

Beginners Database using MS Access

Database Terminology

Data base	Is a collection of 'structured' and organised data (information) e.g. A Library Database will contain data about individual borrowers and books	
Table	Is all the data related to one particular subject e.g. all the data about Books in the Library Database will be stored in one Table.	
Record	Is all the data about one item/person or thing. Think of Records as rows of data. e.g. all the data about Margaret Atwood's book The Handmaid's Tale is one Record	
Field	A field is one chunk of information in a Record. All records have the same fields. Think of fields are columns of data. e.g. the Author Field of the Books Database will contain the value Atwood, Margaret for The Handmaid's Tale.	
Field Types	Different types of information need to be displayed and used by the database differently. Eg. A number is different from text	
	Text	Text or combinations of text and numbers, as well as numbers that don't require calculations, such as phone numbers
	Memo	Lengthy text or combinations of text and numbers. If you need to keep notes or other information that doesn't fit neatly into a text field use a memo field
	Number	Numeric data used in mathematical calculations, e.g. number of copies of a book, number of children etc
	Date/ Time	Date and time values for the years
	Currency	Currency values i.e. money, the cost of a product
	AutoNumber	A unique sequential (incremented by 1) number or random number assigned by Microsoft Access whenever a new record is added to a table, e.g. use this as a primary key to give each of your customers a unique reference number.
	Yes/No	Yes and No values and fields that contain only one of two values (Yes/No, True/False, or On/Off) e.g. attended workshop, is either Yes/No
	OLE Object	An object (such as a Microsoft Excel spreadsheet, a Microsoft Word document, graphics, sounds) linked to or embedded in a Microsoft Access table. E.g. you can link to a digital images of each of your volunteers.
	Hyperlink	A link to a web address
	Lookup Wizard.....	Creates a field that allows you to choose a value from another table or from a list of values by using a list box or combo box. Clicking this option starts the Lookup Wizard, which creates a Lookup field. E.g. if you want to categories your books by genre, e.g. Sci-Fi, Drama, Comedy

Parts of the Access Database

Table	See above. Strictly speaking one Table is not a database. Databases are comprised of several tables linked together by 'relationships' e.g. Borrowers are linked with Books and vice versa. Relational Databases will not be covered here, but will be in a further course.
Query	A query is a question you ask your Database, e.g. all those contacts who attended a seminar, all those books written by a specific author.

Form	A form is a way of viewing, editing and adding data on the screen. Forms make inputting data easier as data can mirror paper based forms and can be set up so you can enter data into two different tables at once. E.g. a Lending table will allow you to link information from the Borrowers Table and link it with the Books Table to keep track of who has what books.
Report	Reports are for printed outputs, they allow you to layout documents in a more professional way and you can easily and quickly produce things like labels.
Macro	These help you automate common tasks. These won't be covered in this course.
Module	Again these help you automate your database in Access Basic. This won't be covered in this course.

Exercise 1 – Creating a simple Table for Women Crime Writer's section of a Second-hand book shop

1. Double Click Microsoft Access
2. Click on **Blank Database**, then **OK**.
3. Save the Database as your name, in the My Documents Folder, Click **Create**.
4. Click on **Table Tab** then **New**. Click on Design View, then **OK**.
5. Design View, enter the following fields with the appropriate data type:

Field Name	Data Type
Surname	Text
First Name	Text
Title	Text
Publisher	Text
Year	Number
Price	Currency
Genre	Text

Tip

Naming files with your own name is not usually a good idea. Use a name which describes the content of your file. However for ease in this workshop, use your name

Design and Datasheet View

Tables, Forms, Queries and Reports all have 2 views. Once where you set the design (Design View) and one where you see the contents of your table/form etc (Datasheet View)

Tip

Setting Default values for Fields can save you time when entering text,

6. After Entering the Genre fieldname and Type, look in the **General Properties** at the bottom of the screen, type in **Crime** as the **Default Text**
7. Click on **Save** to Save the Table Structure, type in **Books** as the Table Name. When Access asks you to create a primary key click **No**, we will be covering this later.
8. Switch to Design View. Go to the button on the toolbar which is farthest left. When you move your pointer over it the text 'View' comes up. Click it once.

9. Enter the following data in Datasheet View:

Surname	First Name	Title	Publisher	Year	Price	Genre
Rendell	Ruth	Kissing the Gunner's Daughter	Arrow	1991	2.99	Crime
James	PD	Shroud for a Nightingale	Sphere	1971	3.50	Crime
Christie	Agatha	Cat Among the Pigeons	Fontana	1959	1.50	Crime
Ellis	Brett Easton	American Psycho	Picador	1991	4.50	Crime
Piercy	Marge	Gone to Soldiers	Penguin	1988	3.95	Crime
Proulx	E Annie	The Shipping News	Fourth Estate	1993	4.50	Crime
Marsh	Ngaio	Tied up in Tinsel	Fontana	1971	1.00	Crime

10. **Print** the Table. First check that it will fit on one sheet of A4 paper – it should do. First go to print preview to check how the Table looks, if it doesn't fit on one page, go to **File, Page Setup** to change the orientation to Landscape. If its still to large to fit on one side of A4 narrow the column width (make sure you can see ALL values though).

11. Two new books have arrived for the women crime writers' section. Add the following record

Heyer	Georgette	Duplicate Death	Grafton	1951	£2.95	Crime
Wentworth	Patricia	Vanishing Paint	Coronet	1955	£1.65	Crime

12. Some of the books have been put in this section incorrectly. Delete the following records, click on the Record Selector (small grey box to the left of the record and press **Delete** on your keyboard).

Ellis	Brett Easton	American Psycho	Picador	1991	7.99	Crime
Proulx	E Annie	The Shipping News	Fourth Estate	1993	6.99	Crime
Piercy	Marge	Gone to Soldiers	Penguin	1988	3.95	Crime

13. Some of the details have been entered incorrectly. Make the following alterations:

Christie	Agatha	Cat Among the Pigeons	Fontana	1960	2.50	Crime
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14. **Sort** the book records by Surname, putting them into alphabetical order. Do this by clicking the Field Selector and clicking on the Sort button on the Toolbar (the A-Z button).

15. Print the Table

16. Sort the books into Date published order.

17. Print the Table and Close it down. Make sure the Database Window is still open.

More Terminology

<p>Sorting</p>	<p>Allows you to list Tables or Queries in alphabetical, numeric or date order. You can sort from A-Z (or 1-10 on number fields) or from Z-A (10-1 on number fields).</p> <p>How To (in Datasheet View): Click on the Field Selector of the Field you want to sort by and click the Sort button on the Toolbar</p>
<p>Record Selector</p>	<p>This is the grey square to the left of each record. This allows you to select the record for deleting or copying etc.</p> <p>How To (in Datasheet View): Move you pointer over the Record Selector next to the Record you want to select. Wait until it is a thick horizontal arrow and click. To highlight more than one record, press and hold down and drag the mouse up or down.</p> <p>To Delete: After highlighting press the Delete button on you Keyboard. Access will warn you it is going to delete the record (you can't Undo after – so be careful), click Yes if you are sure.</p>
<p>Field Selector</p>	<p>This is the grey block at the top of each field which contains the field name. This allows you to select the field for such actions as sorting.</p> <p>How To (in Datasheet View): Move you pointer over the Field Selector you want to select. Wait until it is a thick vertical arrow and click. To highlight more than one field, press and hold down and drag the mouse left or right.</p>
<p>Design View Datasheet View</p>	<p>Tables have two views: Design view and Datasheet view. You use Design view to create and modify the structure of a table. You use Datasheet view to view, add, delete, and edit data in a table.</p> <p>The View button is a toggle button (when your Table is open this is the button to the far left). When your table is displayed in Datasheet view, only the button to switch to Design view is displayed, and vice versa.</p>
<p>Primary Key</p>	<p>Is a fields that uniquely identify each record stored in the table, e.g. Reference Number, NI Number, combination of Firstname or Surname. Primary Keys are set in the Design View of a Table.</p> <p>This information is called the primary key of the table. Once you designate a primary key for a table, to ensure uniqueness, Microsoft Access will prevent any duplicate or Null values from being entered in the primary key fields.</p> <p>How to (in Design View): Click the Field Selector of the Field you want to make the Primary Key, click the Primary Key button (picture of a small key), in the middle of the Toolbar.</p>

Some Tips on Saving

Access does not work like other applications where you add text and then save. As you add text into a Table the data is added direct onto the disk.

You have to save whenever you do the following things in Access

- ◆ Creating a Database
- ◆ Creating or amending a Table (i.e. you save the Table structure and any changes made after e.g. changing column width)
- ◆ Creating or amending a Query
- ◆ Creating or amending a Report.

You do not have to save when you are adding or amending records to a Table.

Q. What advantages does this have for Database Management, especially if there is more than one person using the database at any one time?

When you are working with databases different parts such as Tables and Forms and Queries, may have very similar names. Devise a naming system for the different parts which will help you locate them e.g. if you have a Contacts Table and a Form also called Contacts, this can be very confusing so instead call your Table **tbl:Contacts** and your Form **frm:Contacts**.

Exercise 2: Creating a Primary Key

You are going to add a Primary Key of an AutoNumber to the Books Table. If you have two books the same it will allow you to identify each book separately, as each will have a unique number.

1. Click once on the Table Books, then click Design
2. Highlight the first Field, Surname by clicking once on the Field Selector
3. Click **Insert** then **Rows**
4. In the new blank row that has been created type ID for the Fieldname and choose AutoNumber for the Data Type.
5. Make sure that the cursor is somewhere in the Fieldname or Data Type of the new field you have created and click on the **small key** on the Toolbar.
6. **Save** the Table and **Close** it.
7. **Open** the Table in **Datasheet View** to see how Access has given each record a unique number. Each number is unique to that record and if, for example, you delete one of the records (e.g. Georgette Heyer, number 5 then the numbers will run 1-4 and then 6) that number will not be used again in the Table.

Primary Keys are also very important to **Relational Database Design**, this is when different tables are linked to one another e.g. Projects and Volunteers, Parents and Children, Trainees and Courses. Primary Keys are the means by which different Tables can be linked. We are not covering Relational Databases in this course but see the Happy Computers Access Part 2 Manual for further information. Visit <http://www.happy.co.uk/manuals/login.asp>

Exercise 3: Setting up a Form to Enter Data

The Easy Way

1. Highlight the Table Books (don't open it)
2. Click on the arrow to the right of the **New Object** button on the Toolbar (over on the right)
3. Click **AutoForm**
4. Click **Save** and save the Form as frm:Books
5. Close the Form

The Hard(er) Way

1. Click the **Forms** Tab
2. Click New
3. In the **New Form** Dialogue box, Click **Form Wizard**, then select **Books** from the drop down menu, Click **OK**
4. Use the >> button to move all the fields over onto the right of the screen, this means all the fields will appear in the final form (sometimes you don't want all fields to be displayed so the < and > allow you to move individual fields over to the right and back again).
5. Click **Next**, now Access asks how you want your form to be displayed, have a look at each one but select **Columnar** before then clicking **Next**.
6. Choose any style you like, then click **Next**
7. Give the Form the name **frm:Books2**, Click **Finish**

The Form will look very much like frm:Books!, however you have more choices of Layout, Style and which Fields to include with the second option.

Exercise 4: Using the Form to Enter Data

1. Open up your Form **frm:Books**
2. Click on the **New Record** Button (the arrow with a star >*) this will take you to a blank form. Enter the following details, using the **Tab** or **Enter** key to move through the form.

Sayers	Dorothy L	Five Red Herrings	New English Library	1930	£2.00
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3. Close the Form and Open the Table, as you can see the details have been entered into the underlying **Books** Table

Exercise 5: Using Queries to Extract Information

Queries can help us identify records by what are called 'Criteria'. The most common type of query is a **select query**. A select query retrieves data from one or more tables using criteria you specify, and then displays it in the order you want.

Firstly lets pick out just those books which are published by Fontana

1. Highlight the Table Books
2. Click on the arrow to the right of **New Object**, and click **Query**
3. Click Design View
4. What you see now is called a QBE Grid (a Query by Example Grid). At the top you'll see the list of fields from the Books Table. First Double Click the **Firstname**, then **Surname** then **Title**, then **Publisher**. As you double click each field it will appear in the QBE Grid. This is telling Access which fields of your Table are to be included in the Query.
5. In the Criteria Row of the Publisher Field type Fontana. Click the Run Query Button (Red !). Two records should be shown

First	Surname	Title	Publisher
Aqatha	Christie	Cat Among the Piceons	Fontana
Ngaio	Marsh	Tied up in Tinsel	Fontana

6. As the Query asked for all those books published by Fontana we don't necessarily need Fontana to be viewed in the final Query. Go back to Design View (click the View button on the left of the Toolbar).
7. Just above Fontana you will see a tick in the **Show** row. This tells Access which fields are to be shown in the final query, click take the tick out of the Tick Box for the Publishers Field by clicking once and run the Query again.
8. Save the Query as **Q:Publisher=Fontana**, and Close the Query.

Queries are useful because each time you run the query it runs on the specified Table e.g. Books, so if you add more records which have Fontana in the Publisher field then it will also pick those out.

Exercise 6: Queries using Dates or Numbers

Using the above instructions as a guide, create a second query which shows

- ◆ Title
- ◆ Firstname
- ◆ Surname

For Books

With a Date after 1950. The 'Expression' in this case is >1950.

> is greater than, < is less than, >= is greater than or equal to, and <= is less than or equal to

Exercise 7: Producing Reports

Reports are an effective way to present your data in a printed format. Because you have control over the size and appearance of everything on a report, you can display the information the way you want to see it, not rely on a very boring Table format.

We are going to produce a report using the Books Table.

1. Make sure your Database is open, and click the **Report Tab**
2. Click **New**. In the New Report box, click **Report Wizard** and then choose **Books** from the list menu (can you see now how helpful to have queries separated from Tables with the Q: at the beginning of their name). Now click **OK**.
3. Move all the fields except ID and Genre over to the right (if they are on the right this means they will be displayed in the Report. Remember use the **>>** to move everything over and **<** to move the ID and Genre back to the left. Click **Next**.
4. The next dialogue box to appear asks if you want to add any grouping levels. This allows you to group by a field e.g. Publisher, so that all those from Fontana will be grouped together. Click **Publisher**, then **>**. Click **Next**.
5. The next dialogue box is asking if you want to sort any of your records, because this is a small Table this is not useful at the moment, but bear it in mind when producing reports of your own. Click **Next**.
6. Click on **Stepped** for the Report Layout, and change the Paper Orientation to **Landscape**. Also take the tick out of '**Adjust the field width so all fields fit on a page**'. Click **Next**.
7. Click the Style of your choice and click **Next**
8. Name the Report **Rprt:Books** and click **Finish**.
9. Check the look of the Report and then **Close** it.

Exercise 8: Producing Mailing Labels

1. Open up the file Addresses.mdb which you have saved.
2. Highlight the Table General Contacts
3. Click on down arrow of the **New Object** button, then **Report**
4. Click on **Label Wizard** (note that the because you highlighted tbl:General Contacts and then went to New Object, the table name is already inserted as the table you want to use). Then **OK**.
5. Choose the **Avery Labels L7161**, then click **Next**.
6. The next 2 screens are where you enter the design and layout for your labels
7. Accept the default font of Arial Light 8, by clicking **Next**.

8. Click on **FirstName** and then >, press the **space bar** once and click **LastName** then >
9. Press **Enter** for the first line of the address. Click on **Address1** then >, press **Enter** again and click on **Address2** then >. Carry on until you have the labels as you want them.
10. Click **Next**. Sort the labels by LastName (click **LastName** and then >). Click **Next**.
11. Access will give your Label Report the following name Labels **tbl:General Contacts**, keep that by clicking Finish.

Happy Computers Manuals

These are available free of charge from their web site <http://www.happy.co.uk/manuals/login.asp>. They are very good and there are two Access Manuals, one beginners and one intermediate, which includes Relational Databases.