University of BRISTOL

IT SERVICES

Using and designing Access 2010 databases

Practical workbook

Aims and Learning Objectives

This course provides participants with the basic skills necessary to develop a simple Access 2010 database.

The core learning objectives for this course are to:

- gain an understanding of necessary relational database concepts;
- create and use tables and set relationships between tables;
- import external data;
- create and use queries to manipulate the data;
- create data entry forms;
- create reports to present data in an attractive format using grouping and sorting options;
- create mailing labels.

Note: this document will be of little or no use to those using Access 2003 or earlier versions; those using Access 2007 will find that the Microsoft Office Button has been replaced by a File tab in the Ribbon and that many Ribbon items have moved, mostly to new locations within the same Ribbon tab, but should have no real problems.

Document information

Course files

This document and any associated practice files (if needed) are available on the web. To find these, go to www.bristol.ac.uk/is/learning/resources and in the **Keyword** box, type the document code given in brackets at the top of this page.

Related documentation

Other related documents are available from the web at:

http://www.bristol.ac.uk/is/learning/resources

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Introduction

Access 2007/2010 is the University's recommended database product. This document covers the basic operations required to create an Access 2010 database.

Access is a relational database management system (RDBMS) that lets you store data according to subject. These subjects have set relationships with each other, making it easy to bring the related data together.

Data used in example databases on this course is fictitious. We would remind you that if you store personal information of individuals on a database, you should be aware of the legal requirements under the Data Protection Act. Further information about the Data Protection Act can be obtained from the Registrar's Office.

If you process restricted University data on a database, you should be aware of your responsibilities toward keeping this data safe and secure. See the Information security website (www.bristol.ac.uk/infosec) for further information.

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Prerequisites

Before attending this course you must be familiar with other MS Office 2007 or later applications, such as Word 2007/2010 and Excel 2007/2010.

Task 1 Opening the Student2010 database

Objectives To open the Student2010 database, select the correct security setting and look around the work environment.

Comments Databases created in earlier versions of Access can be opened in Access 2010, though there may be problems with buttons and other objects no longer working.

Opening Access 2010

On opening Access, the **Getting Started with Microsoft Office Access** window is displayed. From here you can create a new database, access pre-created templates (not recommended) or, as we want to do, open a pre-existing database file.

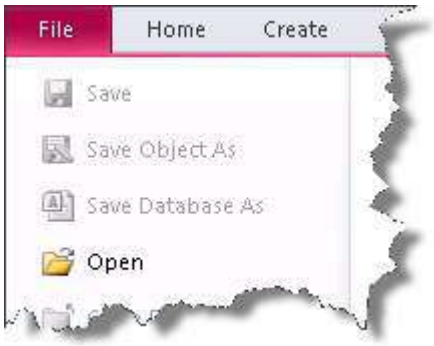


Figure 1 - Getting Started with Microsoft Office Access window

1.1 To open the Student2010.accdb database:

- Click on **Open…**, and navigate to **C:\Training\Access\Access 2010 current course**.
- Double-click on **Student2010.accdb** to open the database.

Note A security warning now appears. If you select the wrong options, functionality, such as buttons and wizards, will not work (if you choose the wrong option, simply close the database and reopen it, this time selecting the correct option as below).

1.2 To select the correct security option:

Figure 2 – select Enable Content

- On the **Security Warning** message box, select **Enable Content** (Figure 2).
- If a further **Security Warning** opens asking if you want to make the file a “Trusted Document”, select **No**.
- Look at the open database taking particular notice of the **File tab** (which now replaces the Office 2007 Button), the tabbed **Ribbon** with available (context-sensitive) commands and the **Navigation pane** but do not click on anything yet (Figure 3).

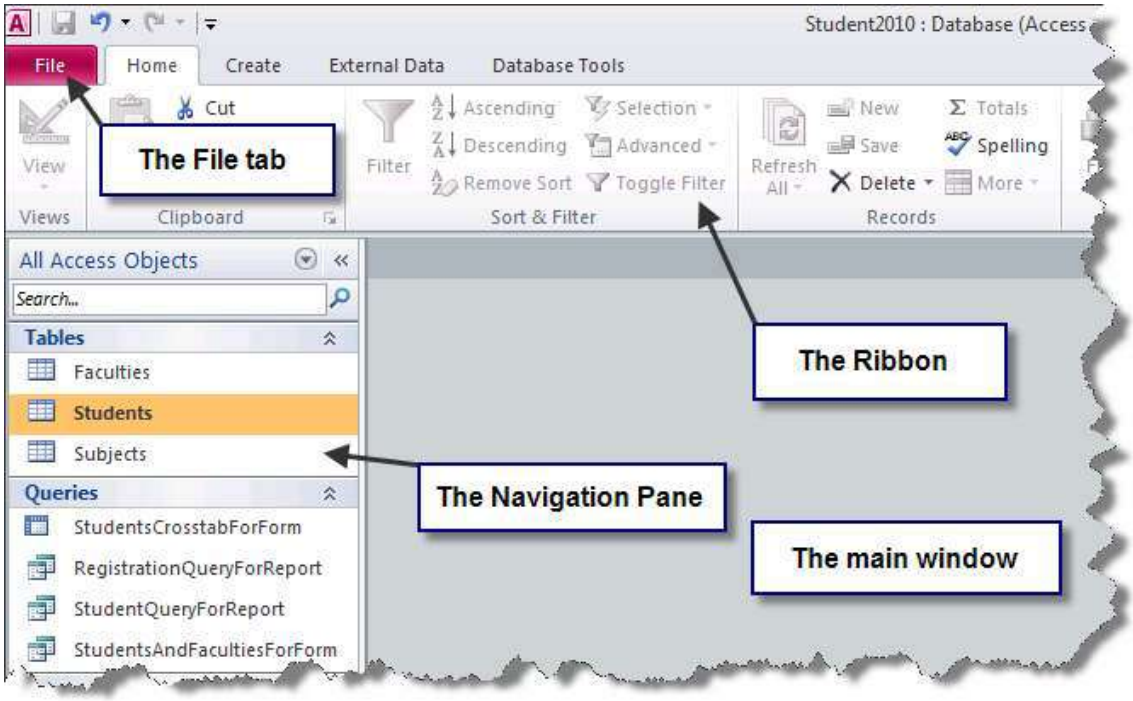


Figure 3 – the Access workspace (you will have different objects showing in the Navigation Pane)

Note The Navigation pane partially takes the place of the Database window in Access 2003 and earlier versions, letting you navigate between and open database objects.

Task 2 The Navigation pane and setting tabbed display

Objectives To view the database objects in the Navigation pane and to set a tabbed display.

Comments The Navigation pane takes the place of the Database window in pre-2007 versions. The default is for objects to open on top if each other, which can make things difficult as you have to remember which objects you have open at any given time. Setting a tabbed display lets you easily see which objects you currently have open.

Object	Function
Tables	Tables are the 'heart' of a database. They define and store data about particular subjects, e.g. candidates. Each candidate has their details stored in a separate row (each row is known as a record). The columns contain details about each candidate, e.g. name, address, date of birth, etc. (columns are known as fields).
Queries	Queries let you view just the information you want to see, rather than having to look at records and fields you are not interested in.
Forms	Forms are designed primarily for data entry and manipulation. Inputting data directly into a table can be awkward, so forms can make this easier. You can use a form to enter data into more than one table at a time.
Reports	Reports are designed to be printed rather than viewed on screen. A report is a collection of data that is summarised and formatted according to your specifications.
Macros	Macros contain a set of commands to automate a task. Macros are covered on the Access buttons and macros course (CC2ABM).

2.1 To view all database objects in the Navigation pane:

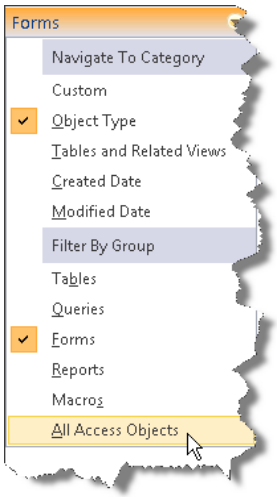


Figure 4 – select All Access Objects at the bottom of the menu

- Click on the downward arrow on the **Header bar** on the **Navigation pane** and select **All Access Objects** (if not already selected as default).

- In the **Tables** section of the **Navigation Pane**, double-click on **Students** to open it and then double-click on **Faculties**.
- Notice that the second object opens on top of the first, so that you cannot see the original object.

Note If both objects open showing a tab including the objects' names, then ignore the next part of this task as you already have tabbed display set!

2.2 To set tabbed object display as default:

- Click on the **File** tab and click on **Options**.
- Click on **Current Database** and under **Document Window Options**, select **Tabbed Documents**.

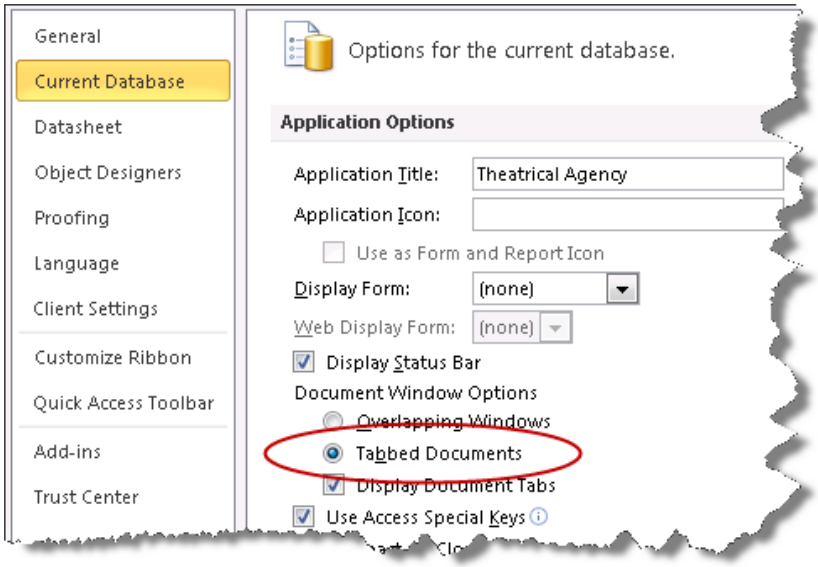


Figure 5 – select Tabbed Documents

- A message will tell you that you need to close the database for the change to take effect, so click on **OK**.
- Click on the **File** tab and select **Close Database**.
- Still in the **File** tab, double-click on **Student2010.accdb** to reopen the database.
- You will need to enable the database again, so click on **Enable Content** and choose **No** if a further security warning appears.

Note Although the default file suffix for an Access 2010 database is .accdb, it is perfectly possible to open up .mdb files created in earlier versions of Access.

- Again, in the **Tables** section of the **Navigation Pane**, double-click on **Students** to open it and then double-click on **Faculties**; notice that these now have a tabbed display at the top of each table.
- Right-click on the **Faculties** tab and select **Close** from the menu that opens, then click on the **X** in the top, right-hand corner of the **Students** table to close that table as well.

Task 3 Working with tables

Objectives To gain familiarity with the database tables by viewing, sorting, entering and modifying data, plus searching and navigating between records.

Comments This database is used throughout the course with the work from many tasks being built upon in later stages of the course.

What should I know about tables before I start?

Question	Answer
Can I just have one table in my database?	Access databases must contain at least one table, however, in most instances, two or more related tables may be required to store your data efficiently.
How are tables linked?	If you use more than one table, these may be linked together by creating *relationships* between them.
Why do I have to build the tables first?	Tables are created before other objects because all other objects, such as forms, queries and reports, are based on one or more tables or the data in them.
What is a field?	Fields relate to columns in a table. Fields are individual items of data such as *last name* or *date of birth*. The same field can appear in more than one table in a database – and this is how those tables are linked.
What is a record?	Records relate to rows in a table. A record is a set of data about one particular item. For example, one record about a *person* could contain their *title*, *initials*, *last name*, *address*, *city*, *postcode* and *date of birth*.

Viewing data in a table

The Students table contains students' details, the Subjects table contains course details and the Faculties table contains a faculty list. Relationships link the tables so you could, for example, print out a list of all the students taking Botany.

Note There are other ways than covered here to view data - some will be covered later.

3.1 To view data in the three tables:

- In the **Tables** section of the Navigation Pane, double-click on **Subjects** to open it in **Datasheet View** (also called **Table View** in Access texts).
- Look at the information in each row and column, and look at the field names at the top of the columns (you can widen columns the same way you would in Excel).
- Close the **Subjects** table by right-clicking the header and open the **Faculties** table.
- Identify the different data types and try the various hyperlinks to see what they do (some may not work due to ever-changing security restrictions in the training room).
- Open the **Students** table. Note that tabbed display enables you to quickly look at each table without closing.
- Close the **Faculties** table and leave just the **Students** table open.

3.2 To navigate around the Students table:

- Use the **TAB** key (or left and right **ARROW KEYS**) to move across the rows, so displaying the fields that are initially out of view.
- Use the up and down **ARROW KEYS** to move up and down the table.

Note The Datasheet View shows all the information entered into all the fields in the table - in a large database the sheer amount and layout of data on the screen can be overwhelming. The following tasks show some simple methods for sorting, navigating and finding records.

Sorting, navigating and finding records

Sorting records

3.3 To sort records based on a field:

- Click on **LastName**.
- In the **Home** tab of the **Ribbon**, click on the **A-Z** icon to sort the names in ascending order, then click on the **Z-A** icon to sort in descending order.

Note You can sort on more than one field by holding down the Shift key whilst selecting fields, though the fields must be next to each other in sort order of left to right.

Navigating through records

The navigation buttons (these are also called *video buttons*) are situated in the bottom, left-hand corner of the table window. The current record number is displayed between the navigation buttons. The total number of records in the table is shown to the right of the navigation buttons.

3.4 To navigate through records:

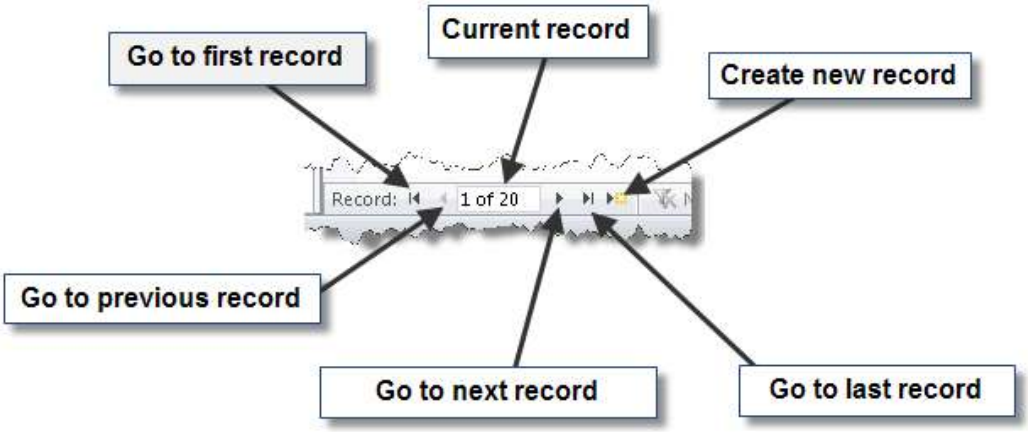


Figure 6 - navigation buttons

- Click on **>** to move one record forward, then click on **<** to move one record back.
- Click on **>|** to move to the last record in the table, then click on **|<** to move to the first record in the table.
- Click on **>*** to create a new record.

Finding records

3.5 To find records containing specific data:

- In the **Home** tab of the **Ribbon**, click on the **Find** icon to open the **Find and Replace** dialogue box.

Figure 7 - find and replace dialogue box

- In the **Find What** field type ***Chelwood Village***.
- Under **Look in** select **Current Document**, and under **Match** select **Any Part of Field**.
- Click on the **Find Next** button then close the dialogue box by selecting **Cancel**.

Entering and modifying data

Warning! Data can be entered directly into a table - although entering and modifying data directly into a table is the least user-friendly method of data entry and variations in the way data is entered are more likely to occur. Forms are better for entering data. They let you concentrate on one record at a time and make it easier to select data from dropdown lists.

3.6 To add a new record to the Students table:

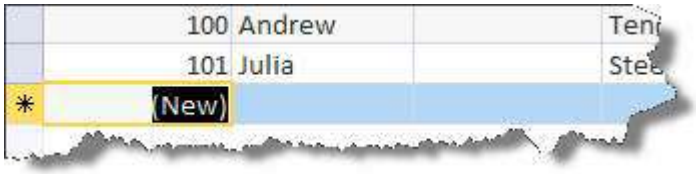


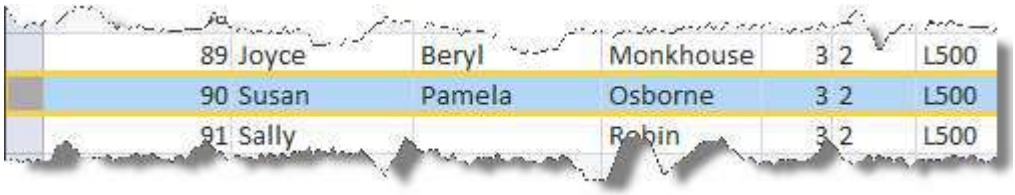
Figure 8 – the StudentNumber field for a new record contains (New)

- Click on the **New Record** button to go to a new, empty record. Note that the student number currently says ***(New)***.
- Add a new student record of your own using the **TAB** key to move from one field to the next.
- Notice that ***(New)*** is automatically changed to a unique number once you start to enter data into the record.
- When you get to the **Subject** field add a known subject code (e.g. ***F800***).

Note Changes made to data are saved as soon as you tab to the next record unless you have entered an incorrect value in which case you will not be able to exit that field. If you change the design of tables, forms, queries or reports, however, you are prompted to save changes, as you will see later.

3.7 To change the subject code for an existing student:

- Use the scroll bars or **Find** button to find the record for ***Susan Pamela Osborne***.



89	Joyce	Beryl	Monkhouse	3	2	L500
90	Susan	Pamela	Osborne	3	2	L500
91	Sally		Robin	3	2	L500

Figure 9 – a row highlighted by clicking on the Selector bar

- Click on the **Selector bar** to the left of the **StudentNumber** field (this is the narrow column to the left of the table) to highlight the whole line.

Note Clicking on the Selector button highlights the whole record so that you can copy or delete it if necessary.

- Click in the **Subject** field, change **L500** to ***L400***, then close the **Students** table.

Task 4 Create a new table and set the primary key

Objectives To create a new table in Design View and assign the primary key.

Comments In this task you will create a new table for adding course marks for each student.

What do I need to know about creating tables before I start?

Question	Answer
What do I see in Design View?	Design View for creating tables has three main columns: Field Name; Data Type; and Description. The first two must be used for every field you create. The last is optional but useful.
What is the Description column for?	Text entered here appears in the status bar at the bottom of the table when you enter a field (and on forms that were created since the description was added). This basically lets you add context-sensitive text, for example, which values should be entered in a specific field.
What do I need to know about field names?	• There are many words that cannot be used as field names in Access, such as ***date*** or ***name***. These are reserved words. Access can lose data from fields named with a reserved word or can get very confused when these are used in queries. • Field names are not case sensitive, e.g. ***TITLE*** and ***title*** are the same as far as Access is concerned. • Do not use symbols in field names (underscores are ok). Use only alphanumeric characters. Spaces should be avoided.
What are the different data types for?	• **Text** - holds up to 255 characters. • **Memo** - holds a large body of text. • **Number** - holds numeric values. • **Date/Time** - holds dates and/or times. • **Currency** - holds numeric values as money. • **AutoNumber** - automatically creates unique, sequential numbers (i.e. for primary keys). Note that if you delete records, then there will be gaps in the sequence. • **Yes/No** - limits a field to one of two values. • **OLE Object** - holds pictures, sounds, MSOffice objects. Linking is more efficient than embedding objects. • **Hyperlink** - links to web addresses, Access objects, MSOffice objects, etc. • **Lookup Wizard** - creates dropdown boxes for entering pre-defined data from either a list or from another table More information can be found in the reference section in **Using and designing Access databases - useful reference information** (acc-2).

Create a new table to hold marks information

Note Do not use a wizard to create tables – building in Design View is the best way.

4.1 To create a new table:

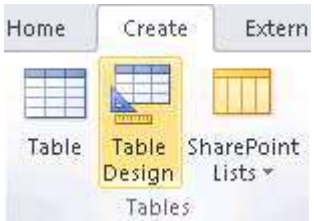


Figure 10 – table options under the Create tab

- In the **Create** tab of the **Ribbon**, select **Table Design**.

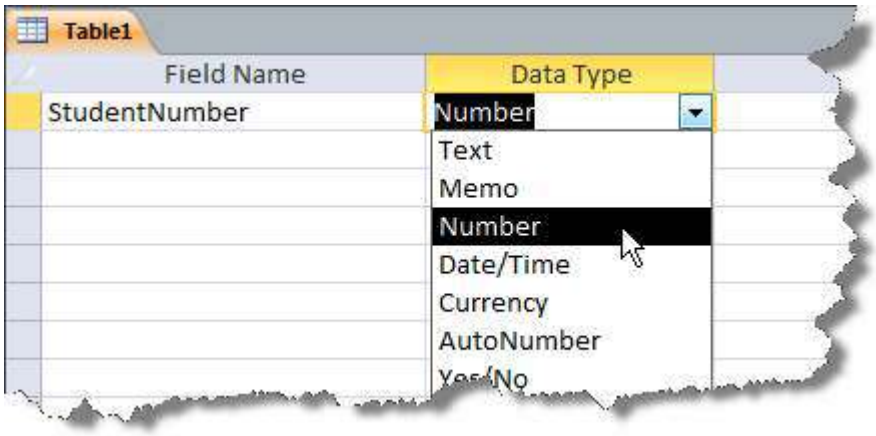


Figure 11 - designing a table

- Enter the information from the following table, using the dropdown list to select **Data Type** (click on the **Field Size** or **Format** box in the **Field Properties** section below the grid to enter the required field properties in the fourth column of the table below).

Field Name	Data Type	Description (to the right of field name)	Field Properties (at the bottom of the screen)
StudentNumber	Number	This identifies the student	Long Integer
SubmitDate	Date/Time	The date the work was submitted	Format = Short Date
Title	Text	The title of work (max 30 characters)	Field size=30
Type	Text	Essay, exam, etc.	Field Size =10
Mark	Number	Enter an integer	Integer
CreditPoints	Number	Enter an integer	Byte
Comment	Text	Any extra information	Field Size = 50

Warning! **StudentNumber** must have the data type ***Number*** and be specified as ***Long Integer*** even though it was an ***Autonumber*** in the **Students** table. The linking field

to an ***Autonumber*** must always be ***Long Integer*** because Autonumbers are Long Integer format.

Add the primary key

What do I need to know about primary keys before I start?

Question	Answer
What is a primary key?	You must set up a **primary key** (a unique index field) before you save your new table. The primary key contains unique values so the database can identify each individual record.
Can you have more than one primary key?	There can be only one primary key index per table (though the primary key may be made up of more than one field). The primary key is used in creating relationships between tables.
Can I leave the primary key empty?	No. Good primary key fields are order numbers and identification (ID) numbers – or other fields that do not often change. It is not a good idea to use last name fields as primary key fields as there may be several *Smiths* or *Browns*.
What happens if I don't allocate a primary key to a table?	If you don't allocate a primary key when saving a table, Access offers to create one: this is an **AutoNumber** field that automatically assigns the next consecutive number each time you add a record. Although this is often useful, sometimes you will want to choose your primary key from existing fields. If you choose not to have a primary key then you will not be able to use that table as a lookup.

4.2 To create a primary key for the new table:

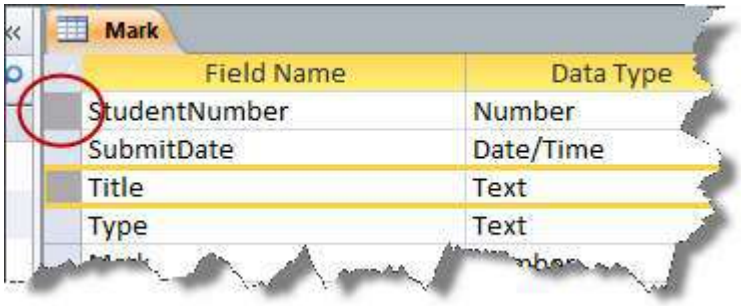


Figure 12 – both fields must be selected as above before clicking the Primary key icon

- Select the **StudentNumber** row then hold the **CTRL** key and select the **Title** row (Figure 12).

Note You can only tell that the first field is selected because the Selector bar is highlighted as circled above. Otherwise only the last selected field is very obviously selected. Earlier versions of Access were a bit more intuitive here!

- Click on the **Primary Key** icon on the toolbar and notice that the two fields now have a small key icon to the left of the **Field Name**.

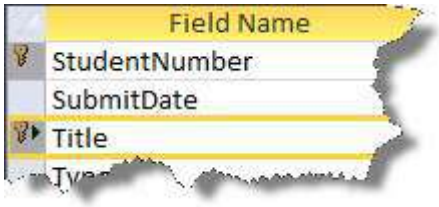


Figure 13 – both fields should show key icons

- Click the **Save** icon (above the **File** tab), name the table ***Marks*** then close it.

Note **Why are there two fields to make up the primary key?** In this table, each student's mark is uniquely identified by a combination of these two fields: the same student can submit lots of different titles and lots of different students can submit the same title. However, no student is able to submit the same title twice. This applies a degree of *validation*. If only the StudentNumber field was chosen as primary key then each student would only be able to submit one piece of work, and if only the date was chosen then only one piece of work could be submitted per day.

Adding data to the Marks table

4.3 To enter some marks into your new table:

- From the **Table** section of the **Navigation Pane**, double-click on the **Marks** table to open it in **Datasheet View** and enter the following data.

Student Number	Submit Date	Title	Type	Mark	Credit Points	Comment
1	1/3/11	Death on the Nile	Essay	75		Late
1	1/3/11	Dial M for Murder	Essay	95		Very inventive
1	1/6/11	English Part 1	Exam	55		Needs resit
1	1/11/11	LANG10031	Module	50	10	

- If you have time, enter some more records with the same titles as above for student ***2*** and student ***3***. Give them different marks and comments (Figure 14).
- Try adding some dates to **SubmitDate** in different ways, e.g. ***Sept 1***, ***1 Sept*** (without year), ***Sept 2002***, ***1/1/02***, ***1/1/50*** and watch what happens to the date.
- Enter ***1/1/29*** and see how the year is represented – do the same with ***1/1/30***.
- Try entering ***30 February*** then close the table.

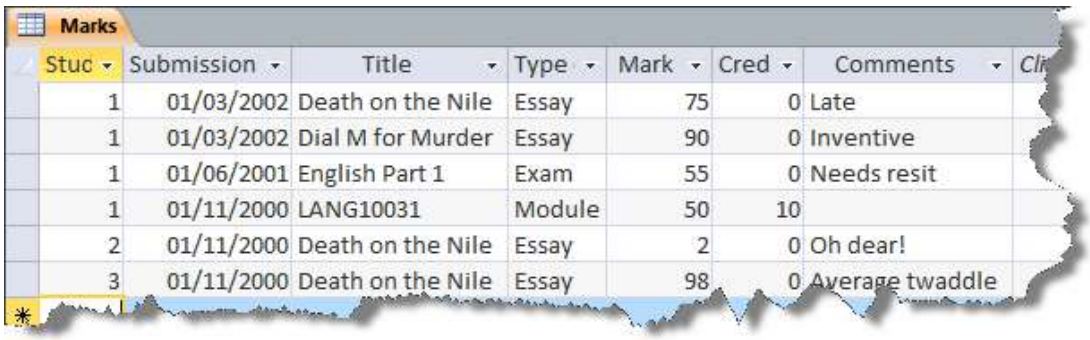


Figure 14 – add the data for student number 1 and add some extra data for other students

Task 5 Relationships within a database

Objectives To create a relationship between the newly-created Marks table and the related table in the student database.

Comments A well-designed relational database eliminates unnecessary duplication of data by relating individual tables to other tables in the database.

What do I need to know about relationships before I start?

Note Only two types of relationships can be created in a relational database: see the table below. To create a relationship the related fields must have the same data type.

Relationship	Description
one-to-many (1:∞)	A relationship is created where each record in a table can be associated with 0, 1 or more records in another table. This is the most common relationship used in relational databases. The primary key is at the '1' end of the relationship.
one-to-one (1:1)	Each record in the primary table can be associated with only one record in the related table (and both ends must have the same primary key). In this case the related fields must be the primary keys of both tables. You may find this useful if you need to add your own data to student views.

Looking at the current relationships in the Student database

5.1 To look at the current relationships in the Student database:

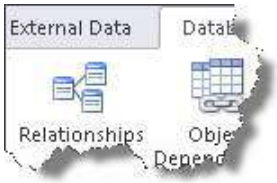


Figure 15 – the Relationships icon in the Database Tools tab

- In the **Database Tools** tab of the **Ribbon**, click on the **Relationships** icon.

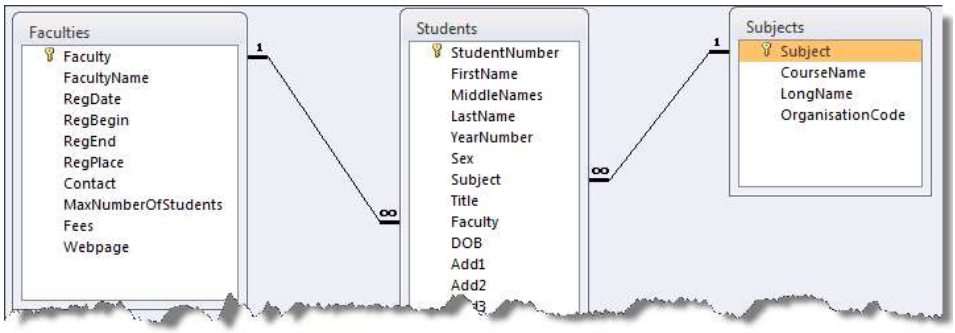


Figure 16 – the Relationships window

- Look at the existing relationships between the three tables (explained below).

Relationship in Student database	Description
Subjects (1): Students (∞)	This relationship means that one subject can be studied by 0, 1 or more students but that each student can study only one subject.
Faculties (1): Students (∞)	Similar to above, this relationship means that one faculty can have 0, 1 or more students, but that each student can only belong to one faculty.

Creating a relationship between students and marks

Relationship to create	Description
Students (1): Marks (∞)	This relationship means that each student can be given many marks, but that each record in the Marks table can only be assigned to one student. Each mark *must* belong to an existing student.

5.2 To add the Marks table to the Relationships window:

- Click on the **Show Table** icon, double-click on the **Marks** table (Figure 17) then close the **Show Table** dialogue box.

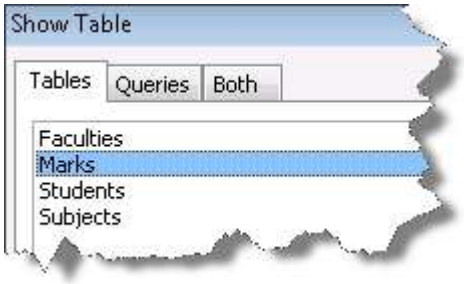


Figure 17 – the Show Table dialogue box

5.3 To create the relationship between the Marks table and the Students table:

- In the **Students** table, click and hold the mouse button down on **StudentNumber**.
- Drag from **StudentNumbe**r in the **Students** table to **StudentNumber** in the **Marks** table and let go of the mouse button. This opens the **Edit Relationships** dialogue.

5.4 To set the relationship:

- Tick **Enforce Referential Integrity** - this makes sure that you cannot enter marks for a student that does not already exist in the Student table. This is indicated by the ∞ symbol.
- Tick **Cascade Update Related Fields** - this means that if you have to alter a student's number in the **Students** table, then that number will be automatically changed in every record in the **Marks** table in which it appears.

Warning! Do not select **Cascade Delete Related Records**. This option has its uses, but it can also cause loss of data. For example, if you had this option set on a relationship between Faculty and Student tables and you needed to delete one faculty, this would cause all the linked students to be deleted from the database as well.

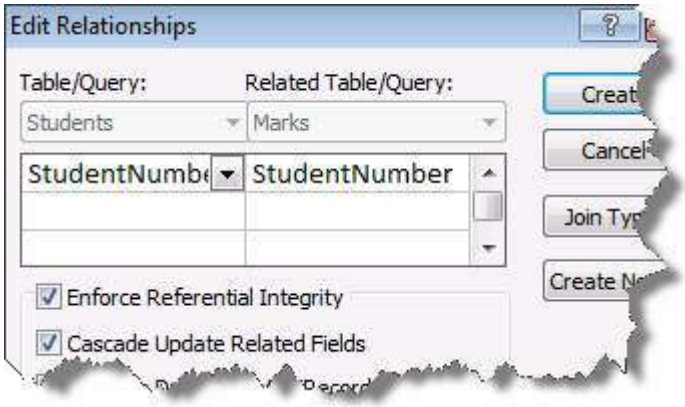


Figure 18 – the Edit Relationships dialogue box

- Click on **Create** to finalise the relationship. The '1' end of the relationship should be by the **Students** table and the '∞' next to the **Marks** table (Figure 19).

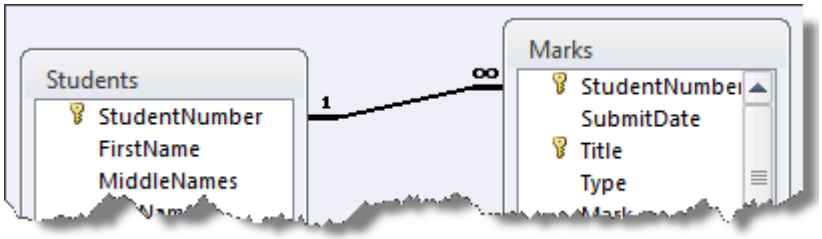


Figure 19 – the new relationship

- Close the **Relationships window** and select **Yes** to save the changes.

Looking at linked data in table view (sub-datasheet)

5.5 To view the new sub-datasheet in the marks table:

- Open the **Students** table and notice the **+** symbol that now appears in the first column (because **Marks** is related to this table).
- Click on the **+** in ***Agatha Christie's*** record to show the marks you added in the previous task. If you added data for students ***2*** and ***3***, look at their marks too.

Note The **+** changes to **–** once the sub-datasheet is open.

- Click on the **–** to close the **Marks** sub-data sheet then close the **Students** table.

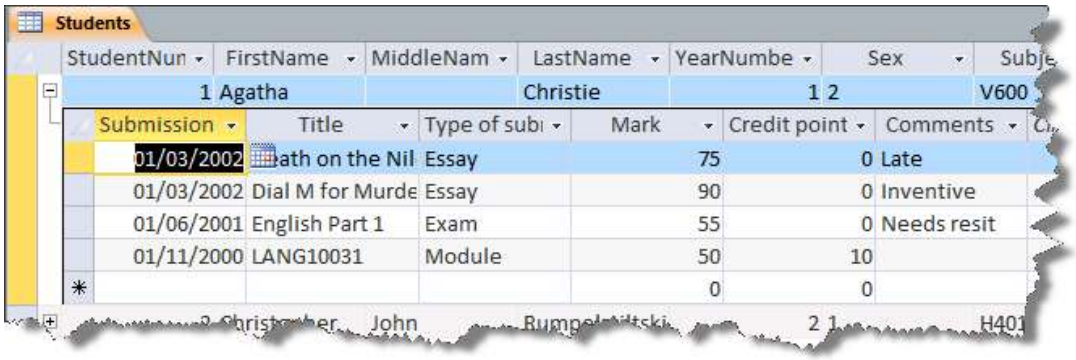


Figure 20 - linked data

Task 6 Importing data from a non-Access source

Objectives To import existing data into an Access table.

Comments Before you start entering reams of information, find out if the information is already available – student and staff data, for instance is available via the DataHub. Even if it is in a different format, you can still import that data into a new table, add it to an existing one or link it so that it is always up-to-date. This prevents typos and saves data entry time.

What do I need to know about importing data before I begin?

Access can import and export data in many different formats, such as from *delimited text files* (the format used in Word Mail Merge) and Excel spreadsheets.

Note Word documents cannot be imported directly and must be saved as txt. Also, any data formatting, such as italics and bold, will be lost on import. You can only import one line per record.

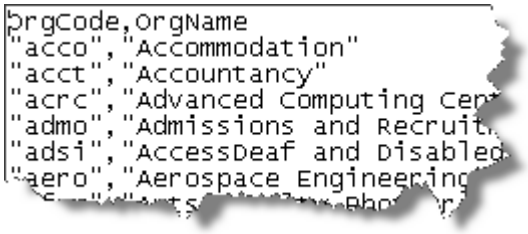


Figure 21 – example of a comma-delimited text file

Question	Answer
Why do some delimited text files have double quotes around each field?	If any field contains a comma, e.g. ***"24, The Drive"***, the double quotes are obligatory to show that the comma is part of the data and not a field separator.
What if the text file includes field names in the first column?	If the first line of the text file contains field names separated by commas (as in the example), it is easy to create a new Access table by importing the text file – Access then uses these as field names. Access assigns the most applicable data types.
What if the text file does not include field names?	If the file does not contain field names or you want to specify your own data types, you can create a table in Access containing the appropriate field names first and then import the data into it. Otherwise your field names will be *Field1*, *Field2*, etc. which you can change later to something more meaningful.
Can I append existing data directly into an existing Access table?	Provided that the number of fields (excluding any autocounter field) in the text file corresponds to the number of fields in the Access table, the data may be appended directly – otherwise you can import into a new table and create an append query.

Importing data to a new table

In this task you use a *comma delimited text file*, including field names and double quotes, to create a new table.

6.1 To choose which file to import:

- Click the **External Data** tab of the **Ribbon** and select **Text File** from the **Import & Link** section (Figure 22).

Figure 22 – select to Import the external data

- In the **Get External Data** window, click on **Browse** and navigate to the file **C:\Training\Access\Access 2010 current course\Org.txt**.
- Make sure that **Import the source data into a new table in the current database** is selected and click **OK** to start the **Import Text Wizard**.

6.2 To select the correct options for importing org.txt:

- Select **Delimited** on the first screen, followed by **Next**.
- Make sure that there is a tick next to **First Row Contains Field Names** (Figure 23).

Note If a message says "The first row contains some data that can't be used for valid Access names…", don't worry, just select OK. If you are importing from Excel, this can cause extra fields to be added – ignore the message and accept the new fields.

- Make sure that **Delimiter** is set to **Comma** and set **Text Qualifier** to **"** (the wizard shows the changes made to the example text as you do this) and choose **Next**.

Warning! The quotes should have vanished as per Figure 23.

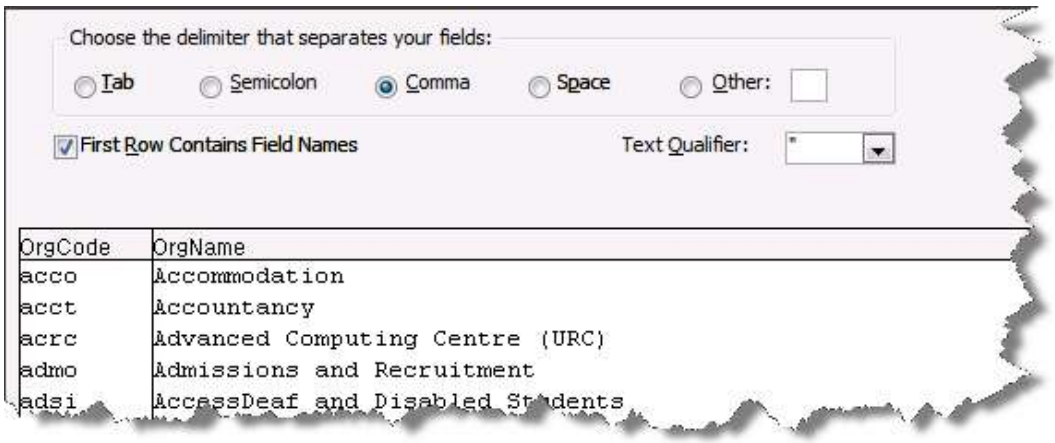


Figure 23 – you should set the import options as above

- You don't need to make any changes in **Field Options**, so just click **Next**.
- Select Choose my own primary key and select **OrgCode** (Figure 24).

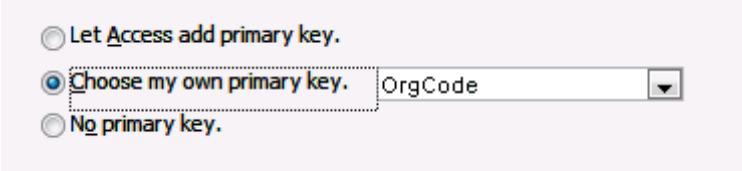


Figure 24 – make sure that you select OrgCode as the primary key

- Choose **Next** then click on **Finish** (don't save import steps if prompted).

6.3 To check that the table has imported correctly:

- In the **Navigation Pane**, double-click on **Org** to check it then close the table.

6.4 To add a relationship between the Org and Subjects tables:

Note Refer to Task 5 if you have forgotten how to create a relationship.

- In the **Database Tools** tab of the **Ribbon**, select **Relationships** and add a relationship between **OrgCode** in **Org** and **OrganisationCode** in **Subjects** – the primary and linked field names are different, but are the same data type.

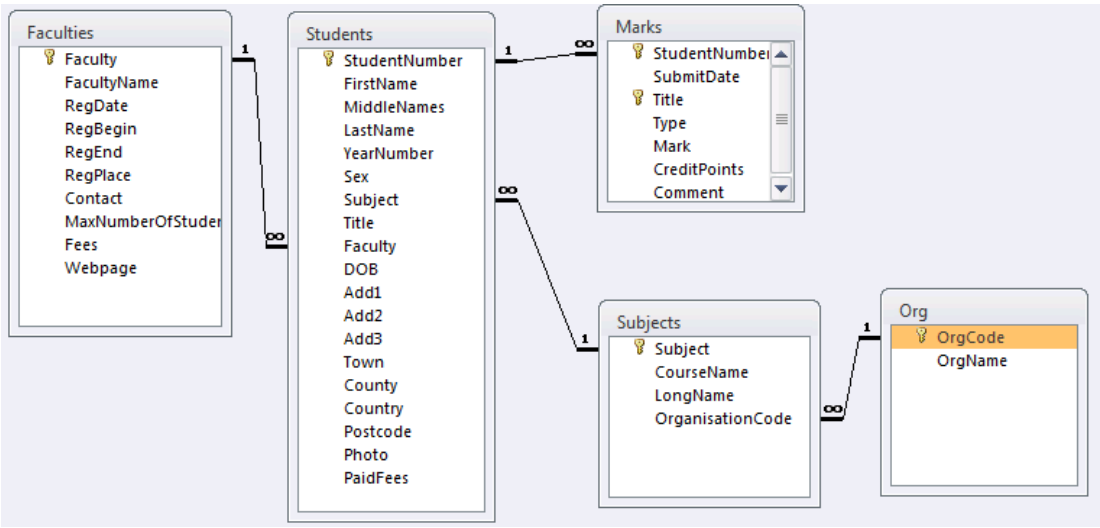


Figure 25 – with the Org table and relationship added, your relationships should now look similar to this

- Close the **Relationships** window and save changes.
- Open the **Org** table and click on the **+** next to the record for **aero**.
- In the sub-table that opens, click on the **+** next to **H400** to view students attached.
- Close the sub-tables and then close **Org**.

Importing dates

Warning! For important information on potential problems when importing dates, refer to the Access 2007 user support website at http://www.bristol.ac.uk/is/learning/office/access2007/training/using/import.html

If you have time

The spelling dictionary and AutoCorrect definitions are shared across all Microsoft Office applications so that user additions only need to be added once, no matter which Office application is being used.

Spell Check wizard

1.1 To use the spellchecker on the Org table:

- Open the **Org** table.
- In the Home tab of the Ribbon select **Spelling** (this spell checks the whole table).
- Click **Ignore 'OrgName' Field** to just spell check the org_name field.
- Select **Ignore** a few times just to see how the spell check function works.
- Click **Cancel** and close the **Org** table.

Autocorrect

AutoCorrect automatically corrects text that you frequently mistype, and can automatically replace abbreviations with long names. For example, you can create an entry **uob** for ***University of Bristol***. Whenever you type ***uob*** followed by a space or punctuation mark, this will automatically be replaced with ***University of Bristol***.

- Click on the **File** tab and select **Options**.
- Select **Proofing** followed by the **AutoCorrect Options...** button.
- Select **Replace text as you type** if not selected.
- In the **Replace** box, enter ***uob***.
- In the **With** box, enter ***University of Bristol***.
- Click **Add** followed by **OK** and then click on **OK** again.

Note AutoCorrect will not correct text that was typed before you selected the Replace text as you type check box.

- Try it out by opening a form or a table and typing ***uob***. Remember that you will have to choose a field that has a large enough text field to accept the 21 characters in ***University of Bristol*** – **MiddleName** in the **Students** table will do.

Warning! If you actually want UoB to appear, you will have to deselect **Replace text as you type**. Once you have entered ***UoB*** and saved the record, you will need to re-select **Replace text as you type**.

Task 7 Customising a table

Objectives To make the table display data in the way that you want it to.

Comments Save changes with each single modification, otherwise troubleshooting is difficult.

Customisation type	Description
Format	You can specify formats for most data types: you can use format symbols to specify any type you want, such as: **>** forces text to display in upper case and **<** in lower case **mmm yyyy** displays date as ***Jan 2002***
Validation Rule	Set rules to determine whether or not data entered is valid, such as only allowing specific text strings or number ranges.
Validation Text	You can set a message which appears if someone tries to enter data that does not obey a validation rule. This is recommended because the systems-generated text is not very enlightening!
Default Value	If you specify a default value, this value will be automatically entered when you start to enter data into a new record. **By default, numeric values always default to zero**. Be careful to clear this value if you want it to be null – having 0 instead of a null value can be misleading in calculations such as finding averages ('0' is a value, whilst 'null' means that there is nothing in the field – that the value is unknown). Changing the default does not affect current records.
Required	If you set this to **Yes**, then you must enter data in this field.

Note For further information on non-standard formats use the on-line help and **Access query language elements** (acc-4) - see the **Related Documentation** section.

7.1 To create a validation rule that limits data entry to the integers 1 through to 7:

- Open the **Students** table in **Design View**.
- In the **Field Name** column click on **Faculty** so that it is highlighted.

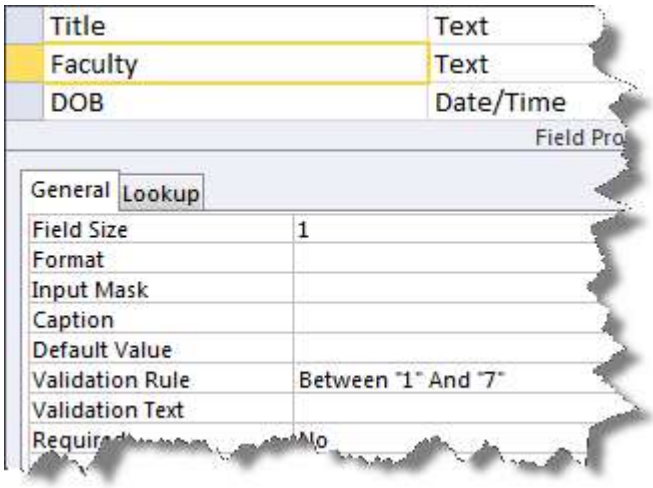


Figure 26 – Validation Rule for the Faculty field (note that Faculty is highlighted)

- Enter ***Between "1" And "7"*** next to **Validation Rule** (the quotes are not needed if it is a numeric field - if you forget to add the quotes you will get a warning when you save the table saying that the expression is incorrect or too complex).

7.2 To create a validation rule that limits data entry to Bristol or Bath in a field:

- In the **Field Name** column click in the **Town** field.
- Enter ***"Bristol" or "Bath"*** next to **Validation Rule** (Figure 27).

7.3 To add validation text:

- Add suitable text for each of the above rules next to **Validation Text** (Figure 27).

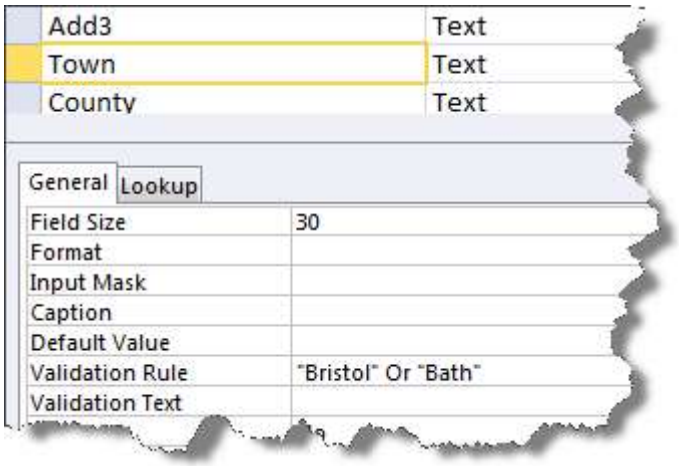


Figure 27 – Validation Rule and Validation Text for the town field

7.4 To set a default value:

Figure 28 – set the Default Value

- In the **Field Name** column click in the **Town** field and set **Default Value** to ***Bristol***.
- Set **Required** to **Yes** so that all new records must include a value in this field.

Note Make sure that the default value is allowed by any validation rules you may have added – e.g. don't assign a text default value to a numeric field!

- Click on **Datasheet View** (when prompted to save the table, select **Yes**).
- Two warning messages appear – just select **Yes** on both of them.

Note The messages warn you that existing data does not correspond to the new Validation Rule set in 7.2 – however, the data already in the table is not changed.

- In **Datasheet View** enter data to test your new rules and then close the table.

Task 8 Create single and multi-table select queries

Objectives To create queries to view specific data based on stated criteria.

Comments Queries are more powerful than using the Find or Sort options.

What do I need to know about queries before I start?

Question	Answer
What are queries?	Queries let you find, sort and change data according to specified criteria. They also let you look at data from different tables into a single query and can use functions and expressions. Queries can be used as the basis of forms, so that you can update multiple tables at the same time when entering data in just one form. They can also be used as the basis for creating reports.
Why might I want to use a query?	Queries are used to ask questions to find specific data so that only required records and fields are extracted. For example, you might want to create a query to view a list of students in surname order, showing their course name and their course tutor. The query will show *only* this data in table format so that you can print it out and/or save the query for future use.
Are all queries the same?	There are two main types of queries: **Select** queries (which is the default type) show requested views of data in the tables but do not change this data (though you can edit the results of the query the same as in a table); **Action** queries actually do something to the data in the tables, such as altering or deleting specific data, depending on which type of action query you have built.
Are there any query wizards?	There are several wizards that can make creation of certain types of queries easier.

Select queries using simple criteria

8.1 To create a new query and add the required fields:

Figure 29 – the Query Design icon available via the Create tab

- Select the **Create** tab of the **Ribbon** and select **Query Design** to open the **Query By Example** (QBE) grid and the **Show Table** window.

Note You can also base a query on a query.

- Double-click on **Students** followed by **Close** to shut the **Show Table** window.
- In the **Students** table, double-click on **LastName**, **FirstName**, **Sex**, **DOB** and **Faculty** in turn.

LastName	FirstName	Sex	DOB	Faculty
Students	Students	Students	Students	Students
☑	☑	☑	☑	☑

Figure 30 – this is how the QBE grid should look

8.2 To add simple text criteria:

Field:	LastName
Table:	Students
Sort:	
Show:	☑
Criteria:	"Jones"
or:	

Figure 31 - Jones criteria in the LastName field

- In **LastName** click on the **Criteria** box and enter ***Jones*** (Figure 31).
- Click out of the column and notice that Access adds two sets of speechmarks (“”) meaning that it recognises this as text.
- Select the **Datasheet View** icon in the **Ribbon** to see the query results.

- Return to **Design View** and change ***Jones*** to ***Smith or Jones***.
- Look at **Datasheet View** to see the result of your query.

Field:	LastName
Table:	Students
Sort:	
Show:	☑
Criteria:	Like "s*"
or:	

Figure 32 – Like s* criteria in the Lastname field

- Return to **Design View** and change ***Smith or Jones*** to ***s**** then click out of the column and notice that Access adds **Like** and puts quotes around **s*** (Figure 32).

Note Using the * operator is known as a *wild card search*.

- Check the result of your query and return to **Design View**.

8.3 To add simple numeric and date criteria

- Remove the criteria from the **LastName** field.
- In **Faculty** enter ***>5*** into the **Criteria** box and then check the result of your query.
- Back in **Design View**, remove the criteria from the **Faculty** field.

Sex	DOB	Faculty
Students	Students	Students
☑	☑	☑
	Between #01/01/1969# And #31/12/1972#	

Figure 33 – Between query in a Date/Time field

- In **DOB** enter ***between 1/1/69 and 31/12/72*** into the **Criteria** row (Figure 33).
- Click out of the column and notice that Access adds hashes (**#**) – this confirms that Access recognises these as date strings – and check the result of your query.

8.4 To add simple true/false criteria:

- Remove the criteria from **DOB** and add **PaidFees** to the grid.
- In **PaidFees** enter ***yes*** and check the results, then change **Yes** to ***no*** and repeat.

Finding blank fields and sorting data

8.5 To find blank fields:

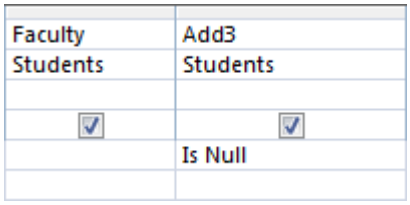


Figure 34 – the Is Null criteria

- Remove all criteria from the above query.
- Add **Add3** to the grid and check the query results - many **Add3** values are blank.
- In **Add3** type ***Is null*** and view the results (Figure 34).
- Change **Is Null** to ***is not null***, view the result, then return to **Design View**.

8.6 To see the students in alphabetical order:

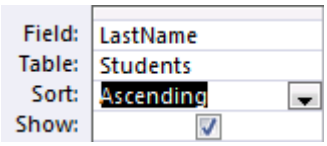


Figure 35 – select Ascending from the Sort dropdown list

- Remove the criteria from the above query.
- In **LastName** click on **Sort**, select **Ascending** and view the query results.

Saving a query

8.7 To save the query:

- Click the **Save** icon next to the **Office Button** and save as ***MyTestQuery***.

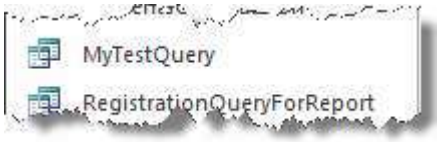


Figure 36 – the query is now available in the Navigation Pane

- Note that **MyTestQuery** now exists in the list of available queries in the **Navigation Pane**. You can run this at any time by double-clicking on it here.

Using more than one criteria

Note All criteria on the same line must be true to retrieve a record. If you want to give two criteria, either of which may be true, then put one of the criteria on the **or** line.

8.8 To practice creating queries with more than one criteria:

- Open the **MyTestQuery** in design view and list all the men (code is **1**).
- List all the women and everyone (male or female) with the surname **Smith**.
- Check the results and then close the query without saving changes.

Queries using more than one table

8.9 To create a query using more than one table:

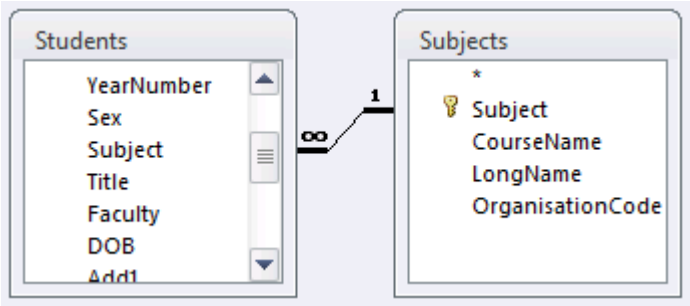


Figure 37 – query using two related tables

- Create a new query and add the **Students** and **Subjects** tables (Figure 37).
- Add **LastName**, **FirstName** and **Subject** to the grid from the **Students** table.
- Add **CourseName** from the **Subjects** table and sort by **CourseName**.
- View the results of your query then return to **Design View** and close it, saving it with an appropriate name.

If you have time...

1.2 To practice multi-table queries:

- Create a query to list all students in the Faculty of Medicine who are studying Dentistry (this query needs three tables).

1.3 To display subjects where there are no students:

- In the **Create** tab of the **Ribbon**, select **Query Wizard**.
- Click **Find Unmatched Query Wizard** and **OK**.
- Select **Table: Subjects**, followed by **Next**.
- Select **Table: Students** as the referring table, followed by **Next**.
- Make sure that **Subject** is highlighted on each side, and click **Next**, then select **CourseName**, **Next** and **Finish**.
- After viewing the query results look at the query in **Design View** to see how it has achieved this result.

Task 9 Create a query to calculate totals

Objectives To create a query that groups information and calculates totals.

9.1 To create a query that calculates how many students are in each year:

- Create a new query and add the **Students** table.
- Add **YearNumber** to the **QBE grid**.
- Add **YearNumber** again in the next column so it appears twice.
- Click on the **Totals** icon and notice that a **Total** line has been added to the **QBE grid** with the default **Group By**.

- Leave the first **YearNumber** column as **Group By** and sort in ascending order so that Access groups first years followed by second years, etc.
- In the second **YearNumber** column, replace **Group By** with **Count** (Figure 38).

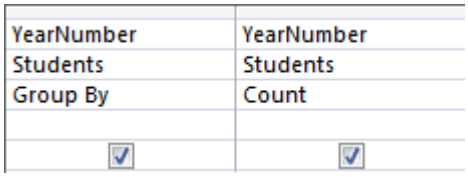


Figure 38 – creating a query to calculate totals

Note This tells Access to look at the unique values of year and then count how many of each there are. Note the other calculations available from the dropdown list.

- View the results of your query (Figure 39).

Note It is preferable to count on the primary key since if there is no value in Year that record would not be shown in the count.

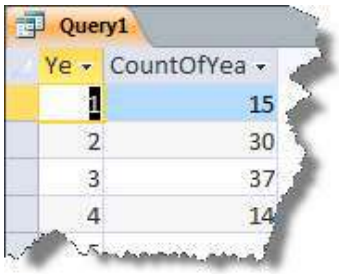


Figure 39 – Datasheet View showing the results of the query in Figure 38

9.2 To view the year with the most students:

- Return to **Design View** and remove the sort from **YearNumber** (the **Group By** one).
- In the **YearNumber** column with **Count**, sort in descending order.
- View the query results then close and save the query with an appropriate name.

Task 10 Create a query with an expression

Objectives To create a query that uses existing fields to create new fields.

Comments Expressions can be used in queries (and also on forms and reports) and are very useful for manipulating existing data held within the database.

Creating a numerical expression

10.1 To create a numerical expression:

- Create a new query based on the **Faculties** table.
- Add the **FacultyName** and **Fees** fields.
- Add the **Fees** field a second time.
- In the first **Fees** field, change **Fees** so that it says ***Fees*2***.
- Click anywhere in the grid and notice square brackets appear around the **Fees** field name and ***Expr1:*** (the default field name for an expression) is added to the beginning of the field (Figure 40).

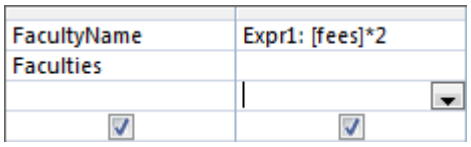


Figure 40 – how the above numerical expression should look before renaming Expr1

Note The square brackets **[ ]** identify the beginning and end of a field name and this is particularly needed if there is a space in the name of the field.

- Look at the query results.

10.2 To change the name of your new expression:

- In **Design View** change **Expr1:** to ***Double fees:*** (do not delete the colon).
- Look at the query results (Figure 41) then close the query (save it if you want to).

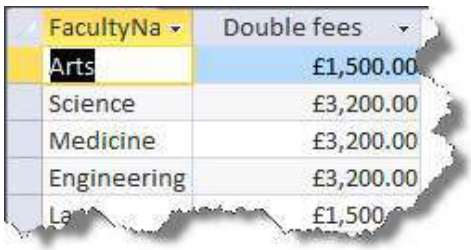


Figure 41 – how the column header should look after renaming Expr1

Creating a text expression

10.3 To join first and last names together into a single field:

- Create a new query based on **Students** and add **FirstName**, **LastName** and **DOB**.
- Click in the **Field** box of the blank column next to **DOB**.
- Enter ***[FirstName] & " " & [LastName]*** (leave a space between the two sets of speech marks) and click somewhere in the grid so that **Expr1:** is added to the beginning of the field (Figure 42).

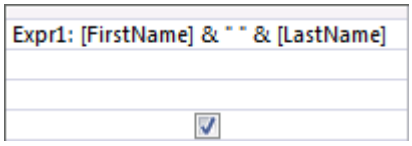


Figure 42 – concatenating (joining) two text fields together

Note This expression uses the *concatenation* operator **&** which joins fields together. The quotation marks mean *"I contain text"* , and you must enter two sets, not just one set. The text we've entered here is a space between the two halves of the name.

- Change **Expr1:** to ***Fullname:*** (do not delete the colon) and view the query results.
- Return to **Design View** and remove **Firstname**, un-tick the **Show** box in **LastName** and sort in ascending order by **LastName**.
- View the query results (Figure 43) and save the query as ***FullName***.

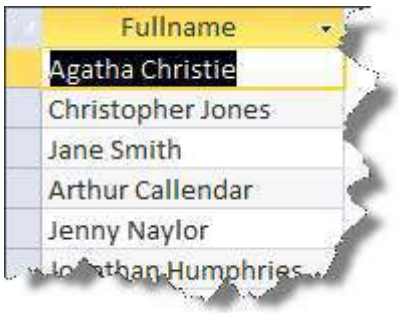


Figure 43 – how the Fullname column should look when run

- Create a new query based on the **Students** table experiment with concatenating various fields.

If you have time...

Task 25 and **Task 26** provide additional query practice – the first provides some easy practice, whilst the second is a bit more difficult.

These tasks will be especially useful for researchers and those needing to analyze their data. Try these tasks if you have time to spare after this task or after the following query tasks.

Task 11 Create an Update query

Objectives To create a query that changes data in the underlying table.

Comments You will alter the contents of the Sex field from 1 to Male and from 2 to Female. You can only update one table at a time. It is easier to update one field at a time so that you can make sure that the right data is being updated. It might be a good idea to make a copy of the table before you make any changes.

What do I need to know about action queries before I start?

Question	Answer
What is an action query?	Action queries are created in the same way as select queries, but action queries *modify* the data. By using an action query, you can make changes to many records in one operation.
What types of action queries are there?	• **Update** queries change the data in a specified group of records - these are very useful for making changes to a large number of records in one go. • **Append** queries append data to a table from the same or another table. • **Make-Table** queries let you create new tables in the same or another database. • **Delete** queries let you delete data from tables.
Can I run an action query by mistake?	Action queries can be dangerous because they can change your data. There may be action queries in a pre-existing database. If the icon next to the query name is different to those next to normal select queries, find out what it does before running it.
What is the safest way to check what an action query will do?	If you want to run a previously-created action query, look at it in Design View first and check what will be altered by looking at Datasheet view before running the query.

Warning! Before you try to create an Update query, it is a good idea to look at the design of the table that is to have data changed to check that the data type of the field will allow the change (e.g. you will not be able to update a Number field with text), and that the field size is big enough to allow the update; if not, it will be truncated.

11.1 To change the entry in the Sex field from 2 to Female:

- Create a new query and add the **Students** table.
- Select **Update** from the **Query Type** section of the **Ribbon** and notice that an extra row has been added to the **QBE grid** with the label **Update To**.

- Add the **Sex** field to the QBE grid and type ***2*** in the **Criteria** box.
- Enter ***Female*** in the **Update to** box (Figure 44).

Field:	Sex
Table:	Students
Update To:	"Female"
Criteria:	"2"

Figure 44 – the QBE grid should look like this

- View the values that be will changed by selecting **Datasheet View** (do not select the Run icon). You should see a column of approximately fifty rows with **2** in each.
- Return to **Design View** and select **Run**, followed by **Yes** to confirm.

- Click on the **View** toggle again. No values will be shown because the value **2** no longer exists in the **Sex** field – they have all been changed.
- To view the query results, double-click on **Students** in the **Tables** section of the **Navigation Pane**.
- Close the **Students** table and close the query, saving it as **UpdateQuery**.

11.2 To practice using an update query:

- Open **UpdateQuery** in **Design View**.
- Change all the men in the table (men are designated as **1**) to ***Male***.
- Check the **Students** table then close both table and query, saving changes to the query as you close it.

Note If you accidentally change both males and females to the same sex, how you can correct this – and what problems might you encounter along the way?

11.3 To distinguish an Update query from other types of query:

- Look for **UpdateQuery** in the **Navigation Pane**.
- Note that it is shown in the query listings with a different icon which distinguishes it from a normal query.

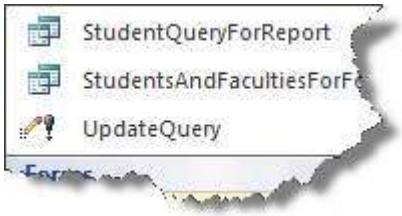


Figure 45 – it is always a good idea to look at action queries in Design View before running them to find out what they do!

- Double-click **UpdateQuery** to run again - why hasn't it changed any data?

Task 12 Create a Parameter query

Objectives To create a query that asks you what you want to see in the query results.

Comments A parameter query is useful if you frequently run the same query but have to change the criteria each time you run it or of having lots of similar queries. Parameter queries ask you for the criteria you want to run the query against.

Simple parameter search

12.1 To create a query prompting you for a subject code:

- Create a new query and add the **Students** table.
- Add **FirstName**, **LastName**, **Subject** and **YearNumber** to the **QBE grid.**
- In the **Criteria** row for **Subject** enter ***[Which subject?]*** (add the square brackets).

FirstName	LastName	Subject	YearNumber
Students	Students	Students	Students
☑	☑	☑	☑
		[Which subject?]	

Figure 46 – a simple parameter query

Note The text inside the square brackets is what will be displayed, asking what subject you want to search for (the text should not be the same as an existing field name).

- Save the query and name it ***SubjectSearch***.
- Select **Datasheet View** and when prompted for a subject, enter ***L500*** and click **OK**.

12.2 To practice the above:

- Remove the criteria from the above query.
- Add a similar question in **LastName** field and search for **Smith**.

Parameter and wildcard search

Note This uses the **like** operator, wildcard character * and the concatenation character **&**. See the Reference document for details of Operators (or use the on-line help).

12.3 To create parameter searches using wildcards:

LastName
Students
☑
Like [Which Lastname?] & "*"

Figure 47 – how this parameter search query should look in the QBE grid

- Remove the criteria and type ***Like [Which Lastname?]&**** (Figure 47).
- Run the query and enter the letter ***s*** when prompted.
- Look at the query results then return to **Design View** and add the **Subjects** table.
- Add a wildcard search for **CourseName**, then close the query, saving it if you want.

Task 13 Using Forms

Objectives To explore the forms in the Student database.

Comments Forms are more convenient than tables for accessing and entering data. Forms let you look at data one record at a time and let you enter data consistently.

What do I need to know about forms before I start?

Question	Answer
What are forms used for?	Forms are designed to make your data easy to look at and use. In particular, forms provide an efficient way to find, edit, and add data, such as through dropdown lists. They also let you look at one record at time and master detail.
Are forms easy to create?	It's easy to create simple forms. More sophisticated forms require more effort but result in powerful and useful facilities.
How many forms can I have in a database?	Any number of forms can be developed within a database to look at or enter the data in different ways. For example, in a student database one form could relate to personal details (e.g. first name, last name, home address, term time address, date of birth), whilst another form could relate to academic progress (e.g. first name, last name, number of projects submitted, project mark, subject, tutor) of male students.

Opening a pre-existing form

13.1 To open an example form:

- Make sure that you have closed all objects.
- In the **Forms** section of the **Navigation Pane**, double click on **StudentForm**.

Note This form displays fields from the **Students**, **Faculties** and **Subjects** tables.

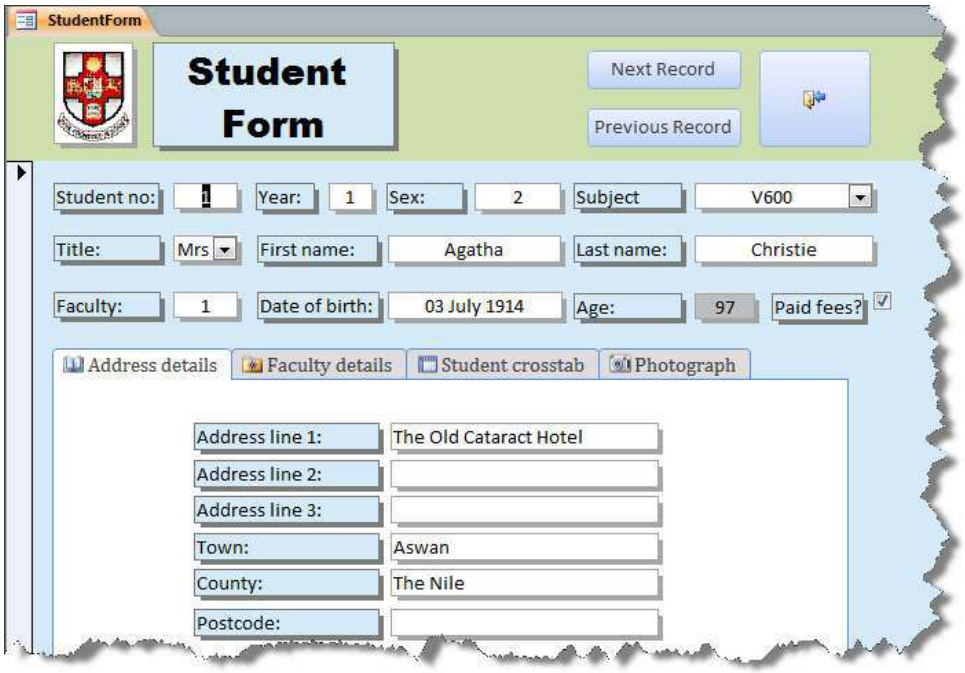


Figure 48 – Student Form

Features on the Student form

Feature	Description
Dropdown lists	**Subject** and **Title** have dropdown lists – the values in **Title** were specified when the dropdown was set up (these can be amended or added to at any time) and the values in **Subject** come from the Subjects table. Dropdown lists reduce data entry time and typos as well as ensuring data consistency.
Calculations	**Age** is a *calculated field* – this field is not included in the Students table. It is greyed out to show it cannot be updated.
Conditional formatting	The **Sex** field changes colour based on the value in the field.
Tabs	Tabs let you group related fields together to save space on the main form. You can also include *subforms* and images on tabs. One tab here includes a *crosstab* form.
Hyperlinks	Links here open another part of the database and a web page.
Record view	In form view only one student's data is viewed at a time.
Images	Images are added for each student and the form header includes a University crest visible on all records.
Buttons	Buttons can show text or images (the latter can show a helpful tip when hovered over). Buttons can be set up for many tasks (there is a course available to explore what buttons can do – see Access buttons and macros, CC2ABM).

13.2 To familiarise yourself with the Student form:

- Read through the above table and locate the elements on the **StudentForm**.
- Click on the down arrow alongside the **Subject** field to display a list of subject codes and titles.
- Select any subject from the dropdown list and notice the contents of the **Subject** window change to display the subject code highlighted in the list.
- Try adding an unknown code, such as ***XYZ123*** to see what happens.
- Change the **Subject** back to ***H300*** before continuing.

Note Only the **Subject code** is shown in the field: the subject titles in the list help you to choose the right code. You will find out later how to display the subject title instead.

- Move between records using the navigation buttons in the bottom left hand corner of the **Form** window.

Finding data

Note Finding a record using the **Find** button in *form view* is the same process as finding a record in *table view*.

13.3 To practice finding specific records in form view:

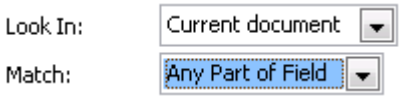


Figure 49 – make sure that Match corresponds to the above setting

- Click on the **Find** button and find ***Chelwood Village*** – make sure that **Look In** says **Current document** and **Match** says **Any Part of Field** (Figure 49).
- Close the **Find and Replace** dialogue box.

Switching between Form and Datasheet View

It is possible to switch between **Form View** (which shows one record at a time) and **Datasheet View** (which shows records in a tabular format, similar to that in tables).

13.4 To view records in Datasheet View:

- Click on the downward arrow next to the **Design View** icon in the toolbar.
- Select **Datasheet View** (Figure 50) and close the window when you are finished.

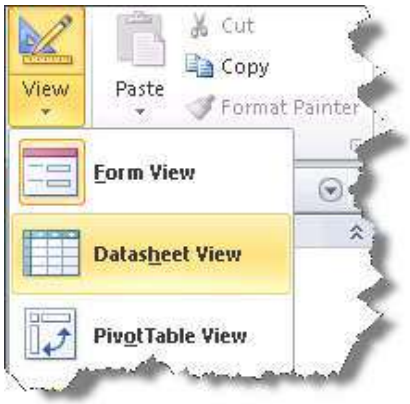


Figure 50 - switching views from a form

Task 14 Create a form with subform using Form Wizard

Objectives To create a form based on the Students table with a subform based on the Marks table. To understand the two different sets of properties associated with a subform.

Comments The Form wizard gives you choices on fields to include and available layouts, thus allowing more flexibility than some other options. You can also, as in this task, use a wizard to create a form with a subform, though to do this there must be an existing relationship between the two tables used in creation of the form/subform.

What do I need to know about subforms before I start?

Question	Answer
How do I create a subform within a form?	• You can use the **Subform/Subreport Wizard** in the **Controls** section within the **Design** tab of the **Ribbon**. • You can drag an existing form, query or table from the **Navigation Pane** onto an existing form. • You can create the main form and subform together by adding all the fields for both using the **Form Wizard**. This way, Access recognises a one-to-many link and uses the correct fields for the main form and the subform.
Why do subforms have two sets of properties?	Subforms have two sets of properties. One relates to the subform and the other relates to the relationship between the main form and the subform.

Creating a form with a subform using Form Wizard

14.1 To create a form with subform using Form Wizard:

Figure 51 – select Form Wizard

- In the **Create** section of the **Ribbon**, select **Form Wizard** from **Forms**. (Figure 51)
- From the dropdown list that shows available tables and queries choose **Table: Students** (you may need to scroll up to find this on the list).

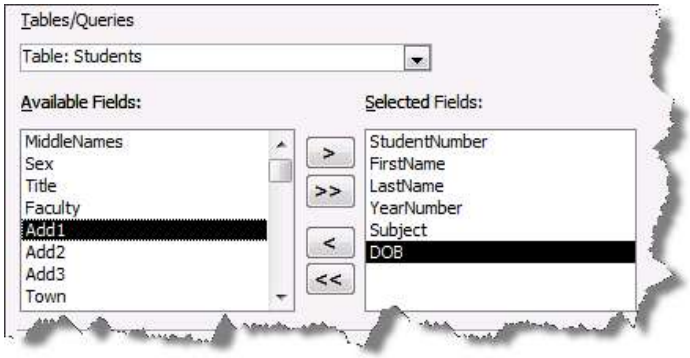


Figure 52 – select the fields from the Students table as shown

- In the **Available Fields** box, double-click on **StudentNumber**, **FirstName**, **LastName**, **YearNumber**, **Subject** and **DOB** in turn to move them to the **Selected Fields** box, then click **Next** (Figure 52).
- Now select **Table: Marks** from the **Tables/Queries** dropdown list.

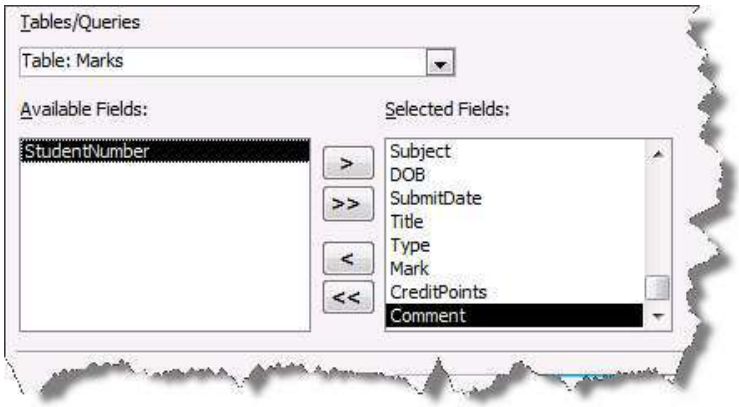


Figure 53 – select all fields except StudentNumber from the Marks table

- Move all fields except for **StudentNumber** across to the **Selected Fields** box, then click **Next**.
- Select to view your data by **Students**, if not already the default, and make sure that **Form with subform(s)** is selected, then click **Next**.

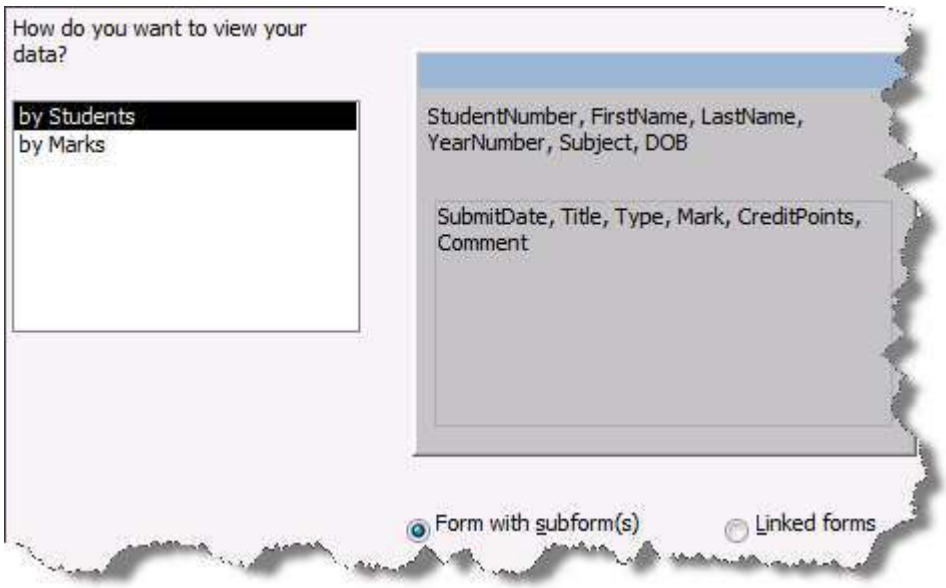


Figure 54 – ensure the wizard screen is the same as above

- Choose **Datasheet** as the layout for your subform, then click **Next**.
- In **Form** change the suggested name to ***MyStudentForm*** and click **Finish** to see the form/subform you have just created (Figure 55).

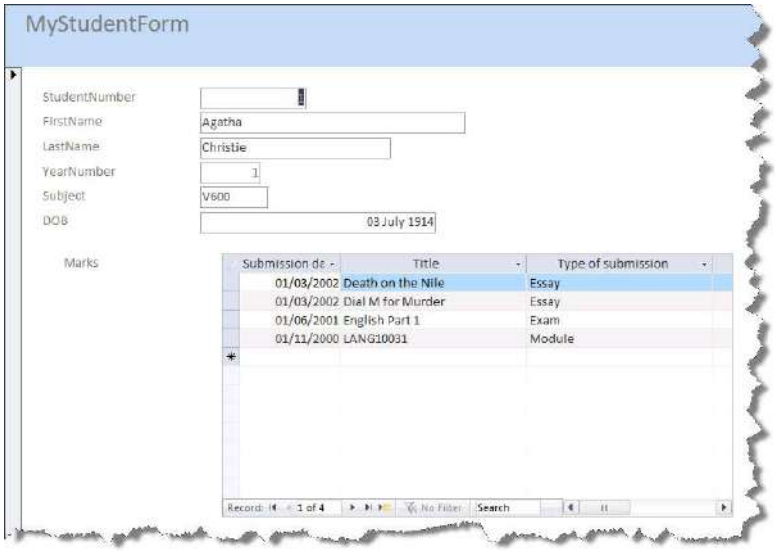


Figure 55 – a very basic form with subform, ready to be customised

- Notice that the data entry fields are different sizes, depending on their data type and the field size assigned when the tables were created.
- Use the navigation buttons at the very bottom of the window (not those under the subform) to move between records – note that any marks you added for student numbers 2 and 3 earlier will shown in the subform when you move to those records.

Form, subform and form/subform join properties

Note Every item on a form has a set of properties associated with it, which allow you to fine tune the way in which any object on a form will work. The form itself also has its own set of properties, as has the subform and the relationship between the form and the subform. You can view and alter all properties on the Property Sheet.

14.2 To view the main form properties:

Figure 56 – select Design View

- In the **Home** tab of the **Ribbon**, click on the downward arrow under the **View** icon in the **Views** section and select **Design View**.
- In the **Tools** section in the **Design** tab of the **Ribbon**, select **Property Sheet**.
- Click on the square box in the top, left-hand corner of the main form so that a small, square, black box appears (Figure 57) and note that the **Property Sheet** shows the word **Form** under **Selection type** directly underneath the **Property Sheet** header.

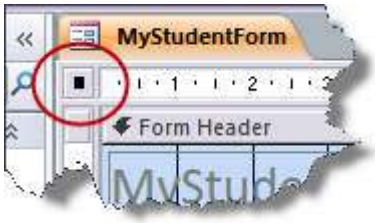


Figure 57 – properties for My Student Form (circled)

14.3 To view the subform join properties:

- Click only once on the blue square box on the subform (if you only click once, the small, black box should not appear) and note that **Property Sheet** now says **Subform/Subreport** as **Selection type** with the name of the form in the dropdown box below.

Figure 58 – click once for properties for the link between the main form and the subform

- Click on the **Data** tab in the **Property Sheet** and look at the contents of the **Link Child Fields** and **Link Master Fields.** Access created this link between form and subform (Figure 59) based on the relationship that you set up earlier.

Link Master Fields	StudentNumber
Link Child Fields	StudentNumber

Figure 59 – the fields that the form and subform are linked on

Note The child field relates to the link field on the subform (foreign key) and the master field relates to the link field on the main form (primary key). Remember that these are the fields that you linked together in the Relationships window earlier.

14.4 To view the subform properties and change the source of a subform:

- Click once more on the square, blue box in the top, left-hand corner of the subform so that the small, square, black box appears and note that the **Property Sheet** shows the word **Form** again as **Selection type** (Figure 60).

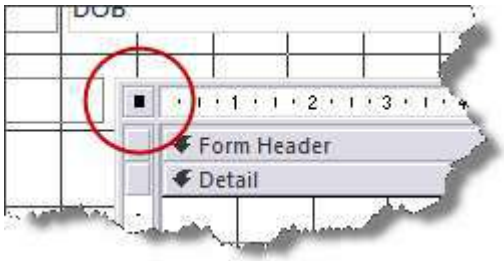


Figure 60 - properties for the Marks subform

- Close the **Property Sheet** by clicking on the icon in the **Tools** section of the **Ribbon**.

Task 15 Customising a form - basics

Objectives To make the form look and work the way you want it to.

Comments Customise a form by changing the appearance of text, data and other objects.

What do I need to know before I start customising a form?

Question	Answer
Can I alter the design in **Form View**?	No. To alter form design you must be in **Design View** (or **Layout View** for simple changes).
What is the best way to learn how to alter form design?	The best way to learn how to customise the form is to experiment…and make mistakes!
What do I do if it all goes horribly wrong?	If it all goes horribly wrong, you can click on the **Undo** icon to undo your last action.
What if it all goes horribly wrong but I don't notice in time to use the **Undo** command?	If it all goes *very* horribly wrong, or if you do not like what you've done, you can just close the form - *but remember to select **No** when asked if you want to save changes*. However, it is a good idea to save the form regularly after making changes that you do like.

Moving and resizing

There are several ways of moving fields, labels and objects (see table below).

15.1 To change the appearance of a field, label or other object:

- Click on the object once so that 'handles' appear.
- Try each of the actions in the two tables below by using the method suggested (you must click on the object to select it first).

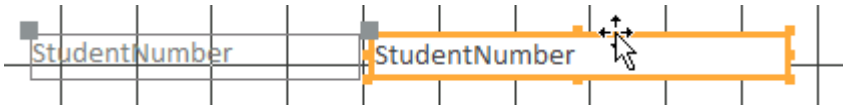


Figure 61 – Moving the field and label together

Action	Method
To move a field and label together (Figure 61)	Move the mouse pointer over the edge of an object so that a four-headed arrow appears, then click and drag the box to a new position.
To move a field without moving the label, or vice versa (Figure 62)	Move the mouse pointer over the larger handle at the top, left-hand corner of the field control, then click and drag it to a new position.

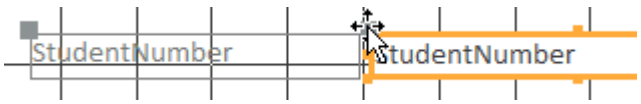


Figure 62 - moving one part of the field by clicking on the large 'handle'

Action	Method
To move selected controls with micro movement	Click on a field control and press **CTRL**+**ARROW** keys to move in the direction of the arrow.
To change the size of an object (Figure 63)	Move the mouse pointer across the handles until a double-headed arrow appears, then click and drag to the required size.
To size selected controls with micro movement	Press the **SHIFT**+**ARROW** keys.

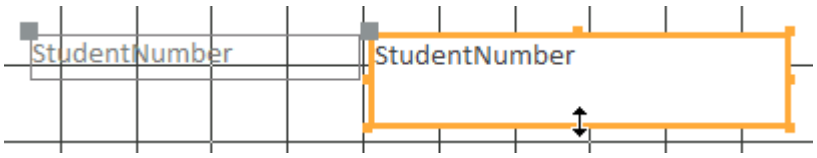


Figure 63 – resizing a field (double-headed arrow)

Formatting options

Note There are several ways in which you can customise your form, for example, there are a number of useful toolbar buttons available in Design View.

15.2 To find out what the various toolbar options can do:

- Click on the **Format** tab of the **Ribbon**, and look at the various options – some should be familiar as they are the same as those found in other Office applications.
- Select a **Text box** (data field) and try changing the font and font size.
- Experiment further on both fields and labels.

Figure 64 - formatting toolbar

- You can also format objects, such as field controls and labels using the **Special Effect** option by right-clicking on an object and choosing one of the options.
- Have a look at the other options that you have on the right-click menu, especially at **Align** and **Position**, which can be quite useful (these options are also available on the **Arrange** tab in the **Sizing & Ordering** section).

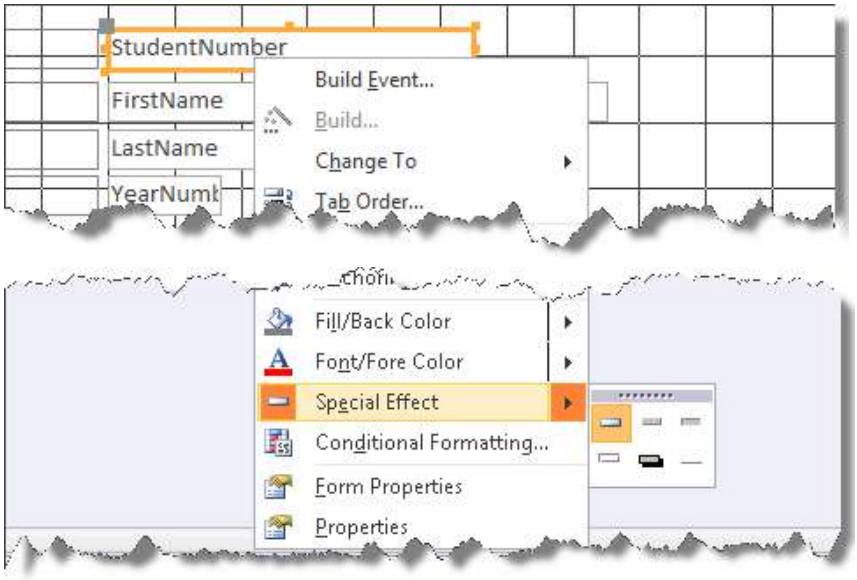


Figure 65 – available Special Effects options

Controls and adding new objects

15.3 To add a title to your form:

Figure 66 – the Controls section of the Ribbon

- Click on the **Design** tab to view the options in the **Controls** section.
- Click once on the label in the **Form Header** that says **MyStudentForm** and press **DELETE** on the keyboard.

Note You could just have altered the text in the original label, but then you wouldn't have found out how to add a label!

- In **Controls**, select **Label** by clicking once.
- Place the mouse on the screen in the **Form Header** space (the cursor should change to **+A** – as in Figure 67), hold the mouse button down and draw a box.

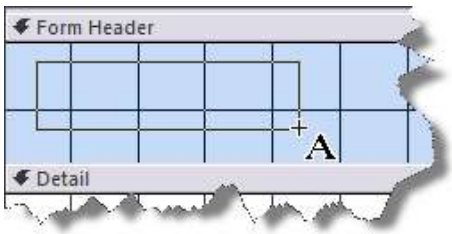


Figure 67 – the cursor changes to +A

- In the label box, type a suitable title, alter the size and colour of the text (you will need to return to the **Format** tab) and resize the box if necessary (Figure 68) – you

will need to click outside of the box and then click once back on it before you can format any text that you have added.

Figure 68 – the new form header label

Note Fields and labels can be deleted by selecting them and pressing the **DELETE** key. If you select the *field* and press **DELETE**, this will delete both the *field and its label*. If you select just the *label* and press **DELETE**, this will delete *only the label*.

Format Painter

Note Formatting an object can take several or more operations. To do the same set of operations to each object in turn would be laborious so Format Painter lets you copy the formatting from one object to another object.

15.4 To use Format Painter:

- In the **Format** tab, click once on a data field and use the **Fill/Back Color**, **Font/Fore Color** and **Line/Border Color** options to change the colours of the background, the text and the text box in turn (Figure 69).

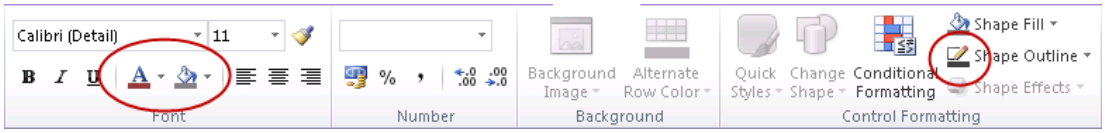


Figure 69 - colour and border icons (circled)

- Click away from the field (somewhere on the form, rather than on another object) and then click back on to the chosen field once to make sure that it is selected.
- Click the **Format Painter** icon, and then select the next field to which you want to apply the formatting.

- To copy the selected formatting to several locations, double-click **Format Painter** and then click once on each of the objects that you want to format.
- Click **Format Painter** again to switch it off.

Selecting and formatting multiple fields

Note You can select a number of fields at the same time so that formatting, sizing and alignment can be carried out in a single operation.

15.5 To select multiple objects if they are located together:

- Move to a point above and to the left of the first object, hold down the left mouse button and drag a rectangle down over the final object to be selected.
- Release the left button and all the objects enclosed by the rectangle will be selected.

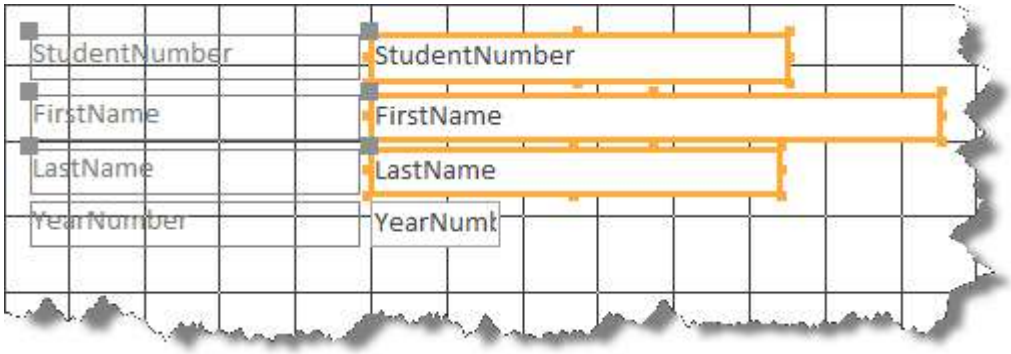


Figure 70 –selected objects are highlighted and display 'handles'

15.6 To select multiple objects if they are not located together:

- Click once on the first object.
- Hold down the **SHIFT** key and click on the other objects once in turn.

Aligning and sizing objects

15.7 To align and size multiple objects:

Note All objects when moved automatically snap to grid to make positioning of objects more uniform.

- Once you have selected several fields, select the **Arrange** tab.
- Align the selected field controls to each other by selecting Align, then choosing from **Top**, **Bottom**, **Left** or **Right** as your form design requires (Figure 71).

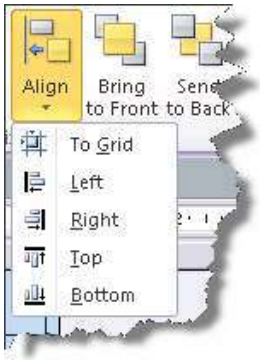


Figure 71 – the Align options

- To make the fields uniform in size to each other, click on the **Size/Space** icon and select **To Tallest**, **To Shortest**, **To Widest** or **To Narrowest** as your form design requires.

- Also use the **Size/Space** icon to experiment with the various options in the **Spacing** section (at least three vertically spaced controls should be selected for the **Equal Vertical** options).

Note If you get unwanted results, select **Undo** on the toolbar and try again selecting only the field controls and not the labels.

- Look at how the form looks in **Form View** (Figure 72).

Resizing and repositionsing the subform

15.8 To resize and reposition the subform:

- Click on the **Marks** label to the left of the subform and press **DELETE** on the keyboard.
- Click once and hold down the mouse on the subform and drag to the desired position.
- Use the handles to resize the subform so that you can see all of the available fields in the subform.

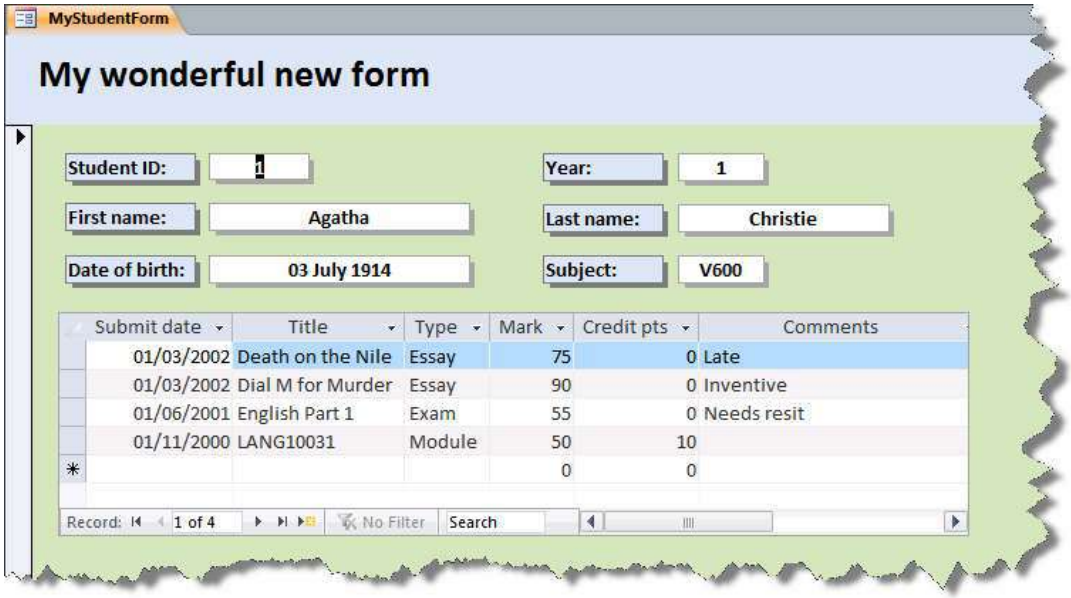


Figure 72 – how your form with subform might look

Task 16 Customising a form – more advanced methods

Objectives More ways to make the form look and work how you want it to.

Comments This task reintroduces the Property Sheet, which gives you fine control over how various objects look and act.

Properties

For several of the following tasks you will need to use the Properties box. As you become more experienced in fine-tuning the controls on your form, you will find that it is useful to keep the Properties box open whilst designing your form.

16.1 To open and get to know the Properties box:

- In **Design View** go to the **Design** tab of the **Ribbon** and select **Property Sheet**.
- Click on one of the fields that you have formatted and select the **Format** tab to look at the options (Figure 73).

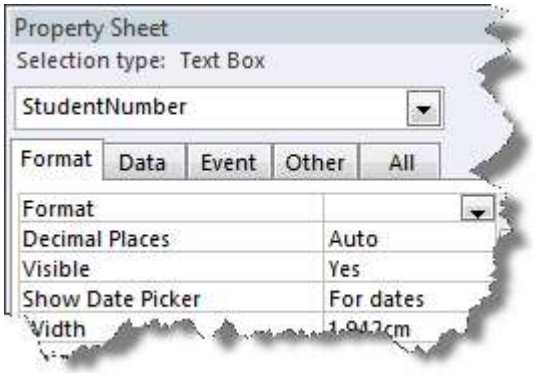


Figure 73 - properties box

- Now click on a field that you have not applied any formatting to and see how the values of the various options are different from the object you first selected.

Note If you do not have any unformatted fields, do the following and then repeat 16.1.

16.2 To add another field to your form:

- Select Add Existing Fields from the Ribbon to open the Field List

Note If you have forgotten to add a field when creating the form using Form Wizard, or if you have accidentally deleted a field, you can add these fields to your form.

- Click on **MiddleNames** in the **Field List** box and drag it onto an empty part of the form. The field and label will appear on your form with default formatting.

Note Multiple fields can be selected by holding down the **CTRL** key whilst clicking the mouse on each field in turn.

- Close the **Field List** then repeat task 16.1 to see the differences in the properties then delete **MiddleNames** from your form – unless you really want to keep it on your form, that is!

Locking fields and removing them from the tabbing list

Note For some databases, it is important that users should not be allowed to change the values of certain fields; a student reference number would be an example. This can be achieved by locking the field.

16.3 To lock a field:

- Make sure that the **Property Sheet** is open and click on the **YearNumber** field.
- In the **Property Sheet**, select the **Data** tab and set **Locked** to **Yes** (Figure 74).

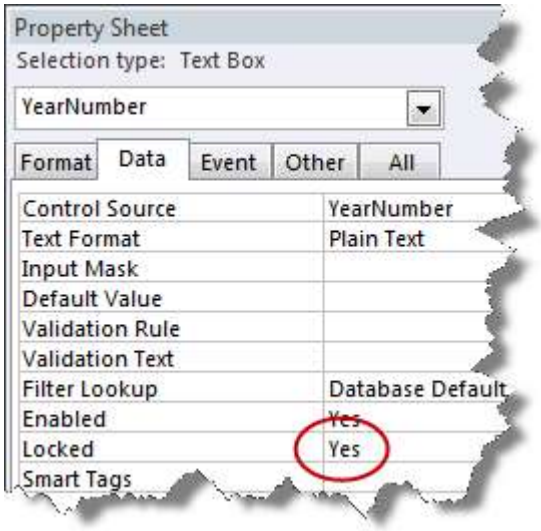


Figure 74 – set Locked to Yes

- Test out the locked field by looking at **Form View** and trying to edit the data in the field which you have locked.

Note You can also use the **Enabled** property under the **Data** tab to stop searching or entering the field, but this means that you cannot then use the field for sorting.

Changing the order of data entry (tabbing order)

Note Pressing the **TAB** key moves from one data field to the next. However, if you have moved fields around in Design View, then the tabbing order is likely to be wrong.

16.4 To change the order of data entry tabbing on the form:

- In **Form View**, try **TABBING** from field to field and see if the order is odd.
- In **Design View**, go to the **Design** tab and select **Tab Order**.

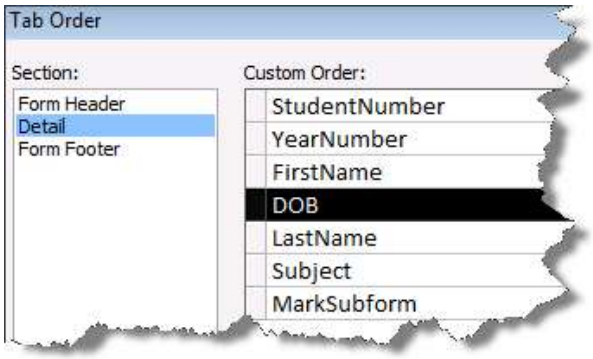


Figure 75 - changing the tab order

- In the **Tab Order** dialogue box change the order of the fields by clicking once on the grey box to the left of the field name.
- Click on the box (which is now black) again and drag the field to a new position in the list.
- When the order is correct, click on **OK**.

Note The **Auto Order** option doesn't always work as might be expected!

Adding an image

www.bristol.ac.uk/imagelib holds a library of corporate graphics which you can use.

Note Forms can include pictures, sounds and other objects. These can be stand-alone, *unbound* objects (i.e. the same object is shown on every record), or *bound* and stored in the underlying table (e.g. a photo of each student).

16.5 To insert an image onto your form:

- Save one of the images from the webpage (the easiest way is to right-click on the image and select **Copy**).
- Right-click in the **Form Header** and select **Paste** from the menu that appears.
- Notice that the picture is placed inside a box, which can be resized.

16.6 To format the image to taste:

- Resize the box and see what happens to the picture inside.
- Open the **Property Sheet** if it is closed and select the **Format** tab.

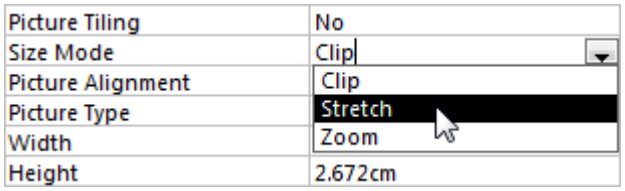


Figure 76 – Size Mode properties

- Click on **Size Mode** and experiment with the options available from the dropdown list: **Stretch** shows the whole picture stretched to outline; **Zoom** shows the whole picture in proportion (Figure 76).

Task 17 Add a dropdown box

Objectives To add a dropdown box to the form, from which to select data from a linked table.

Comments When you click on a dropdown box a list of values appears. Selecting the value enters it into the field. Not only does a dropdown box reduce the need for typing, it also helps to ensure accuracy and consistency of data. Combo boxes can use either values from an existing table (generally most useful) or values you type in yourself.

17.1 To create a dropdown box containing subject codes and course names:

- Make sure that you have **MyStudentForm** open in **Design View**.
- In the **Design** tab of the **Ribbon** click once on the **Combo Box** icon.

- Draw a box on your form roughly where you want the **Combo Box** to appear.
- The values will come from another table, so accept the defaults and click **Next**.
- From the list of available tables, select **Table: Subjects** and click **Next**.
- Double-click on **Subject** and **CourseName** (in that order) so that they are added to the **Selected Fields** box and click on **Next** (Figure 77).

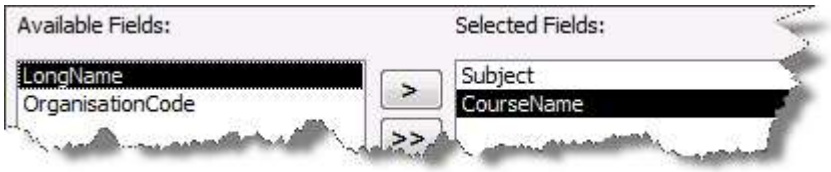


Figure 77 – select Subject and CourseName as above

Note **Subject** must be chosen first because the first field chosen is the one stored later.

- Sort by **CourseName** (leave the default as **Ascending**) and click **Next**.
- If necessary, adjust the width of **CourseName**. **Subject** is not visible, which is what we want, so leave the key column hidden and click on **Next** (Figure 78).

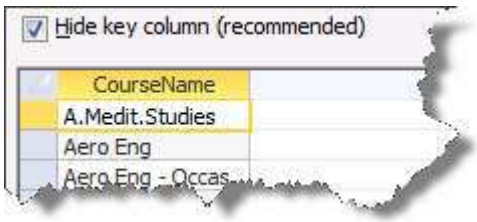


Figure 78 – leave the key column (Subject) hidden and adjust CourseName width

- From the dropdown list select **Subject** and click on **Next** (Figure 79).

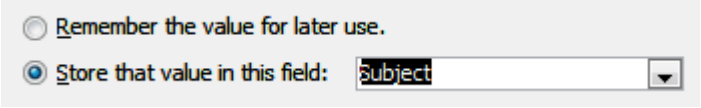


Figure 79 – store the value in the Subject field in the Student table

Note The Subject field we have chosen to include in the dropdown box is the *primary key* from the Subject table. The Subject field on the form in which we want to store the value is a *foreign key* in the Students table.

- The wizard now suggests a name for your new combo box. Name it as ***SubjectCombo*** and click **Finish**.

17.2 To test your new combo box and to tidy up some loose ends:

- Click on **Form View** to try out your new combo box.
- Check that the code in the **Subject** field changes when you select a new subject from the list. If it doesn't change, then delete the combo box and run through the wizard again, as you will most likely have missed out on one of the above stages.
- Delete the existing **Subject** field from the form if you don't want to see both the code and the name of the subject.

Note Even if you delete Subject from the form, the combo box still updates this field when you enter data using the combo box because the control source is bound to Subject.

- Change the name on the combo box's label to ***Subject name***, adjust the size and position of the combo box if necessary and once you are happy, save the form.

Figure 80 – the contents of the dropdown box are arranged in alphabetical order

Limit to List

17.3 To prevent entry of items that are not included in a combo box's list:

- In the **Property Sheet**, select the **Data** tab and look at the default for **Limit To List**.

Note The default for this combo box is set to **Yes** already. This is because Access recognises that you are entering data into a field that is a foreign key, where the relationship demands referential integrity. If you defined the contents of the list yourself, this would default to **No**.

Disallowing null values

Note Combo boxes always accept null values when **Limit to List** is set to **Yes** whether or not the list contains null values.

17.4 To check the current default and disallow null values:

- Open **MyStudentForm** in **Form View** and try giving a blank subject to a student.
- Close the form completely (do not just minimise the form) and open the **Students** table in **Design View**.
- Set the **Required** property of **Subject** to **Yes** to make sure null values are not accepted (Figure 81). (This is probably already set to Yes.)

- Close and save the table, selecting **Yes** and **Yes** on the warning messages that appear.

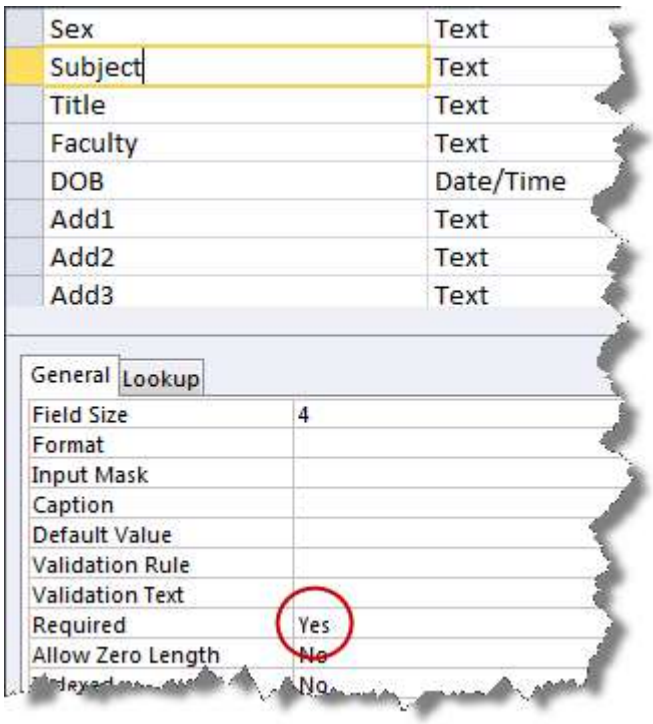


Figure 81 – set the Required property of Subject to Yes in table Design View

Note You can only set this property from the table.

- Reopen **MyStudentForm** and try to give a blank subject to a student.

If you have time…

1.4 To practice creating combo boxes:

- Using the **I will type in the values that I want** option, add another combo box that enters values into the **Title** field on the **StudentForm** (e.g. ***Mr***, ***Mrs***, ***Miss***).

Note You will have to add the **Title** field to the form from **Add Existing Fields** in the **Design** tab of the **Ribbon**.

- Limit the combo box to only accept items from the list.

Task 18 Add a calculation to a form

Objectives To add calculated fields onto a form.

Comments You can use expressions and functions to add calculated fields to a form, including many of those listed in **Access query language elements** (acc-r4). You must use a Text Box to create calculated fields. Do not confuse the Text Box and Label options.

A simple calculation

18.1 To create a simple calculated field on the form:

- In **Design View**, select the **Design** tab on the **Ribbon** and click the **Text Box** button once and let go.

- Move the mouse pointer to where you want to add the text box on the form, then click and draw a small rectangle with the mouse button depressed.

Note The new text box will say **Unbound** because you haven't yet told Access what value the new field control is to show.

- Click in the unbound box and type ***=[dob] + 21*** (Figure 82).

Note Calculations must always be preceded by **=** to indicate that it is a calculation rather than an actual value.

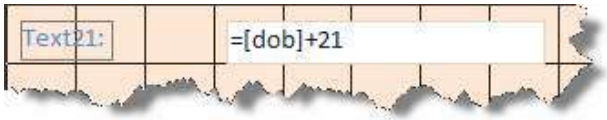


Figure 82 – creating a simple calculation in a new text box

Note This uses the existing DOB field and a static number to add 21 days to the date of birth (days is the default value).

- In the label box to the left type a suitable label.

Warning! Changing the label text does not alter the name of the text box. If you want to name the text box, this must be done via the text box properties – see 18.2 below.

- View the form and change the date of birth to see what happens to the new text box.
- In **Design View** change the calculation in the text box to ***=[dob]+[StudentNumber]***.

Note This now adds two fields together with the calculation adding the relevant student number to the date of birth in days.

Using the previous calculation in a subsequent calculation

18.2 To use the previous calculation in a new calculation:

- In **Design View** click on the text box that you have just created.
- Open the **Property Sheet** and select the **Other** tab, then look at the content of the **Name** field – it will be called something along the lines of **Text21** (Figure 83).
- Rename this field as ***YearPlus***.

Figure 83 – rename the field as YearPlus

Note It is useful to give calculated fields sensible names so that you have a better idea of what the control is when trying to sort out tabbing orders – otherwise you will see unhelpful Access-generated control names in the tabbing order list.

- Create a new text box from **Design** tab of the **Ribbon**.
- Type ***=[YearPlus]+21*** and check the result in **Form View**.

If you have time…

Conditional calculations

Note You can use the function =iif(expression, true, false) where *expression* is the criteria, *true* is what to do if the criteria is true and *false* is what to do if the criteria is false.

1.5 To create a text box with a conditional calculation:

- Create another text box using the **Controls** section from the **Design** tab and enter ***=iif([PaidFees]=no,"Fees still owing","Paid")*** then check the result.

Note **iif** above is not a misprint and stands for *if and only if*. Also make sure that you enter the correct number of [ ] and ( ) and make sure that they are entered *exactly* as above.

Task 19 Using filters

Objectives To create filters to find selected records when browsing the database.

Comments Filters and queries are very similar in that they are ways of searching the database quickly. The main difference is that queries are useful when you know what data you are looking for, whilst filters are useful for *browsing* the database when you don't necessarily know what data it holds.

What do I need to know about filters before I start?

Question	Answer
What is the difference between a filter and a query?	One difference between filters and queries is the result. With a query you can specify the fields that you see for the given criteria. With a filter you see all of the fields for the given criteria. You cannot specify the fields or the order of the fields.
What different methods of filtering records are there?	There are four methods: • Filter by Selection • Filter by Exclusion • Filter by Form • Advanced Filter/Sort
Which database objects can I filter on?	You can create filters on tables and queries in Datasheet View and in forms and subforms in either Form View or Datasheet View.
Does removing a filter delete it?	Removing a filter does not delete it - it just does not apply it. When you save a table or form, Access saves the last filter. You can reapply the filter by clicking on Apply Filter.
How do I find out if I have a filter saved?	You can check if a filter is attached to an object by looking at the object's properties.
Can I break anything by using filters?	Yes! Treat filters with care, especially Filter by Selection because it is very easy to modify the data by mistake.

Selection filter on a whole field

19.1 To use a Selection filter on a whole field:

- Open **MyStudentForm** in **Form View**, noting how many records there are specified by the navigation buttons (you might find it easier to do this task if you go to the **Datasheet View** of the form – though if you want to do this there is an extra step involved – see Note below).

Note If your new form does not have a Datasheet View option in the Views section on the Ribbon, go to Design View and select the form's properties (see 14.2 for how to do this). In the Property Sheet, select the Format tab and change Allow Datasheet View to Yes.

- Navigate through the records until you find one where the student is, for example, in year **2**.

Warning! Do not type ***2*** in the **Year** field to find a record because all this will do is change whatever is in the field to a ***2***. You need to go to a record that already includes what you want to filter against.

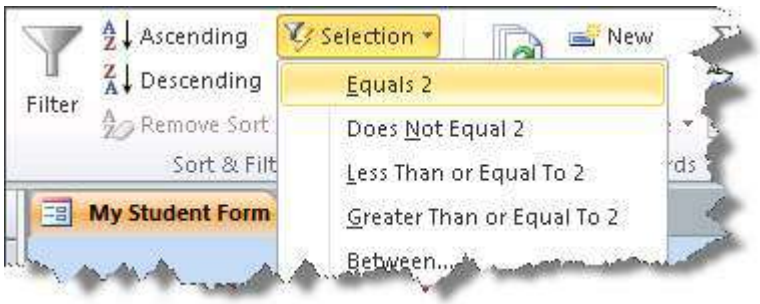


Figure 84 – the Selection filter option

- Click in the **Year** field that contains the value **2**, and then click on **Selection** and choose **Equals 2** from the dropdown list (under the **Home** tab of the **Ribbon**).
- Note that fewer records are displayed because only students in year 2 are displayed, and that **Filtered** is now highlighted in the **Navigation Bar** at the bottom of the window.

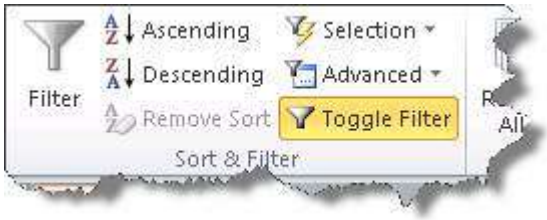


Figure 85 – remove the filter

- Click the **Toggle Filter** icon (Figure 85) to remove the filter and display all the records again.
- Now look at the form in **Design View** and select the form (if you have forgotten how to do this, refer back to 14.2).
- Having selected the form, open the **Property Sheet**, select the **Data** tab and look at **Filter** (Figure 86).

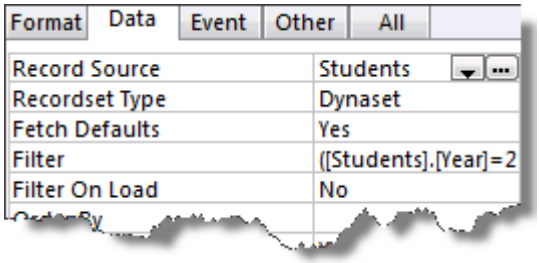


Figure 86 – even though the filter has been removed, the form records the last filter

Selection filter on only part of a field

19.2 To use the **Selection** filter on only part of a field:

- Return to **Form View**.
- In **Date of Birth**, find a record where **Date of Birth** includes **July** and highlight just that word (Figure 87).

Figure 87 – select just the word July

- Click **Selection** followed by **Contains July**. This will only show students born in July.
- Do not remove the filter as the results of this filter will be used in the next task.

Selection filter using more than one filter

19.3 To use a **Selection** filter using more than one filter:

- Use the filter from the previous task, showing all those with a birthday in July.
- Click in the **Year** field where the record is for year **1** and click **Selection** followed by **Does Not Equal 1** to display just those students who were born in July and who are not in year 1.
- Remove the filter (**Toggle Filter**).

Filter By Form

Note If you want to choose the values to search on from a list use **Filter By Form**. This is very useful to show you what values are in that field. It is also useful when specifying multiple criteria.

19.4 To use Filter By Form:

- Open the **Students** table (so that you can see a filter working from a table).

Figure 88 – remove existing filter if necessary

- Select **Advanced** followed by **Clear All Filters** to remove the previous filter.
- Select **Advanced** again, followed by **Filter By Form**.

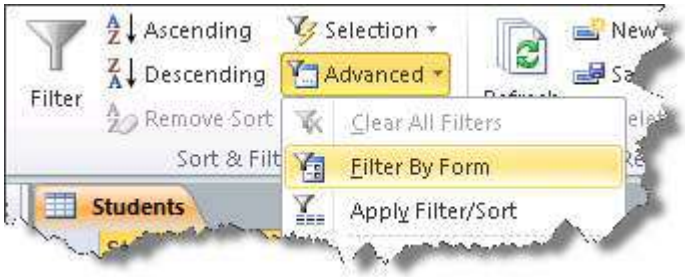


Figure 89 – select Advanced / Filter By Form

- Click each field in turn and notice the dropdown arrow that appears when you click in each field (Figure 90) – each individual value for that field is shown.

Note You can specify the filter criteria by selecting the value you are searching for from the list for that field, or by typing the value or an expression into the field.

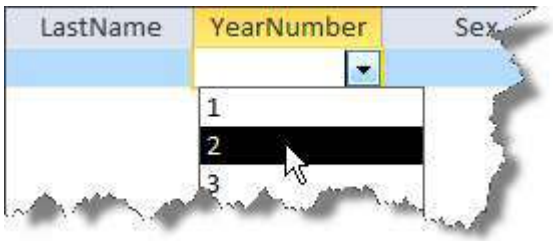


Figure 90 – you can choose values from the dropdown list

- Click on **YearNumber** and select **2** from the dropdown and apply the filter (**Toggle Filter**).
- Remove the filter by selecting **Advanced** / **Clear All Filters**.

19.5 To display surnames starting from "S" using Filter By Form:

- Select **Advanced** / **Filter by Form** again.
- Click in the **LastName** field and press the **S** key.

Note The dropdown list now starts at **S** so that you can now select the name you want without having to scroll all the way down from the start of the list. It is not possible to display only those students with surnames beginning with S by this method.

- Choose **Smith** then apply the filter (**Toggle Filter**) then clear the filter (**Advanced** / **Clear All Filters**).

19.6 To list only surnames that start with S:

- Select **Advanced** / **Filter by Form** again.
- Type ***S**** in the **LastName** field and apply the filter (Access automatically alters what you have entered to ***Like "s*"***) (Figure 91).

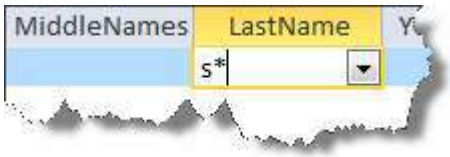


Figure 91 – this will find just those surnames that begin with the letter 's'

19.7 To use another type of condition when using Filter By Form:

- Clear all filters and in **Filter By Form** view enter ***>=1/1/72*** in **Date of Birth** to find students born after 1 January 1972.
- Apply the filter and view the results (Access automatically adds hashes to show that it recognises that it is looking for a date) (Figure 92).

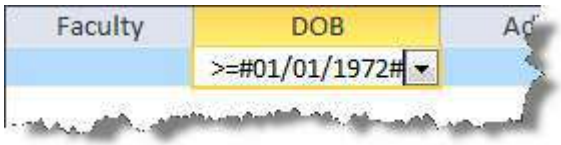


Figure 92 – this will find all those students born on or after 1 January 1972

19.8 To find null values by using Filter By Form:

- Clear all filters and in **Filter By Form** view**,** select **Addr3**, enter ***is null*** and apply the filter to find records by those students with no value in **Addr3** (Figure 93).

Figure 93 – this will find all those records where there is no data in the Add3 field

Note If you specify values in more than one field, the filter returns records only if they satisfy all values. To specify alternative values, click the **Or** tab at the bottom of the window, and enter the optional criteria there.

Filter records by using Advanced Filter/Sort

Note For complex filters use the **Advanced Filter/Sort** option. This lets you add all the filter criteria and the sort order in one step.

19.9 To filter records using Advanced Filter/Sort:

- Clear all filters and select **Advanced** / **Advanced Filter/Sort** to open the query grid (Figure 94).

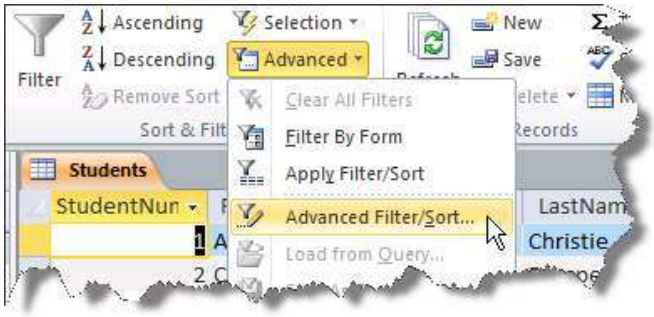


Figure 94 - opening the advanced filter

- Add **Year** and **LastName** to the grid.
- Add criteria to find students in **Year *2***, sorting by **Lastname** ascending (Figure 95).

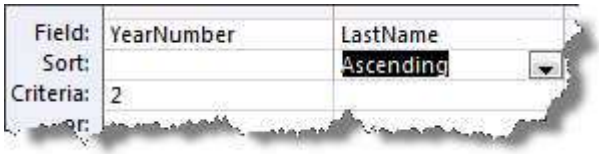


Figure 95 – creating an advanced filter

- Apply the filter and view the results.
- Return to the grid (**Advanced** / **Advanced Filter/Sort**), click on the **Save** icon above the **File** tab and save the filter as ***TestFilter***.

- Apply the filter again then clear all filters and close the **Students** table

19.10 To load a saved filter:

- Look in the **Queries** section of the **Navigation Pane** to find **TestFilter**.
- Double-click on **TestFilter** to apply the filter.
- Close **TestFilter** and then close any other objects that you still have open.

Task 20 Using and creating reports

Objectives To explore the elements that make up an existing report and to create a report using the Report Wizard.

Comments Reports let you display and print out data in an attractive format. Reports also let you group data together, such as, in the report that you will create, showing a list of all students taking each course under the course title. You can also include calculations on your reports based on numerical data.

What do I need to know about reports before I start?

Question	Answer
If I spot something wrong with the data in a report, can I edit the data in **Report View**?	No. Data shown in reports is only for display. To edit the data you will have to edit the data in **Table View** or **Form View** and then run the report again to show the changes made in the underlying data.
What is the report based on?	As with creating a form, a report is based on a query or table. You cannot include fields in your report which are not in the table or query. You may find it easier to create any expressions in the query rather than in the report.
Is the **Report Wizard** any good?	**Report Wizard** may not produce exactly what you want but it is better than the alternative of **Design View**, which provides you with a blank page! The wizard comes into its own when it comes to grouping data and providing summary reports, graphs and labels.
Isn't this all a bit like hard work?	The good news is that, just like fine-tuning a form, the more experience you get, the easier it becomes.
Don't I recognise a lot of this fine-tuning from form design?	Yes – most report design modification is done in exactly the same way as when modifying a form, though you need to understand grouping levels in reports.

Viewing existing reports

20.1 To view an existing report:

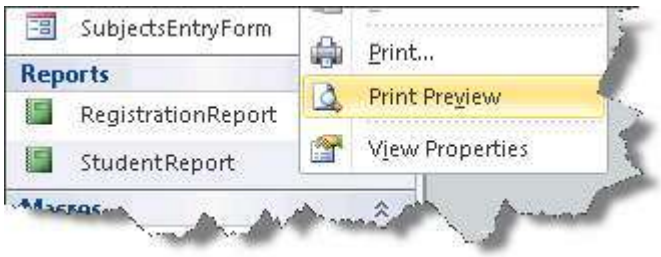


Figure 96 – right-click on the report to open a context-sensitive menu

- In the **Reports** section of the **Navigation Pane**, right-click on **StudentReport** and select **Print Preview**.
- Click on the report or use the **Zoom** icon (magnifying glass) to change the magnification and use the vertical and horizontal scroll bars to browse the report.
- Notice that the report has a picture of the University crest and that the students are all grouped under the name and code of their course.

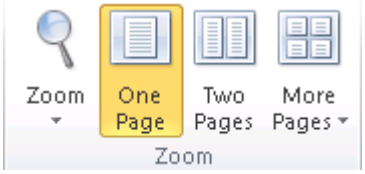


Figure 97 - the print preview toolbar

- Use the various icons on the **Ribbon** (Figure 97) to look at the different ways of viewing the report, having taken into account the warning below!

Warning! Do not click on the **Print** icon!

- Close the report by clicking on the **Close Print Preview** icon to return to the **Database window**.

Creating a report using Report Wizard

20.2 To create a report using the Report Wizard:

Figure 98 – select Report Wizard

- Click on the **Create** tab on the **Ribbon** and select **Report Wizard**.
- Select **Query: RegistrationQueryForReport** as the object from which the data comes.

Note This query uses three tables so all the fields from those three tables are available to use for the report.

- Include all fields except for **Faculty** and click **Next** (Figure 99).

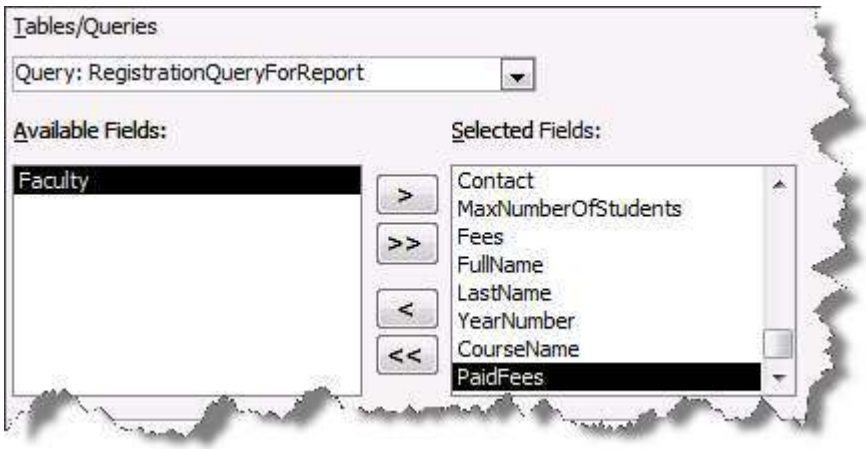


Figure 99 – select all fields except for Faculty

- When asked how you want to group the data, select **by Faculties** (this should already be highlighted) and click **Next**.
- On the next screen choose **Next** as we don't want any additional grouping levels.

Note You can select up to four grouping levels if necessary. Though note that you have to have relationships between tables set up, otherwise you would not be able to create any grouping levels – Access only knows what grouping levels are possible based on the relationships that have been set up within a database.

- When asked what sort order you want, select **CourseName** in the first dropdown box followed by **LastName** in the second dropdown box (Figure 100). Don't click on **Next** yet.

Figure 100 – sort by Coursename followed by Lastname

- Have a look at the **Summary Options** (these would normally put calculated fields and percentages onto your report) to see what is available (noting that **Count** is not included), though don't add anything - we are going to add some 'manually' later. Click **Cancel** followed by **Next**.
- Choose **Outline** for the look of the report and click **Next**.
- Click on each style option in turn to see a preview: select **Office** and click **Next** (see note below).

Note Depending on setup, you may not see the above style option.

- Name the report ***MyRegistrationReport*** and click **Finish** to preview the report.

Note The name you choose appears as the main header on the report and the name of the report. If the name already exists a suffix will be added to preserve both objects.

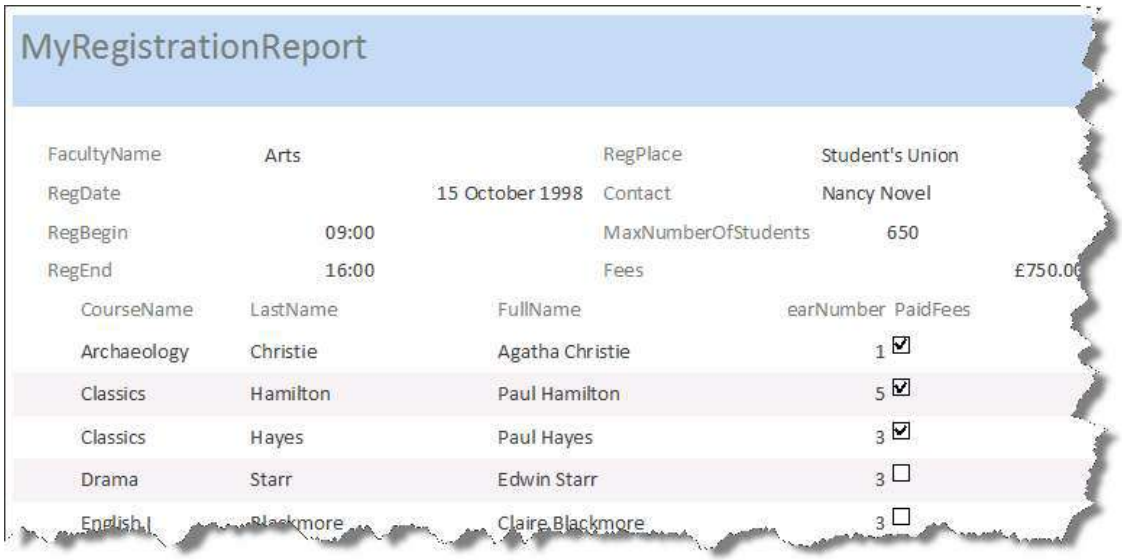


Figure 101 – basic grouped report created using Report Wizard

- Notice that the report doesn't look particularly beautiful – but we will do something about this in the next task.
- Close the report by selecting **Close Print Preview** - this takes you into **Design View**, which we don't want to see quite yet, so close this view as well.

Task 21 Customising a report

Objectives To understand the different grouping and sorting levels in a report and to improve the layout and design of your new report.

Comments There is very little difference between Design View in forms and reports, so this section points out the main difference – different sections depending on sorting and grouping levels – along with a few other useful tasks.

Note Controls, such as text, data labels, calculations, etc., can be added, moved and sized, and font size can be changed, emboldened, italicised, etc. in exactly the same way as in **Design View** for *forms*. The **Property Sheet** has additional layout formatting capabilities.

Look at the design of an example report

21.1 To look at various aspects of the structure and design of a pre-existing report prior to working on your own report:

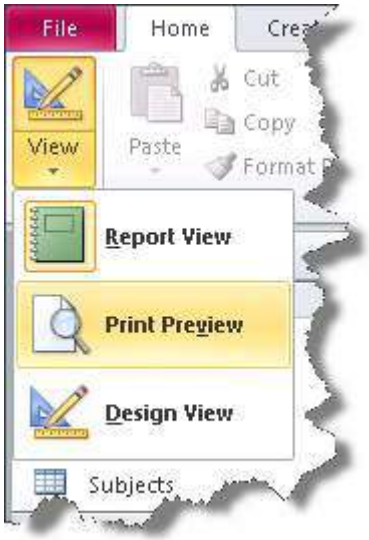


Figure 102 – you will need to toggle between Design View and Print Preview

- Open **RegistrationReport** in **Design View** and look at each of the items described in the table below – you will need to move between **Design View** and **Print Preview** to spot some of these.

Aspect of report to view	Description and/or 'how to' tips
Lines	A number of extra lines have been added to make the design of the report more attractive. Lines can be added from the **Controls** section in the **Design** tab.
Text fields	Text fields containing expressions have been added to the report.
Running total	Consecutive numbers appear to the left of the student details. Notice that the numbering starts at ***1*** in each Faculty.
Report structure and sorting and grouping levels	Notice that where a form in **Design View** only has three sections, *Form Header*, *Detail* and *Form Footer*, here there are currently six sections, though one has no content.

- Look at **=Now()** – this can show the time and/or date depending on properties set.
- Look at the **=1** field in the **Detail** section – change the **=1** to ***=5*** and see what difference this makes when you look at the report in **Print Preview**.
- Look at the **=sum([fees])** fields in **Faculty Header** and **Report Footer** and note that different values are displayed in **Print Preview** depending on where the calculation is done.
- Look at **="Page" & [Page] & " of " & [Pages]** – ***[Page]*** is page number and ***[Pages]*** is total number of pages.

Note Other aggregate functions such as count and avg can be used – see the **Access query language elements** document (document number acc-4).

- Play around with moving and sizing controls, and adding lines and text fields for a few minutes, just to gain some familiarity before moving on to redesign your own report in the following section.

Report design structure

21.2 To understand the design structure of your report:

Note There are more sections to understand with reports than with forms. Forms only have a Form Header, Detail and Form Footer.

- Still in **RegistrationReport** (in **Design View**) look at each section, as described in the following table.

Section	Description
Report Header	This is only printed once at the beginning of the report and could be just a title or a cover page.
Page Header	This is printed at the top of each page (there is nothing in this section in **RegistrationReport**).
Faculty Header	This section is here because you grouped the report by Faculty when you went through the wizard. This includes all the fields related to faculty: it appears on the report as many times as there are faculties with students attached.
Detail	This section shows each student's details repeated on for each faculty.
Page Footer	This is printed at the bottom of each page.
Report Footer	This is printed once at the end of the report and is often used to display grand totals and counts.

- Look to see where and how the objects in these sections appear on the report when previewed then close the report.
- Close the report and save any changes that you have made.

Redesigning the report you created earlier

You are going to add a new group footer section to your new report and then add a calculated field to this section. You will add a running total to sequentially number the students by faculty. There are then some suggestions that you can try for yourself, otherwise you can experiment as you wish with the redesign of your report.

Sorting and grouping levels

21.3 To add a Faculty Footer to the report:

21.4 Open **MyRegistrationReport** in **Design View**.

Figure 103 – select Group & Sort from the Grouping & Totals section of the Ribbon

- Amend the sorting and grouping properties for the report by selecting **Group & Sort**.
- Notice (underneath the **Design View** window) that **Faculty** is highlighted to show that grouping has been set (you did this when you went through the wizard).

Figure 104 – the Sorting and Grouping dialogue box

- Click on **More** in the highlighted **Group** bar.
- Change **without a footer section** to **with a footer section**.
- Deselect **Group & Sort** in the **Ribbon** to close the **Group, Sort and Total** window and notice the new, empty section labelled **Faculty Footer** (Figure 105).

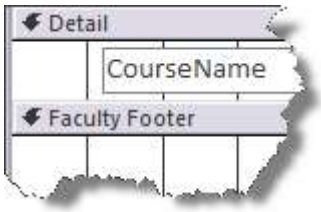


Figure 105 – notice that a new Faculty Footer appears

- Preview the report to see where this space now appears throughout the report.

Running total

21.5 To add a running total:

- Return to **Design View** and click on **Text Box** in the **Controls** section of the **Ribbon**.

- Add the text box in the **Detail** section of the report to the left of **CourseName**.
- Delete the label, which will say something along the lines of **Text39**.
- In the text box, enter ***=1*** (Figure 106).

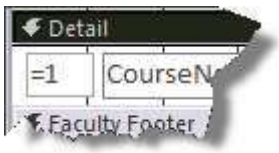


Figure 106 – the new text box next to the Coursename field

- Look at the report in **Print Preview** and then return to **Design View** and alter the size and position of the text box if necessary.
- Select the new text box and select **Property Sheet** from the **Ribbon**.
- In **Property Sheet**, select the **Data** tab.
- In **Running Sum** choose **Over All** and see what this does in **Print Preview**, then change to **Over Group** and check **Print Preview** again (Figure 107).

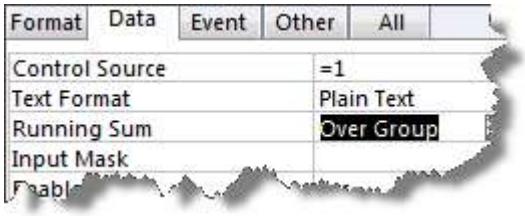


Figure 107 – try the different options under Running Sum

Counting students per faculty in the Faculty Footer section

21.6 To add a calculation that counts the number of students in each faculty:

- Create a new text box in the **Faculty Footer** section.
- Enter ***=count(*)*** into the text box, change the label so that it says ***Total number of students***, and preview the report (Figure 108).

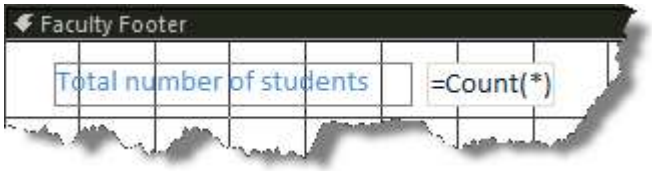


Figure 108 – new calculated field in the Faculty Footer

Add more calculations

21.7 To experiment with adding calculations:

- Create a new text box (for each calculation).
- Add the following calculations to a text box and note the different results, depending on which part of the report you place the calculation.

Calculation	Where to enter the calculation in Design View
= count(*)	Put this in the **Faculty Footer** and also in the **Report Footer**.
= sum([Fees])	As above.
= avg([Fees])	As above.
= sum(iif(PaidFees=true,1,0))	As above.
= iif([YearNumber]=5,"Final year","ongoing")	Put this calculation in the **Detail** section only.
=[Fees]*1.6	This type of calculation can be done to convert £s to another currency. In **Properties**, change **Format** to show Euros.

Force a new page

21.8 To force a new page after each set of faculty details:

- Make sure that you are in **Design View** and that the **Property Sheet** is open.
- Click on the **Faculty Footer** bar and click on the **Format** tab in the **Property Sheet**.
- Change **Force New Page** from **None** to **After Section** and preview the report.

Figure 109 – force a new page after each Faculty Footer

Change the formatting and add objects to taste

- Try changing the font size text and moving and resizing some of the controls.

Figure 110 – try adding boxes and lines (circled above) to your report

- Try using some of the features in the **Controls** section of the **Ribbon** to add, shapes and lines to separate data or some descriptive text of your own (you will need to click on the downward arrow to the bottom, right of the visible icons in the **Controls** section to see all options).
- Remember that you can use text boxes to create expressions, so you can join fields together the same way as with both queries and forms, e.g. ***=[FullName] & " is in year " & [Year]*** (don't forget to include = at the beginning of any expression or calculation).
- Click on **Print Preview** to view any changes you make.

Task 22 Produce mailing labels

Objectives To produce mailing labels with student addresses.

Comments You need to remember to select the object from which the data is to come before you start the Label Wizard.

22.1 To create mailing labels using the Label Wizard:

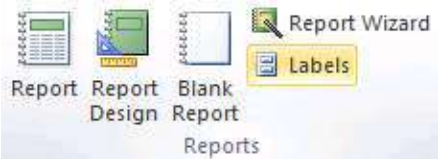


Figure 111 – select Labels

- Click once on the **Students** table in the **Navigation Pane** to select it.
- In the **Create** tab of the **Ribbon**, click on **Labels** from the **Reports** section to open the **Label Wizard**.
- For **Unit of Measure** select **Metric** and for **Filter by Manufacturer** select **Avery**.
- For **Product number**, scroll down and choose **Avery J8162**, then click on **Next**.

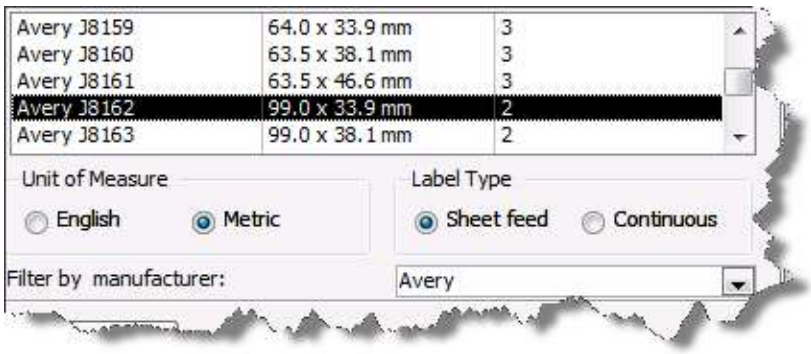


Figure 112 – select the options as above

Note You will find a list of codes starting with **J**, but the code you need is not amongst this batch – scroll down further and you will find another batch that includes the word **Avery** at the start. The code you need is amongst this batch.

- Leave the font and formatting of the labels as it is and click on **Next**.
- Add the fields listed in the following table by double-clicking on them in turn, making sure that you follow each field with the correct keystroke on the keyboard.

Field to add	Keystroke to use after adding field
Firstname	SPACE
Lastname	ENTER
Add1	ENTER
Add2	ENTER
Add3	ENTER
Town	ENTER
Postcode	No keystroke required

- Check that the Prototype label looks the same as that in Figure 113.

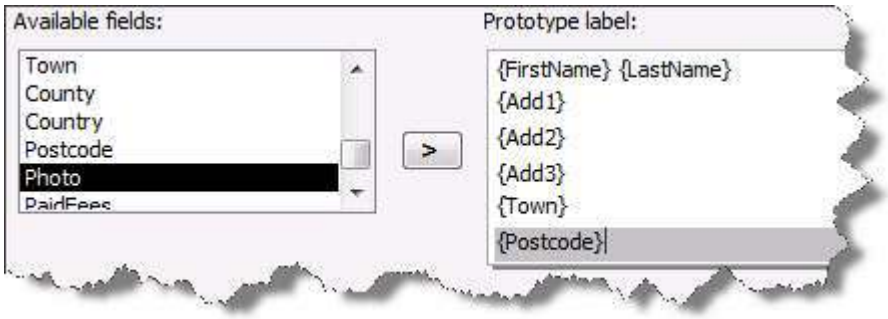


Figure 113 – the prototype label

- Click on **Next**, then double-click on **LastName** to sort by surname and click **Next**.
- Save the report as ***StudentLabels*** and click **Finish** to see the result.

22.2 To customise the labels:

- Click on **Close Print Preview** to view at the report in **Design View** (Figure 114).

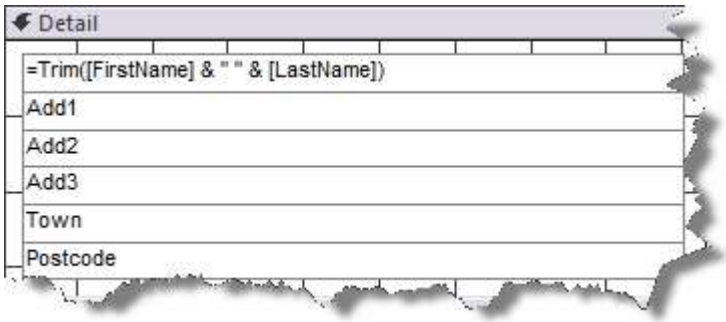


Figure 114 – view the label in Design View

- Open the **Property Sheet** and click on **Add1**.
- In the **Format** tab, look at the following properties: **Can Grow** makes all the data visible by wrapping it rather than truncating it; **Can Shrink** stops blank lines showing in the middle of the address when not all field are populated.
- **=Trim** in the top field removes trailing and leading spaces.
- Close the report.

Task 23 More table practice (optional task)

Default date

Note If you have a date field in a table and you want to make it default to the current date when new data is added the **Date()** function can be used.

23.1 To make a date field default to the current date in new records:

- Open the **Marks** table in **Design View** and click on the **SubmitDate** field.
- In the Field Properties at the bottom of the window, type ***Date( )*** as the **Default Value** property.
- Open the **Marks** table (save it when prompted) to see that existing values for **SubmitDate** have not been changed, but that today's date is entered automatically in the new record row at the bottom of the table (this value can be overwritten).
- Close the **Marks** table.

Table Lookup using another table

Note Table Lookup is used to create a field with a dropdown list that looks up data from another table. A field that is created as a lookup field in a table is shown as a lookup field when looking at tables, queries or forms – so it saves effort to create lookup fields in tables rather than forms.

23.2 To create a Table Lookup using another table:

Note If a relationship already exists between the current table and the table you want the **Lookup Wizard** to look up values in, you must delete the relationship before the wizard will work. Don't forget to add the relationship back in once finished.

- Open the **Relationships** window (in **Database Tools** tab) and delete the relationship between the **Students** and **Faculties** tables (right-click on the relationship and select **Delete**).
- Close the **Relationships** window and save changes if prompted.
- Open the **Students** table in **Design View** and click on the **Faculty** field.
- In the **Data Type** column, select **Lookup Wizard…** at the bottom of the list.
- The default is set to look up another table or query, so just click **Next**.
- Select **Table: Faculties** and click **Next**.
- Double-click on **Faculty** and **FacultyName** and click **Next**.
- Sort by **FacultyName** and click **Next**.
- Click **Next** again and name the lookup as **Faculty**.
- Save the changes to the table and close it
- Open the **Relationships** window.
- Right-click on the relationship and select **Edit Relationship**.
- Tick **Enforce Referential Integrity** and **Cascade Update Related Fields** then **OK**.
- Open the **Students** table and see that a dropdown arrow appears when you click into the **Faculty** field.
- Click on the arrow and select a different faculty.

Note Once you have created a Lookup list field, if you add the field to a form, Microsoft Access copies its definition into the form so combo or list boxes are created automatically. If you change the definition of a Lookup or Value List field in the table after adding it to a form, those changes will not be reflected in that form. To correct this, delete the field from the form and then add it again.

Table Look up using a specified list of values

23.3 To create a Table Lookup using a specified list of values:

- Open the **Students** table in **Design View** and click on the **Title** field.
- In the **Data Type** column, select **Lookup Wizard…**
- Select **I will type in the values that I want** and click **Next**.
- Enter ***Mr*** into the empty cell and then add ***Mrs***, ***Miss***, ***Ms*** and ***Dr*** into the subsequent cells.
- Click **Next** and name the lookup as **TitleLookup**.
- Open the **Students** table and save the changes.
- Click in the **Title** field and use the dropdown list to change some of the titles from ***Mrs*** to ***Ms***.

Table Lookup using values from the same table

Note The **Lookup Wizard** data type does not allow you to use the table you are currently changing.

23.4 To create a Lookup box based on data held in the same table:

- Open the **Students** table in **Design View** and click on the **Sex** field.
- In the **Field Properties**, select the **Lookup** tab.
- In **Display Control** select **Combo Box** and in **Row Source Type**, select **Table/Query**.
- In **Row Source** type the SQL statement, ***select distinct sex from students order by sex*** to create a list box that lists the existing sexes entered so far in alphabetical order without duplication.

Note This can also be done on a form in **Design View** by right-clicking on the **Sex** field and selecting **Change To**. Select **Combo Box**. Open the **Property Sheet** for the **Sex** field and insert the row source as above. In query **Properties** set **Unique Values** to **Yes**.

- Look at the result of your changes in **Datasheet View** and change one field to ***3***.
- Select **Records** / **Refresh** and look at the contents of the dropdown box again to see that you now have three sexes available, ***1***, ***2*** and ***3*** ("3" could, perhaps, mean *sex undisclosed*).
- Close the **Students** table.

Task 24 More easy queries (optional task)

Objectives To provide more valuable query practice.

The not operator

24.1 To create a query using the not operator:

- Create a new query based on the **Students** table and add **LastName** and **Town** to the grid.
- In the **Criteria** box for **Town**, enter ***not Bristol*** to list all students not living in Bristol.

Date expressions

24.2 To use date expressions in a query:

- Remove the criteria from the previous task and add the **DOB** field twice.
- In the second **DOB** field change **DOB** to ***DOB+7*** to add 7 days to the date of birth.
- Change **Expr1:** to ***Next week:*** (don't forget to include the colon).
- In the next column type ***Next year:[Next week] +365*** and check the query results.
- In the design grid, right-click on the **Field** row for **Next week** and open **Properties…** to look at the display options under **General** / **Format**.
- Select several and look at the way these display the date when you run the query.

Using Functions

Note A function is a small program to perform a task and return a value. Refer to **Access query language elements** (acc-2) for a complete list of functions and examples.

24.3 To experiment with using functions in a query:

- Remove the two fields added during the previous task and enter ***left (FirstName, 1)*** in the first empty column to return the first letter of the field. Check the results.
- In the next empty column enter ***strconv(Town, 1)*** to the grid and look at the results.

Note **strconv** capitalises the first letter of each word in the field. Thus, if the town field shows all values in uppercase, such as ***BRISTOL***, it would now display ***Bristol***. This is a very useful function for showing text consistently.

- Change the **1**, first to ***2*** and then to ***3***, and check the results each time.

24.4 Remove all the fields from the grid and enter ***Max (Len*(*LastName))*** to show the length of the longest surname. (If you don't believe it, count the number of letters in ***Rumpelstiltskin*** just to check!)

More Grouping

24.5 To experiment further with grouping:

- Start with an empty grid and add the **YearNumber** field twice and click on the **Totals** option.
- In the second **YearNumber** column, change **Group By** to **Count** and enter ***>10*** in the **Criteria** field to show all years with more than 10 students.
- In the first **YearNumber** column (the one with **Group By**), enter ***>1*** in the **Criteria** field to show all years above year 1 which have more than 10 students.

Task 25 More advanced queries (optional task)

Objectives To use functions, create a crosstab query using the Crosstab Query Wizard and look at joins between tables in queries.

Comments These tasks are especially useful for researchers and those needing to analyze data. Functions always need round brackets around the arguments.

Finding a person's age using a simple date expression

25.1 To find a person's age by using a simple date expression:

- Create a new query based on the **Students** table and add the **DOB** field.
- In the next empty field enter ***Date( )-DOB*** and look at the result of the query, noting that if you subtract two dates then you will get the difference in days.

Note **Date()** is today's date and must have round brackets because it is treated as a function even though it takes no arguments. Another function **Now()** includes time.

Finding a person's age using the Datediff function

25.2 To find a person's age by using the DateDiff function:

- In the next empty field enter ***DateDiff("d",DOB,Date( ))/365.25*** and look at the result of the query.
- Change **Expr1:** to ***Age:*** (don't forget to include the colon).

Note For further information on the DateDiff function, go to the Access user-support website at: http://www.bristol.ac.uk/is/computing/advice/software/packages/access/

Rounding (as well as basing one calculated field on another)

25.3 To round numbers up and down to a whole number:

- In the next empty field enter ***int(Age)*** and look at the result of the query.
- Change **Expr1** to ***Age rounded down***.

Note **int** rounds the age down to the nearest integer. To round up add **0.5** to the age that is, **int([age]+0.5)**.

- Change ***Age rounded down: Int([Age])*** to ***Age rounded up: Int([Age]+.5)*** and look at the result of the query.

Date difference in months

25.4 To calculate the age calculated in months rather than days type:
Age in months:DateDiff("m",DOB,Date( )).

Set properties on an expression

25.5 To set properties on an expression so as to control the layout:

- Right-click the **Age** column, open the **Property Sheet** and, in the **General** tab, change **Format** to **Fixed** and **Decimal Places** to **2** and look at the result of the query.

Note If the number of places is set to 0, the age will be rounded up. You must specify fixed format to be able to change decimal places shown.

Crosstab query using the Crosstab Query Wizard

Crosstab queries show your data with row **and** column headings based on the values in two selected fields, and is a good way to summarise large amounts of data: for example, viewing the number of male and female students for each faculty.

25.6 To create a crosstab query using the Crosstab Query Wizard:

- In the **Create** tab of the **Ribbon**, select **Query Wizard**, followed by **Crosstab Query Wizard**, then click **OK**.
- Select **Table: Students** and click **Next**.
- Double-click on **Faculty** (depending on whether you have done a previous optional task, this field may now be named **FacultyLookup**) as the row heading (since it has more fields than **Sex**) and click **Next**.
- Now select **Sex** as the column heading and click **Next**.
- Click once on **StudentNumber** in the **Field** box and click once on **Count** in the **Functions** box and then click **Next**.
- Name it ***StudentsCrosstab*** and click **Finish** to view the results.

Customising a crosstab query using the QBE grid

Warning! If the crosstab query created above shows faculty names already, rather than just faculty code, then do not bother with this task.

25.7 To customise the above crosstab query using the QBE grid:

- Look in **Design View** and notice that there is now a **Crosstab** row and a **Total** row.
- Add the **Faculties** table.
- In the **Faculty** (or **FacultyLookup**) column, click in the **Table** row and use the dropdown box to change the table to **Faculties**.
- Now click in the **Field** row change the field to **FacultyName** using the dropdown.
- Check the result of these changes and notice the column heading.

Outer Joins

By default, when you link two tables in a query, only those records that have a corresponding value in the other table are shown. However, sometimes you may want to see records where there are no matching values.

25.8 To alter the join relationship to show results where there are no matching values:

- Create a new query and add the **Subjects** and **Students** tables.
- Add **CourseName** from the **Subjects** table and **LastName** from the **Students** table.
- Check the result and notice that there is a surname against every subject.
- Double-click on the relationship line between the two tables in the query and select **Include ALL records from 'Subjects'…** and click **OK**.
- Notice that the relationship now has an arrow at the many end.
- Look at the query again to see that for some subjects, no surname appears. This is because all subjects are now shown regardless of whether there are any students. There are no students studying unknown subjects because of referential integrity.

Note This query only works if there are two tables (or queries) being used. Any more tables (or queries) will result in an ambiguous query error.

Task 26 More advanced forms (optional task)

Objectives To add a calculation, add a tab control and create a calendar on a form.

Adding a calculation

26.1 To add a calculation to a form:

- Open **MyStudentForm** in **Design View** and add a text box from **Controls**.
- In the text box, type ***=int((date( )- DOB)/365.25)*** to calculate age and view changes.

Note The **=** indicates that this is a calculation rather than an actual value.

Adding a tab control to a form

Note A tab control avoids the need for long forms and is very useful when the data can be sub-categorised. For example, **Student Form** has the basic details of the student on the main form and then tabbed pages for address, photo, and summary statistics.

26.2 To add a tab control to My Student Form:

- Click once on the **Tab Control** icon in the **Controls** section of the **Ribbon** and then click once on the form where you want to place the control.

- Highlight several fields then right-click on one of them and select **Cut**.
- Click on the tab of the page where you want the fields to appear then right-click anywhere on that page and select **Paste** (you cannot drag and drop objects).
- Double-click on the individual page tab to open the **Property Sheet**.
- Select the **All** tab and change **Name** to ***Tab Page 1*** and **Caption** to ***My New Tab***.
- Add a new page by right-clicking on the page tab bar and selecting **Insert Page**.

26.3 To add a picture to a tabbed page:

- Click on the **Format** tab in the **Property Sheet** and click the three dots next to the **Picture** option, to get a list of pictures.
- Select a picture from the list and look at where it is inserted.

Creating a calendar on a form

26.4 To create a calendar on a form:

- Create a new form based on the **Faculties** table and add **FacultyName**, **Faculty** and **RegDate**.
- In **Design View** select **Active X Controls** from the **Controls** section of the **Ribbon** (you will need to click on the lower of the two downward arrows), then choose **Calendar Control 12.0** and click **OK**.
- Open the **Property Sheet**, click on the **Data** tab and set the **Control Source** to **RegDate** to display this date on the calendar.
- Go to **Form View** and change the date on the calendar.
- Click on the **Record Selector** bar to save the record and notice that the **RegDate** field changes.

Note You would not normally have both the field and the calendar - this is to illustrate that the field really changes.