicking the *Next* button once again.
5. Enter *Student Registration* as the Form title. Click *Finish*.



Access users should refer to the note at the end of this section.

Fine Tune the Form Layout

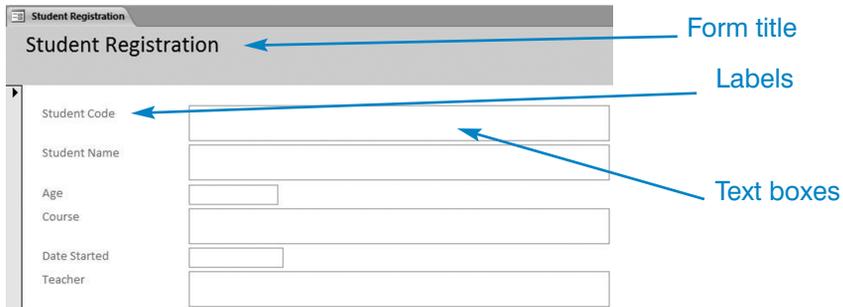
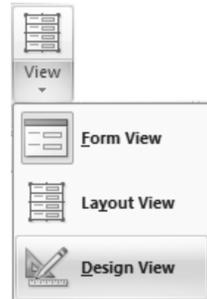


Figure 1.13: The completed *Student Registration* Form

1. Figure 1.13 displays the completed *Student Registration* Form. Some of the text boxes are too wide and must be adjusted. Changes to the design of an Access Form can be made in layout view or design view. While layout view is very useful for fine tuning Form design, the initial set-up and design of a Form is best done in design view.

In the Home section of the Ribbon, select design view from the View drop-down list.



2. Select and resize each text box individually. Point at the dot at the right-hand side of the selected text box. Drag to the left when the mouse pointer changes to a double horizontal arrow. Figure 1.14 demonstrates the resizing of the *Student Code* text box using this method. Resize all other text boxes so that they appear like Figure 1.14.

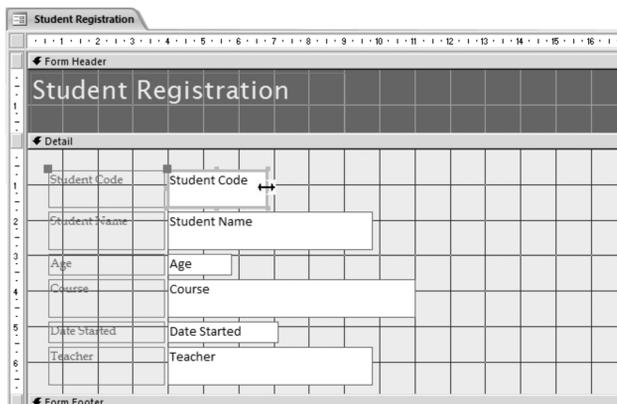


Figure 1.14: Use the double arrow mouse pointer to resize a text box



Adjusting the width of a text box in a Form has no effect on the field size of the corresponding field in the Table.



Save

3. Right click the *Student Registration* tab and select Save from the pop-up menu.



Form View

4. Adjustments to the design of the *Student Registration* Form are now complete. In the Home section of the Ribbon, click the *Form View* button to switch from design view to Form view. To enter data using an Access Form, you must be in Form view.



Important note for Access 2007 users: In Access 2007, all of the labels and text boxes in the Detail section of the Form were grouped in a single layout. The effect of this is that resizing a particular text box also resizes all of the other text boxes in the Detail section. You will only be able to resize text boxes individually once you remove the labels and text boxes in the Detail section from the existing layout. Follow these steps.

1. Select all labels and text boxes by clicking the cross symbol in the top left-hand corner of the Detail section (to the left of the Student Code label).
2. In the Design section of the Ribbon, click the *Remove* button to ungroup the text boxes. This allows each text box to be resized independently.
3. De-select all labels and text boxes by clicking in a blank area of the Detail section.
4. Continue from step 2 in the 'Fine Tune the Form Layout' section.

Enter Data



With the *Student Registration* Form in Form view, enter all the records shown in Table 1.3. To move to the next field, press the *Tab* key on the keyboard.

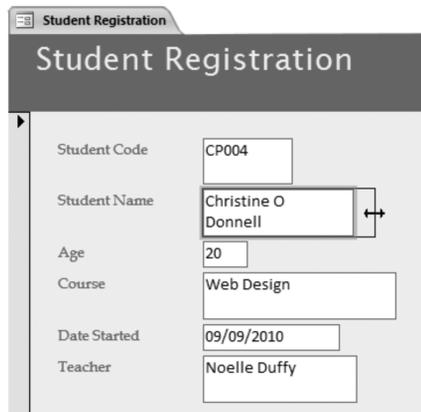
If necessary, adjust the width of text boxes (using layout view) as you enter the data.



Student Code	Student Name	Age	Course	Date Started	Teacher
BS001	Peter Dunne	18	Admin	02/09/2014	Tadhg Allen
BS002	Mark Connolly	17	Admin	02/09/2014	Tadhg Allen
BS003	Dave O Neill	21	Finance	02/09/2014	Gerry Browne
BS004	Maura Keegan	18	Finance	02/09/2014	Gerry Browne
BS005	Ann Murphy	20	Admin	02/09/2014	Tadhg Allen
CP001	Enda Doyle	19	Web Design	09/09/2014	Noelle Duffy
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CP003	Tetyna Maryshko	18	Database	09/09/2014	Liam Kearney
CP004	Christine O Donnell	20	Web Design	09/09/2014	Noelle Duffy
CP005	Martin Murray	19	Database	09/09/2014	Liam Kearney

Table 1.3

N You can make adjustments to your Form as you are entering the data using layout view.



Student Registration	
Student Code	CP004
Student Name	Christine O Donnell
Age	20
Course	Web Design
Date Started	09/09/2010
Teacher	Noelle Duffy

Figure 1.15: Adjusting the *Student Name* text box in layout view

 Layout view allows you to view the data you have entered while making adjustments to the design of the Form. In Figure 1.15, the *Student Name* text box is being adjusted to prevent the text from wrapping. You can't enter data in layout view, so you will need to click the *Form View* button when you have finished adjusting your Form.

N Data is saved automatically as it is entered in a Form. There is no need to click the *Save* button to save the records you have entered. You only need to click the *Save* button when you make adjustments to the design of a Form.

Use the Form to Edit Data

1. Edit Existing Records

Maura Keegan has switched from the Finance course to the Web Design course. This information needs to be updated in the database.



1. With the *Student Registration* Form open in Form view, click in the text box containing the Student Name.
2. In the Home section of the Ribbon, click the *Find* button.
3. Type *Maura Keegan* in the Find What box.
4. Click *Find Next*. Maura Keegan's record is now displayed on the screen.
5. Change Maura's course from Finance to Web Design.

 You can quickly display the Find and Replace dialog box using the *CTRL + F* keyboard combination.

Edit the following records using the *Student Registration* Form:



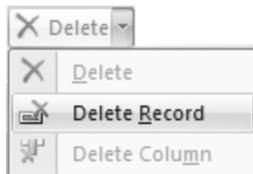
Click in the *Student Name* text box before clicking the *Find* button.

- Ann Murphy started on 16/9/2014.
- Martin Murray's age is 20.
- Tetyna Maryshko is in the Finance course.
- Enda Doyle started on 02/09/2014.

2. Delete a Record



1. Find the record for Mark Connolly using the *Find* button. Close the Find and Replace dialog box.
2. In the Home section of the Ribbon, select Delete Record from the Delete drop-down list.
3. Click Yes to confirm that you want to delete this record.



3. Add a New Record



Click the *New Record* button on the toolbar and enter the following information:

A new student, Keith Little, aged 19, has joined the Admin course. His start date is 24/09/2014. His teacher will be Tadhg Allen and his Student Code is BS006.



ASSIGNMENT SUMMARY

Basic Concepts	
Table	A database object that stores data. It is divided into rows and columns. The rows are called records. The columns are called fields.
Field	A specific column in the Table, e.g. Student Name. The data type of a field reflects the data that it stores, e.g. text, number, date/time.
Record	A specific row in the Table.
Primary Key	A special field in a Table where data cannot be duplicated. Records in the Table are stored in ascending order of the primary key field.
Form	A database object designed to facilitate data entry. The Form is linked to the Table. Data entered in the Form filters down to and is stored in the Table.
Label/Text Box	Each label/text box combination in the Form is linked to a specific field in the Table. Data is entered in the text boxes. Descriptive text is displayed in the labels.

Potential Pitfalls

- An Access Form is specifically designed for data entry. Although data can be entered directly in the Table, it is best to use the Form for data entry.
- Once a particular field has been identified as the primary key, Access will not allow you to duplicate values in that field.
- Access will not allow you to enter letters or symbols in a field with a Number data type.

Useful Shortcut	
Keyboard Combination	Action
CTRL + F	Find records in a Form

Table 1.4

Log on to www.gillmacmillan.ie to download review questions for Assignment 1.