
Unit 2 Database



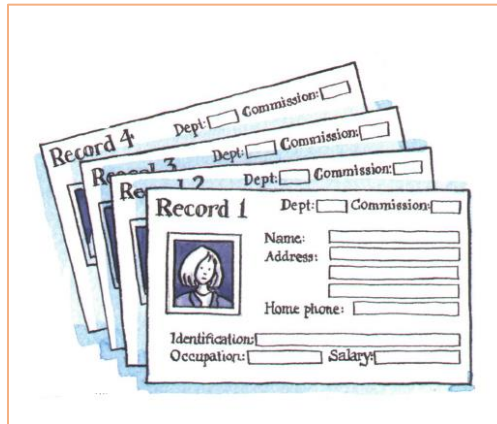
Learning outcomes:

By the end of the lesson, the students are expected to be able to use appropriate English to:

- identify and explain field and record of a database.
 - identify and explain part of database
 - identify and explain types of data in database
 - identify, explain, and make the selection rules to search data in a database.
 - identify and explain wildcard characters to search data.
 - use appropriate *if sentences*.
 - identify and explain about data processing
 - identify and explain about data storage devices (magnetic and optical storage)
-

2.1. Database Basics

Exercise 1: Look at the illustration which represents a database file. Can you identify a record and a field?



Exercise 2: Study this example of a record from a database of students. What fields does it contain? What other fields might be useful?

DEREHAM SCHOOL	
Crown Road, Dereham, Norfolk	
Name:	Kattie Heffernan
Address:	4 Elm Street, Dereham, Norfolk, NR024AG
Phone number:	01362 696910
*GCSEs:	English, Maths, French, Spanish, History, Physics, Biology, Chemistry, Music
Class:	11H
Date of Birth:	12/07/1990
Parents:	Joe Heffernan, Claire Moore
Father's Job:	Architect
Mother's Job:	Teacher
Sports:	Hockey, Netball, Swimming



*GCSE: General Certificate of Secondary Education

Exercise 3: What field would you include in a database for a school library? Try to design a database form.

Exercise 4: Read the text about *Part of Database* below and do the exercises.

Database Basics

Database is essentially a computerized record-keeping system. Each unit of information you create is called a **record** and each record is made up of a collection of **fields**. Typically, a single record consists of a set of field names like: *Title, First Name, Surname, Job Title, TelNo*, and *ID*. You fill in a form with relevant information for each field to add a new record to the database. There are different data types.

- **Text** – holds letters and numbers not used in calculations
- **Number** – can only hold numbers used in calculations and reports
- **Memo** – can store long texts
- **Date/Time** – a date or time or combination of both
- **Auto number** – assigns a number to each record
- **OLE Object** – (object linking and embedding) holds sounds and pictures
- **Yes/No** – for alternative values like true/false, yes/no, on/off, etc.
- **Hyperlink** – adds a link to a website

Once you have added data to a set of records, indexes must be created to help the database find **specific** records and **sort** (classify) records faster. An **index** performs the same function as in the back of a book or in a library. For example, if you regularly search your database by surname, the index should be defined on this field.

Relational Database

Two database files can be **related** or joined as long as they hold a piece of data in common. A file of employee names, for example, could include a field called 'DEPARTMENT NUMBER' and another file, containing details of the department itself, could include the same field. This common field can be used to **link** the two files together.

Extracting information from a database is known as performing a **query**. For example, if you want to know all costumers that spend more than \$9,000 per month, the program will search the name field and the money field simultaneously.

Students: Table				
ID	Name	Surname	Address	Teacher ID
1	Lucy	Reeve	3 Pond Road	106
2	Joe	Davey	7 Oxbury Close	107
3	Adam	Moore	4 Quebec Street	108

Teachers: Table				
Teacher ID	Name	Surname	Address	Subject
106	James	Pullin	9 The Green	Maths
107	Liz	White	5 London Road	English
108	Karen	Southwell	8 Granary Street	ICT

Relationship between tables: the key field
has the same value in both tables

Fill in the blank using words in the text to complete this passage.

A _____ (1) program allows the user to store, change, and retrieve information. A database file is a collection of records. Each _____ (2) contains a set of fields. Each _____ (3) holds a separate piece of information; for example, a student file contains a list of records, each of which consists of several fields which give their name, address, birthday, etc.

In a _____ (4) database, information is stored in tables that have a connection or link with one another.

A database lets you create an _____ (5), a list of records ordered according to the content of certain fields; this helps you search and _____ (6) records into numerical or alphabetical order very fast. It has also a _____ (7) function which allows you to extract information that meets certain criteria.

Taken from Professional English in Use ICT, pp. 37

Exercise 5: Look at this form. Decide which data types each of these numbers.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

The form contains the following fields and data:

- 1. Catalogue ID: 2
- 2. Artist: Blue Rain
- 3. Album title: Fantasy
- 4. Type of music: pop
- 5. Number of copies: 3
- 6. Song titles: 1. Fantasy, 2. Don't cry, 3. Friday night, 4. Life is a journey, 5. True love, 6. Can you hear me?, 7. We're dreaming, 8. I'll take care of you, 9. Rock with you
- 7. Video clip: Fantasy documentary film
- 8. Lyrics included?: ☒
- 9. Website: www.bluerain.com
- Music sample: [audio icon]
- Release date: 23 Oct 2004
- Label: The Star Club

Exercise 6: Read the text about *wildcard characters* carefully then do the exercise following.

In most databases you can use *wildcard characters* when you do not know exactly what you are searching for. Study these examples.

? any single character in this position

* any number of characters in this position

a single number in this position

[] find these characters

[!] don't find these characters

Using these characters in a search. We can be certain what we will find and what we will not find.

Example: If you search for **Sm?th**, you will find **Smith** and **Smyth**, but you won't find **Smit**.

(Taken from Basic English for Computing, pp.72)

Write *similar sentences* as the above example for these searches:

1. ?ry - cry, dry, try, pray
2. b*d - bed, bread, bead, breed, breath
3. #th - 7th, 55th, path.
4. Fred[ao] - Fredi, Freda, Fredo
5. Mart[!o] - Marta, Marti, Marto

Exercise 7: Find *at least* 3 other wildcard characters, explain them, and give examples.

Exercise 8: Some databases use symbols rather than words for selection rules. Here are some

of the symbols and their meanings:

=	equals, equal to	<>	not equal to
=>	equals or greater than	.AND.	And
>	greater than	.OR.	or
=<	equals or less than	.NOT.	Not
<	less than		

Study this extract from database of members of a sports club, and the results of five searches.

Write selection rules to obtain these results. Use the symbols above. (Note: to make sure that you have written the right selection rules, you can prove it using any database applications).

Example:

Search result: *Helen Trim*

Selection rule: *Occupation = technician.AND.sex=F*

First Name	Surname	Sex	Age	Occupation	Residence
Lilias	Brown	F	21	student	Los Angeles
Lucy	Cruden	F	28	actrees	New York
Alan	Brew	M	24	student	Chicago
Helen	Trim	F	23	technician	Boston
John	Walls	M	26	student	New York
John	Pond	M	31	computing officer	San Fransisco
Arnold	Bright	M	31	technician	Los Angeles

No.	Search Results	Selection Rules
1.	Lilias Brown, Alan Brew, John Walls	
2.	John Pond	
3.	Lucy Cruden, Helen Trim	
4.	John Walls	
5.	Lilias Brown, Arnold Bright	

2.2 Grammar Study

Exercise 9: Read the explanation of *if sentence*, then do the exercise following.

The sentence is begun with *if clause* (the underline clause of the example above); thus, it is named *if sentence*. After the *if clause*, the other part of the sentence is named independent clause where there is a subject, *you* and a modal, *will*.

We use *will* when we **are certain** one action will follow another.

For example: If you switch on Caps Lock, you **will** get all capital letters.

However, when we **are less certain** one action will follow another, we can use these expressions:

- will probably/possibly
- probably/possibly won't
- may (not), might (not)

Complete *if sentences* below using an appropriate expression of certainty

Example: *If there is power failure, you **may** lose all your data.*

-
1. If there is power failure, you _____ lose all your data.
 2. If you have a virus, it _____ corrupt your files.
 3. If you don't back up your files regularly, you _____ lose some of them.
 4. If you can choose a simple password, someone _____ access your files.
 5. If you don't give your files meaningful names, you _____ forget what they contain.
 6. If you copy pirated software, your PC _____ have a problem with computer viruses.
 7. If you never read computer magazines, you _____ miss important new products.
 8. If I know more programming languages, I _____ get a better job.

2.3. Data Processing

Exercise 10: Match the headings in the box to the data processing steps a-f

data coding data collection data entry data sorting data tabulation data validation

- a. _____ gather the raw data which you want to process.
- b. _____ arrange and systemise the data.
- c. _____ clean the data and double-check for faults and inconsistencies.
- d. _____ enter the data into a system.
- e. _____ arrange the data into table format so that it can be analysed.
- f. _____ create categories to organize the data into relevant groups.

Exercise 11: Put the data processing steps in Exercise 10 into the correct order.

Exercise 12: Listen to an IT expert describing the data processing steps to a colleague. Check your answers to Exercise 10 and 11 above.



2.4 Data Storage Devices

Exercise 13: Look at the pictures and descriptions about *Types of Magnetic Storage* below and identify the following:

1. The name of the hard drive on a PC platform
2. The type of hard drive that plugs into a socket at the back of a computer
3. The system that works in sequential format
4. The size and storage capacity of a floppy disk



A 3.5" floppy drive and diskette

A floppy disk drive uses 3.5" disks, which can store 1.44 MB of data; it is usually assigned to the A: drive. Floppy drives are becoming increasingly rare.



The inside of a hard drive

Most PCs have one internal hard drive, usually called C: drive. It is used to store the operating system, the programs, and the user's files in a convenient way. A hard drive can hold hundreds of gigabytes of data.



A portable external hard drive

External hard drives are connected to the USB or Fire Wire port of computer. They can be as small as a wallet but can have as much capacity as internal drives; they are typically used for backup or as secondary storage.



Magnetic tapes and drive

A tape drive reads and writes data on tapes. It is sequential-access- i.e. to get to a particular point on the tape, it must go through all the proceeding points. Tapes can hold hundreds of gigabytes of data and are used for data collection, backup, and archiving.

Exercise 14: Complete these following sentences using the words in the box.

capacity

storage

archiving

hold

secondary

1. There are basically three types of magnetic _____ device available to the computer users: hard drives, diskettes, and tapes.
2. The _____ of a 3.5" floppy disk is only 1.44 MB.
3. Hard drives can _____ hundreds of times more data than floppy disks.
4. A portable hard drive is a good choice for _____ storage.
5. Magnetic tapes are used for _____ information taht you no longer need to use regularly.

Exercise 15: Sue wants to buy a new drive. Listen to her conversation with the sales assistant.

Does she buy anything? How do you know?

Exercise 16: Listen the conversation and answer these questions.

1. What is the storage capacity of the *lomega eGo* portable hard drive?
2. How much information can be stored on the *Edge DiskGo* model?
3. Which hard drive is good for mobile professionals?
4. How much does the *lomega eGo* drive cost?
5. How much does the *Edge DiskGo* cost?

Exercise 17: Read the text about *Optical Storage* and answer the following exercise.

Optical drives use a laser to read and write data, so they are not affected by magnetic fields; but they are slower than hard drives. Modern DVD recorders accept all CD and DVD formats.

CDs (Compact Disks) can store up to 650-700 MB of data.

- **CD-ROMs** (Read Only Memory) are 'read-only' units, so you cannot change data stored on them (e.g. a dictionary or a game).
- **CD-R** (recordable) discs are write-once devices which let you duplicate CDs.
- **CD-RW** (rewritable) discs enable you to write onto them in multiple sessions, like a hard disk.

DVDs (Digital Versatile Discs) are similar in size to CDs (both are 1.2 mm thick), but they differ in structure and capacity. DVDs have more tracks and more pits (tiny holes) per track, and can store from 4.7 GB to 17 GB of data, movies, high-definitions sound, etc. so they will probably replace CDs. DVD formats include:

- **DVD-ROM** (Read-Only Memory)
- **DVD-R** or **DVD+R** (Recordable Only Once)
- **DVD-RW** or **DVD+RW** (rewritable, so it can be erased and used many times).

Portable DVD players let you watch movies or TV, play games, and listen to music, wherever you are. They usually run on batteries, have a widescreen (rectangular 16:9 format) LCD and support multi-format playback, allowing you to many file formats including DVD video, JPEG pictures, MP3 music, etc. They have two built-in stereo speakers, or headphones if you do not want to disturb other people.

Removable flash memory

Flash memory is solid-state, rewritable memory; it is non-volatile, so it retains data when the power is turned off. This explains its popularity in small devices.

- **Flash memory cards** such as CompactFlash or Secure Digital are found in cameras, PDAs and music players.
- **Flash drives**, also known as thumb or pen drives, are connected to a USB port of the computer. They let you save and transfer data easily.

Taken from Professional English in Use ICT, pp. 28

Find the terms in the text to match these following description.

1. the CD and DVD formats that can be written many times
2. the CD and DVD formats that can be written to by the user only once
3. the CD and DVD formats that can be read by a computer but not written to
4. the type of cards used in digital cameras

-
5. a type of drive that plugs into a usb ports and lets you share photos and music with friends
 6. the memory without moving parts; it is erasable, non-volatile, and used in small devices
 7. the expression that means to 'initialize and prepare it to receive data'

Exercise 18: Discuss this with your partner. Which device or format would be the most suitable for storing these things.

1. the operating system and the programs on home computer
2. an electronic encyclopedia for children
3. a movie in digital format
4. the music tracks by your favorite artist
5. all the files generated by a company in one day
6. the phone taken with a digital camera