

Module 2.1 Database Management

Introduction

When we store facts and figures we need to organise them. Putting them in a standard layout and placing them in order makes it easy to find the facts we need.

A **database** is a collection of facts stored as a computer file. The data is stored in a structured form, once the data is in the computer you can organise it and look at it in different ways.

In this module you will learn how to create and use a computerized database for storing information.

A database **file** consists of **records**. A record is a collection of information about a particular person or thing.

One record is made up of **fields**. Each field is a single item of information about the person or thing.

For example, the College will have a student **file** with information on all students in the college. There will be individual **records** for each pupil. Each record will contain several **fields** e.g. name, address, date of birth.

Microsoft Access 2002 is a database management program. With **Microsoft Access 2002**, you can create **tables** to contain your information, **queries** to retrieve information from the tables, and **forms and reports** to make the information available to users in various ways.

Task 1 - Databases

When you first create a database the information is stored in a **table**. A table is structured like a spreadsheet, records are stored in rows of the table and the fields of all records make up columns. Tables are the basic building blocks of a database.

- Ensure you have copies of Mod 2.2 Task 1 and Mod 2.2 Task 4 in your own folder
- Double click on the file Mod 2.2 Task 1 to open a previously created database file
- Double click on Table1 to browse the records in this file

	Artist	Album Title	Number Of Tracks	Record Label	CD Number
	Dodgy	Homegrown	11	A&M	12
▶	Air	Moon Safari	10	Source	13
	Beth Orton	Trailer Park	11	Heavenly	14
	Lionel Richie	Back To Front	16	Motown	15
	Led Zeppelin	III	10	Atlantic	16
	New Order	Technique	9	London	17
	Teenage Fanclub	Songs From Northern Britain	12	Creation	18

Record: 13 of 21

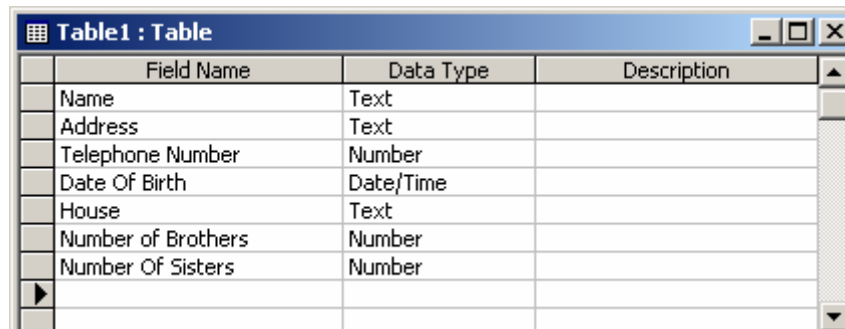
Answer the following questions in your jotter.

1. How many records are in this database file?
2. How many fields are in each record?
3. Name the fields in this database.
4. You must specify which type of data will be inserted in each field. For each field in this database, identify whether it contains text or numbers.
5. Write the contents of the Macy Gray record.
6. How many records are there for Lauryn Hill?
7. In which order has the database been organised?
8. Suggest an alternative way of organising this file.
9. What are the advantages in organising information in a computerised database file?

Task 2 - Creating a New Database

When you create a new database you first define your fields and field types. Then you can enter the information in a blank table.

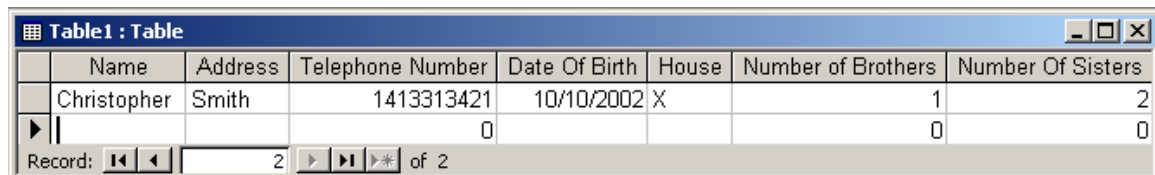
- Using the Start Menu, launch Microsoft Access
- Choose to create a new, blank database called Mod 2.2 Task 2 in your folder
- Choose to create a new table in design view
- Create the following fields



The screenshot shows the 'Table1 : Table' design view in Microsoft Access. The table has the following fields:

Field Name	Data Type	Description
Name	Text	
Address	Text	
Telephone Number	Number	
Date Of Birth	Date/Time	
House	Text	
Number of Brothers	Number	
Number Of Sisters	Number	

- Save this table and close it. You need not define a primary key
- Double click Table1 to start entering information
- Enter information for yourself and five classmates. If necessary, use email to obtain information from your classmates



The screenshot shows the 'Table1 : Table' datasheet view in Microsoft Access. The table contains the following data:

Name	Address	Telephone Number	Date Of Birth	House	Number of Brothers	Number Of Sisters
Christopher	Smith	1413313421	10/10/2002	X	1	2
		0			0	0

Record: 2 of 2

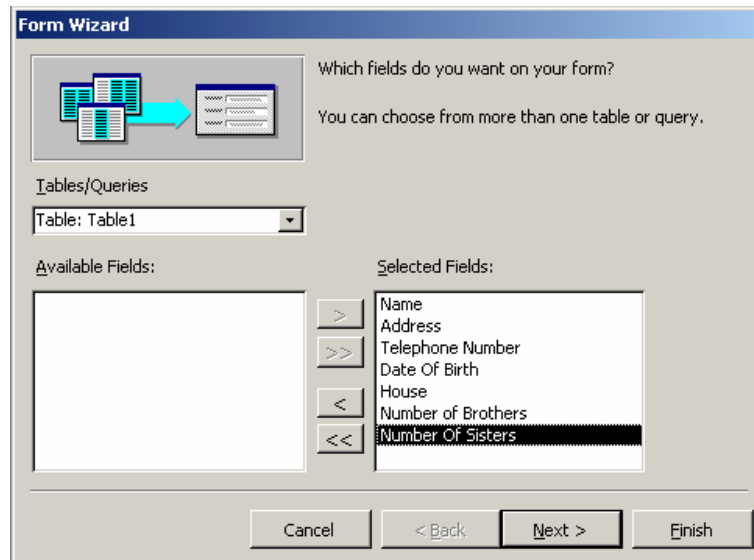
Answer the following questions in your jotter.

1. The fields above can contain text, numbers and date/time. List the other data types available.
2. Describe two ways of moving from field to field using the keyboard.
3. How would you add another field to this database?
4. What happens if you try to enter text in a number field?
5. What happens if you try to enter a number in a text field?

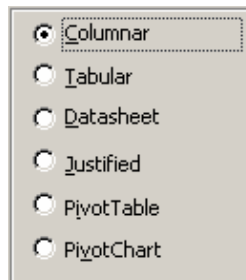
Task 3 - Creating Forms

An easier way to enter information in a database is to use a **form**. A form just presents an individual record in a graphical format to make entering, viewing and amending information easier.

- Open your Mod 2.2 Task 2 database file
- Go to Forms and choose Create form by using wizard
- Select all the fields to be included



- Choose columnar layout



- Choose any style from the list
- Finish the form by opening and entering information

Answer the following questions in your jotter.

1. What are the advantages to using forms instead of tables?
2. Why would an inexperienced computer user prefer forms to tables?
3. Are there any advantages to using tables instead of forms?

Task 4 - Sorting Records



One advantage of computerised databases is that you can very easily organise data in a particular way. This is called **sorting**. When you sort a database you choose which field or fields you want to put in order and which order - ascending or descending.

A **simple** sort puts the records in order by one field, e.g. sort pupils by surname. This is fine unless two pupils have the same surname. In this case you must perform a **complex** sort. In a complex sort you sort on one field and then on another, e.g. sort pupils by surname then, if any surnames are the same, sort by forename.

For example,

Smith, Jamie		Robertson, Tom
Smith, Edward		Smith, Jamie
Taylor, James	Sorted by Surname	Smith, Edward
Robertson, Tom	in ascending order	Smith, Clare
Smith, Clare		Taylor, James

Smith, Jamie		Robertson, Tom
Smith, Edward		Smith, Clare
Taylor, James	Sorted by surname	Smith, Edward
Robertson, Tom	then forename, both	Smith, Jamie
Smith, Clare	in ascending order	Taylor, James


- Open your Table 1 in the Module 2.2 Task 4 file
- Click on the Module Name field
- Press the Sort Ascending tool, 
- Next, Click on the Duration In Weeks field and press the Sort Descending tool, 

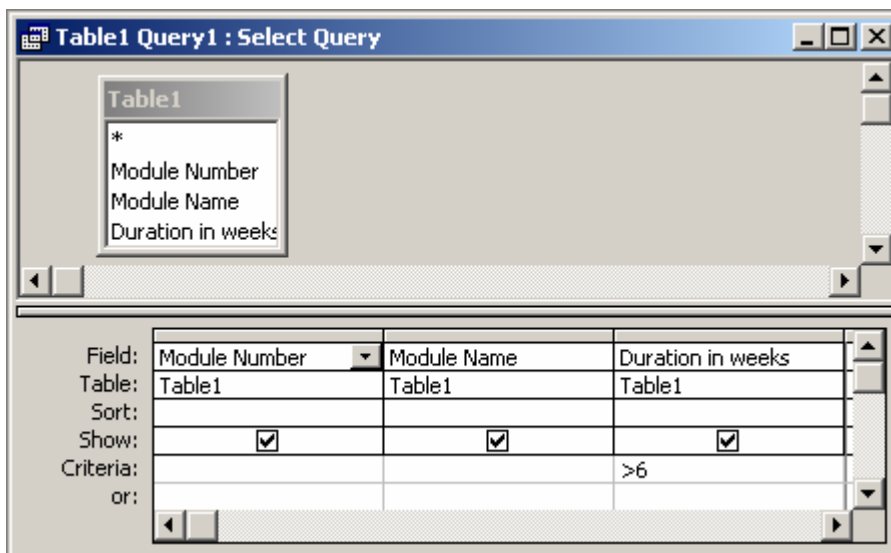
Answer the following questions in your jotter.

1. When text is sorted in descending order, does it go from A to Z or from Z to A?
2. When you sort Duration In Weeks in descending order, what order are Module Number and Module Name displayed in?
3. What is the main advantage in being able to sort information?

Task 5 – Queries

A query is a request for specific information from a database. You use queries to view, change, and analyse data in different ways. For example, if you want to find all S2 students in Xavier house you would produce a query to find this information.

- Open the Module 2.2 Task 4 file
- Click on the Query tool, 
- Choose to create a query by using the wizard
- Select all fields to be included in the query
- Choose a detail query, i.e. show every field of every record
- Choose to Modify The Query Design and press Finish
- Under Duration In Weeks enter the Criteria >6




- Save this query, close this query design then open it to view all records matching the criteria.

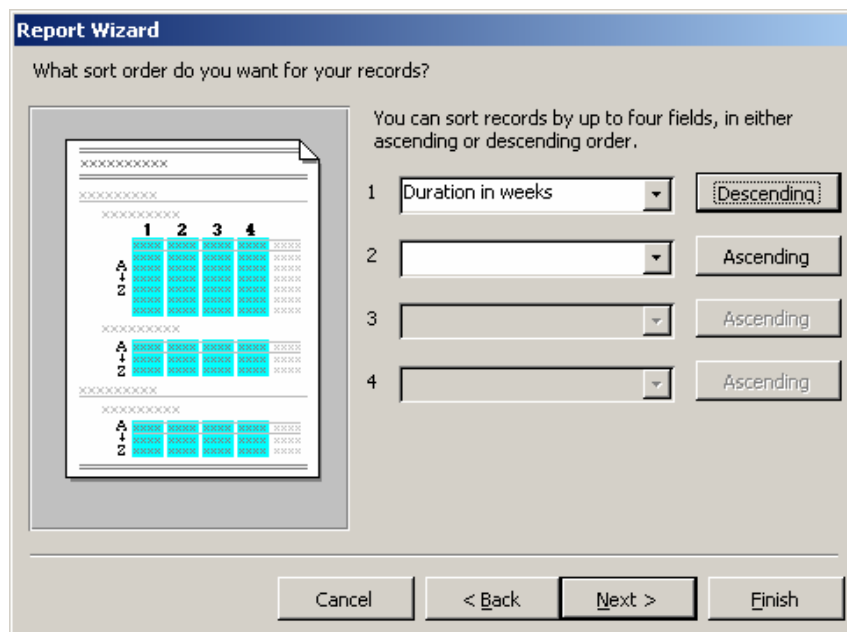
Answer the following questions in your jotter.

1. How many records matched the criteria Duration In Weeks > 6?
2. If the criteria were changed to be Module Number < 2, how many records would be displayed in the query?
3. For the Task 2 database, write criterion to find all Xavier students.
4. For the Task 2 database, write criterion to find all pupils with 2 or more brothers.

Task 6 – Reports

Frequently you will want to produce a printed copy of information in your database. A **report** is information in your database presented in a form ready for printing.

- Open the Module 2.2 Task 4 file. We will prepare a list of all modules, sorted by their duration, for printing
- Click on the Report tool, 
- Choose to make a new report using the report wizard
- Include all fields on your report
- Do not add any grouping levels
- Sort Duration in Weeks in descending order



- Choose a tabular report
- Choose any style
- Finish by previewing the report
- You should see the print preview of the information presented attractively. It is not necessary to print this report

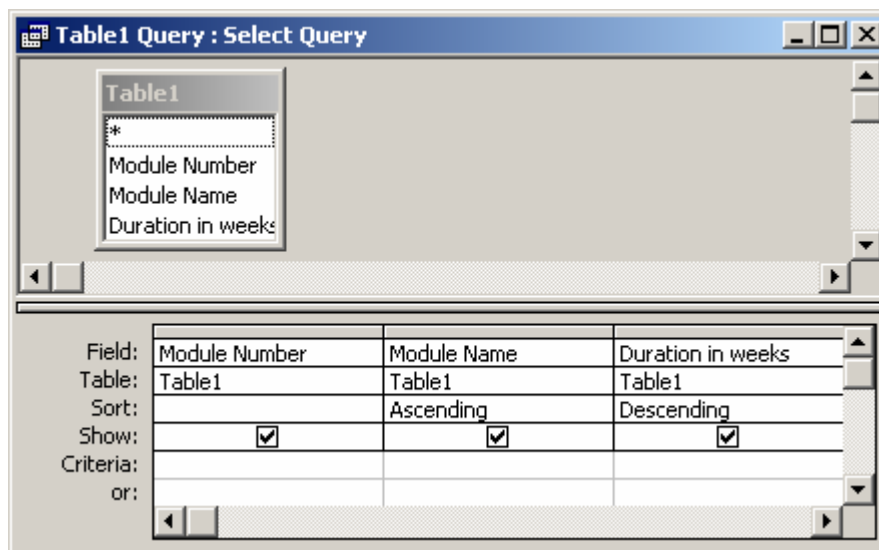
Answer the following questions in your jotter.

1. Why, in the world of the Internet and email, do many people prefer to receive printed reports?
2. Describe a situation where a teacher might want a report produced from the school database.

Task 7 – Complex Sorts

Complex sorts, when you sort two or more fields, can only be carried out when you are designing a Query or a Report.

- Open the Module 2.2 Task 4 file
- Create a new query using the method described in Task 5
- Include all fields, choose a detail summary and then choose to modify query design
- Sort on two fields as shown below



- Save and close this design, then open the query to view the sorted data.

In large databases you can apply criterion to find specific information and sort the found information using the technique learned in this lesson.

Answer the following questions in your jotter.

1. Why is a simple sort not always sufficient to organise data?
2. A teacher may produce an alphabetical set list by searching for a specific set then sorting the results. Describe another situation where the school database could be used to perform a similar operation.

Homework 1 - Database Structure

1. What is a database file? (1)
2. What is a record? (1)
3. What is a field? (1)
4. State two advantages of a computerised database over a paper based filing system. (2)
5. The following is a sample of a computerised database file.

Module Number	Module Name	Duration in weeks
1.1	Introductory ICT	5
1.2	Spreadsheets	4
1.3	Computer Systems	4
1.4	Computer Communication	6
1.5	Animation Graphics	9
1.6	Collecting Information	8
2.1	HTML	8
2.2	Database Management	5
2.3	Computer Systems	5
2.4	Data Modelling	5
2.5	Control	6
2.6	Creating Web Pages	8

- (a) How many records are in this database? (1)
- (b) How many fields are in each record? (1)
- (c) Name the fields. (1)
- (d) Identify the field types for each of these fields. (1)
- (e) Which field can uniquely identify each record? (1)

Total (10)

A+	10,9	A-	8,7	B+		B-	6	C+		C-	5	N	
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Homework 3 – Extracting Information

The following is a sample of a computerised database:

Surname	Forename	House	Year
Smith	Joe	X	1
Burns	Joseph	C	2
Curran	Aidan	O	1
Taylor	Alan	X	1
Davis	Joanne	O	2
Thomson	Mary	X	2
Houten	Anne	X	2
McCann	Anna	C	2
Smith	Ann	L	1
Smyth	Ann	O	1
McCain	Alan	L	1
Thompson	James	C	2

1. How many records would be found when the following queries were performed?
 - (a) surname=Smith (1)
 - (b) forename=Ann (1)
 - (c) House= X OR C (1)
 - (d) Year <3 (1)
 - (e) Year > 1 (1)
 - (f) House NOT L (1)
 - (g) Forename = Ann AND House = L (1)

2. Write criterion to find the following:
 - (a) All pupils in Champion house (1)
 - (b) All pupils in S1 (1)
 - (c) Anyone called Joseph or Joe (1)

Total (10)

A+	10,9	A-	8,7	B+		B-	6	C+		C-	5	N	
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