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This document is an introduction to Microsoft Access 2007, running under Microsoft Windows XP. For further information see Microsoft Access 2007 - An Intermediate Guide.

Introduction

A database is a computer program for storing information in an easily retrievable form. It is used mainly to store text and numbers (for example, the Library catalogue, which includes the author, title, class number and accession number for each book). Most modern databases also allow the storage of other types of information such as dates, hyperlinks, pictures and sounds. As well as being able to store data, a database allows you to select information quickly and easily (for example, a list of the books written by a particular author or those on a certain subject). Finally, it may allow you to produce printed summaries (reports) of the information selected.

When setting up your own database, it is important to plan its use in advance. This is particularly important if you are setting one up which will be used by other people. Among the things which you should consider are:

- What information you will need to store
- What information you want to get out
- Who the data is intended for and how other users will use it
- Whether you want to restrict access to parts of the data to some users only
- Who is allowed to add or change data
- If your data refers to actual people, it may need to be registered under the Data Protection Act (though this doesn’t apply to a personal database of family and friends)

Although you can change the specifications of your database as you develop it, you will save yourself a lot of work if as much as possible is planned in advance.

Microsoft Access is a relational database management system (which allows you to link together data stored in more than one table). It is fully supported by IT Services and is available for personal purchase as part of the Ultimate Steal and for departmental installation under the Microsoft Select Agreement.

Starting Microsoft Access

If you are using an IT Services machine, login as usual by entering your username and password. Then, to start up the program:

1. Open the Windows start menu and choose All Programs
2. Select Microsoft Office then Microsoft Office Access 2007

Tip: If you right click on the Microsoft Access entry in the menu and choose Send To then Desktop (create shortcut) you’ll have an icon on the Desktop for future easy access. You can also do this with any Access file.

The Access Screen

On entering Access you are presented with a Getting Started with Microsoft Office Access screen. This has set of sample templates to help you create your own database. Further templates, grouped into four categories, are available from Microsoft Office Online via the links provided in the left pane. These can be quite helpful for particular applications but you nearly always have to tailor the database produced to your own requirements.

You can also either create a new blank database (without help) or open an existing one. In this course you are going to use an existing database, to see how it is set up and how it can be used.
1. Click on the [Office Button] and select Open (or simply press <Ctrl o>)
2. An Open window appears - change Look in: to User (D:)
3. Double click on the folder called Training to open it
4. Click on example.accdb from the list which appears and press <Enter> or click on [Open]

Note: For those using these notes on a computer not run by IT Services, the example file can be downloaded from the link provided at step 4 above.

Users are welcome to take a copy of the example file if they want to practice.

**The Navigation Pane**

In the next screen, the Navigation Pane appears on the left. This controls navigation within a particular database. A database is made up of several objects, grouped into a single file. This database has been set up to show All Access Objects which currently exist in this database, but there are other types of object as well which do not currently appear.
The full list is:

- **Tables** - hold the raw data
- **Queries** - extract part of the raw data to produce dynasets - dynamic sets of data which can change each time the query is run (to reflect any changes to the data in the tables)
- **Forms** - user-friendly layouts to display data on the screen (either in a table or from a query)
- **Reports** - output files, ready for printing
- **Pages** - for creating/editing WWW pages
- **Macros** - lists of commands to perform particular functions
- **Modules** - programs which expert users write in a programming language called Access Basic to perform tailor-made functions not generally available

The objects are accessed from the Navigation Pane. Pages, Macros and Modules are not dealt with in this Beginners’ course. As you use the different components, the tabs on the Ribbon change appropriately.

1. Click on the arrow at the top of the Navigation Pane to view the available options
2. Click on a double arrow to show or hide the objects in a particular group

### Part 1: Using an Existing Table

Begin by investigating the table named students. This contains data relating to imaginary students in a fictitious department in the University, but it could equally be members of a club or just information about your friends and relatives.

1. Click on the **students** table then press **<Enter>** (or double click with the mouse) to open it

A new pane opens on the right showing the data set out in a table. This method of display (known as Datasheet View) shows the data in columns and rows, similar to a spreadsheet. There are a number of entries (records), one for each student, which each take up one line or row of the table. For each student, various items of data are recorded in columns - each column contains one variable (or field). On the top of the table is a tab, which provides easy access when you have more than one object open.

Immediately below the data is the status bar, which shows you are positioned at Record 1 (of 390). The current record has a slightly darker background, while the column on the far left is yellow-orange (the current field has a coloured border). You can move the indicator down to the next record by clicking on the button immediately to the right of the number 1 on the status bar. The next button to the right takes you to the end of the table - click on this and you should be at Record 390. Matching buttons on the left take you back a single record and back to Record 1 - try out these too. You can also move up and down using the arrow keys on the keyboard. The scroll bar down the right edge of the table window moves the display up and down. Another scroll bar is provided at the foot of the window for moving to the left and right when the records extend over more than one screen. To move from field to field across a record, use the **<right arrow>** and **<left arrow>** keys or **<Tab>** and **<Shift Tab>**. The **<End>** key takes you to the last field, the **<Home>** key to the first. **<Page Up>** and **<Page Down>** take you up and down a screen, while **<Ctrl Home>** and **<Ctrl End>** take you to the first field of the top record and final field of the last record, respectively.

To see exactly what each record contains and how it has been set up:

2. Click on the [View] button (the first on the Ribbon) – the Design tab is added to the Ribbon
The *Table Design* pane lists the field names, indicates their data types and also shows the field properties. The screen appears as below:

The fields (and properties) are as follows:

- **StudentNo**: A text field containing each student’s personal id, as allocated by the University Registrar’s Office. Text fields are the commonest type of fields and can be used to store any characters (letters, punctuation, numbers etc). Numbers should be stored as text if not being used in calculations. This field is set up to hold up to 10 characters and a Caption is used to expand the field name. This number uniquely identifies each student - the *Required* property has been set to *Yes* and *Indexed* is set to *Yes (No Duplicates)*. This field has also been used to set up a *Primary Key*, which you will learn more about later.

*Tip*: It's good practice not to include spaces in field names (or in the names of tables / queries / forms / etc). Instead, make use of Captions to expand the field name (to include any spaces). Not only do you have less characters to type but it makes manipulation of the data much easier if you find you need to use more advanced database features.

3. Press `<down arrow>` to move to the next field (then repeat this for each field):

- **Surname**: A text field containing the Family Name of each student. This field is can hold up to 25 characters and is *Indexed* as *Yes (Duplicates OK)*
- **Title**: Another text field but this time for up to 4 characters. Here, we know the possible values (Mr/Mrs/Miss/Ms) and can set up a *Validation Rule* to check that the data entered is correct - if it is not, the *Validation Text* is displayed. A *Default Value* (Mr) has also been set
- **FirstName**: Another text field for student’s first name - up to 20 characters
- **OtherInitials**: A text field for any other initials - up to 6 characters
- **Hall**: Another text field where the possible values are known (the University only has certain Halls of Residence) so a *Validation Rule* has been set - up to 15 characters. A *Default Value* (Private) has also been set
- **Userid**: This is the student's computer username, which could be used for the e-mail address - a text field for up to 8 characters
- **Tutor**: The student's tutor - again a text field for up to 20 characters
- **Option**: A number field which points towards different optional course modules the student can study. Numbers can be stored using different field sizes; here, as the number of options is small (and always +ve) a byte is used - see the Appendix for a full explanation. A slightly different Validation Rule is used to check the data entered.
- **DOB**: The data type here is Date/Time, which has been set up in Medium Date format. Note that a Caption is used to expand the field name.
- **Street**: First line of the student's home address - a text field storing up to 50 characters
- **Town**: The student's home town/city - a text field storing up to 20 characters
- **PostCode**: The student's home post code - a text string storing up to 10 characters
- **Phone**: The student's home telephone number - note that even though this is a number it is stored as text (you won't be doing any mathematical calculations with it!)
- **Overseas**: A Yes/No (or logical) field storing whether the student is from an EEC country or not. The Default Value is set to No.
- **Notes**: For any other pieces of information - for longer pieces of text, a memo is used
- **Photograph**: Digital data (eg a passport photograph) are stored as OLE Objects

Other data types exist which are not included here, namely: currency, autonumber and hyperlink (see the Appendix for details).

**Tip**: Note that the student's surname is stored separately from the first name (similarly each line of the address is in a separate field). Information should always be stored in its component parts. You can then, for example, sort by surname then first name, or reference the students formally (ie Mr X) or informally (by their first name). You will see later how to combine this data into a single field, if you need to.

To close the Table Design pane and return to the top of the datasheet:

4. Click again on the [View] button - note how the icon on the button changes as you move between Design and Datasheet view

### Searching for a Particular Record

Find: 📚

To search for a particular record (ie down a field), you should first move to the field you want to search:

1. Press <Tab> to move to the Surname field
2. Click on the [Find] button on the right hand side of the Home tab on the Ribbon (or press <Ctrl f>) and a Find and Replace window will appear
3. The cursor is already positioned in the Find What: box - type in *smith*

The default options should already be set correctly. The Look In: box shows the search is restricted to the current Surname field (alternatively, you can search the whole table). In the Match: box, you can choose to match the Whole Field, Any Part of Field or the Start of Field. Search: is set to All records.

The other options are Up and Down. Match Case lets you distinguish capitals from lower case (if you need to). Finally, Search Fields as Formatted is useful for finding data as displayed (a date format, for example). Note that you also have access to a Replace tab for editing data.

4. Press <Enter> for [Find Next] and the search should be carried out
5. Press <Enter> again and another Smith will be found
6. Keep pressing <Enter> until you get the message that the search item is not found

Obviously, this is not a very elegant way of retrieving information from the database - but it works! To close both the warning message and Find window:

7. Press the <Esc> key twice or click on [Cancel] (or on the red [Close] button)
8. Finally, press <Ctrl Home> to move back to the first record (or use the first button on the record indicator bar)

### Sorting

The records, as you have seen them so far, are shown in the order that they were first entered into the database - as the data came from the Registrar’s Office, it is in Student Number order. For this reason, it wouldn’t have been easy to search for Smith simply by scrolling through the records (and imagine trying to find a book in the Library if they were all listed by their date of purchase!). If the data is sorted, however, then you can scroll through the records to search for a particular one.

#### Quick Sort

![Ascending: A→, Descending: Z→, Clear All Sorts: A→Z]

To sort any field into alphabetical/numeric order, a quick sort facility is provided. First, you have to move to the column on which the sort is to be based:

1. Press <Tab> to move to the Surname field
2. Click on [Ascending] in the Sort & Filter group on the Home tab of the Ribbon

The names of the students are now in alphabetical order. Note that only the screen display is sorted - the records are still stored in the order in which they were typed, and they always will be.

3. Use the [Clear All Sorts] button to reset the data to its original unsorted order

### Changing the Display Order Permanently

If you want to keep the new display order for the next time you open the table, all you have to do is close the table, saving the changes to its design. Try this next:

1. Move to the field you want sorted (eg Surname)
2. Click on [Ascending] (or [Descending] if you want the data in reverse order)
3. Close the table by clicking on its [Close] button
4. Save the changes to the table design when asked - press <Enter> or click on [Yes]
5. Now press <Enter> again to reopen the table - you should find it in the new order

**BEWARE:** it’s very easy to accidentally save unwanted changes to the table design (if you perform a quick sort on another field, for example). Sort on the correct field again (then close and save) to get back your original table order.

### Sorting in a Query

Sorts can also be carried out and stored in a query. Moreover, within a query you must set an explicit sort otherwise the records are displayed in their original order of entry. Queries are particularly useful where you have more than one field you need sorted - a simple quick sort only lets you sort on the one field (you can’t for example sort by surname then firstname). By using a query you can produce a display sorted on any of the
fields and can even create complex sorts within sorts. You will be looking at queries shortly, and carrying out sorts in them, so there is no need to carry out an example here.

## Indexes

An index can be likened to an index in a book (this adds just a few extra pages but is invaluable if you want to look up something). In a database it is used to speed up searching, sorting and grouping data - one should be set on any field used frequently in these ways. Access records the sort order in a hidden object so that it doesn't need to repeat the sort each time. Indexes also perform a second useful function in that they can be used to guard against duplicate data entry. They are always used when a field is set up as a Primary Key. Try setting up an index on another field:

1. Click on the [View] button to switch back to Design View
2. Note that the StudentNo field already has an index - set to Yes (No Duplicates). As this is used as the Primary Key, it must have this setting

The Surname field has an index of Yes (Duplicates OK). This field is frequently used for sorting and duplicate values are allowed - as you have already seen with Smith. Try setting an index on Hall - another field likely to be used in sorting/selecting:

3. Click on the Hall field and, using the list arrow, set Indexed to Yes (Duplicates OK)
4. Next click on the Userid field and note the index here is set to Yes (No Duplicates). The values in this field should be unique and the index will ensure this
5. Click on the [View] button again to switch back to Datasheet View. When asked, press <Enter> or click on [Yes] to save the changes to the design of the table

## Adding, Editing and Deleting Records

Whenever you make any changes (additions, deletions or edits) to a table, it is the original data file that you are altering. Unlike most other applications, a database does not make a working copy of the file first. For this reason, it is essential to keep a back-up copy of your file (to which you can always return), just in case you make mistakes when carrying out amendments.

To add a new record to the database, use the [New] button (on the status bar or in the Records group on the Home tab of the Ribbon) – you can also press <Ctrl +>. New records are always added at the end of the existing data. As soon as you start to type, Access creates a new empty record (marked with an asterisk), while the current record indicator changes from an arrow to a pencil:

1. Click on the [New] button - you should now be on Record 391
2. Type in a number for the StudentNo (anything under 1000 would do) then press <Enter> (or <right arrow> or <Tab>) to move to Surname
3. Type in your own name then move to Title (press <Tab>, <Enter> or <right arrow>)
4. Repeat step 3 until you have filled out most of the record

Note that some fields already have a default value. To change a value in a field you simply type in a new one.

Note also that some fields (eg Hall and Option) can only accept certain values, others (eg StudentNo, Surname and FirstName) cannot be left blank.

The Photograph field can hold a picture. The best way to add one is via the Clipboard (ie Copy and Paste). If you right click on the field and choose Insert Object... then it may appear as an icon which you then have to double click to open. As pictures cannot be displayed in tables anyway, don't try filling out this field here.
Note: The best method for entering data is via a form, which you will be meeting later.

To delete the current record (in this case your own):

5. Simply press the <Delete> key (or use the [Delete] button to the right of [New] on the Ribbon and choose Delete Record)

Deleting records from a database is potentially very dangerous as they are erased once and for all, hence you are given one final chance to change your mind:

6. Press <Enter> for [Yes] to confirm the deletion

Note that you can’t now use [Undo] to recover the record. If you have several records to delete:

7. Using the mouse, point to the left-hand edge of the first record to delete - you will find that the mouse cursor changes to an arrow

8. Hold down the mouse button - the record is marked - then drag through the records required

9. To delete them, press the <Delete> key (or use the [Delete] button)

10. When asked to confirm the deletions, this time click on [No] and the records will reappear

Note: Records must be next to each other in order to delete them (you cannot use <Ctrl> click like you can in other Microsoft software, though <Shift> click can be used to select a block of records). You will see next how to select a subset of non-contiguous records, which you could then delete.

Selecting Records

Databases offer you the facility of extracting sub-sets of records according to some pre-set conditions. In the Library, for example, you can search for the books written by a particular author or those dealing with a given subject. Access offers you two methods for selection, Quick Select using a Filter and Selection using a Query.

Quick Select

Simple selections can be made directly on the table itself, using a filter. Access 2007 provides two mechanisms for this, as you will see:

1. Press <Ctrl Home> to move to the first record (press <Enter> first if this didn’t work)
2. Move across to the Hall field - to find all the students living in a particular hall
3. Using the <down arrow> key, select the Hall of Residence you require (or you could use [Find] to search for a particular Hall)
4. Click on the [Selection] button (in the Sort & Filter group) and choose Equals...

Note that at the bottom of the screen it says Record 1 of XX (Filtered). To turn off the filter:

5. Click on the highlighted [Toggle Filter] button (under [Selection])

You can also filter on part of a field - for example, you might want all students registered in 2008:

6. Move to the Userid field
7. Find a record containing 08 and drag through the figures to select them (ie just 08)
8. Click on the [Selection] button and choose Contains “08” to carry out the filter

If you now also wanted to find the students in this year who had a particular tutor:

9. Move to the Tutor field
10. This time, click on the [Filter] button to see how the other method of filtering works
11. Untick the Select All check box and tick the tutor required – press <Enter> for [OK]
Note that this method is more flexible in that it allows you to set more than one criterion:

12. Click on the [Filter] button again and tick a second tutor – press <Enter> for [OK]

You now have the 2008 students for two of the tutors. If you also wanted the 2007 students (ie a filter based on Contains) you can do so by using the Text Filters option in the Filter button window. Note that you can also open the filter selection by clicking on the filter icon shown on the right at the top of each column.

Having made your required selection, there are several things you might want to do next. For example, you might want to delete these records - even though they are not next to each other in the full dataset, you could drag through them here and delete them as before (but don’t do so here).

Another thing you might want to do is to print off the data. However, you probably wouldn’t want all of the fields, so you’ll see next how to hide unwanted columns.

**Changing the Fields Displayed**

Tables often contain a lot of data, only some of which may be required. You can control which fields are shown and which hidden. Here, you may want just the student name and hall:

1. **Right click** on the StudentNo column heading and choose **Hide Columns**

To hide several adjacent columns in one go:

2. Click on the Userid column heading
3. Scroll to the right then hold down <Shift> and click on the Photograph column heading
4. **Right click** on the selected columns and again choose **Hide Columns**

If you want to change the order of the fields on the screen, you can either use *cut and paste* or, more simply, *drag and drop*. Both these techniques should be familiar to the Microsoft Office user. To list the students starting with their full name (including title) in the correct order:

5. Click on the Surname column heading to select the column
6. Move the mouse cursor back into the column heading, hold down the mouse button then (with the button still depressed) drag the column to the right to a position immediately before the Hall field
7. Release the mouse button to drop the field in its new position

**Note:** you are only changing the screen display - the data is still stored in its original order.

Finally, you might want to print your list. First, it’s a good idea to preview it:

8. Click on the [Office Button] button, choose Print then Print Preview

You will notice that Access automatically adds a header and footer to your page, which you may or may not want. Normally you would now print your list, but here:

9. Click on the [Close Print Preview] button on the far right of the new Print Preview tab to turn off the preview

To redisplay any of the hidden fields:

10. **Right click** on any column heading and choose **Unhide Columns**...
11. Click in the box against the required hidden column to redisplay it

**Advanced Filters**

The relationship between queries and filters is a very close one. You can in fact save a filter as a query by turning on the advanced filter option. This can be a useful aid in designing a query. As an introduction to queries, save the current filter (students who came in 2008 with a named tutors):

1. Click on the [Advanced] button in the Sort & Filter group and choose Advanced Filter/Sort...
A Filter Design pane appears. This is very similar to the Query Design pane, which you will be using next. Examine how the criteria have been set up.

2. Click on the [Office Button] and choose Save – the Save As Query window appears
3. Save the filter as Tutor08 (press <Enter> for [OK]), then [Close] the filter window
4. Close the students table - don't save the changes to the design (click on [No])

Tip: The simplest way to redisplay all the fields if some are hidden is to close the table without saving the changes to its design. When you reopen it, it will appear in its original format.

To rerun the filter:
5. Select Tutor08 from the new Queries in the Objects list and press <Enter> to open it

You'll find that all the fields are now displayed. You’ll see later how to specify particular fields in a query.

6. End by closing the query - click on its [Close] button

Once a filter has been saved as a query, it's easy to modify its design if necessary.

Using a filter in this way is straightforward but a little limited. To do more complicated selections you may have to use a Query. Queries also offer various other facilities, including sorts within sorts and calculating new fields. In fact you may always want to view a table through a query – here, for example, you would want to see the students listed alphabetically by Surname then by FirstName.

Sorting in a Query

To introduce you to queries (which may look a little complicated at first, but which are in fact very easy), try carrying out a sort within a sort. There are two ways to start a query:

- You can choose [Query Design] on the Create tab of the Ribbon
- You can choose [Query Wizard] on the Create tab to get help

The Query Wizard isn't applicable here, so try the first method instead:

1. Move to the Create tab on the Ribbon then click on [Query Design] on the right
2. In the Show Table window, select the students table then press <Enter> to [Add] it
3. Press <Esc> to [Close] the Show Table window

Note: If you ever wanted to add a different table, click on the [Show Table] button in the Query Setup group on the new Query Tools Design tab on the Ribbon.
Earlier, you sorted the students table by students' surnames but you couldn’t then also sort by their first name. Here in a query, you can:

4. Click on the list arrow on the right of the Field: cell and choose students.*

The asterisk notation means all the fields in the students table (if you only wanted certain fields displayed you must choose them individually). If you were to run the query as it stands, you would see the data in its original unsorted format (ie the sort you set when the table is opened isn’t carried across – instead you have to set up explicit sorting in the query).

5. Click on the list arrow in the Field: cell in the second column and choose Surname
6. Repeat step 5 in the third column but choose FirstName
7. Move down to the Sort: (third) row and type a (for Ascending) in both columns 2 and 3
8. In the Show: (fourth) row, untick the check boxes in both columns 2 and 3 (you can click anywhere in the cell) - if you don’t, the Hall will appear twice as it’s already included in students.*
9. To carry out the query, click on the [Run] button on the far left of the Ribbon (or you can use [View] to move from Design View to Datasheet View)

You should find that the students are now listed in their correct order (look at the Smiths) and that this query should act as the default whenever you want to look at the complete set of data.

10. Click on the query’s [Close] button
11. When asked, press <Enter> or click on [Yes] to save the query
12. Save the query as SortedStudents - press <Enter> or click on [OK]

Selection using a Query

Next, you are going to repeat the filter you carried out earlier to list all students from a particular hall. This time your new query will be making use of the fact that you already have the students sorted by name (a query can be based either on a table or another query):

1. Click on the [Query Design] button on the right of the Create tab
2. In the Show Table window, click on the Queries tab and select the SortedStudents query
3. Press <Enter> to [Add] the sorted students then press <Esc> to [Close] the Show Table window
4. Set the Field: in the first column to Surname and that in the second column to FirstName

You now need the Hall field in a separate column to set up the selection criteria. Another way to fill up a field is to double click on it in the field list in the top half of the Select Query window. You can try this next:

5. Double click on the Hall – it should be added to the next empty column in the query
6. Move down to Criteria: in column 3 and type the name of the required hall - eg Childs
7. To carry out the query, click on the [Run] button on the far left of the Ribbon (or you can use [View] to move from Design View to Datasheet View) or right click on the Query design and choose Datasheet View

The difference between this query and the earlier filter is that you can save it directly for future use.

8. Click on the query’s [Close] button
9. When asked, press <Enter> or click on [Yes] to save the query
10. Save the query as Hall - press <Enter> or click on [OK]

Note: You can’t give a table and query the same name.

Now try re-running the query:

11. Double click on the Hall query in the Objects list - you have your results again
Parameter Queries

The selections you have carried out so far have only met fixed criteria - in this case: Show me the students who live in Childs (or whichever) Hall. With a query, however, you can change the criteria each time you run it by making it a parameter query. The design is very similar to what you have already seen except that instead of setting a fixed criteria Access asks for the information at run time. Modify the Hall query to do this:

1. With the Hall query still open, click on the [View] button to change to the Design View
2. Click in the Criteria: field in the third (Hall) column and <Delete> the current criteria
3. Type in a new criteria saying: [Which Hall?]
4. Click on the [Run] button (or on [View] to switch to Datasheet View)
5. When asked the question Which Hall? type in the required hall of residence - eg Bridges
6. Press <Enter> or click on [OK] and the query will be run

Normally, you would run the query each time from the Objects list (or from a user-friendly interface - a form called a switchboard). Here, however, to run the query again:
7. Click on the [View] button to change to the Design View
8. Click on the [Run] (or [View]) button again
9. Type in the name of a different hall - eg Windsor - and press <Enter> or click on [OK]

As you can see, this query is much more useful than when it only worked for a fixed hall. The same mechanism is used when you look up a book in the Library. Here, the query picks up the parameter from a box on the screen (where you have typed in the author's name or the subject you are searching for).

More Complex Queries

Next, try some more complicated queries. What if you want to have an alternative criteria in a parameter query? For example, you might want a list of students living in either one hall or another. To do this, you have to set up criteria on two different lines.

1. Click on the [View] button to change to Query Design
2. In the second line of the Criteria: in column three, type: [or?] for a second question
3. Click on the [Run] button (or on [View]) to switch to Datasheet View
4. When asked Which Hall? type in the name of the first hall - eg Nantage (press <Enter>)
5. When asked or? type in the name of another hall - eg Wessex (press <Enter> )
6. You now have the students from both halls - [Close] the query, saving the new design

You have seen how to match values in a query but you can also use criteria such as greater than, less than, not equal to, between one value and another, or matching part of a field. For example, how do you set up a query to pick out the students who came in 2008? The answer is that you have to use a special notation called Like.

The Like notation indicates that the words which follow must be embedded within the data in that field for a record to be selected - wildcards (*) or ?) can be used to denote characters which may precede or follow the required text. ? represents a single character whereas * represents any number of characters. For example, Like C* could be used to give you all the students with names beginning with the letter C, while Like *son would match students whose names ended with son. For the 2008 students:

1. Click on the [Query Design] button on the Create tab of the Ribbon
2. In the Show Table window, click on the Queries tab, select SortedStudents and [Add] it
3. Press <Esc> or click on [Close] to close the Show Table window
4. Set the Field: in the first column to SortedStudents.* (ie double click on the *)
5. Set the Field: in the second column to Userid
6. In Criteria: in the second column type: *08* and press <Enter> (Access automatically changes this to Like "*08*" for you)
7. Turn off Show: by unticking the box
8. Click on the [Run] button to run the query - or switch to Datasheet View

To set up a second condition on this subset of data (eg 2008 students who have a particular tutor) is very easy. Whereas alternative conditions are set up on different lines, simultaneous conditions must be set up on the same criteria line:
9. Click on the [View] button to move back to Design View
10. Set the Field: in the third column to Tutor
11. Turn off Show: by unticking the box
12. In Criteria: in the third column, top line, type: [Which Tutor?] - or set a fixed value
13. Click on the [Run] button to run the query - or switch to Datasheet View
14. When asked Which Tutor? type in the name of a tutor (eg Foot) - press <Enter> for [OK]
15. [Close] the query, saving it as 2008

Adding New (Calculated) Fields

Earlier, you did a very simple selection to show just the student's name and hall of residence. One fault with the original example was that the students' names (first name and surname) were printed in separate columns. In a query you can calculate a new field, joining these together:

1. Click on the [Query Design] button on the Create tab of the Ribbon
2. In the Show Table window, select the Students table and [Add] it - press <Esc> to [Close] the window
3. In Field: in column one, type: FullName: FirstName & " " & Surname (don't forget the space between the double quotes) - press <Enter>

**Tip:** You should always use an ampersand (&) rather than plus (+) sign when joining text together. Though both appear to work, plus signs can occasionally cause problems.

4. Set the Field: in the second column to Hall
5. Set the Field: in the third column to StudentNo
6. In the fourth column, calculate another new Field: for the email address, type: Email: Userid & "@reading.ac.uk" and press <Enter>
7. Set the Field: in the fifth column to Surname and set Sort: to Ascending and turn off Show:
8. In the sixth column, repeat step 7 but set the Field: to FirstName

Note that this email field will not create a hyperlink (ie you wouldn’t be able to click on it to send a message).

9. Finally, click on the [Run] button (or on [View] for Datasheet View) to run the query
10. Right click on the StudentNo heading and choose Hide Columns (this field is needed later but doesn’t need to be displayed here)
11. Double click on the dividing lines between the column headings to widen the FullName and Email columns
12. [Close] the query, saving it as Names

**Tip:** When creating complicated calculations, it’s useful to evoke the Expression Builder. This appears if you right click in the Field: row (or, indeed in Criteria:) and choose Build... There’s also a [Builder] button on the Ribbon. You then have access not just to the field names but also to built-in functions. Even more importantly, a Criteria: can be set to pick up values held on forms.
Using a Form

The next object to investigate is a Form. Forms offer a friendly way of viewing the data in that they show a single record at a time. Forms can also be used to display results from queries. They are also used to facilitate data input. A form has already been set up for the students table:

1. Double click on the students form in the Objects list (or click on it and press <Enter>) to open it

A user-friendly screen is displayed, with a title at the top and the fields listed and boxed. The buttons work as they did before, allowing you to move around, add new records, delete records, filter, sort and search etc.

2. Move to the Surname field (press <Enter>, <Tab> or <right or down arrow>)
3. Click on [Ascending] on the Home tab on the Ribbon to sort the forms into alphabetical order
4. [Close] the form then reopen it - the sort order remains, as it did with the table

Forms also provide short-cuts to data entry, including letting you select from a list of valid values. Use this form to type in your own information again:

5. Click on the [New] button in the Records group on the Home tab
6. Fill in the fields with your own information, as you did before
7. In the Title field, select the required title using the list arrow
8. In the Hall field, start typing the name of the hall and watch Access select from the list of values
9. The Tutor field also has a list arrow attached
10. The Overseas field appears as a check box - click on it (or press <spacebar>) to set it on if necessary
11. In the Notes field, type several lines of text (type rubbish text, if you like) and watch how the box accommodates it. Press <Tab> to move to the next field (the <down or right arrow> keys don't work, while <Enter> gives you a new paragraph!)
12. For a Photograph, right click inside the box and choose Insert Object... then Create from File and Browse for the file. If you haven't got a picture file handy, press <Alt PrintScreen> to dump the current window then press <Esc> followed by <Ctrl v> to [Paste] it from the Clipboard

Tip: As was mentioned earlier, when you insert a picture file in Access it often appears as an icon. Insert it into Word or PowerPoint instead, then Copy and Paste into Access and it appears okay.

13. End by deleting your own record - click on the [Delete] button and choose Delete Record then press <Enter> for [Yes] or click on [No] if you really want to keep it (the <Delete> key doesn't work here)

Form Design

Though forms are very easy to use, they are not that easy to design from scratch. Fortunately, Access has wizards to do most of the work for you. To modify a form, you view the form design:
1. Click on the [View] button (or right click and choose Design View)

Note that Access provides you with two new tabs on the Ribbon to help you with the design. You are not going to modify the design of this form - you will see how to later, in Part 2 of these notes. For the moment:

2. Click on the [View] button to move back to Form View

**Filter by Form**

When using forms, if you want to select a subset of the records using a filter, you can still use the [Selection] button as before. This isn't very convenient, however, if you want to base the filter on information not displayed on the current form. Here, for example, you might want to search for all the students living in Wessex Hall (which isn't the hall on the current record). You can do this using the [Filter] button as before, but Access also provides a special filter for use with forms.

1. Click on the [Advanced] button and choose Filter by Form
2. Click on the list arrow attached to the Hall field and select Wessex
3. Click on the [Toggle Filter] button - you should have just 9 records (use <Page Down> see them)
4. Click on the [Toggle Filter] button again to see all the records

Though this exercise could have been carried out using the [Filter] button, this next one can’t:

5. Again, click on [Advanced] and choose Filter by Form – your previous filter is shown
6. Click on the list arrow attached to the Title field and select Mr
7. Now click on the Or tab at the bottom of the filter pane for a second filter
8. Select a Title of Miss and a Hall of Whiteknights
9. Click on the [Toggle Filter] button - you now have 14 records (press <Page Down> to see them)
10. Close the form by clicking on its [Close] button
11. Don’t save the changes to the design of the form – click on [No]

Note that you can also use [Filter by Form] on a table (a blank record appears for you to type in the criteria).

**Using a Report**

The fourth object button in the Navigation Pane is Report. This allows you to create (and store) reports which can then be printed. A students report has already been prepared (you’ll see how to create one later):

1. Double click on the students report in the Objects list (or click on it and press <Enter>) to preview it
2. The mouse button acts as a zoom facility - position the magnifying glass over a particular piece of text and click on the mouse button to magnify it (you can also use the Zoom control in the bottom left corner of the screen - this sets the two magnification levels for the mouse)
3. Use the page selection buttons at the foot of the Preview window to move to other pages (<Page Up> and <Page Down> stop working temporarily if you change the Zoom level)

To see how the report is designed:

4. Right click on the report and choose Design View

Note how similar Report Design and Form Design are - you have the same Design tabs on the Ribbon to draw the various components. Again, you will see how this is done later.

5. Click on the [View] button to move back to Print Preview

Reports can also be viewed in Report View:

6. Right click on the report and choose Report View
7. Scroll down (or use <Page Down>) to see the results
8. Close the report - click on its [Close] button
Part 2 : Creating a New Table

In this next section you will be creating your own table (and form). You will be typing in a couple of records and then retrieve some more from a file.

Designing the Table

As much as possible of a table design should be done in advance on paper. Here, however, you will be creating the table on the screen so that you can see the stages as they are implemented. The table you are going to create contains information about the Halls of Residence at the University. In Part 3 of these notes, you will see how to link this information to the data in the students table:

1. Click on the Create tab on the Ribbon

The Tables group on the left offers you various alternative methods to create a new table:

- **Table** creates a blank datasheet for you, with an ID field and an Add New Field column. As you enter data into this column, another Add New Field appears and the first column is relabelled Field1. Access recognises the type of data entered and automatically allocates a Data Type to it (eg if you type a date, the field will be set up as a Date/Time field). To rename the fields, double click on each column heading and type in its new name.

- **Table Templates** has predefined Sample Tables (Contacts, Tasks, Issues, Events, Assets). Each sample table has many fields, which you may or may not want to include in your own table design. Templates have the disadvantage that they sometimes try to be too clever and are very much geared to the American market (eg Addresses have States, not Counties)

- **SharePoint Lists** - SharePoint is not supported by the University, so this is irrelevant

- **Table Design** lets you do everything yourself, from scratch

It’s important to understand the fundamentals of table design, so choose that method:

2. Click on the [Table Design] button

3. The first field is for the name of the hall - type in **Name** and press <Enter>

A warning message appears telling you that Name is a reserved word and could cause problems later. Other reserved words include Date and Year. There’s a problem here in that it’s necessary for this field to be called Name in order to import the Halls’ data in the later exercise. Indeed, it’s important that you name the fields exactly as specified in these notes for this exercise to work.

4. Press <Enter> for [OK] to cancel the warning and accept the field name

5. The Data Type is Text by default - press <Enter> as this is what you want for this field

6. The Description is optional - type in Name of Hall of Residence if you want

7. Move down to the Field Properties

**Tip:** Key <F6> can be used to Switch panes - or you can use the mouse.

8. Set a Field Size of **15** and press <Enter>

If you need to increase the field size at some time in the future there should be no problem (any existing data stays exactly the same). However, if you ever choose to decrease it then you could lose some data. This is called truncation.

9. Set up a Caption of Name of Hall then Required to Yes

10. Set Indexed to Yes (No Duplicates) - it’s important to put an index on this field since it will be used to link up the students’ data and it also insures that the data for a particular hall is not entered twice

11. Move to the second row - use the mouse this time

12. Set the Field Name to Warden and the Data Type to Text
You could now fill in the Description and set some Properties but, to speed things up, just leave the settings for this (and subsequent fields) as they are.

13. Press <down arrow> then <back arrow> to move to the third field
14. Set the Field Name to Phone and the Data Type to Text
15. Press <down arrow> then <back arrow> to move to the fourth field
16. Set the Field Name to Road and the Data Type to Text
17. Press <down arrow> then <back arrow> to move to the fifth field
18. Set the Field Name to Town and the Data Type to Text
19. Press <down arrow> then <back arrow> to move to the sixth field
20. Set the Field Name to Rooms, the Data Type to Number (for a Description add Number of rooms in the Hall) and the Field Size property to Integer
21. Move to the seventh field
22. Set the Field Name to Meals, the Data Type to Yes/No (for a Description add Are meals provided?) and the Default Value property to Yes

Note: The Lookup tab in the Field Properties allows you to set up a different Display Control on a form or table. For a Yes/No field, this is set to Check Box but can be Text or Combo Box:

23. For the Meals field, click on the Lookup tab and set Display Control to Text Box

Setting up a Primary Key

Whenever you design a new table, it’s a good idea to set up a Primary Key on one of the fields. Primary Keys help Access uniquely identify each individual record in a table and hence work more efficiently. If a table doesn’t contain a unique identifier then Access will ask to set up an ID field for you. Here, the Halls of Residence table already has a unique field - the name of the hall:

1. Click on the Name field (row 1)
2. Click on the [Primary Key] button - a key symbol appears in the field indicator column
3. Click on the [View] button to move to Datasheet View
4. When asked (press <Enter> for [Yes]), save the table as HoR - press <Enter> for [OK]

You’ll find you have an extra column labelled Add New Field. To hide this:

5. Right click on the column heading and choose Hide Columns

You could now type in your data, if you wanted to. Using a datasheet isn’t very friendly, however, so try setting up a special data-entry form. A form gives you more control over what data is entered and can be designed to cut down on typing mistakes, as you saw with the students form.

Creating a Data Entry Form

There are two simple ways of creating a form; you can either use a Form Wizard or AutoForm. AutoForm is a very quick and easy way to produce a form - it does so at the click of a button:

1. With the HoR table still open, click on the Create tab then on [Form] - the form appears instantaneously in a new window
2. Click on its [Close] button to Close the form - don’t save it this time (click on [No]) as you will be creating the form using a Wizard next

The Form Wizard is equally easy to use and offers you various additional options.
3. Still on the Create tab, click on [More Forms] then choose Form Wizard

As you already had the HOR table open, that is chosen automatically. If you start up the Wizard without a table or query open (or if you wish to base the form on a different set of data) then you would select it here.

You are now asked which fields you want to appear on your form (here you have the choice - AutoForm gave you them all). As it happens, for a data entry form, you need all the fields:

4. Click on the double arrow [>>] to move them all (alternatively select individual fields in the order you want and use the [>] button) - press <Enter> or click on [Next>

5. Choose a layout for your form (explore the alternatives, if you like); Columnar is best so choose that then press <Enter> or click on [Next>

6. Set a style for your form - choose None (press <Enter> or click on [Next>]

7. Add a title - type Halls of Residence (press <Enter> to [Finish])

The form is now opened for you to use. As it stands it is neat and simple, but a little boring - in fact it's almost exactly the same as that produced using AutoForm. To improve it

8. Right click on the form (or use the arrow attached to the base of the [View] button) and choose Design View to move to Design View

Forms have three (sometimes more) sections - a header, footer and the detail. The data itself is entered into the detail section; the header and footer can be used for titles etc. To add a footer:

9. Position the mouse over the bottom border of the Form Footer - the cursor should change shape to a double-headed arrow. Hold the mouse button down and drag the border down one unit (there's a scale on the left-hand side)

10. Click once on the [Label] tool in the Controls group - the mouse pointer now has an A attached

11. Move the pointer into the form footer (top left corner) and click once

12. A small label box is drawn - type your form footer: The University of Reading

13. Press <Enter> and the label box is completed

14. Change the [Font Size] (eg to 14 point) and click on [Bold] to make the title more imposing

To display the enlarged label:

15. Right click on the label box and choose Size then To Fit

16. Right click on the label box and choose Font/Fore Color - pick a colour to apply to your footer

17. Right click on the header background (away from the label) and choose a Fill/Back Color

Note: If you wanted to add a picture to the form (eg the University identity) then simply click on the [Logo] tool, choose where you want the picture, click the mouse button then browse for the required picture file.

You can also amend the design of a form (just the position of objects and their colour) in Layout View:

18. Right click on the tab at the top of the form and choose Layout View

19. Click on the detail area on the far right – the detail area is outlined in orange

20. Use the [Fill/Back Color] button on the Ribbon to change the colour of the detail background

Tip: Use the [Format Painter] to copy the colour scheme of one label or text box to the others - this speeds things up and gives a better overall design. Double click on the button if you want to paint the format to more than one object (then click on it again to turn it off when you have finished).

21. Press <Ctrl s> (or click on the [Save] button) to save the changes to the design of the form - the name of the form is picked up automatically as Halls of Residence

22. Click on the [View] button to move to Form View

The form is now ready for you to type in the data. Note how large the boxes are for the Warden, Phone etc compared to the Name box. This is because you left the Field Size at 255 (whereas for Name you set it at 15).
Enter Data Using the Form

You are now going to use the form to enter a couple of data records:

1. For the first record, type in the following:
   - Name: Bridges (and press <Tab> - if you press <Enter> by mistake, press <Backspace>)
   - Warden: Dr R.P.B. Smith (<Tab>)
   - Phone: x8647 (<Tab>)
   - Road: Whiteknights Road (<Tab>)
   - Town: Reading RG6 6BG (<Tab>)
   - Rooms: 458 (<Tab>)
   - Meals: the option box is already set on for Yes

2. Press <Tab> or <Enter> to move on to the second record, which is as follows:
   - Name: Childs (and press <Tab>)
   - Warden: Prof A.L. Jones (<Tab>)
   - Phone: x8800 (<Tab>)
   - Road: Upper Redlands Road (<Tab>)
   - Town: Reading RG1 5JW (<Tab>)
   - Rooms: 458 (<Tab>)
   - Meals: again, the option box is already set on for Yes

This is all you are going to enter explicitly; the remaining records are going to be imported from a data file created using another package.

3. Close the Form window by clicking on the [Close] button (save any changes to the design)
4. Also, close the HoR table by clicking on its [Close] button (saving any design changes)

You may be wondering why the records you entered weren’t shown in the table (remember, the form is used as a friendly way to enter data into the table). The reason is that the screen wasn’t refreshed. To see the data:

5. Double click on the HoR table in the Objects list then [Close] it again once you have seen the data

Importing Data

Access allows you to bring in information from other sources - this is called importing. Databases vary on how they bring in the data and on which sort of files they can import. If you have a really large dataset, it is a good idea to try importing a small section to a new table first and only if that works successfully to try to import it all.

Access can import data in various formats, including Dbase (another widely-used database) and HTML (from web pages). Microsoft Excel spreadsheet files can be imported directly. Here, the data has been saved as tab separated values, which is a standard format which any spreadsheet (or indeed word processor) should be able to produce. Other basic formats include comma separated values and just plain text. One thing to note when importing a file is that the first line may contain headings - Access has an option to cope with this and can use them for field names.

To add the data to an existing table (or create a new table) from a file:

1. Move to the External Data tab then click on [Text File] in the Import group
2. Click on [Browse] to search for the required file
3. Check that the current directory is set to Training on the D: drive (if using a lab PC; if not, the file can be downloaded from the WWW via the hyperlink at step 4)
4. Select the file called halls2007.txt then press <Enter> to [Open] it

The default is to create a new table, but here:

5. Choose the Append a copy of the records to the table option and select HoR – click on [OK]
6. The Import Text Wizard now starts up. This has several stages, as follows:
   a. Choose whether the data is Delimited (eg tab, comma or space) or Fixed Width (where extra spaces have been used to line up the data in columns) - press <Enter> or click on [Next>] for Delimited
   b. Choose the delimiter (here, Tab is correctly chosen) and whether or not the First Row Contains Field Names (here, it does, so click to set it) - press <Enter> for [Next>]
      Tip: If you are adding to an existing table and the first row doesn't match the table field names then import them as an extra record, which you later delete
   c. The final step of the wizard confirms the table name (or asks you for a one if creating a new table) - press <Enter> for [Finish]
   d. Don't bother saving the import steps – press <Esc> for [Close]

You should have imported 11 new records – if a message appears press <Enter> for [OK] to cancel it.

7. Double click on the HoR table in the Objects list to see the new records
8. Resize the columns by double clicking on the column heading dividers
9. End by closing the table - click on its [Close] button, saving the changes to the layout of the table (press <Enter> for [Yes])

Note: you can also export data from Access for another package via the Export buttons on the External Data tab. Amongst the formats available are Excel, Word and Text File (suitable for many applications, including SAS, SPSS and Minitab).

Part 3: Relating Tables Together

A relational database management system lets you store information in many tables which can then be linked together. This is particularly useful when you have information which is either heavily duplicated or sparse (many records having empty fields). This improves both performance and scalability.

For example, if you have an inventory of equipment, it's better to record information about the suppliers (the name, address, phone/fax numbers, contact etc) in a separate table. Then, in your inventory, you need only record the name of the supplier to find out the other information. As each supplier will be supplying several pieces of equipment, this avoids massive data duplication.

It's the same situation here with the students. There is no need to store information about Halls of Residence for each student - that can be picked up from the HoR table. You'll see next how this is done. The aim of the exercise is to create a list of students, living in hall, such that you can send a letter to them to their University address.

1. Move to the Create tab and click on [Query Design] in the Other group on the right of the Ribbon
2. [Add] both the HoR and students tables and the Names query - press <Esc> or click on [Close]

You next have to join the three tables together on common fields. Joins can be created between tables when you design the database (in a special Relationships window), or made in a query (in which case they only apply to that particular query).

Tables are automatically joined in a query if two fields have the same name. Here, the StudentID field in the Names query has been joined to the equivalent field in the students table. The other common field (the Hall of Residence) is called Hall in the students table but Name in the HoR table and has not been linked. In this case you have to create the join manually by dragging the field name from one table/query over to the corresponding name in the other table/query.

3. Position the cursor over the Hall field in the students table
4. Hold down the mouse button and drag the field over the Name field in the Halls table

When you release the mouse button, a join line appears. If you made a mistake, simply click on the join line to select it then press <Delete> and try again. Now you need to set up your query:
5. In column 1, set the Field: to **Full Name** from the **Names** query (double click on it)

6. In column 2, set the Field: to **Hall** from the **students** query

7. In column 3, set the Field: to **Road** from the **HoR** table

8. In column 4, set the Field: to **Town** from the **HoR** table

9. Click on [Run] to run the query - you should find 265 records are displayed (if you spelt Bridges and Childs correctly - the 125 students living in private accommodation are excluded)

10. Click on the query window's [Close] button, saving it as **Addresses**

## Relationships

To save creating relationships each time you create a query, the tables and some existing queries can be linked and held as a hidden object in the database. This is done through the **Relationships** dialog box:

1. Move to the **Database Tools** tab on the **Ribbon** then click on [**Relationships**] in the **Show/Hide** group

2. Click on the [**Show Table**] button in the **Relationships** group on the new **Relationships Tools Design** tab if the Show Table dialog box isn’t displayed (use this to add further tables/queries if you need to)

3. [**Add**] both the **HoR** and **students** tables and the **Names** and **Addresses** queries as you did in the previous exercise - press <Esc> to [**Close**] Show Table

4. Drag the **Hall** field in the **students** table over the **Name** field in the **Halls** table – an Edit Relationships dialog box appears:

   ![Edit Relationships dialog box](image)

   Various additional options can be set but some of these are only available if Referential Integrity exists. This happens if all the possible values in the field in the main table (the student’s hall) are present in the matching field (the Hall name) in the related table. That isn’t true here as many students are in Private accommodation.

   Referential Integrity can also be used to protect data. You wouldn’t be able to remove a Hall from the HoR table as records in the SortedStudents depend on it. If you were to turn on Cascade Delete Related Records then you could delete a Hall … but then all the students in that hall would be deleted from the database. This isn’t a good idea here but would be if a customer of a business were to die. His related records (eg orders) could be deleted at a single stroke, just by deleting his record.

5. Click on [**Create**] to create the link

6. Repeat steps 3 and 4 to join the **StudentNo** in the **students** table to that in the **Names** query

7. Repeat steps 3 and 4 to join the **Full Name** in the **Addresses** query to that in the **Names** query

8. [**Close**] the **Relationships** – answer [**Yes**] to save the changes to the design

9. Start setting up the **Addresses** query again – you’ll find the join links appear automatically

10. [**Close**] the new query – don’t bother saving it, click on [**No**]
Creating a Report

Earlier you viewed an existing report; now, try to generate some yourself. Reports are saved within the database - you can then modify them at some later date if you need to tidy up the layout, for example. Note that you can also export data to Word or Excel via Export on the External Data tab.

Access gives you the opportunity of designing your own reports from scratch (using Design View), however, unless you are an expert, don't even attempt this. It's much easier to use AutoReport or a Report Wizard and then modify the design if you need to.

Using AutoReport

Begin by creating a report for the HoR table using AutoReport.

1. Click on the HoR table in the Objects list – there’s no need to open it
2. Move to the Create tab and click on [Report]

Access shows you the results in Layout View. The dashed lines show the page breaks, but it's much easier to see the layout in Print Preview:

3. Right click on the report tab (or use the arrow below the [View] button) and choose Print Preview
4. In the Zoom group, click on [Two Pages]

You'll find that the information stretches over two pages, with the paper portrait (upright). It should be possible to display all the information on one sideways sheet. To do this:

5. Right click on the report tab again and this time choose Layout View

You'll find the report still doesn't quite fit onto a single page; next, you have to manually shrink the columns:

7. Position the mouse cursor on the border between the Phone and Warden columns (it becomes a two-headed arrow)
8. Hold down the mouse button and drag the border to the left - release the mouse button when the column is properly sized
9. Repeat steps 6 and 7 on the other columns until all columns fit on the one page
10. Repeat step 3 to Print Preview the page

There are still some problems with the report – Access doesn’t seem to have realised the paper has been changed to Landscape (the date and page number are in the wrong position). To rectify this:

11. Right click on the report tab and choose Design View
12. Click on the Date placeholder (where it says =Date()) in the Report Header then hold down the <right arrow> key to move it to the far right of the page (or drag it to the right with the mouse)
13. Repeat step 12 for the Time and Page Number placeholders, moving the latter to the centre
14. Next, click on the Count(*) placeholder in the Report Footer and <Delete> it
15. Right click on the report tab again and choose Print Preview to check your changes
16. Finally, close the report (click on the [Close] button) and, when asked, [Save] it as HoR

With AutoReport, you have no say in the way the report is produced. By using the Report Wizard instead, however, you can set various other options (as you found with the Form Wizard). You'll look at this next.

Using Report Wizards

To demonstrate the Report Wizard, you are going to produce a report listing the students by their hall of residence, with the hall address only appearing once for each group of students. You’ll see how, at each step of the wizard, you have control over which fields appear and also over the layout of the report:
Tip: Getting Access reports looking exactly the way you want can be very time-consuming. It may be easier to do the formatting in Excel or Word. On the External Data tab, the [Excel] button lets you send data to an Excel spreadsheet, while the [Word] button creates a Rich Text Format (.rtf) file. Using the [More] button you can export in various other formats or carry out a mail merge in Microsoft Word.
Leaving Access

You should now be back at the Navigation Pane, where you could continue to work on the students database, adding further tables and queries and producing more reports. When you have completely finished your work:

1. Click on the [Office Button] and choose Close Database

This closes any opened tables etc and ensures that the database file is properly shut down. You could now go on to use or create another database, but the course is now over so

2. Click on the [Office Button] and choose Exit Access

3. Finally, on the public machines, don’t forget to Log Off

Appendix

Below is a summary of the different data types and what they are used to store. If you know how a computer works then the seemingly random values make sense. For example, the basic storage unit in a computer is a byte, which can hold 8 zeros or ones. These, in turn, represent whole numbers between 0 and 255. Two bytes can hold 65536 whole numbers (0 to 65535 or -32768 to +32767).

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Format/Field Size</th>
<th>Stores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text</td>
<td>Up to 255 characters</td>
<td>Text - including numeric text (eg phone numbers)</td>
</tr>
<tr>
<td>Memo</td>
<td>Up to 65535 characters</td>
<td>Longer pieces of text</td>
</tr>
<tr>
<td>Number</td>
<td>Long Integer</td>
<td>Whole numbers between -2,147,483,648 and +2,147,483,647</td>
</tr>
<tr>
<td></td>
<td>Integer</td>
<td>Whole numbers between -32768 and +32767</td>
</tr>
<tr>
<td></td>
<td>Byte</td>
<td>Whole positive numbers between 0 and 255</td>
</tr>
<tr>
<td>Single</td>
<td></td>
<td>Any number to 7 significant figures up to (3.402823 \times 10^8)</td>
</tr>
<tr>
<td>Double</td>
<td></td>
<td>Any number to 15 sig figs up to (1.79764313486231 \times 10^{10})</td>
</tr>
<tr>
<td>Date/Time</td>
<td>General</td>
<td>Both date &amp; time - eg 25/12/98 16:25:08</td>
</tr>
<tr>
<td></td>
<td>Long/Med/Short Date</td>
<td>Dates: eg 25 December 1998 or 25-Dec-98 or 25/12/98</td>
</tr>
<tr>
<td></td>
<td>Long/Med/Short Time</td>
<td>Times: eg 16:25:08 or 4:25 (12 hour) or 16:25 (24 hour)</td>
</tr>
<tr>
<td>Currency</td>
<td>Currency</td>
<td>Up to 15 figures before dec place, 4 after - eg £1,234.56</td>
</tr>
<tr>
<td></td>
<td>Fixed/Standard</td>
<td>Numbers with above accuracy - eg 1234.56 or 1,234.56</td>
</tr>
<tr>
<td></td>
<td>Percentage/Scientific</td>
<td>Ditto but using % or E notation</td>
</tr>
<tr>
<td>AutoNumber</td>
<td></td>
<td>Automatic counter - incremented by 1 for each record</td>
</tr>
<tr>
<td>Yes/No</td>
<td>Yes/No True/False On/Off</td>
<td>For data with only 2 possible values</td>
</tr>
<tr>
<td>OLE Object</td>
<td></td>
<td>For pictures, sound, video, Word/Excel documents etc</td>
</tr>
<tr>
<td>Hyperlink</td>
<td></td>
<td>For links to the WWW or e-mail</td>
</tr>
</tbody>
</table>