

Appendix

This Appendix contains extracts from the Course Companion and Unit 1 *Data and information*, and a sample TMA question related to the Unit 1 extract. There is also an outline of the work students will undertake in the first week of study. These have been provided to give an indication of the level of study you can expect to experience on M150.

Programme of work – week 1

- Read the Course Guide if you have not already done so. The Course Guide provides you with some important information you will need to study the course.
- Read Sections 1 to 4 of the Course Companion; these sections provide an overview of the course, guidance on how to get the best out of studying the course and pointers to additional study resources should you need them.
- Work through Section 5 of the Course Companion which describes the preparatory tasks you need to complete, such as installing the required software, accessing the computer conferences and electronic TMA (eTMA) system.
- Look at Section 6 of the Course Companion which describes how to use the Study Calendar and how to pace your studies.

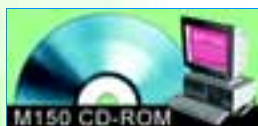
Refer to the remainder of the Course Companion as and when you need; it contains details of how to approach writing assignments and working with others.

When you study the course units you will find that there are sometimes icons in the margin, these are used to draw your attention to the need to use resources outside of the course units.

There are three icons associated with this course:



An icon to indicate that there is a website on a particular topic that may interest you.



An icon to indicate that you need to use the course CD-Rom to access some study material.



An icon to indicate that there is a FirstClass conferencing activity.

- Now study Sections 1 and 2 of Unit 1.

An extract from the Course Companion follows.

1 Introduction

Welcome to the course. You should have this booklet and the Course Guide close to you when you study M150. As this booklet also references web links, if possible have your computer to hand when you are reading it.

These web links are duplicated on the course website so that if a link changes the course website will be updated with the correct link.

1.1 The aims of this booklet

This booklet is a companion to the course. It aims to:

- outline the various components that make up the course, for example, the course booklets (units), the M150 course website and the final end-of-course assessment.
- provide guidance in carrying out the learning tasks associated with the course. For example, what you should do when studying a course unit. This guidance will be of a general nature. However, if you want detailed guidance then the course website will point you to specific university learning resources.
- provide activities which will familiarise you with the tasks you will be carrying out time and time again.

The course uses three marginal icons to help you locate:

computer-based activities



web addresses



conferencing



Section 4.3 gives you more details.

1.2 Assumed skills

For this course, we are assuming that you can:

- use a word processor;
- use a web browser; and
- install software from a CD onto your computer.

If you do not have these skills, you should contact your Regional Centre for advice because one of our other courses may better meet your needs.

M150 students will have varying needs: for some of you this will be your first OU course; others may have already completed one of our Openings courses or a different level 1 course. Some of you may be returning to study after some time while others will be continuing students. To cater for these different needs we provide you with signposts to where you can acquire additional study skills should you require them (see in particular Section 1.3).

1.3 Learner's Guide

The Learner's Guide is a part of the OU website and provides guidance that will be useful throughout your studies. It can be accessed via

<http://www3.open.ac.uk/learners-guide>

or from the 'LINKS' section on the M150 course website (referred to as the course website). Subsection 5.3 has information on how to access it.

ACTIVITY 1.1

Access the Learner's Guide now and browse through it as you read through the remainder of this section. You might like to bookmark the home page.

The Learner's Guide contains a wealth of information, ideas and tips about studying with the OU. It is currently split into four main sections:

- 1 Course choice;
- 2 Services for disabled students;
- 3 Career planning;
- 4 Learning skills.

It is a site you can dip into as and when you need information throughout your OU studies. All the sections are useful, but now, you should look at:

- 'Studying with the OU' which is under 'Course Choice';
- the 'Learning Skills' section, so that you are aware of the help it can provide.



Learner's Guide

Studying with the OU

Click on 'Course choice', then on 'Studying with the OU'; from this click on the button 'Preparing to study' along the top of the page. Then click on 'get to know the OU' link in the middle of the resulting page. On the page that now comes up there is a section 'Read the "Learning with the OU starts here" booklet'. In this section, click on the 'how to download it' link. This brings up a page that offers you the choice of downloading two booklets. Choose the one headed 'Learning with the Open University'. You will find it useful to print out this booklet. Spend a few minutes becoming familiar with its contents so that you can use them for reference later in the course. Some parts on 'Who to contact about what' and 'Organising your studies' are worth reading fully now as they contain useful information for those starting their studies with the OU.

Learning skills

One very useful resource in the 'Learning skills' section of the Learner's Guide is the 'Learning how to Learn' toolkit. This can be found if you click first on the link 'Additional resources available to OU students' and then on the 'Learning strategies' link. This toolkit helps you to develop your learning skills.

(The web address is www3.open.ac.uk/learners-guide/learning-skills/additional_resources/learning_strategies.htm; you will be asked to signed in.)

There are also useful toolkits on:

- taking notes and reading to learn;
- writing assignments;
- extending and developing your thinking skills;
- revising and taking exams.

Another part of the Learner's Guide to look at is the 'study skills quiz' (on the 'Additional resources available to OU students' page). This quiz enables you to assess and develop your study skills.

If you feel you need to develop your key skills of communication or to plan your learning further, then have a look at the section on 'Find out about our Good Study Guides'. The one that is probably most relevant for this course is 'The Good Study Guide'.

When clicking on the 'Additional resources available to OU students' link you will be asked to enter your OU name and password.



Learning how to learn toolkit

1.4 Student Handbook

Another resource on the OU website that you need to use as a reference is the Student Handbook. This can be accessed at:

www3.open.ac.uk/ug-handbook

or from the 'LINKS' section on the home page of the course website. This handbook includes details of the University's administrative arrangements, procedures and policies. You will need to refer to this, for instance, if you want to:

- change your address details;
- find out the rules for late submission of assignments.



2

Learning outcomes for the course

M150 provides opportunities for you to achieve some general learning outcomes listed below.

Knowledge and understanding

After studying the course, you will be able to:

- explain the nature of data, methods of capture and how such data can be converted into different representations;
- identify the operations and data in a simple (not necessarily computing) system and demonstrate how agreed standards are essential;
- describe the basic composition of a simple computing system;
- list the fundamental principles of information design (including principles of human–computer interaction) and apply them in simple situations;
- describe some of the common uses of data and how they influence the way the data is stored.

Cognitive skills

After studying the course, you will be able to:

- analyse a small computer program in terms of its inputs, programming structures and outputs;
- analyse a simple problem in terms of the necessary operations that are required to develop a program;
- modify part of a computer program to incorporate specified operations on given data by choosing appropriate program structures.

Key skills

After studying the course, you will be able to:

- demonstrate study skills at a level appropriate to higher education, such as timetabling study; read critically for meaning and take effective notes; and use study aids such as dictionaries and glossaries;
- read and understand a simple computer program;
- write short discursive pieces appropriate to the subject area, suitable for both technical and non-technical audiences;

- write 'documentation' in the form of a user's guide;
- communicate appropriately with your tutor and other students using email and online conferences;
- write a short discursive piece on a given subject using information located on the World Wide Web.

Practical and/or professional skills

After studying the course, you will be able to:

- discuss the legal and ethical issues surrounding data acquisition, privacy, accuracy, surveillance, and the use of cryptography (and its possible compromise by legislation);
- demonstrate basic skills to enable you to progress to more advanced level studies at the OU or any other university.

Extract from Unit 1

There are three important themes in this case study on maps that will recur throughout this course.

- 1 The right sort of data, properly used, is a very powerful aid in creating appropriate information (e.g. generating maps from geographical data).
- 2 It is possible to present information in a variety of ways to meet different requirements (e.g. a map for a hiker or directions for those who find maps daunting).
- 3 A computer can transform data into information in ways not previously thought possible (e.g. the information on a GPS receiver).

Here are some further examples of how a computer system can use the right sort of data to generate useful information in an appropriate way.

- A computer in a microwave oven transforms the pulses of an electronic clock into a time display that shows how long until the cooking is finished.
- A computer in a satellite television control box obtains the signals emitted by a transmitter satellite and converts them into a television picture and sound for the attached television set.
- The computers in a nuclear power station monitor signals produced by pressure sensors and other devices to provide a moment-by-moment summary of the state of the reactor.
- A computer in a car turns the pressure of the driver's foot on the brake pedal into fine control movements of each wheel's brake so as to prevent the car from skidding.
- A powerful PC turns signals from a scanner into a representation on the computer's screen of the item scanned. The PC can then accept commands from the user to modify that image.

It is transformations like these that lie at the heart of this course.

EXERCISE 4.2

Consider a computer in a modern cooker.

- (a) What kinds of data might it require and where would these originate?
- (b) What kinds of information might it present to the cook?



Discussion



- (a) The data originates either from the cook (pressing buttons to set a timer, for example) or from signals from the cooker's clock or its temperature sensor inside the oven.
- (b) A small display might show the time on the clock, how much time is left on the timer, and the oven temperature.

SAQ 4.1

- (a) What is the role of the computer with respect to the data given to it?
- (b) How should requirements (such as the need for a user's attention to be focused on a complex task like driving) affect the presentation of information?
- (c) What, in your own words, is the meaning of the term *parameter*?

Answer to SAQ 4.1 ✓

- (a) The role of the computer is to transform data into information.
- (b) The presentation of information needs to be *fit-for-purpose* and, in the example given, presented in a way that lets the user keep their primary focus of attention on the task.
- (c) A parameter is a property or characteristic of something that is measurable or quantifiable.

4.2 Finding information: the web

The web is a vast storehouse of ever changing, linked information on subjects as diverse as dog breeding, astronomy, tiddlywinks, and coping with bereavement.

A *browser*, like Internet Explorer, is used to access the web. However, given that the web contains literally billions of words of text, how would you find information on, say, the Open University?

The internet and the web: what's the difference?

People sometimes confuse the internet and the World Wide Web.

The **internet** refers to the *physical* interconnection of large numbers of smaller data communications networks to form a huge, publicly accessible 'network of networks'. Thus the internet carries electronic mail (email), hosts chat rooms and bulletin boards, enables the transfer of files, and is the physical basis for supporting the World Wide Web.

The **web** is the collection of linked data stored on the internet which is accessed using a browser.

Search engines: what are they?

The computer application that facilitates finding things on the web is known as a **search engine**. This is an application that serves a similar function to an index in a book. Figure 4.6 shows the home page of a typical search engine called Google.

There is a single box shown in Figure 4.6 into which **keywords** (words or terms that identify and distinguish topics from other topics) are typed. The keywords used in Figure 4.6 are 'rugby' and 'wales'.

The use of 'Rugby' and 'Wales' would produce the same results.

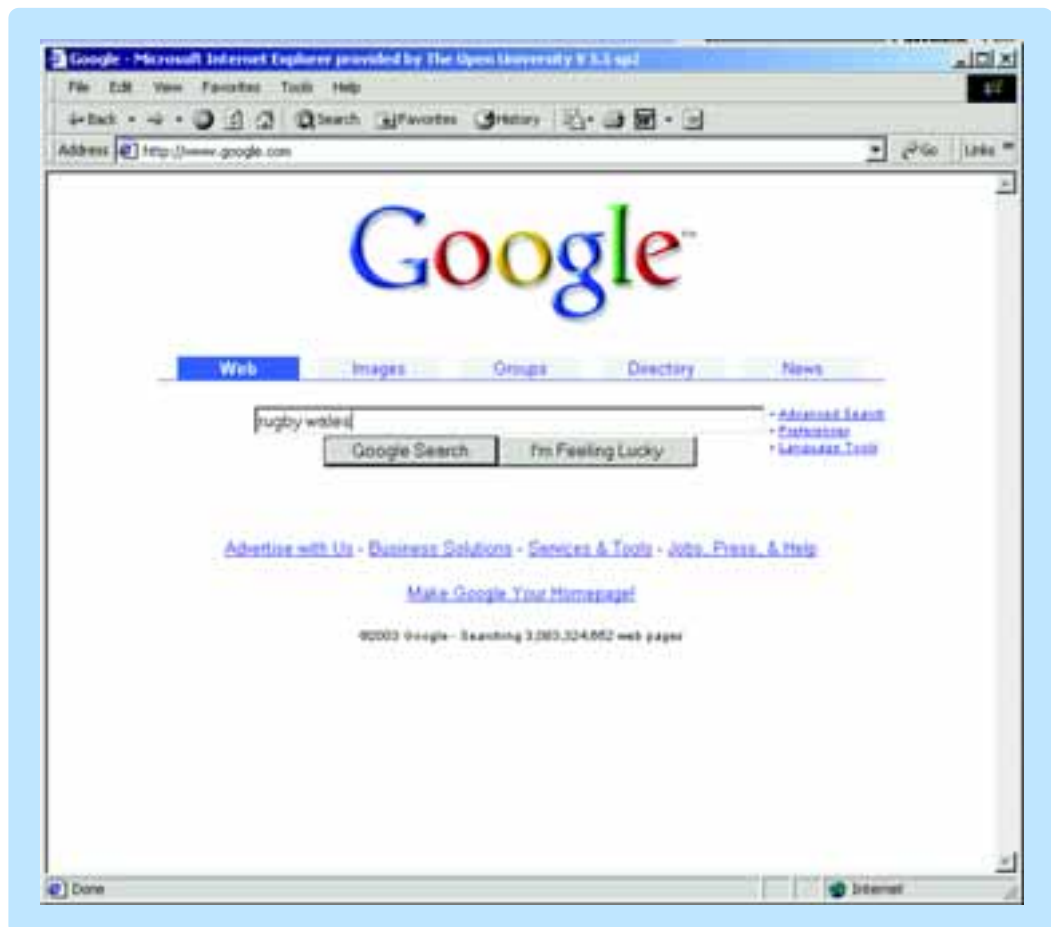


Figure 4.6 The interface to the Google search engine

When the button labelled 'Google Search' is clicked (or the 'Return' key is pressed), the search engine finds and returns a list of references to any websites which match *all* the keywords. Figure 4.7 shows the results of search for 'rugby wales'. In this case there are more results than will fit on a single screen, and only the first screenful of results is shown.

Different search engines give different results owing to the way in which they classify websites, and the relative

As the web changes constantly, repeating a search a few days later may well produce slightly different results.



Figure 4.7 The output from the Google search engine in response to the keywords 'Rugby' and 'Wales'

There are a number of references to the game of rugby in Wales, with the third being to the Welsh Rugby Union's home page. Each of the entries in blue (and also those underlined) can be clicked on to see more detailed information.

Ego surfing

The web is full of its own special jargon, abbreviations and acronyms. An example is the term *surfing*, which refers to the process of wandering around the web searching for information. The term *ego surfing* describes the act of looking for information about oneself.

Yahoo and Lycos are also web search engines. Like Google, they find results based on keywords, although you may find that each gives slightly different results to the same search. Figure 4.8 shows two displays, one from Google and one from Lycos, using the same keywords: 'maps in history'.

MAPS IN HISTORY, ART, AND LITERATURE

HONS 301.84: **MAPS IN HISTORY, ART, AND LITERATURE** ... Yet analysis of the literary use of **maps** is virtually uncharted in the **history** of cartography ...
everest.hunter.cuny.edu/~chuck/hons301.84/ - 6k - [Cached](#) - [Similar pages](#)

Syllabus, Hons 301 84 Maps in History, Art, and Literature

... 1 Read and discuss: Articles 1-2 Read and discuss: Wood, Chapter 1, **Maps** work by serving interests Tuesday, September 9 (CE), Overview: **History** of cartography, ...
everest.hunter.cuny.edu/~chuck/hons301.84/syllabus.html - 8k - [Cached](#) - [Similar pages](#)
 [More results from everest.hunter.cuny.edu]

EARLIEST MAPS IN HISTORY?

EARLIEST MAPS IN HISTORY? At three sites (perhaps four now that Site 2 has been rediscovered) in the Eastern desert, lines and squiggles ...
www.lankester.force9.co.uk/earliest.htm - 2k - [Cached](#) - [Similar pages](#)

Maps

... American **History maps** from the Library of Congress - Cities and Towns Panoramic **Maps** Conservation and Environment Yellowstone **Maps** Discovery and Exploration ...
killeenroos.com/link/maps.html - 20k - [Cached](#) - [Similar pages](#)

(a) Top four results of Google search using the terms 'maps in history'

MAPS IN HISTORY, ART, AND LITERATURE

HONS 301.84: **MAPS IN HISTORY, ART, AND LITERATURE** 3 hours, 3 credits Code 2968, Section 001 Tuesdays and Fridays, 2:10-3:25 PM Room ...
http://everest.hunter.cuny.edu/~chuck/hons301.84/index.html | ...more hits from this domain

MAPS IN HISTORY, ART, AND LITERATURE

HONS 301.84: **MAPS IN HISTORY, ART, AND LITERATURE** 3 hours, 3 credits Code 2968, Section 001 Tuesdays and Fridays, 2:10-3:25 PM Room ...
http://www.hunter.cuny.edu/classics/classics/honors301_84.htm

EARLIEST MAPS IN HISTORY?

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http://www.lankester.force9.co.uk/earliest.htm | ...more hits from this domain

Teaching with Historic Maps -- J. Krokak syllabus

... MW 3:30-5:00)DePaul University Autumn 1997 Professor Jim Krokak jkrokak@wppost.depaul.edu **Maps in History** and Culture Texts: David Buissere, From Sea Charts to Satellite Images: ...
 Description: Jim Krokak is Professor at DePaul University in Chicago. This course, **Maps in History and Culture**, was a course for advanced history students.
http://www.newberry.org/nl/smith/teachers/krokak/syllabus1.ht...

(b) Top four results of Lycos search using the terms 'maps in history'

Figure 4.8 Different search engines, same search (on 'maps in history'), different results! Note that the first, second and third entries on each display point to the same websites, but with different descriptions

It is instructive to understand the steps involved when a web search engine is used; assume you have run your browser, invoked a search engine and chosen the keywords you are interested in.

You will learn how to invoke a search engine in Activity 4.1.

- 1 The keywords are transmitted over the internet to a special computer known as a *web server*. This web server contains an index to websites. Each website is associated with a series of *keywords* which can be found in the site's title, address or contents. The index keywords and the user's requested keywords are compared by the server.
- 2 The web server then retrieves *references* to those websites that contain the right keywords and sends details of each reference back to the user's browser.
- 3 The browser then displays the references for the user.

Servers are explained in greater detail in Unit 4.

Here data (the keywords) is used to assemble information (the references to websites) but I have introduced some additional ideas here.

- Computers can communicate with each other, and two or more computers can cooperate to provide a service to users.
- Some remote computer, the web server, contains data that the user, who could be anywhere in the world, wants to access. This web server computer holds the index used to select those websites relevant to a user's search.
- Possibly the most important idea is concerned with the sentence in step 2, 'The web server then retrieves references to those websites that contain the right keywords ...'. The computer certainly does this, but how? The answer is that a *computer program* stored inside a computer carries out the actions necessary to do whatever it is that the computer system is designed for (in this case, to search through an index of websites seeking keywords that match the user's request).

A **computer program** is essentially a step-by-step set of instructions that tell the computer what to do. In other words, it's analogous to a cookery recipe.

Computer programs are often referred to as *software programs* or simply *programs*. Notice the spelling. You'll learn more about programming in Block 2.

Translated into English the instructions in a computer program (all written in specially designed language) might read as follows:

- extract the keywords from the user's search engine web page;
- send the keywords to the web server.

This would happen on the user's computer (often referred to in this context as a *client*). On the web server, the instructions might be:

- extract each keyword from the message sent by the user's browser over the internet;
- search the index for all websites that contain all the keywords.

Computer programs can be as small as a few instructions or contain hundreds of thousands of instructions.

Using the web more effectively: gateways



Looking at gateways

A gateway can also refer to a computer that acts as a message router on the internet.

A **gateway** on the web is a website intended to direct users to other *pre-selected* websites containing information on a particular topic.

University librarians often set up gateways for particular areas of study, although they may be set up by anyone with sufficient expertise in a topic. Gateways may be fairly general, such as a gateway site for sciences, or more specific, such as a gateway for particle physics.

Professional or vocational bodies may also develop gateways useful to their members, as may hobby organisations. A well-known gateway for people interested in family history and genealogy is Cyndi's List. This is updated by volunteers who notify new links relevant to topics of interest such as seventeenth and eighteenth century ships' passenger lists, local history websites, lists of names of war veterans, and so on.

Many gateway sites are searchable, often using the same search engines (e.g. Google) that are available directly through browsers. Because the search engine limits its search to the gateway site's indexes, this can prove to be a more focused way to search, particularly if the topic is one that is likely, in the wider web, to yield lots of spurious results.

Figure 4.9 shows the main page of a gateway website about historical maps and cartography aimed at academics, students, historians and map collectors. It contains the following:

- a selectable list of main topics on the left, each of which may contain links to other pages or other websites;
- selectable boxes at the top giving the index to the site, a site map page explaining how the site is organised, an 'ABOUT' link telling the user who hosts the site (the Institute of Historical Research at the University of London), and a 'WHAT'S NEW' link with information about recent changes to the site;
- welcoming messages (stating who the intended audience of the site is);
- a search engine with which to search the site.

Using a search engine more effectively

The search shown in Figure 4.7 above is an example of how to use a search engine in a simple way. However, one of the problems with finding information on the web is that there is so much! And not all of it is relevant to what you want. My search for 'rugby' and 'wales' using the Google search engine yielded a total of 38 screenfuls of websites which, at about 10 sites per screen, gives a total of nearly 400 websites. The first few sites listed will probably tell me what I want to know. But what about all the others? Are they all about the *game* of rugby in Wales?

The answer is 'no'. A website about rugby in New South Wales, Australia also appeared as a result of this search. Google didn't make a mistake since the site contains the chosen keywords. However, it wasn't smart enough to distinguish between Wales and New South Wales.

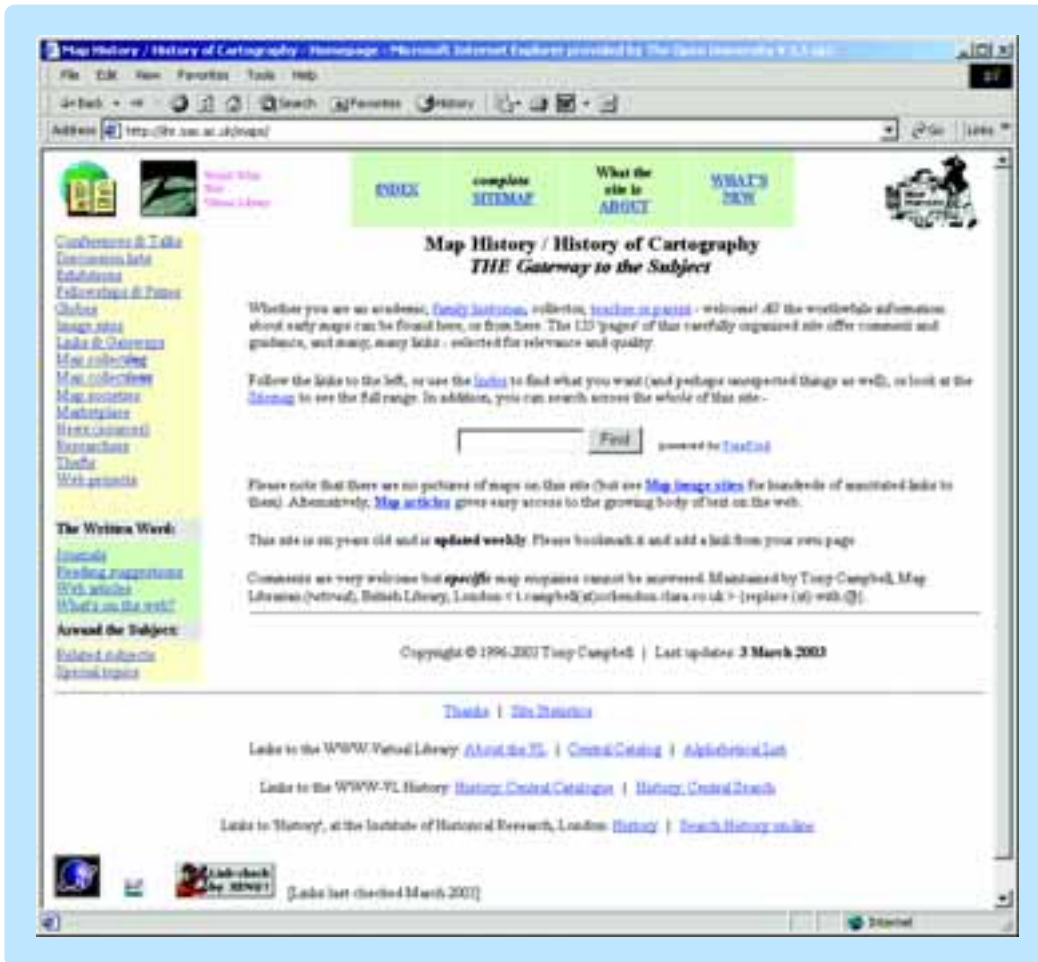


Figure 4.9 The main page of the gateway website for map history and the history of cartography

If you are just looking ('surfing') for information in a general way, too much information isn't always a problem. Where it becomes irritating and counter-productive is when you are looking for some quite specific information.

Example 4.1

Suppose you're interested in genealogy, and your surname is Bird. If you search on the web by typing in the keywords 'bird' and 'family', the web server will return every website it finds with those two words in it, so you'll probably find scientific and hobby sites on bird 'families' such as the passerines! It's clearly not what you want, but do you need to examine all the websites returned (which could run into hundreds) to find the one you're looking for?

The answer is that there are 'tricks' that you can use to narrow down your search to eliminate at least some of the things you aren't looking for. Each search engine has its own 'tricks', though the concepts of making more targeted searches are common to most search engines. Search engine screens will generally have a selectable topic called something like 'Advanced Search' or 'Search Tips'.



One obvious trick is to choose your keywords carefully. The more specific the keywords you choose, the more likely you are to get what you want. For example, if you want to find information on antique chairs, typing in just the keyword 'antique' will return all websites that use the word antique, and typing in the keyword 'chair' by itself will return all websites that use the word chair. But typing in both keywords will only return websites that use both words. The more keywords you add, the more targeted will be the websites returned to you. So adding 'British' to 'antique' and 'chair' will only return websites that have all three words in them.

EXERCISE 4.3

How could you adapt this trick of using more keywords to help you look for the Bird family?



Discussion



You could choose to enter the keywords 'bird' and 'genealogy' (the study of family lineages). This will almost certainly eliminate websites about storks and flamingos, or you could add an additional term to 'bird' and 'family' by specifying 'bird family history'.

Interestingly, if you have misspelled the keyword 'genealogy' as 'geneology' some search engines will not match it to websites containing the term 'genealogy'. Others will respond with the closest word possible. Google, for example, will respond to 'geneology' with the message 'Did you mean genealogy' together with some websites related to genealogy. Some search engines can't match 'family', say, with its plural 'families'. So if, in a particular search you don't get any matches (called **hits**), one strategy is to try making plural keywords singular and vice versa. Also remember to check your spelling carefully.

Another useful strategy is to look for phrases rather than individual words. In Exercise 4.3, I mentioned that you might use 'bird family history' to look for information on the Bird family. This might yield a response that includes anything about the animal 'bird' using the scientific term 'family' and any use in any context of the word 'history'. However, if you were to enclose the words 'family' and 'history' in quotation marks (as 'family history'), the web server will only return websites that contain the word 'bird' and the phrase 'family history'.

SAQ 4.2

- (a) **What is a search engine? How does it differ from a browser?**
- (b) **In carrying out a web search, how many computers (at least) are involved?**
- (c) **What makes a computer actually do work?**
- (d) **In what way is a gateway useful?**

Answer to SAQ 4.2 ✓

- (a) A search engine is a computer program that uses keywords to help users locate websites containing information they want.
- (b) At least two are involved: the user's computer (the client) and the web server.
- (c) A program of instructions, stored in the computer, called a computer program.
- (d) A gateway provides a pre-chosen set of links on the web for a particular topic. Instead of searching the whole of the web for information, a gateway provides a very focused means of getting information that usually has been compiled by an expert.

4.3 Computer-based activities



Note that when this icon appears you need to check the CD for a related activity.

ACTIVITY 4.1

This introduces you to search engines. It shows you how to invoke a search engine from your browser and make simple searches for topics of interest.

ACTIVITY 4.2

This gives you the chance of using some advanced search facilities (such as the two mentioned above) to make more targeted searches.

4.4 Summary

This section described how computers can be used in geographical applications (and in doing so it discussed maps and showed how modern maps are composed of layers of different data).

It discussed the GPS to demonstrate how computers can communicate in order to solve a problem, such as navigation.

It also showed how the geographical data that supports both map-making and the GPS navigation system can be presented in different forms such as a map, a list of directions, a moving graphical display on a navigation device such as a GPS receiver or as spoken directions. The reasons why one form of presentation is preferable over another were discussed: it depends on fitness-for-purpose, i.e. on the requirements of the user and/or the situation in which the information is needed.

Finally the section described how computers can be used to find information on the web. The two activities associated with this section introduced you to gateways and to the simple and advanced use of search engines.

Sample TMA question

Q1 (Unit 1) (25 marks)

Your grandmother has just learned to use a computer including being able to use a browser. In her retirement she is keen to develop a family tree which stretches back to the early nineteenth century. For this TMA question we would like you to write her a short letter (no more than 500 words) which describes how she could use a search engine to find information that would help her in this task. Assume that she has never used a search engine before.

You will gain marks for this question by explaining:

- what a search engine does;
(7 marks)
- how to use a search engine;
(9 marks)
- what the results of a search are and how they can be used.
(9 marks)

For the second point above you do not need any technical details just a high-level description of the use of a search engine.

Acknowledgements

Grateful acknowledgement is made to the following sources for permission to reproduce material within this product.

Figures

Figures 4.6, 4.7, 4.8 (a): Google Inc;

Figure 4.8 (b): Lycos UK Ltd;

Figure 4.9: Copyright © 1996–2002 Tony Campbell.

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