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Методическая разработка
по развитию навыков технического чтения на английском языке
для студентов 2-го курса ИЭФ, ФКСиС, ФИТУ
дневной формы обучения

READINGS IN MODERN INFORMATION TECHNOLOGY

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Методическая разработка предназначена для студентов 2-го курса ИЭФ, ФКСиС и ФИТУ. Содержит оригинальные тексты по вычислительной технике.

Цель разработки — развить навыки чтения, понимания и реферирования текстов, расширить лексический словарь, а также развить навыки профессионально-ориентированной речи.

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UNIT 1. C O M P U T E R A R C H I T E C T U R E

STARTER

1. Name different types of computers. Then match the possible users below to each type. Justify your choice.

1) Marketing research person collecting data from the general public.
2) Large company processing payroll data.
3) Travelling salesperson giving marketing presentations.
4) Large scientific organisation processing work on nuclear research.
5) Businessperson keeping track of appointments while travelling.
6) Graphic designer.
7) Secretary doing general office work.

2. What do these abbreviations mean?

CD-ROM, RDRAM, MB, GHz, AGP, SDRAM, SVGA

READING

3. Now study the information below to find the folloning:

1) What is the memory size of this PC?
2) Which input devices are supplied?
3) What size is the monitor?
4) How fast is the processor?
5) What is the capacity of the hard drive?
6) Which operating system does it use?
7) What multimedia features does the computer have?

HOW TO READ A COMPUTER AD.

1. Intel Pentium IV 1.7GHz Processor
2. Mini Tower Chassis
3. 256MB Rambus RDRAM
4. 60GB Hard Drive
5. Embedded Intel 3D Direct AGP video with 64MB SDRAM
6. 64-voice wavetable sound
7. 48 X CD-ROM Drive
8. 19” (17.9” VIS) Colour SVGA monitor
9. Microsoft Windows XP
10. 1.44MB 3.5” Floppy Drive
11. Microsoft Intellimouse
12. 105-key keyboard

1. The main processing chip that operates at a clock speed of 1.7 thousand million cycles per second.
2. A small size of tall and narrow style of case containing the computer system.
3. 256 megabytes of Rambus dynamic type of main memory chips that constitute the computer RAM.
4. A hard drive internal storage device with a capacity of approx. 60 thousand million bytes.
5. A video controller for controlling the monitor screen that is built on to the computer motherboard. It can process 3D images using the AGP type of video bus interface. It also contains approx. 64 million bytes of synchronous dynamic random access memory that is used as video memory.
6. A soundcard that has 64 voices and generates sounds using the wavetable system.
7. A CD-ROM storage device that operates at 48 times the speed of the original CD-ROM devices.
8. A colour monitor for displaying output on a screen at resolutions determined by the SVGA standard. The diagonal measurement of the whole screen is 19 inches but the diagonal measurement of the actual viewable area of the screen is only 17.9 inches.
9. The operating system that is used to control the system.

4. Match each item in Column A with its function in Column B. Then describe its function in two ways.

A Item	B Function
RAM	controls the cursor
Processor	inputs data through keys like a typewriter
Mouse	displays the output from a computer on a screen
Clock	reads DVD-ROMs
3.5” floppy drive	reads and writes to removable magnetic disks
Monitor	holds instructions which are needed to start up the computer
keyboard	holds data read or written to it by the processor
DVD-ROM drive	provides extremely fast access for sections of a program and its data
Cache	controls the timing of signals in the computer
ROM	controls all the operations in a computer

5. Describe the functions of these items.

1. Scanner	6. Supercomputer
2. Printer	7. Mainframe computer
3. ATM	8. Barcodes
4. PDA	9. Swipe cards
5. Hard disk drive	10. Memory

6. Complete each sentence using the correct preposition.

1) The CPU is a large chip…….the computer.
2) Data always flows……the CPU…… the address bus.
3) The CPU can be divided…… three parts.
4) Data flows…… the CPU and memory.
5) Peripherals are devices…… the computer but linked……it.
6) The signal moves……the VDU screen……one side……the other.
7) The CPU puts the address…… the address bus.
8) The CPU can fetch data…… memory……the data bus.

PROBLEM-SOLVING

7. Study these 'System upgrades and options' for the computer described in Task 3. Which upgrades and/or options would improve these aspects of this computer: capacity, speed, protection from damage due to power failure, network connections

Upgrades and options
3Com 10/100 Ethernet controller
CD-RW Drive
Extra memory module
APC 1400 Smart-UPS
3 Year Next-Business-Day On-site Service

SPEAKING

8. Work in pairs, A and B. Find out as much as you can about your partner's computer and complete this table. Use the following details:

Student A

• Workgroup server • Dual Pentium IV 1.4GHz processor • 133MHz system bus • 256MB ECC SDRAM (upgradable to 2GB)	• Hot plug 60GB 7200rpm LVD SCSI hard drive upgradable to 180GB of internal storage • Dell 19" (17.9" VIS) SVGA colour monitor • 24/52X EIDE CD-ROM drive and 3.5" 1.44MB floppy disk drive	Options • APC 1400 SmartUPS • High performance RAID adapter with 128MB cache • Hot-plug redundant power supplies • Year Next-business-day onsite service

Student B

• Portable • Mobile Pentium III Processor 850MHz • 100 MHz system bus • 20GB EIDE Hard Disk • 128MB SDRAM • Modular 16/40X DVD Drive and 3.5” Floppy Drive	• High Performance 256-bit 32MB Graphics • 15” SXGA (1400 x 1050) High Resolution TFT Display • Microsoft Windows 2000	Options • Upgrade to 256MB RAM • 56Kbps PCMCIA Modem • 3 Year International Next-business-day on-site service • Spare lithium ion battery • 10/100 Ethernet Port Replicator

Feature	A	B
Processor type Processor speed Bus speed Memory (RAM) Memory type Hard disk capacity Hard disk type Monitor size Monitor resolution CD-ROM drive speed		

9. Put these instructions for opening a computer in the correct sequence.

a) Release the two catches underneath and lift up to remove panel.
b) Shut down your computer by choosing Shut Down from the Apple menu or the Special menu.
c) If there are security screws on the vertical plate on the back of the computer, remove them with a Philips screwdriver.
d) Unplug all the cables except the power cord from your computer.
e) Pulling gently, slide the tray out.

SPESIALIST READING

A. Find the answers to these questions in the following texts.

1. What is one of the main causes of a PC not running at its highest potential speed?
2. What word in the text is used instead of ‘buffer’?
3. What device looks after cache coherency?

4. What is the main alternative to ‘write-through cache’?
5. When does a write-back cache write its contents back to main memory?
6. When is data marked as ‘dirty’ in a write-back cache?
7. What determines what data is replaced in a disk cache?

CACHE MEMORY

Most PCs are held back not by the speed of their main processor, but by the time it takes to move data in and out of memory. One of the most important techniques for getting around this bottleneck is the memory cache.

The idea is to use a small number of very fast memory chips as a buffer or cache between main memory and the processor. Whenever the processor needs to read data it looks in this cache area first. If it finds the data in the cache then this counts as a ‘cache hit’ and the processor need not go through the more laborious process of reading data from the main memory. Only if the data is not in the cache does it need to access main memory, but in the process it copies whatever it finds into the cache so that it is there ready for the next time it is needed. The whole process is controlled by a group of logic circuits called the cache controller.

One of the cache controller’s main jobs is to look after ‘cache coherency’ which means ensuring that any changes written to main memory are reflected within the cache and vice versa. There are several techniques for achieving this, the most obvious being for the processor to write directly to both the cache and main memory at the same time. This is known as a ‘write-through’ cache and is the safest solution, but also the slowest.

The main alternative is the ‘write-back’ cache which allows the processor to write changes only to the cache and not to main memory. Cache entries that have changed are flagged as ‘dirty’, telling the cache controller to write their contents back to main memory before using the space to cache new data. A write-back cache speeds up the write process, but does require a more intelligent cache controller.

Most cache controllers move a ‘line’ of data rather than just a single item each time they need to transfer data between main memory and the cache. This tends to improve the chance of a cache hit as most programs spend their time stepping through instructions stored sequentially in memory, rather than jumping about from one area to another. The amount of data transferred each time is known as the ‘line size’.

If there is a cache hit then the processor only needs to access the cache. If there is a miss then it needs to both fetch data from main memory and update the cache, which takes longer. With a standard write-through cache, data has to be written both to main memory and to the cache. With a write-back cache the processor needs only write to the cache, leaving the cache controller to write data back to main memory later on.

HOW A DISK CACHE WORKS

Disk caching works in essentially the same way whether you have a cache on your disk controller or you are using a software-based solution. The CPU requests specific data from the cache. In some cases, the information will already be there and the request can be met without accessing the hard disk.

If the requested information isn't in the cache, the data is read from the disk along with a large chunk of adjacent information. The cache then makes room for the new data by replacing old. Depending on the algorithm that is being applied, this may be the information that has been in the cache the longest, or the information that is the least recently used. The CPU's request can then be met, and the cache already has the adjacent data loaded in anticipation of that information being requested next.

B. 1. Match the terms in Table A with the statements in Table B.

Table A	Table B
a) cache hit b) cache controller c) cache coherency d) write-through cache e) write-back cache f) line size	a) The process of writing changes only to the cache and not to main memory unless the space is used to cache new data b) The amount of data transferred to the cache at any one time c) The process of writing directly to both the cache and main memory at the same time d) The processor is successful in finding the data in the cache e) Ensuring that any changes written to main memory are reflected within the cache and vice versa f) The logic circuits used to control the cache process

2. Mark the following as True or False:

a) Cache memory is faster than RAM.
b) The processor looks for data in the main memory first.
c) Write-through cache is faster than write-back cache.
d) Write-back cache requires a more intelligent cache controller.
e) Most programs use instructions that are stored in sequence in memory.
f) Most cache controllers transfer one item of data at a time.
g) Hardware and software disk caches work in much the same way.

UNIT 2 P E R I P H E R A L S

LISTENING

1. Study this description and answer these questions.

1) How do digital cameras differ from conventional cameras?
2) How do they work?
3) What are their advantages and disadvantages compared to conventional cameras?

HOW A DIGITAL CAMERA WORKS

Digital cameras store images on memory cards so pictures can be transferred easily to a computer.

A lens focuses the image on to a CCD unit or Charge-Coupled Device where the film would normally be.

So you can aim the camera accurately, there is an optical viewfinder.

So you can play back the images and decide which to keep and which to re-shoot, the image is passed to a small LCD screen on the back of the camera.

2. Listen to Part 1 of this discussion between A and B and complete this table of similarities and differences between conventional and digital cameras. Tick (v) or cross (x) the boxes.

Feature	Digital	Conventional
lens		
viewfinder		
requires chemical processing		
film		
transfer images directly to PC		
can delete unsatisfactory images		

3. Listen to Part 2 of the dialogue to list the disadvantages of digital cameras.

4. Now listen to both parts again to find the answers to these questions:

1) What does a CCD contain?
2) What is a pixel?
3) How can you view pictures before they are downloaded to a PC?
4) When you have downloaded the images, what can you do with them?
5) Is special software required?

6) Why is the resolution important?
7) What does the capacity of a digital camera depend on?
8) Why is it worth getting a rechargeable battery?

5. Compare digital and conventional cameras. Use the table from exercise 2.

6. Study this data about storage devices. Then complete the blanks in the following sentences comparing and contrasting the different types. Use the words: **both, like, unlike, whereas, but, however.**

Device	Read/Write	Speed	Media Capacity	Media Removable	Cost
Floppy disk	Read and write	Slow	Very low	Yes	Low
Fixed hard disk	Read and write	Fast	Very high	No	Medium
Removable hard disk	Read and write	Medium to fast	High	Yes	Medium
CD-ROM	Read only	Medium	High	Yes	Low
CD-R	Recordable	Slow	High	Yes	Medium
CD-MO	Read and write	Medium	High	Yes	High
DVD-ROM	Read only	Medium	High	Yes	Medium
DVD-RAM	Read and write	Medium	Very high	Yes	High
Magnetic Tape	Read and write	Very slow	High	Yes	Medium

1) You can write to hard disks …….. …….. optical disks.
2) Floppy disks have a …… capacity …… other devices.
3) CD-ROMs and floppy disks are …… low priced.
4) DVD-RAM has a …… capacity …….. other optical disks.
5) CD-ROMs cannot be re-recorded …… some other optical disks can be.
6) …… hard disks, you can read from and write to CD-MO drives.
7) …… CD-ROMs, CD-Rs are recordable.
8) Magnetic tape is much …… …… other devices.
9) …… DVD-RAM and fixed hard disks have very high media capacity.
10) Floppy disks are cheap …… DVD-RAM is expensive.

7. Write your own comparison of printer types.

Type	Speed	Text Quality	Graphics Capability	Color Quality	Cost
Dot-matrix	Slow to medium	Fair to good	Limited	Fair if you add a color option	Low
Ink-jet	Medium to fast	Good to excellent	Good to excellent	Good to Very Good	Low to high
Laser	Medium to very fast	Excellent	Good to excellent	Good in colour laser printers	Medium to high
Thermal Transfer	Medium to fast	Excellent	Good to excellent	Good to superior	Medium to high
Solid lnk	Medium to fast	Excellent	Good to excellent	Good	Medium to high
Electro-static	Slow to fast	Fair to good	Fair to good	Fair to good	Low to high

PROBLEM-SOLVING

8. Study this list of needs. Which type of peripheral would you advise in each case?

1) inputting printed graphics
2) building cars
3) controlling the screen cursor in a fast action game
4) making choices on a screen in a public information terminal
5) recording moving images
6) recording a book loan in a library
7) printing very high quality text and graphics
8) creating drawings
9) printing building plan drawings
10) recording sound
11) listening to music without disturbing others
12) storing programs and data
13) inputting a lot of text
14) backing up large quantities of data.

SPECIALIST READING

A. Find the answers to these questions in the following text.

1. What is Currie Munce's main aim?
2. How quickly did the possible areal density of hard disks increase in the 1990s?
3. How long does Munce think magnetic recording technology will continue to make rapid advances in capacity?

4. What problem does he predict for magnetic storage?
5. What is the predicted limit for discrete bit magnetic storage capacity?
6. What storage technologies might replace current magnetic systems?
7. What is the advantage of holographic storage being three-dimensional?
8. What improvements are predicted due to the fast access rates and transfer times of holographic storage?
9. What is predicted to be the most important high capacity removable storage media in the next 10 years?
10. What method of software distribution is likely to replace optical disks?

READY FOR THE BAZILLION-BYTE DRIVE?

Thinking about writing your memoirs – putting your life story down on paper for all eternity? Why not skip the repetitive strain injury and just capture your whole life on full-motion video, putting it all in a device the size of a sugar cube? It might not be as far off as you think.

Currie Munce, director of IBM's Advanced HDD Technology Storage System Division, has one avowed goal: Build bigger storage. Recently Munce and his fellow Ph.Ds restored Big Blue's lead in the disk space race with a new world record for areal (bit) density:35,3 gigabits per square inch – roughly three times as dense as any drive shipping at press time.

During the 1990s, areal density doubled every 18 months, keeping pace with the transistor density gains predicted by Moore's Law. But increasingly daunting technical challenges face those who would push the storage envelope further. 'I think magnetic recording technology has another good 5 to 10 years,' says Munce. 'After that, we'll see substantial difficulties with further advances at the pace people are accustomed to.'

From here on, a phenomenon called superparamagnetism threatens to make densely-packed bits unstable. Provided that new developments continue to thwart superparamagnetic corruption, scientists speculate that the theoretical limit for discrete bit recording is 10 terabits per square inch (1 terabit = 1,000 gigabits).

Approaching this limit will require new technologies. Two possible contenders are atomic force microscopy (AFM) and holographic storage.

AFM would use a spinning plastic disk, perhaps inside a wristwatch, and a tiny, 10-micron cantilever with a 40-angstrom tip (an angstrom represents the approximate radius of an atom) to write data. In theory, AFM will allow densities of 300 to 400 gigabits per square inch.

While AFM is still in the lab, holographic storage is closer to reality. According to Rusty Rosenberger, optical program manager for Imation, 'We are targeting a $5\frac{1}{4}$ –inch disk with 125 GB of storage and a 40MB-per-second transfer rate.' Future iterations of holographic systems should improve substantially.

The three-dimensional nature of holography makes it an appealing storage medium because 'pages' of data can be superimposed on a single volume – imagine

transferring a whole page of text at once as opposed to reading each letter in sequence.

Hans Coufal, manager of IBM's New Directions in Science and Technology Research division, predicts that the fast access rates and transfer times of holographic storage will lead to improved network searches, video on demand, high-end servers, enterprise computing, and supercomputing.

Meanwhile, also-ran technologies are thriving. Tape, first used for data storage in 1951 with the Univac I, has been revitalized by the corporate hunger for affordable archiving solutions. In the consumer arena, says Dataquest analyst Mary Craig, recordable CD-ROMs and DVDs will remain the dominant high-capacity removable storage media for the next decade. Despite their failure to match the areal density gains of hard disks, optical disks are cheap to produce, making them ideal for software distribution (until a mature digital rights management system facilitates online delivery). Finally, solid state options such as flash cards can't yet match the pricing of hard disks at high capacities.

Further out, scientists salivate over the prospect of data manipulation and storage on an atomic level. Because consumer demand for capacity is lagging behind what technology can deliver, bringing new storage options to the masses will depend on seeing the need for more space.

B. 1. Match the terms in Table A with the statements in Table B.

Table A	Table B
a) Big Blue b) Areal density c) Moore's Law d) Superparamagnetism e) Terabit f) AFM g) Angstrom	a) Atomic force microscopy b) The approximate radius of an atom c) IBM d) The data capacity of storage device measured in bits per square inch e) Prediction that the number of transistors that can be incorporated into a processor chip will double every 18 months f) A phenomenon that threatens to make densely packed bits unstable in magnetic storage devices g) One thousand gigabits

2. Mark the following statements as True or Flase:

a) The development of AFM is more advanced than holographic storage.
b) The predicted maximum storage density of AFM is 400 gigabits per square inch.
c) Holography works in 3D.
d) Univac I was the first computer to use tape storage devices.
e) Users want higher capacity storage devices than technology can provide.

UNIT 3. THE DESKTOP

STARTER

1. What do you see first when you turn on a computer? How do you open a program?

READING

2. Read the text quickly and match the headings (a-i) with the paragraphs (1-15).

a The control panel	**d** Using icons	**g** The Folder
b The drives	**e** Scrollbar	**h** CD-ROM icon
c The desktop	**f** Menu bar	**i** Desktop pattern

1) The desktop is the screen that appears after you boot up, or turn on, your computer. It shows a number of icons on a background picture or colour. When you buy a new computer and boot up for the first time, the desktop will only show a small number of icons. In the Windows operating system, these usually include My Computer and the Recycle Bin.

2) Double-clicking on an icon with the mouse opens a computer program, a folder or a file. Folders usually contain other files. You can move icons around the desktop, add new ones or remove them by deleting them. Deleted files go to the Recycle Bin. People usually put the programs they use most often on the desktop to find them quickly.

3) When you double-click on My Computer another screen appears. This screen shows the A: drive icon, for floppy disks; the C: drive icon, which usually contains all of the main programs and folders on your computer; the D: drive icon, which is usually the CD-ROM drive, and the Control Panel folder.

4) When you double-click on Control Panel, another screen appears that shows many other icons, such as the Display icon and the Date/Time icon. Double-clicking on Display opens a box that lets you personalize your desktop by changing the screen saver (the moving image that appears when no one is using the computer) or the background picture.

5) Just about all programs display a menu bar across the top of the screen, including the 'Finder'. The menu bar will change, depending on the program you're running at the time.

6) Application

This is an application, or program icon.

Double-clicking on it will start the program. It's not always obvious whether an icon is for a document or a program, but you soon get to be able to spot these things.

7) All folder icons tend to look the same – like a kind of 3D view of a suspension file. Sometimes they're adorned with other graphics, but they're usually

pretty easy to spot. Double- clicking on a folder icon displays that folder's contents in another window.

8) Hard Disk icon

Folders, files documents and other items are displayed as little icon.

9) Your hard disk icon (and Wastebasket icon) may be the only ones you see on your desktop. If you insert a CD-ROM, trough, it will appear as an icon on your desktop too. You double-click on it to display its contents.

10) Folder window

When you double-click on a folder or a disk drive, its contents are displayed in a window. These contents can be documents, program or other folders.

11) Wastebasket or Recycle Bin icon

The Wastebasket is where you throw things you no longer need. It doesn't empty straight away, so you can change your mind if you have to.

12) Menu/menu option

To open a menu, click on its name in the menu bar. This displays a drop-down list. To choose one of the menu options, just click on it (the options are highlighted as the mouse pointer moves over them to help you get the right one). Don't forget to always shut down your iMas via this menu, NOT by simply switching the power off.

13) Control Strip

The Control Strip offers quick access to many of your iMac's settings like the speaker volume sound input and CD player controls. Until you've found out what these gadgets do, you can 'hide' it by clicking on the small ribbed area to the far right. This reduces it to a little handle in the bottom left-hand corner of the screen. Click this handle if you want to display the Control Strip again.

14) You'll see these gadgets whenever the contents of a folder won't fit in the window. You click on either the horizontal or vertical scroll arrows to display more of the contents –either that, or drag on the little blue 'scrollbox'.

15) This background image can be swapped for many more via the Appearance control panel. You can use a repeating 'pattern' or a single image – scanned photograph for example.

3. Decide if the sentences are true (T) or false (F).

1) The desktop appears before you boot up.
2) Files are usually inside folders.
3) People usually put their favourite programs on the desktop.
4) Use the C: drive to open floppy disks.
5) You cannot change the background picture of the desktop.
6) The Control Panel folder contains the Date/Time icon.

4. Find the words in the text that mean.

1) comes into view so you can see it (paragraph 1) _____
2) the picrure or colour on your screen (1) _____

3) clicking the mouse two times quickly (2) _____
4) something that holds documents or files (2) _____
5) most important (3) _____
6) make something the way you want it (4) _____

5. Complete sentences (1-7)with the words in the box.

Display	screen	saver	folders	Recycle Bin
	files	deleted	desktop	

1) The _____ icon lets you change the way your desktop looks.
2) If you remove a file by mistake, you can find it in the _____.
3) The _____ appears when you don't use the mouse or keyboard.
4) I didn't use that program very much so I _____ it from my desktop.
5) I have a great program on my _____ that I use for playing music.
6) Windows Explorer lets you move _____ from one folder to another.
7) _____ contain documents or files.

SPEAKING

6. Choose five icons on your desktop. Say what you use these programs for.

Go into Control Panel or your computer and choose two other icons that interest you.

Double-click on them and make notes on what they do. Report back to the class.

7. Study the description of the Windows Desktop and answer these questions about its features.

1) What does Outlook Express let you do?
2) Which feature shows you current programs?
3) How do you read the date?
4) What is My Briefcase for?
5) Which background colour is most common?
6) Which feature lets you see which files are stored on your PC?
7) What is the program that helps you get on the Internet?
8) How do you delete files permanently?

Start Button is the main starting point for most of your actions. Click once and you'll see a list of programs and your most recently used documents.

My computer icon lets you browse the files stored on your PC. Move the mouse pointer over this icon and double-click the left mouse button: a new window shows your hard disk, floppy disk and CD-ROM drive, as well as special Printer and Control Panel folders.

Outlook Express button starts Microsoft Outlook Express, which lets you send electronic mail if you have Internet access.

Recycle Bin or Wastebasket. When you delete files they go here, so you can easily retrieve them if you make a mistake. To delete the files permanently, you can empty the Recycle Bin.

The Internet icon. The Internet Connection Wizard is a special program that helps you get on the Internet. You may also have an icon for the Microsoft Network – an Internet service you can subscribe to.

The background of the Desktop can be a solid colour, a pattern or even a picture. Most new PCs have a solid green-blue background, while some may show the logo of your PC maker.

My Briefcase icon. If you often take files and documents to and from a PC at work, My Briefcase helps you to keep them organised and up to date.

The Taskbar shows you the programs that you are currently running and the windows you have open. To switch between different windows, click on their buttons on the Taskbar.

Status/Time box. This box normally displays the current time, but it can also display other information. Pause the mouse pointer over the time for a moment and a pop-up box tells you the date. The box is also used very often by programs to show the status of tools such as the printer, modem or – on a notebook (a portable computer) – it might display the amount of battery power you have left.

8. Complete the gap in each sentence with the correct form of the verb in brackets.

1) The Help facility enables users…… (get) advice on most problems.
2) Adding more memory lets your computer……(work) faster.
3) Windows allows you……(display) two different folders at the same time.
4) The Shift key allows you……(type) in upper case.
5) The MouseKeys feature enables you…….(use) the numeric keypad to move the mouse pointer.
6) ALT+TAB allows you……(switch) between programs.
7) The Sticky Keys feature helps disabled people…….(operate) two keys simultaneously.
8) ALT+PRINT SCREEN lets you……(copy) an image of an active window to the Clipboard.

9. Describe the function of these features using ‘enabling’ verbs: “*allow, enable, help, let, permit”*

1) In a window, the vertical scroll bar.
2) The Find command.
3) The Undo command.

4) Cut and paste.
5) Print Screen.
6) Menus.
7) Recycle bin.
8) Tooltips.

SPEAKING

10. Work in groups. Complete this questionnaire for yourself. Then take turns in your group to explain how to perform each of these actions. You may need these verbs: *choose, right/left/double-click on, hover, drag and drop, select*.

Do you know how to:	Yes	No
1. Create a folder?		
2. Start a program?		
3. Shut down the system?		
4. Adjust the speaker volume?		
5. Arrange the icons?		
6. Display the date?		
7. In Windows, show Tooltips?		

11. Study these instructions for moving a file from one folder to another using Windows Explorer. Then write your own instructions for one of the actions in Task 10. Compare your instructions with those given in the Help facility on your computer.

TO MOVE A FILE
1. If you want to move a file that was saved in a different folder, locate and open the folder.
2. Right-click the file you want to move; then click Cut on the shortcut menu.
3. Locate and open the folder where you want to put the file.
4. Right-click the folder; then click Paste on the shortcut menu.

SPECIALIST READING

A. Find the answers to these questions in the following text.

1. What developments are driving the development of completely new interfaces?
2. What has inspired a whole cottage industry to develop to improve today's graphical user interface?.
3. In what way have XML-based formats changed the user interface?
4. What type of computers are certain to benefit from speech technology?
5. Name a process where a mouse is particularly useful and a process where it is not so useful.
6. What facilities are multimodal interfaces likely to offer in the future?

7. What type of input device will be used to give vision to the user interface?
8. What development has led to an interest in intelligent agents?
9. List ways in which intelligent agents can be used.

USER INTERFACES

Cheaper and more powerful personal computers are making it possible to perform processor-intensive tasks on the desktop. Break-throughs in technology, such as speech recognition, are enabling new ways of interacting with computers. And the convergence of personal computers and consumer electronics devices is broadening the base of computer users and placing a new emphasis on ease of use. Together, these developments will drive the industry in next few years to build the first completely new interfaces since SRI International and Xerox's Palo Alto Research Center did their pioneering research into graphical user interfaces (GUIs) in the 1970s.

True, it's unlikely that you'll be ready to toss out the keyboard and mouse any time soon. Indeed, a whole cottage industry – inspired by the hyperlinked design of the World Wide Web – has sprung up to improve today's graphical user interface.

Companies are developing products that organize information graphically in more intuitive ways. XML-based formats enable users to view content, including local and network files, within a single browser interface. But it is the more dramatic innovations such as speech recognition that are poised to shake up interface design.

Speech will be come a major component of user interfaces, and applications will be completely redesigned to incorporate speech input. Palm-size and handheld PCs, with their cramped keyboards and basic handwriting recognition, will benefit from speech technology.

Though speech recognition may never be a complete replacement for other input devices, future interfaces will offer a combination of input types, a concept known as multimodal input. A mouse is a very efficient device for desktop navigation, for example, but not for changing the style of a paragraph. By using both a mouse and speech input, a user can first point to the appropriate paragraph and then say to the computer, 'Make that bold'. Of course, multimadal interfaces will involve more that just traditional input devices and speech recognition. Eventually, most PCs will also have handwriting recognition, text to speech (TTS), the ability to recognize faces or gestures, and even the ability to observe their surroundings.

At The Intelligent Room, a project of Massachusetts Institute of Technology's Artificial Intelligence Lab, researchers have given sight to PCs running Microsoft Windows through the use of video cameras. 'Up to now, the PC hasn't cared about the world around it', said Rodney A. Brooks, the Director of MIT's Artificial Intelligence Lab. 'When you combine computer vision with speech understanding, it liberates the user from having to sit in front of a keyboard and screen'.

It's no secret that the amount of information – both on Internet and within intranets – at the fingertips of computer users has been expanding rapidly. This information onslaught has led to an interest in intelligent agents, software assistants

that perform tasks such as retrieving and delivering information and automating repetitive tasks. Agents will make computing significantly easier. They can be used as Web browsers, help-desks, and shopping assistants. Combined with the ability to look and listen, intelligent agents will bring personal computers one step closer to behaving more like humans. This is not an accident. Researches have long noted that users have a tendency to treat their personal computers as though they were human. By making computers more 'social', they hope to also make them easier to use.

As these technologies enter mainstream applications, they will have a marked impact on the way we work with personal computers. Soon, the question will be not 'what does software look like' but 'how does it behave?'

B. 1. Match the terms in Table A with the statements in Table B.

Table A	Table B
a GUI b Multimodal interface c Intelligent agent d TTS e The Intelligent Room	i Software assistant that performs tasks such as retrieving and delivering information and automating repetitive tasks ii Text to speech iii Graphical user interface iv A project of the Massachusetts Institute of Technology's Artificial Intelligence Lab v A system that allows a user to interact with a computer using a combination of inputs such as speech recognition, handwriting recognition, text to speech, etc.

2. Mark the following statements as *True* or *False*:

a Fewer people are using computers because computer functions are becoming integrated into other electronic devices.

b Keyboards and mice will soon not be required for using personal computers.

c There have been no improvements in interface design since the development of the GUI

d Speech recognition is likely to completely replace other input devices.

e Computer speech and vision will free the user from having to sit in front of a keyboard and screen.

f Intelligent agents will make computers seem more like humans.

UNIT 4. M U L T I M E D I A

STARTER

1. Work in groups and discuss the questions.

1) How are books and CD-ROMs different?
2) Have you ever used CD-ROMs to help you study? Do you prefer them to books?

2. Match the parts of the CD-ROM with the information they provide.

a The history of multimedia
b Education and entertainment
c What is multimedia?
d Business and industry.

1) Multimedia is any computer application that integrates text, graphics, animation, video, audio or other methods of communication. Multimedia is different from television, books or cassettes because it lets you interact with the application. You can click on a word to make a picture appear, or click on a picture to start a video.ia is different from television, books or cassettes because it lets you interact with a word to make a picture appear, or click on a picture to start a video.

2) Multimedia became more popular after the mid-1990s when the price of hardware began to fall. Then people started using it in industry, business, education, entertainment and for other purposes. Today, we can find multimedia at home, in school, at work, in public places, such as libraries, and on the Internet.

3) In business, advertisers use virtual reality in multimedia applications to advertise their products in three dimensions (3-D). Using multimedia for graphs and tables is now the best way for managers to present company results. In industry, pilots learn to fly using multimedia simulations of real situations, and scientists simulate experiments with dangerous chemicals in safety. Publishers are also producing interactive magazines, called e-zines, and e-books online.

4) In education, students study interactive CD-ROMs at their own speed and explore topics creatively by clicking on related links. Teenagers have played computer games for years, but many multimedia applications combine education and entertainment and they let them visit virtual worlds or change the ending of films.

3. Complete the sentences with one way these people use multimedia applications.

1) Advertisers _____
2) Managers _____
3) Pilots _____
4) Scientists _____

5) Publishers _____
6) Students _____
7) Teenagers _____.

4. Match the first part of the sentence (1-5) with the second part (a-e).

1) People like using multimedia
2) Multimedia combines
3) Most educational CD-ROMs
4) Prices of multimedia hardware
5) Students like learning about new topics

a started falling around 1995.
b using interactive multimedia.
c many different ways of learning.
d integrate audio, video and text.
e because it is interactive.

5. Match the multimedia terms in Column A to the activities in Column B. More that one match is possible.

Column A	Column B
MIDI	watching movies
MP3	composing music on a PC
DVD	downloading music from the Internet
MPEG	using reference works like encyclopaedias

READING

6. Read this text to find the answers to these questions.

1) What does MP3 stand for?
2) What is the difference between MP3 and WAV files?
3) What kind of sound does MP3 strip out?
4) What kind of information is included in the tag?

UNDERSTANDING MP3

The name comes from MPEG (pronounced EM-peg), which stands for the Monitor Picture Experts Group. MPEG develops standards for audio and video compression. MP3 is actually MPEG Audio Layer3.

MP3 competes with another audio file format called WAV. The key difference is that MP3 files are much smaller than WAV files. An MP3 file can store a minute of sound per megabyte, while a WAV file needs 11 or 12 megabytes to hold the same amount. How does MP3 achieve this compression? CDs and audio files don't

reproduce every sound of a performance. Instead, they sample the performance and store a discrete code for each sampled note. A CD or WAV file may sample a song 44,000 times a second, creating a huge mass of information.

By stripping out sounds most people can't hear, MP3 significantly reduces the information stored. For instance, most people can't hear notes above a frequency of 16kHz, so it eliminates them from the mix. Similarly, it eliminates quiet sounds marked by noise at the same frequency. The result is a file that sounds very similar to a CD, but which is much smaller. An MP3 file can contain spoken word performances, such as radio shows or audio books, as well as music. It can provide information about itself in a coded block called a tag. The tag may include the performer's name, a graphic such as an album cover, the song's lyrics, the musical, genre, and a URL for more details.

7. Read the rest of this to find the answers to these questions:

1) How do you play MP3 files?
2) What does the Windows Media Player file do with an MP3 file?
3) What is a standalone player?
4) What special features can players offer?
5) What information can you obtain by clicking on the track info button?
6) What does a skin enable you to do?
7) How do you play music from a CD-ROM on an MP3 player?
8) What hardware and software do you need to make your own audio CDs?

PLAY MP3 FILES

Most machines today have enough processing power and memory to play MP3s immediately. Simply download an MP3 file like any other and click on it in Windows Explorer. The Windows Media Player will decode the file and route the signals to your soundcard and the to your speakers.

Other MP3 features include:

Players

Most standalone players have many features beyond Windows' default Media Player. To control what music you play, players let you group songs into playlists and randomize the selections. To control how the music sounds, they offer spectrum analyzers, graphic equalizers, and frequency displays.

Track info

A track info button gives you the information on the MP3 file's tag. Other buttons may take you to a music library where you can organize your MP3 files by performer or genre.

Skins or themes

These programs are designed to change the appearance of the most popular players. They're akin to the wallpaper that alters the look of the Windows desktop.

With a skin, a player can become a jukebox, a car dashboard, or a Star Trek tricorder. Think of them as easily interchangeable faceplates.

Rippers and encoders

A ripper is a program that rips songs from a CD in your CD-ROM drive and turns them into WAV files. An encoder converts WAV files into MP3 files or vice versa. Many MP3 players incorporate rippers and encoders and can do both steps in one.

Recorders

With a writeable CD-ROM drive, a recorder program lets you create your own audio CDs.

SPEAKING

8. Work in pairs, A and B. With the help of the notes provided, explain to your partner one aspect of multimedia.

Student A

DVO Lisks

Explain to your partner with the help of these notes what DVD disks are, how DVD disks store such large quantities of information and how that information is read.

DVD = Digital Versatile Disk

- can hold complete movie
- like CD in size and thickness
- but CD drives use red laser light, DVD drives use blue
- blue laser has shorter wavelenght therefore data can be denser

DVDs can de double-sided

- each side can have two layers
- top layer 4.7GB, bottom layer 3.8GB, total capacity = 17 GB
- data transfer rate twice rate of CD-ROM

Student B

MPEC Video

Explain to your partner with the help of these notes what MPEG Video is and how it operates.

MPEG = method of compressing/decompressing video signals to reduce size by up to 95%

- video sequences stored in series of frames
- intraframe (I-frame) every 1/3rd second has most important picture information
- between I-frames are predicted frames (P-frames) and bidirectional frames
- (B-frames)

- P- and B-frames store changes only
- P- and B-frames preserve video quality between I-frames
- Human eye can't detect information discarded

SPECIALIST READING

A. Find the answers to these questions in the following text.

1. Into what two components is the data stream split?
2. What information does an Intra frame contain?
3. What is stored in the P-frames following an I-frame?
4. What is stored in a P-frame in the case of a bouncing ball?
5. What gives the massive reduction in the amount of information needed to reproduce a video sequence?
6. Why is a new I-frame used after a few P-frames?
7. What is stored in a B-frame?
8. Why do B-frames not propagate errors?

THE TRICKS TO MPEG'S SUCCESS

The most common system for the compression of video is MPEG. It works like this. The single data stream off the CD-ROM is split into video and audio components, which are then decompressed using separate algorithms. The video is processed to produce individual frames as follows. Imagine a sequence of frames depicting a bouncing ball on a plain background. The very first is called an Intra Frame (I-frame). I-frames are compressed using only information in the picture itself just like conventional bitmap compression techniques like JPEG.

Following I-frames will be one or more predicted frames (P-frames). The difference between the P-frame and the I-frame it is based on is the only data that is stored for this P-frame. For example, in the case of a bouncing ball, the P picture is stored simple as a description of how the position of the ball has changed from the previous I-frame. This takes up a fraction of the space that would be used if you stored the P-frame as a picture in its own right. Shape or colour changes are also stored in the P-frame. The next P-frame may also be based on this P-frame and so on. Storing differences between the frames gives the massive reduction in the amount of information needed to reproduce the sequence. Only a few P-frames are allowed before a new I-frame is introduced into the sequence as a new reference point, since a small margin of error creeps in with each P-frame.

Between I and P-frames are bi-directional frames (B-frames), based on the nearest I or P-frames both before and after them. In our bouncing ball example, in a B-frame the picture is stored as the difference between the previous I or P-frame and the B-frame and as the difference between the B-frame and the following I or P-frame. To recreate the B-frame when playing back the sequence, the MPEG algorithm uses a combination of two references. There may be a number of B-frames

between I or P-frames. No other frame is ever based on a B-frame so they don't propagate errors like P-frames.

Typically, you will have two or three Bs between Is or Ps, and perhaps three to five P-frames between Is.

B. 1. Mark the following statements as True or False:

a. JPEG is the most common compression system used for video.
b. P-frames only store the changes in the image.
c. There is always at least one P-frame between two I-frames.
d. B-frames store the complete picture information.
e. There can only be one B-frame between each I a and P-frame.
f. There are typically about four P-frames between each I-frame.

2. Match the words in Table A with the statements in Table B.

Table A	Table B
a Algorithm b I-frame c JPEG d P-frame e B-frame f MPEG	i A common type of compression used for video data ii A compressed video frame known as a predicted frame iii A compressed video frame that stores changes between the frame before it and the frame after it. iv A formula used for decompressing components of a data stream v A type of compression used for bitmap images vi A compressed video frame that contains the complete image information

UNIT 5 N E T W O R K S

STARTER

1. Describe the function of these components of a typical network system:

1) a file server
2) a bridge
3) a router
4) a backbone
5) a LAN
6) a gateway
7) a modem

2. Now read these definitions to check your answers. You may also refer to a dictionary.

A bridge is a hardware and software combination used to connect the same type of networks. Bridges can also partition a large network into two smaller ones and connect two LANs that are nearby each other.

A router is a special computer that directs communicating messages when several networks are connected together. High-speed routers can serve as part of the Internet backbone.

A gateway **is an interface that enables dissimilar networks to communicate, such as two LANs based on different topologies or network operating systems.**

A backbone is the main transmission path, handling the major data traffic, connecting different LANs together.

A LAN is a network contained within a small area, for example a company department.

A modem is a device for converting digital signals to analogue signals and vice versa to enable a computer to transmit and receive data using an ordinary telephone line.

READING

3. Now study this text and summarise the information about future home new works.

The technology needed to set up a home network is here today. It is just a matter of connecting a number of PCs equipped with Ethernet adapters to a hub using twisted-pair cabling which uses sockets rather like phone sockets. Special isolation adapters can be fitted to allow existing mains lines to be used instead of twisted-pair cabling. Most future home networks, however, are likely to be wireless network systems, using tuned transmitter and receiver devices. The simplest networks allow basic file-sharing and multi-player gaming as well as sharing of peripherals such as printers. Most advanced home networks are likely to have a client/server structure, with low-cost terminals, or 'thin' clients, connected to a central server which maintains the system's storage capacity and, depending on whether the terminals are dumb or processor-equipped network computers, its processing power. To make the most of such a network, it must become part of an integrated home entertainment and control system. To the user, the desktop becomes just one of many features accessible throughout the house. Tired of working in the study? Pop down to the living room and reload it into the terminal there. Before you start work, call up the hi-fi control program and have the music of your choice pumped through the living room speakers. Computer and entertainment networks can be separate but linked by the server to allow control of the latter from the terminals. Future home networks are more likely to have the entire system based on a single loop.

4. Complete these definitions with the correct participle of the verb given in brackets.

1) A gateway is an interface (enable) dissimilar networks to communicate.
2) A bridge is a hardware and software combination (use) to connect the same type of networks.
3) A backbone is a network transmission path (handle) major data traffic.
4) A router is a special computer (direct) messages when several networks are linked.
5) A network is a number of computers and peripherals (link) together.
6) A LAN is a network (connect) computers over a small distance such as within a company.
7) A server is a powerful computer (store) many programs (share) by all the clients in the network.
8) A client is a network computer (use) for accessing a service on a server.
9) A thin client is a simple computer (comprise) a processor and memory, display, keyboard, mouse and hard drives only.
10) A hub is an electronic device (connect) all the data cabling in a network.

PROBLEM-SOLVING

5. Work in two groups, A and B. Group A, list all the advantages of a network. Group B, list all the disadvantages. Then together consider how the disadvantages can be minimised.

Group A Advantages of a network	**Group B Disadvantages of a network**

SPEAKING

6. **Transmission modes** Read and compare how one mode of transmission between computers operates.

Asynchronous transmission

This method, used with most microcomputers, is also called start-stop transmission. In asynchronous transmission, data is sent one byte (or character) at a time. Each string of bits making up the byte is bracketed, or marked off, with special control bits. That is, a 'start' bit represents the beginning of a character, and a 'stop' bit represents its end. As a means of checking that the whole character has been transmitted, an error check bit is generated immediately after each character.

Transmitting only one byte at a time makes this a relatively slow method. As a result, asynchronous transmission is not used when great amounts of data must be sent rapidly. Its advantage is that the data can be transmitted whenever it is convenient for the sender.

Synchronous transmission

Synchronous transmission sends data in blocks of characters. Start and stop bit patterns, called synch bytes, are transmitted at the beginning and end of the blocks. These start and end bit patterns synchronise internal clocks in the sending and receiving devices so that they are in time with each other. Error check bytes are included immediately after each block of characters to ensure that the whole sequence of characters has been correctly transmitted.

This method is rarely used with microcomputers because it is more complicated and expensive than asynchronous transmission. It also requires careful timing between sending and receiving equipment. It is appropriate for computer systems that need to transmit great quantities of data quickly.

SPECIALIST READING

A. Find the answers to these questions in the following text.

1. Into what units is data subdivided by the following layers?
   a transport layer
   b network layer
2. What is the purpose of a transmission checksum test?
3. How long does the data-link layer keep a copy of each packet?
4. What processes can be carried out at intermediate nodes?
5. Which network communications layer is described by each of the following statements?
   a Makes sure that the message is transmitted in a language that the receiving computer can understand
   b Protects the data being sent
   c Encodes and sends the packets
   d Supervises the transmission
   e The part of a communications process that a user sees
   f Starts communications and looks after communications among network nodes
   g Chooses a route for the message
   h Makes backup copies of the data if required
   i Confirms the checksum, then addresses and duplicates the packets.

NETWORK COMMUNICATIONS

1. The application layer is the only part of a communications process that a user sees, and even then, the user doesn't see most of the work that the application does to prepare a message for sending over a network. The layer converts a message's data from human-readable form into bits and attaches a header identifying the sending and receiving computers.

2. The presentation layer ensures that the message is transmitted in a language that the receiving computer can interpret (often ASCII). This layer translates the language, if necessary, and then compresses and perhaps encrypts the data. It adds another header specifying the is language as well as the compression and encryption schemes.

3. The session layer opens communications and has the job of keeping straight the communications among all nodes on the network.

It sets boundaries (called bracketing) for the beginning and end of the message, and establishes whether the messages will be sent half-duplex, with each computer taking turns sending and receiving, or full-duplex, with both computers sending and receiving at the same time. The details of these decisions are placed into a session header.

4. The transport layer protects the data being sent. It subdivides the data into segments, creates checksum tests - mathematical sums based on the contents of data - that can be used later to determine if the data was scrambled. It can also make backup copies of the data. The transport header identifies each segment's checksum and its position in the message.

5. The network layer selects a route for the message. It forms data into packets, counts them, and adds a header containing the sequence of packets and the address of the receiving computer.

6. The data-link layer supervises the transmission. It confirms the checksum, then addresses and duplicates the packets. This layer keeps a copy of each packet until it receives confirmation from the next point along the route that the packet has arrived undamaged.

7. The physical layer encodes the packets into the medium that will carry them - such as an analogue signal, if the message is going across a telephone line – and sends the packets along that medium.

8. An intermediate node calculates and verifies the checksum for each packet. It may also reroute the message to avoid congestion on the network.

9. At the receiving node, the layered process that sent the message on its way is reversed. The physical layer reconverts the message into bits. The data-link layer recalculates the checksum, confirms arrival, and logs in the packets. The network layer recounts incoming packets for security and billing purposes. The transport layer recalculates the checksum and reassembles the message segments. The session layer holds the parts of the message until the message is complete and sends it to the next layer. The presentation layer expands and decrypts the message. The application layer converts the bits into readable characters, and directs the data to the correct application.

B. 1. Match the term in Table A with the statement in Table B.

Table A	Table B
a Bracketing b Half-duplex c Full-duplex d Checksum	i Transmission mode in which each computer takes turns sending and receiving ii Mathematical calculations based on the contents of data iii Set boundaries for the beginning and end of a message iv Transmission mode in which both computers send and receive at the same time

2. Mark the following statements as True or False:

a Most of the work that an application does to prepare a message for sending over a network is not seen by the user,
b ASCII is always used to transmit data,
c The encryption layer compresses the message,
d The network layer keeps track of how many packets are in each message,
e The network layer keeps a copy of each packet until it arrives at the next node undamaged,
f Analogue signals are used on ordinary telephone lines,
g When a message arrives at its destination, it passes through the same seven network communications layers as when it was sent, but in reverse order.

UNIT 6 WEBPAGE CREATOR

STARTER

1. Match these reviews of websites to their titles. Some words and parts of words have been omitted. Try to replace them.

1) Babelfish
2) Fish I.D.
3) Strangely Satisfying
4) Sheepnet
5) Download. com

REVIEWS OF WEBSITE

a) If you want to buy old comics, old toys such as plastic fish for your bath, nodding dogs for your car and many other strange and bizarre items, this site is for you.
b) Everything you ever wanted to know or didn't want to know about. Breeds, pictures and fascinating facts including the information that almost all are either white or black. Guaranteed to raise a smile.

c) Trouble identifying? This site has pictures, quizzes, a special corner for children and a handy reference on all kinds of aquatic life. It also hosts a discussion area for all concerned with the marine environment.
d) Can't remember the word in English or any other major language? Try for an instant translation. Easy to use. Just type in your text. Choose the language you want and select 'Search'. You can also translate websites. Only drawback is that you get a literal translation. Don't expect to cope with slang or idioms.
e) Whether it's demos, full freeware or shareware products you are looking for, the chances are you'll be able to find it here. Rather usefully the site also contains all major drivers and development tools – pretty much anything you get the most out of your PC really. Well worth a visit whatever it is you're looking for.

LISTENING

2. John lives in North Dakota. Here he talks about his website.
Listen to the recording and complete this table about his site.

Name, site name topic, site address, why special, last updated

3. Listen to the recording again to find the answers to these questions.

1) Why did John choose this topic?
2) What package is Netscape Composer a part of?
3) What previous experience did he have of website creation?
4) What's the price of his 'free' domain name?
5) What does he mean by 'Yahoo! just seems to swallow submissions'?
6) What do you think Yahoo! Clubs are?
7) List 4 tips he gives for other website builders.
8) List 4 website addresses he mentions.

WORD STUDY

4. Definitions and collocations. Fill in the gap in these definitions.

1) A……is an interface enabling dissimilar networks to communicate.
2) A……is a hardware and software combination used to connect the same type of networks.
3) A…….is a network transmission path haandling major data traffic.
4) A…….is a special computer directing messages when several networks are linked.
5) A……is a number of computers and peirpherals linked together.
6) A……is a network connecting computers over a small distance such as within a company.
7) A……is a powerful computer storing data shared by all the clients in the network.

8) A……is a network computer used for accessing a service on a server.

9) A……is a simple computer comprising a processor and memory, display, keyboard, mouse and hard drives only.

10) A……is an electronic device connecting all the data cabling in a network.

5. Link each word in column A with a word which it often occurs with from column B. In some cases, more than one link is possible.

A	B
1. bulletin	board
2. domain	button
3. file	engine
4. graphical	link
5. mobile	map
6. search	message
7. site	name
8. synchronous	page
9. text	phone
10. web	transmission

SPEAKING

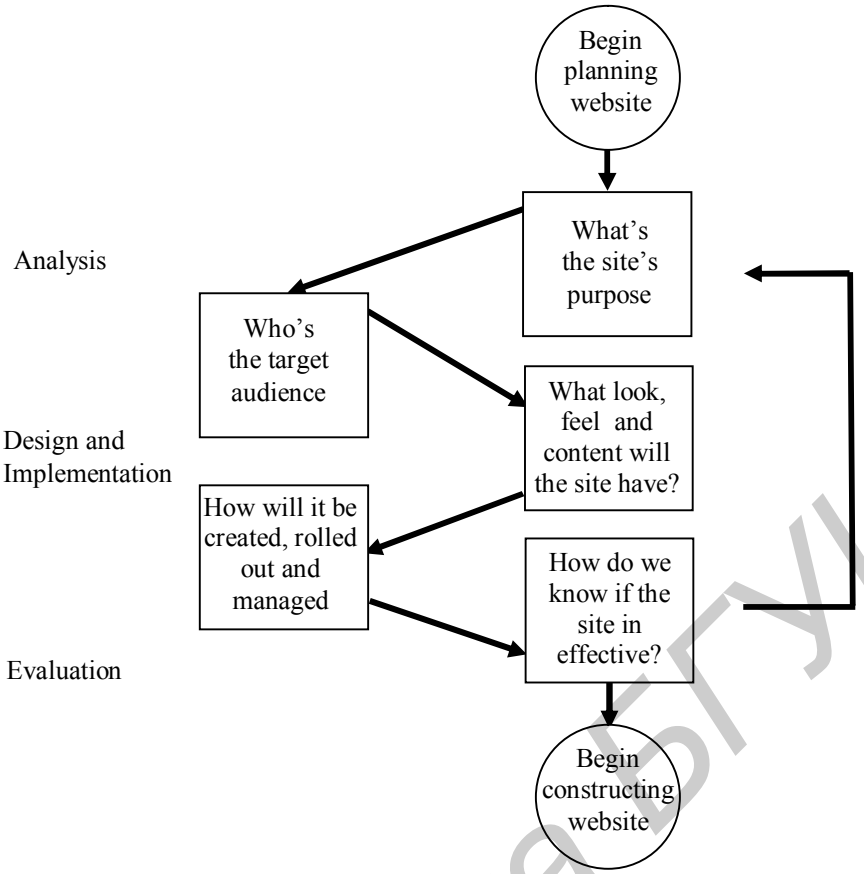
6. Work in pairs, A and B. You both have information about some websites. Find out if your partner can suggest a website to help you with your problems.

7. Planning your website. Study this flowchart for planning a website. Use it as the basis for a short text providing advice on website planning. Your text should have three paragraphs corresponding to the three stages in this diagram:

1) Analysis
2) Design and implementation
3) Evaluation

Begin your text like this:

You need to plan your website carefully before you go ahead and create it. There are three stages to the planning process:



PROBLEM-SOLVING

Student A

1) You want to brighten up your website.
2) You would like to reserve seats on the London to Edinburgh train.
3) You want some help with a project on computer security.
4) You're feeling a bit flabby and would like to take up marathon running. How can you prepare for this?

Student B

1) You would like to cheer up a friend.
2) You're going to rent a car in the USA and travel from Miami to New Orleans. You would like to plan a route.
3) You're going walking in the mountains this weekend. You would like to know what the chances are of rain.
4) You want to forward a video email attachment you're received to a friend and it won't go.

WEBSITES

Weather Reports

Several weather-related sites can give you up-to-the-minute weather reports and precipitation radar for your city or local region or for an area in which you'll be travelling. You'll also find extended forecasts. Some weather sites provide safety tips for dealing with severe weather (www.weather.com).

Comic Strips

Everyone needs a laugh from time to time, and few things can put a smile on your face more quickly than a classic comic strip. You can check out dozens of your favourite comics and, in some cases, even send a comic strip to a friend (www. unitedmedia.com, www.uexpress.com).

Maps

Websites can give you detailed street maps for major cities, or they can give you a map of Interstate highways. Some sites can help you find a particular address or suggest the best method of travel to your destination. You can also print maps at many websites (www.mapblast.com).

Travel Research

Whether you're looking for the best airline and hotel fares or researching the best travel destinations, the Web can help. Several websites also offer tips for travelling by aeroplane or with small children. Some allow you to book train tickets (www.expedia.com, www.concierge.com, www.thetrainline.co.uk).

Neon City

If you have a webpage that's looking a little dull, you might want to add some neon signs, word or tubes. Neon City produces a variety of cool neon clipart that you are free to use on your personal webpage so long as you link to the page you got the design from (www.neoncity.co.uk).

Exercise information

If your current exercise program doesn't seem to be working, consult the Web. While Web surfing doesn't quality as exercise, you can use the Web to find information on an exercise program you'll enjoy. Some websites also help to track your progress (www.fitnesslink.com, www.runnersworld.com).

UNIT 7. COMMUNICATIONS SYSTEMS

STARTER

1. Answer the questions. Then discuss in pairs.

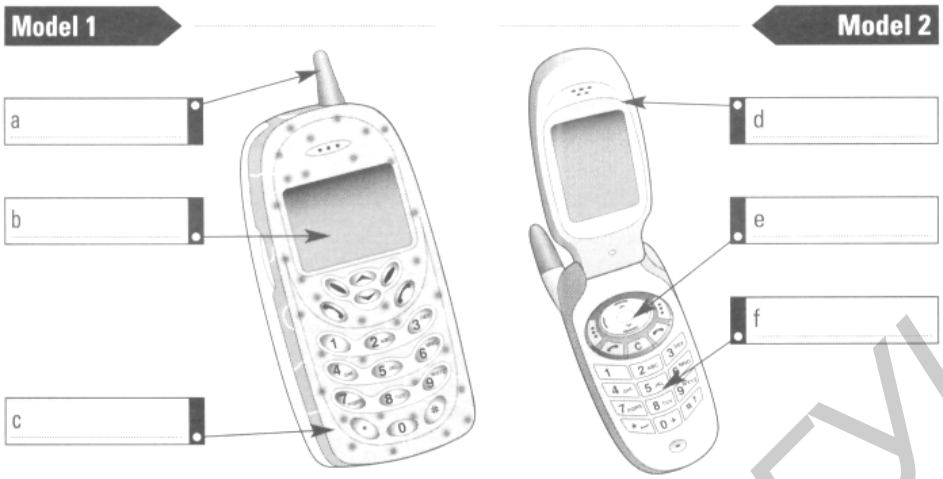
1) Do you use a mobile phone?
2) What do you use it for? Make a list.
3) When is it a good or bad time to make/receive mobile phone calls?

2. Carry out a survey of mobile phone use amongst your classmates. Find out:

1) How many have mobile phones.
2) What they use them for.
3) What makes they have.
4) How often they use them per day.
5) What additional features their phones have, e.g.
   phone book, messages, calls register, games, calculator alarm call.

3. Label the parts of the mobile phones with the words in the box.

antenna • flip cover • display screen • faceplate • keypad • scroll keys



4. Read the adverts to check your answers to Exercise 2. Which phone is best for a business person and which is best for a student? Then write the correct names by Model 1 and Model 2 above.

The new Brightman QT1

This new super-cool model gives you the best in mobile phones

- multimedia messaging to send snapshots to your friends
- downloadable games, graphics and music
- infrared signal transmission to your computer (no cables!)
- voice-activated dialing — just speak to call
- programmable ting tones so you know who is calling before you answer
- detachable faceplate so you can change in to match your clothes
- antenna for clearer reception

SPECIFICATIONS

BAND MODE digital
TALK TIME 4 hours
STANDBY 5 days
DIMENSIONS8x4x1cm

The SP5 Deluxe

Everything you need in mobile technology!

- multimedia messaging with pictures and video
- make calls while browsing the Web

- digital and analog band modes for town and country
- voicemail to send messages to your office
- large screen with 6 text lines for text messages
- large key pad and scroll keys for easy navigation
- Personal Information Manager (PIM) for your appointment schedule
- wireless connection to your PC and headset

SPECIFICATIONS
Band mode dual
Talk time 5 hours
Standby 7 days
Dimensions 5.5x4x1cm

5. Which mobile phone has these features? Write QT1, SP5 or Both.

1) can work anywhere
2) a diary
3) a camera
4) no cables
5) faceplates you can change
6) a one-week standby time
7) ring tones you can program
8) games you can download

6. Which of the words in the box are specific to phones/IT and which are used in general English?

- band mode
- connection
- dual
- navigation
- ring tones
- text messages
- transmission
- voice mail

7. Work in pairs. Text messages or SMS (Short Message Service) use abbreviations. Match the text messages (1-5) with their meanings.

1 gtg 2 brb 3 thx 4 J4F 5 Ik%d meet u@7

I could meet you at 7.00. • Be right back. • Thank you. • Got to go. • Just for fun.

8. Study these examples of abbreviations used in mobile phone text messages. Try to guess the meaning of the other abbreviations.

1	ATB	All the best
2	BCNU	Be seeing you
3	CU	See you

CU L8R, Luv, Msg, NE, NE1, N01, PPL, RUOK, THNQ, Wknd, 4

READING

9. What do these abbreviations mean? Use a dictionary to help if necessary.

GPRS, Wap, HTML, WML, SMS, XML

10. Read the text. Find the answers to these questions.

1) What is the predicted Wap phone use?
2) What developments have made this technology possible?
3) How can you access a favourite website easily?
4) How can one time slot be shared by many users?
5) What peripheral can be attached to some phones?
6) Why cannot Wap phones access all websites?

WAP PHONE

What is Wap? Wap stands for "wireless application protocol" which I allows users to send emails and access information from the Internet on a mobile phone. This has been made possible by technological advances in 'bandwidths', the amount of data that can be received or sent within a fraction of a second. This means that it can be used for many more purposes than were previously imagined, including video transmission.

Spread Some analysts reckon that Wap phones will overtake PCs as the most common way of surfing the Internet although PCs will still be used for more complex applications such as spreadsheets and video players.

Lifespan Some industry experts believe that Wap will have a limited lifespan and will quickly be replaced by more sophisticated technology, such as General Packet Radio Service (GPRS) and the Universal Mobile Telecommunications System (UMTS). GPRS increases the bandwith still further and allows you to send up to ten times more information than Wap technology. However, users will still be limited by the size and resolution of the screen on which the data is received. One analyst, Jakob Nielsen, advises companies to forget Wap and plan, instead, for the next generation of phones. He believes that mobile phones are going to become more like palmtop computers.

Language A Wap phone cannot dial into every website. The language of the Web is HTML - hypertext markup language. Wap operates on WML - wireless

markup language, so Wap phones can only read pages written in WML. Because the screen on a Wap phone is so small that you are unable to read a normal webpage, WML pages tend to consist of small chunks of information. Soon, however, most webpages will be written in XML - extensible markup language. This can be programmed to ensure that every phone or PC receives transmissions in the language it understands.

Internet Wap allows you to deliver online services to a handheld computer. People are also expected to use Waps to access online news and financial services, sports scores and entertainment information, most of which you should be able to reach by scrolling down a set menu bar. You will also be able to book tickets by Wap.

Email Sending emails is likely to be the application that is used most often, as people will be able to pick up messages at any time from anywhere in the world.

Games Gambling and games, some of which can be downloaded, are also expected to be popular with users. But you can, of course, use the Wap to make regular phone calls.

11. Listen to this expert talking about future developments in computing. Note down his predictions.

12. The recording was made in 2000. Has the situation changed today? Discuss in groups.

13. Make statements about these predictions for the next five years. For example:

All school children in my country will have mobile phones.
I think it's unlikely that all school children will have mobile phones
but it's probable that many of the older pupils will have them.

1) ATM machines will use iris recognition rather than PIN numbers. You will get access to your account by looking at the machine.
2) People will vote in elections online.
3) Taxis will be robot-controlled.
4) TV journalists will be able to transmit what they see by using sensors in their optic nerves.
5) There will be more robots than people in developed countries.
6) Most computers will be voice-controlled.
7) Mobile phones will replace computers as the commonest way to access the Internet.
8) English will no longer be the commonest language for websites.
9) Email will be replaced by a voice-based system.
10) Computers will become more powerful.

PROBLEM-SOLVING

14. Try to write these two text message poems in standard English. Compare your versions with others in your group.

txtin iz messin, mi headn'me englis, try2rite essays, they all come out txtis. gran not plsed w/letters shes getn, swears i wrote better b4comin2uni. & she's african.	14: a txt msg pom. his is r bunsn brnr bl%, his hair lykfe filings w/ac/dc going thru. I sit by him in kemistry, it splits my @oms wen he :-)s @ me.

WRITING

15. Write a paragraph about the mobile phone you have or the one you would like to have.

16. Use the Internet or magazines to find a new, up-to-date mobile phone. Make a list of the features it has and report back to the class.

17. The Global Positioning System Link each set of sentences to make one sentence. You may omit, change or add words as required. Then form your sentences into two paragraphs to make a description of how the GPS works and its uses.

1) The GPS was developed by the US military.
It was designed to pinpoint locations.
The locations could be anywhere in the world.
2) It consists of 24 earth-orbiting satellites.
The satellites are 17,000 kms. above the earth.
3) Each satellite broadcasts a coded radio signal.
The signal indicates the time and the satellite's exact position.
4) The satellites have atomic clocks.
The clocks are accurate to one second every 70,000 years.
5) A GPS receiver contains a microprocessor.
The microprocessor compares signals.
The signals are from at least three satellites.
The microprocessor calculates the latitude, longitude and altitude of the receiver.
6) GPS has many uses apart from military uses.
GPS can be used for orienting hikers.
GPS can be used for aiding the navigation of ships.
GPS can be used for tracking trucks and buses.
GPS can be used for locating stolen cars.

SPECIALIST READING

A. Find the answers to these questions in the following text.

1. How many channels does an ISDN system commonly use?
2. What types of wireless systems are named in the text?
3. What do PCs connected to a satellite system use to send data?
4. What types of cables are used in cable network systems?
5. What may need to be upgraded when using a shielded DSL system?
6. Compared to the downstream bandwidth, the upstream bandwidth in an ADSL line is:
   a larger
   b smaller
   c the same
7. Which type of broadband service is the cheapest?

BROADBAND COMMUNICATIONS

Integrated Services Digital Network (ISDN)

ISDN services can be carried over existing telephone network infrastructure to terminal adapters (TAs) in the client machine. A common ISDN interface standard has a digital communications line consisting of three independent channels: two Bearer (B) channels, each at 64Kbit/s, and one Data (D) channel at 16Kbit/s. The D channel is used to carry signalling and supervisory information to the network, while the B channels carry the data and can be linked to provide a 128Kbit/s data channel.

Wireless connections

The wireless alternatives come in two forms: satellite and cellular. Satellite systems require the use of a modem to maintain the upload. Downstream bandwidth is provided via a dedicated satellite dish, connector hardware and proprietary software.

Cellular systems use assigned radio frequencies and are based around a network of transmitters that are arranged in a cellular network, much like cellular mobile phone systems.

The cable alternative

Cable companies can also offer affordable broadband services over copper coaxial or fibre infrastructure networks. The connection is shared by several customers on a branch, so actual connection rates are variable, unlike ISDN and DSL.

Digital Subscriber Line (DSL)

DSL technology capitalises on the existing network of copper infrastructure, but allows digital signals to be carried rather than analogue. It allows the full bandwidth of the copper twisted-pair telephone cabling to be utilised.

With splitter-based services, the DSL signal is pulled out from the phone line as it enters your premises and is wired separately to a DSL modem. This involves additional hardware and installation by the service provider at the customer site. The

shielded option involves no installation, but the telephone company's equipment and some of your equipment might need upgrading.

With Asymmetric Digital Subscriber Line (ADSL), most of the duplex bandwidth is devoted to the downstream direction, with only a small proportion of bandwidth being available for upstream. Much Internet traffic through the client's connection, such as Web browsing, downloads and video streaming, needs high downstream bandwidth, but user requests and responses are less significant and therefore require less on the upstream. In addition, a small proportion of the downstream bandwidth can be devoted to voice rather than data, allowing you to hold phone conversations without requiring a separate line.

DSL-based services are a very low-cost option when compared to other solutions offering similar bandwidth, so they can be made available to the customer at extremely competitive prices.

B. 1. Match the terms in Table A with the statements in Table B.

Table A	Table B
a ISDN b TA c Data channel d Bearer channel e DSL f Splitter-based services g ADSL	i DSL system that separates the digital signals from the analogue signals ii Digital channel used to carry ISDN signalling and supervisory information to the network iii Device installed on a PC to allow it to receive ISDN signals iv Integrated Services Digital Network v Asymmetric Digital Subscriber Line vi Digital channel used to carry ISDN data vii Digital Subscriber Line

2. Mark the following statements as True or False:

a ISDN can only operate over a special digital telephone line.

b Two ISDN channels can be combined to give the user double the bandwidth.

c Computers connected to a satellite system do not need a modem.

d Cellular networks work in a similar way to mobile phone systems.

e DSL systems require a special digital telephone line.

f DSL systems use analogue signals.

g You need a separate line to hold normal phone conversations on an ADSL system.

UNIT 8. C O M P U T I N G S U P P O R T

STARTER

1. Find out what the most common computing problems are for your classmates and how they get help with these problems. Use this form to record your results.

Problems	Sources of help
viruses monitor problems mouse problems computer hangs printer problems computer crashes other	

Ask questions like these:

1. Have you ever had a problem with a virus?
2. Have you ever had a software problem?
3. What kind of problem?
4. What did you do about it?
5. How did you get help?

LISTENING

2. Study this form used by computing support staff in a help centre to record problems reported by phone. What questions would you ask to get this information? Compare your questions with your partner.

3. Now listen to this recording of a computing support officer, David, advising a user. Complete the form to record the main details of the problem.

Help Desk Technician's Name		Date of Call	Time Commenced
Reported By		Address	
Under Warranty	service Tag No.	Make	Model
Processor	RAM Size	Operation System	Network Type
Problem Description		Diagnosis	
Cleared by Phone		Job Number	
Passed to Supplier	Time	Ref. No.	
Passed to Third Party	Time	Ref. No.	
Requires Visit	Time	Visiting Technician	
Equipment Required		Comments (e/g/ case history)	

4. Listen again to note the questions asked by David. How do they compare with the questions you produced in Task 2?

5. Study these steps to take before you phone for technical support. Rewrite each one using the clue given.

1) Reboot your PC to see if the problem recurs, (should)
2) Use your PC's on-board diagnostic and repair tools, (recommend)
3) Record the details of the problem so you can describe it accurately, (good idea)
4) Note your system's model name and serial number, (advise)
5) Keep a record of hardware and software you've installed along with any changes you've made to settings, (strongly recommend)
6) If you think hardware may be at fault, figure out how to open the case, (should)
7) Visit the vendor's website and check the FAQs, (best thing)
8) Avoid phoning in peak times, (never)
9) Have your system up and running and be near it when you call, (good idea)
10) When you reach a technician, tell him or her if you may have caused the problem, (advise).

6. Diagnose these faults and provide advice on each problem.

1) My laser printer produces very faint copies.
2) When I print, three or four sheets come through the printer at the same time.
3) My spreadsheet does not seem to add up correctly.
4) Everything I type appears in capitals.
5) My PC is switched on but the monitor screen is blank.
6) I tried to print a document but nothing came out of the printer.
7) My monitor picture is too narrow.
8) My monitor screen flickers.
9) My mouse responds erratically.
10) The time display on my computer is one hour slow.
11) When I print out a page, the first two lines are missing.
12) My computer sometimes stops and reboots itself. The lights dim at the same time.

SPEAKING

7. Work in pairs, A and B. Advise your partner on his/her computing problem. Ask for advice on your computing problem. Complete this form for your partner's problem.

Student A Your problems and advice.

Problem A
Monitor power light flashing but display screen is completely blank.

SYSTEM	**SOLUTION**	
Make and model Dell, GS205X **Service Number** X3457 **Processor** Pentium IV **Memory** 256MB **O.S.** Windows XP **Configuration** standalone	**INSTRUCTIONS** Check to see if the computer system unit power light comes on when the computer is switched on. Check that the monitor data cable is connected correctly to the VGA port at the rear of the computer. Check that the graphics expansion card is installed properly by: • Switching off the computer. • Disconnecting the power cable. • Opening the computer case by removing the four securing screws. • Inspecting the graphics card to see if it is seated properly in the expansion slot. Correct the fault and check the system by: • Pushing the graphics card fully into the expansion slot. • Replacing the casing. • Reconnecting the power supply. • Switching on the computer and checking that the monitor is functioning correctly.	**RESULT** Computer power seems to be O.K. Data cable is plugged in O.K. Graphics card is loose. Monitor functioning O.K.

Student B Your problems and advice.

Problem B
The monitor display screen is flickering.

SYSTEM	**SOLUTION**	
Make and model Compaq, CV602 **Service Number** 8JD3 **Processor** Pentium III **Memory** 128MB **O.S.** Windows 2000 **Configuration** Windows 2000 network	**INSTRUCTIONS** Change the monitor refresh rate setting by: • Right clicking with the mouse on the desktop. • Selecting “Properties-Settings”. • Clicking on the Advanced button. • Choosing the “Monitor” tab. • Making sure that the “Hide modes that this monitor cannot display” checkbox is ticked. • Selecting a higher refresh rate (i.e. 75 Hz or more). • Rebooting the computer. • Checking that the monitor is functioning properly.	**RESULT** Monitor no longer flickering.

SPECIALIST READING

A. Find the answers to these questions in the text and table below.

1. Give two reasons why server computers often have connected hard drives.
2. Why is RAID 0 particularly suited to imaging and scientific work?
3. What is the advantage of using drive mirroring?
4. To store data, RAID levels higher than 1 require:
   a At least double the disk space
   b Up to about a third more disk space
   c Less than half the disk space
5. Where is the backup data stored in a RAID 5 system?
6. Which levels of RAID can reconstruct data lost in failed drives from the backup data spread across the remaining drives in the array?
7. Which level of RAID is the fastest?

RAIDING HARD DRIVES

Server manufacturers connect hard drives to ensure that data is adequately protected and can be quickly accessed. Computer engineers call such an arrangement a redundant array of inexpensive disks (RAID). By arranging drives in sets, users hope to take advantage of the higher seek times of smaller drives. A special hard disk controller, called a RAID controller, ensures that the RAID array's individual drives are seen by the computer as one large disk drive.

RAID schemes are numbered, with higher numbers indicating more elaborate methods for ensuring data integrity and fault tolerance (or a computer's ability to recover from hardware errors).

	Raid 0	**Raid l**	**Raid 2-4**	**Raid 5**
1	**2**	**3**	**4**	**5**
Fault tolerance?	No	Yes	Yes	Yes
What does it do?	Called disk striping, RAID 0 breaks data into blocks that are spread across all drives rather than filling one before writing to the next.	Called disk mirroring, RAID 1 uses two identical drives: data written to the first is duplicated on the second.	RAID 2-4 are rarely used and simply enhance the striping provided by other RAID levels.	Called striping with parity, the popular RAID 5 writes error-correcting, or parity, data across available drives.

1	2	3	4	5
What are the advantages?	Improved disk I/O throughput - the fastest of all RAID configurations as it distributes read/write operations across multiple drives. Good for imaging and scientific work where speed is important.	If either drive fails, the other continues to provide uninterrupted access to data.	2 enhances 0 by using additional drives to store parity data. 3 enhances 2 by requiring only one error-checking drive. 4 builds on 3 by using larger block sizes, boosting performance.	If one drive fails, its contents are recovered by analysing the data on the remaining disks and comparing it with the parity data.
What are the disadvantages?	The failure of any single drive means the entire array is lost.	Inefficient use of disk space.	Uses dedicated disks to store the parity data used to reconstruct drive contents. Up to 30% more hard disk space needed than 1.	Not as fast as RAID 0.

B. 1. Match the terms in Table A with the statements in Table B.

Table A	Table B
a RAID b RAID controller f An array d Striping e Mirroring f Check data	i Information which is used to restore data if one of the RAID drives fail ii A process of spreading data across a set of disks iii Redundant array of inexpensive disks iv A set v A device for controlling a set of hard disks vi The technique of writing the same information to more than one drive

2. Mark the following statements as True or False:

a Small disks tend to have lower seek times than large disks.
b RAID controllers make one large hard disk act like a set of small disks.
c In RAID systems, one disk is filled with data before the next disk is used.
d A higher numbered RAID array uses a more elaborate system to protect the integrity of data.
e RAID 0 provides good data recovery.
f Small file servers do not usually use RAID level 3.

UNIT 9. DATA SECURITY

STARTER

1. Consider these examples of computer disasters. How could you prevent them or limit their effects? Compare answers within your group.

1) You open an email attachment which contains a very destructive virus.
2) Someone guesses your password (the type of car you drive plus the day and month of your birth) and copies sensitive data.
3) Your hard disk crashes and much of your data is lost permanently.
4) Someone walks into your computer lab and steals the memory chips from all the PCs.
5) Your backup tapes fail to restore properly.

READING

2. Find words or phrases in the table which mean:

1) copies of changes to files made to reduce the risk of loss of data
2) software available for a short time on a free trial basis; if adopted a fee is payable to the author
3) cannot be disrupted or cut
4) put at risk
5) deciphered, worked out
5) protect data by putting it in a form only authorised users can understand
6) a combination of hardware and software to protect networks from unauthorised users
7) observe and record systematically
8) measuring physical characteristics such as distance between the eyes
9) at regular intervals.

LANGUAGE WORK

Cause and effect (2) links using *allow* and *prevent*

What is the relationship between these events?

1) The scanner finds a match for your fingerprint.
2) The keyboard is unlocked.
3) You can use the PC.

1 and 2 are cause and effect. We can link them using an if-sentence. Note that the tenses for both cause and effect are the same. For example:

If the scanner finds a match for your fingerprint, the keyboard is unlocked.

2 allows 3 to happen. We can link 2 and 3 using *allow* or *permit.*

The keyboard is unlocked, *allowing/permitting* you to use the PC.

What is the relationship between these events?

4) The scanner does not find a match for your fingerprint.
5) The keyboard remains locked.

6) You cannot use the PC.

We can show that 4 and 5 are cause and effect. **We can also use *therefore.***

The scanner does not find a match for your fingerprint, *therefore* the keyboard remains locked.

5 prevents 6 from happening. We can link 5 and 6 using *prevent* or stop.

The keyboard remains locked, *preventing* you *(from) using* the PC.

The keyboard remains locked, *stopping* you *(from) using* the PC.

3. Put the verbs in brackets in the correct form in this description of how smart cards work.

Smart cards prevent unauthorised users .....[1] (access) systems and permit authorised users ……..[2] (have) access to a wide range of facilities. Some computers have smart card readers .....[3] (allow) you ……[4] (buy) things on the Web easily and safely with digital cash. A smart card can also send data to a reader via an antenna .....[5] (coil) inside the card. When the card comes within range, the reader's radio signal[6] (create) a slight current in the antenna ……[7] (cause) the card ……[8] (broadcast) information to the reader which ……..[9] (allow) the user, for example, ……..[10] (withdraw) money from an ATM or ……[11] (get) access to a system.

4. Decide on the relationship between these events. Then link them using structures from this and earlier units.

1) Anti-virus program
   a A user runs anti-virus software.
   b The software checks files for virus coding.
   c Coding is matched to a known virus in a virus database.
   d A message is displayed to the user that a virus has been found.
   e The user removes the virus or deletes the infected file.
   f The virus cannot spread or cause further damage.

2) Face recognition
   a You approach a high-security network.
   b Key features of your face are scanned.
   c The system matches your features to a database record of authorised staff.
   d Your identity is verified.
   e You can log on.
   f Your identity is not verified.
   g You cannot use the system.

3) Voice recognition
   a Computers without keyboards will become more common.
   b These computers are voice-activated.
   c The user wants to logon.
   d She speaks to the computer.
   e It matches her voice to a database of voice patterns.
   f The user has a cold or sore throat.
   g She can use the system.
   h Stress and intonation patterns remain the same.

SPEAKING

5. Backups Work in pairs, A and B. You each have details of one form of backup. Explain to your partner how your form of backup works. Make sure you understand the form of backup your partner has. Ask for clarification if anything is unclear.

Student A Your information

Incremental backup

An incremental backup includes only files with their archive bit on. The archive bit indicates whether a file has been backed up since it was last changed. Whenever you back up a file in Windows, the operating system automatically sets the archive bit to 0 (off). 1 (on) indicates a file has not been backed up since it was last worked on. This way, as you append a series of incrementals to your full backup, each contains only those files that are new or have changed since your last backup. This keeps your backup set up to date using a minimum of time and tape.The disadvantage is that it may need many tapes to fully restore the hard disk.

Student B Your information

Differential backup

A differential backup doesn't set the archive bit to the off position after backing up the file. In a full backup in Windows, the operating system automatically sets the archive bit to 0 (off). 1 (on) indicates a file has not been backed up since it was last worked on. Thus, if you do a series of differentials, each backs up all the files created or modified since the last full backup, not just those that have changed. Normally, you keep only the most recent differential backup on hand. This minimises the size of your backup set, since it will never contain more than two copies of any file - one in the full set and one in the differential. This method is mostly used when you're backing up to disks. The downside is that it won't back up files that were created and deleted before the differential backup.

SPECIALIST READING

A. Find the answers to these questions in the following text.

1. What factor determines which type of storage is used to store a file in an HSM system?
2. Complete the following table using information from the text.

Storage Type	Media	**2 Speed**
offline	optical	very fast with quickest access speed

3. What happens to data that is not accessed for a long time?
4. How does the system record that a file is in near-line storage?
5. What happens when a user tries to access a file in near-line storage?
6. What does the reference to a file in offline storage contain?
7. To whom does the user send a request for the retrieval of a file from offline storage?
8. Name three types of magnetic tape mentioned in the text.
9. Select the correct answers in the following:
   a How long can data be stored on tape?
      i) 6 months ii) 2 years iii) 10 years
   b Hard disks are usually used for which type of storage?
      i) offline ii) online iii) near-line
   c Tape is normally used for which type of storage?
      i) offline ii) near-line iii) online
   d Files are automatically retrieved from offline storage
      i) always ii) sometimes iii) never
10. What two factors determine the choice of storage media used?
11. What items must you remember to maintain while data is stored?

BACKUP HSM AND MEDIA CHOICE

Near-line and offline storage (often called Hierarchical Storage Management) is the modern way of dealing with current storage needs. Hard disks are becoming cheaper, but data storage requirements are higher, so it's better to plan for HSM than assume disks can continually be added to systems.

HSM is essentially the automatic movement of data between media, the media type used depending on when it was last accessed. Many software and hardware vendors have HSM solutions, and all are based on the same basic techniques.

The most common HSM setup is where there's s online storage (the hard disk), near-line storage (some sort of fast media from where a file can be quickly retrieved), and offline storage (slower media that might take some time for files to be recovered,

but it is cheaper for a long-term storage). This arrangement is the major thrust of today's systems. Most of the time these systems will comprise optical media for near-line and tape media for offline storage.

Data is automatically moved from the online disk to the near-line optical media if it hasn't been accessed for a definable period of time. This is typically three months (depending on your business). This near-line system is likely to be erasable optical disks in some form of jukebox.

The system has to operate on the basis that a user won't know that a file has been moved into near-line storage. Therefore some marker is left in the directory structure on the disk so that the user can still see the file. If the user then tries to open it, the file will automatically be copied from near-line to online storage, and opened for the user. All the user notices is a slight time delay while the file is opened.

Moving data from near-line to offline storage can be done using a similar mechanism, but more often the marker left in the directory for the user to see will just contain a reference. This gives the user the facility to request the file back from the systems administrator, and could have information like 'This file has been archived to offline media' and a reference to the tape number that the file is on. This is then sent to the systems administrator and the file can be recovered from tape in the usual way.

Some modern systems have the ability to keep multiple tapes in a tape changer or jukebox system, so retrieval from offline to online storage can be automatic. However, it is more likely that when a file goes into offline storage it will never be recovered, as it has probably been untouched for several months (again depending on the business). Therefore the requirement to recover from offline to online is reasonably infrequent.

The choice of storage media type is a crucial aspect of HSM. The cheapest is undoubtedly tape (be it digital, analogue or digital linear), so this tends to be used for offline storage. However, tape has no guarantee of data integrity beyond one or two years, whereas optical systems, such as CDs, WORMs and MO disks, have much better data integrity over a longer period of time. Depending on the precise application, archiving systems are usually based on the media type that has the best integrity. The major suppliers within the HSM market are totally open about the media that can be used with their software. Current HSM systems support most hardware devices, so you can mix and match media to suit requirements. Given the fact that media choice depends on the length of time you want your data to remain intact, and also the speed at which you want to recover it, the choice for many system managers is as follows.

Tape is used for backup systems where large amounts of data need to be backed up on a regular basis. Tape is cheap, integrity is good over the short to medium term, and retrieval from a backup can be made acceptable with good tape storage practices.

Near-line storage should be based on erasable optical disks. This is because access is random, so the access speed to find and retrieve a particular file needs to be fast, and data integrity is also good.

Archiving systems should probably be CD- or WORM-based, as again access speeds are good, media costs are reasonably cheap and, importantly, the integrity of the media over the medium to long term is good.

One important thing to remember with archiving systems is the stored data's format. The data might be held perfectly for 10 or 15 years, but when you need to get it back, it's essential that you maintain appropriate hardware and software to enable you to read it.

B. 1. Mark each of the following statements with True or False:

a Hard disks are still very expensive.
b Near-line storage needs to have a quick access speed.
c Near-line storage is usually some form of jukebox.
d Offline storage needs to have a fast access speed.
e Users are aware that their files have been moved to near-line storage.
f The movement of files between near-line and online storage is automatic.
g The user sometimes has to request files from the systems administrator.
h Files are frequently recovered from offline storage.
i Tape has much better data integrity than optical media.
j It is usually possible to use whatever media you want in an HSM system.

BEFORE YOU START

1. Answer the questions. Then discuss in pairs.

1) How long have you been using the computer?
2) Can you program on your computer? What do you need to make programs?
3) What programming languages have you already known? Which ones are you studying at the moment?

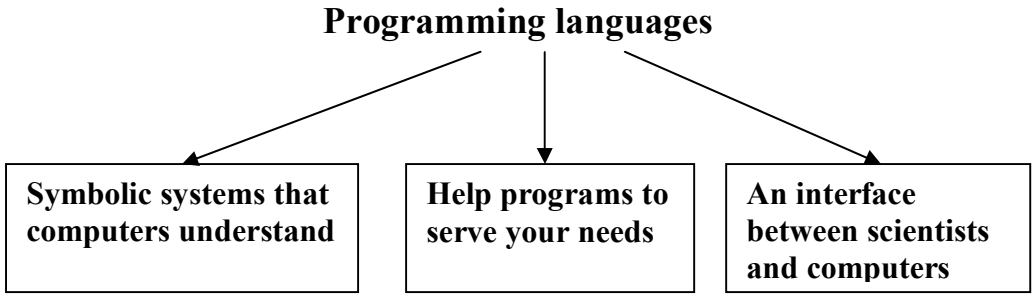
UNIT 10 PROGRAMMING LANGUAGES

STARTER

1. Carry out a survey of PL use among your classmates. Find out: What programming languages are the most popular among them? Why?

READING

2. With the help of this diagram and the text below, try to tell about the functions the programming languages perform.



PROGRAMMING LANGUAGES

Computer languages are symbolic systems that computers eventually understand. They help your programs serve your needs. Compilers are programs that help to make this "understanding" happen. While the first generation of high-level programming languages, such as **Fortran**, are still in wide use and evolving, many new languages with higher level abstraction capability are emerging. Since the nature of scientific research is to explore the unknown world and test new theories, programming languages are usually the most important interface between scientists and computers. For computer scientists, improving code execution efficiency on a given architecture and developing high level abstraction capability of the language are challenging.

3. Read the texts below and answer:

1) What does the performance of your application depend on?
2) Why is OOP gaining its popularity in comparison with other types of programming?

TYPES OF PROGRAMMING LANGUAGES

How fast your applications are likely to run when you put them into production use. Performance depends more on your algorithmic programming skills than the actual language. As a rule of thumb, C, C++ and Fortran are sometimes necessary because they can offer better performance than other languages – at other times they might be unwieldy for the desired purpose. One idea for unscientific "benchmarking" of the languages would be to implement a simple sorting algorithm in all of them and compare running times. This of course does not measure the performance of the actual language – since that concept does not make sense – but only the implementation. Of course it's also not a very reliable or thorough method, but it would give an example how running times in different languages can differ.

BASED LANGUAGES
OOP, Object-Oriented Programming vs. other paradigms

Object-oriented programming is an important programming paradigm that is gaining popularity. In object oriented programming, data structures and algorithms are integrated into units, often called classes. OOP is often contrasted with procedural programming (which uses separate algorithms and data structures). It is not strictly dependent on language: you can do OOP in languages not listed as such (C for example), and program in the procedural style in languages that are listed as OOP. Functional languages (Lisp for example) are a bit different breed – among other things, functional programming is a superset of OOP. Logic programming (Prolog),

also called declarative programming, on the other hand, is not related to the other types of programming in a similar sense.

4. Work in groups of 3 (A, B, C). Read your text extract and answer the following questions:

1) What is this programming language designed for?
2) What are its advantages/disadvantages in comparison with the other programming languages?

MAJOR LANGUAGES

Group A

Ada - is an advanced, modern programming language, designed and standardized to support and strongly encourage widely recognized software engineering principles: reliability, portability, modularity, reusability, programming as a human activity, efficiency, maintainability, information hiding, abstract data types, concurrent programming, object-oriented programming, etc. Ada does not allow the dangerous practices or effects of old languages, although it does provide standardized mechanisms to interface with other languages such as Fortran, Color, and C.

BARSIC (Business And Research Scientific Interactive Calculator) is new programming language for education, research and business. It is a powerful tool to develop applications for mathematical simulation, data processing and visualization, numerical calculations and computer animation. Maine field of BARSIC applications is Physics and Mathematical Physics

HotTEA - HotTEA is an implementation of the BASIC language written in Java. You can implement applications for Internet or Intranet systems in a fraction of the time it takes to learn JAVA but with all the inherent cross-platform and security features that JAVA provides.

A COBOL Interpreter - COBOL Interpreter is a compact and easy to use. Currently still under development, this interpreter implements some new language features that are very useful. One such feature is the DELIMITED WITH option on the OPEN statement. Using this feature you can quickly develop simple COBOL data conversion programs to convert data that would normally require manually importing data into a database or spreadsheet product and then exporting the data to a file with the required format. Interpreted COBOL programs are very useful when interfaces need be built to convert delimited text file data provided by one system to a different file format required by the interfacing system.

Group B

EIFFEL - is a pure object-oriented language, designed for building robust applications, using programming by contract. Eiffel is an advanced object-oriented method and language that emphasizes the design and construction of high-quality reusable software, based on the principles of Design by Contract.

Java & JDK - An object oriented language initially targeted in making nicer web page. It has evolved into much more. It is becoming known as a computing platform — the base upon which software developers can build applications. Developers can build a variety of applications using Java — traditional spreadsheets and word processors in addition to mission critical applications used by the biggest companies: accounting, asset management, databases, human resources and sales.

LISP- high-level language for:

Artificial Intelligence (AI) is a branch of computer science concerned with making computers behave like humans. This includes giving expert advice, understanding a natural language, speaking like a human, and recognizing complex patterns like handwriting. The 3 most useful AI Programs today are Expert Systems (solve real world problems by following the same IF/THEN rules a human expert follows), Natural Language (focuses on getting computers to understand spoken or typed language), and Neural Networks (a digitized model of a human brain, simulated in the binary memory of computer).

Modula-3 - is a member of the Pascal family of languages. Designed in the late 1980s at Digital Equipment Corporation and Olivetti, Modula-3 corrects many of the deficiencies of Pascal and Modula-2 for practical software engineering. In particular, Modula-3 keeps the simplicity of type safety of the earlier languages, while providing new facilities for exception handling, concurrency, object-oriented programming, and automatic garbage collection. Modula-3 is both a practical implementation language for large software projects and an excellent teaching language.

Group C

Perl - It is an interpreted language optimized for scanning arbitrary text files, extracting information from those text files, and printing reports based on that information. It's also a good language for many system management tasks.

PostScript - is a programming language optimized for printing graphics and text (whether on paper, film, or CRT is immaterial). In the jargon of the day, it is a page description language. The main purpose of PostScript was to provide a convenient language in which to describe images in a device independent manner.

Prolog - is a logical and a declarative programming language. The name itself, Prolog, is short for PROgramming in LOGic. It was designed to facilitate natural language processing.

Python - is an interpreted, interactive, object-oriented programming language. Python combines remarkable power with very clear syntax. It has modules, classes, exceptions, very high level dynamic data types, and dynamic typing. There are interfaces to many system calls and libraries, as well as to various windowing systems. New built-in modules are easily written in C or C++. Python is also usable as an extension language for applications that need a programmable interface.

TXL - TXL is a unique programming language and rapid prototyping system specifically designed to support source text analysis and transformation tasks. It is particularly well suited to tasks that involve structural analysis and transformation of

formal notations such as programming languages, specification languages, and structured document notations.

5. Make a summary to report to the rest of the class.

6. What do these abbreviations mean?

OOP
BARSIC
AI
PROLOG

SPEAKING

7. What programming languages are designed to be used in science, education? Which ones are more useful in business, engineering? What programming languages are specially designed to work with web-pages in Internet?

8. What do you think about the prospects of programming languages development?

9. Try to make predictions for the next 10 years. What kind of new PL will appear? Which ones will become outdated in your opinion?

SPECIALIST READING

10. Read the text and find the answers to these questions:

1) What is C prized for? Why has it become so widespread?
2) What features in C are the most important?
3) What features that C lacks are found in other languages?
4) Why is C used as an intermediate language by high-level languages? Is it ideal for this use?

C PROGRAMMING LANGUAGE

The **C programming language** is a standardized imperative computer programming language developed in the early 1970s by Dennis Ritchie for use on the Unix operating system. It has since spread to many other operating systems, and is one of the most widely used programming languages. C is prized for its efficiency, and is the most popular programming language for writing system software, though it is also used for writing applications. It is also commonly used in computer science education, despite not being designed for novices.

C is a relatively minimalistic programming language. Among its design goals was that it be straightforwardly compilable by a single pass compiler — that is, that just a few machine language instructions would be required for each of its core language elements, without extensive run-time support It is quite possible to write C

code at a low level of abstraction analogous to assembly language; in fact C is sometimes referred to (and not always pejoratively) as "high-level assembly" or "portable assembly". In part due to its relatively low level and modest feature set, C compilers can be developed comparatively easily. The language has therefore become available on a very wide range of platforms (probably more than for any other programming language in existence). Furthermore, despite its low-level nature, the language was designed to enable (and to encourage) machine-independent programming. A standards compliant and portably written C program can therefore be compiled for a very wide variety of computers.

C was originally developed (along with the Unix operating system with which it has long been associated) by programmers and for programmers, with few users other than its own designers in mind. Nevertheless, it has achieved very widespread popularity, finding use in contexts far beyond its initial systems-programming roots.

C has the following important features:

- A simple core language, with important functionality such as math functions and file handling provided by sets of library routines instead
- Focus on the procedural programming paradigm, with facilities for programming in a structured style
- A type system which prevents many operations that are not meaningful
- Use of a preprocessor language, the C preprocessor, for tasks such as defining macros and including multiple source code files
- Low-level access to computer memory via the use of pointers
- A minimalistic set of keywords
- Parameters that are passed by value. Pass-by-reference semantics may be simulated by explicitly passing pointer values.
- Function pointers and static variables, which allow for a rudimentary form of closures and runtime polymorphism
- Lexical variable scope
- Records, or user-defined aggregate datatypes (`struct`s) which allow related data to be combined and manipulated as a whole

Some features that C lacks that are found in other languages include:

- Automatic garbage collection
- Language support for object-oriented programming, although the original implementations for C++ was a preprocessor that translated C++ into C source code.
- Closures
- Nested functions, though GCC has this feature as an extension.
- Compile-time polymorphism in the form of function overloading, operator overloading, and there is only rudimentary language support for generic programming
- Native support for multithreading and networking

Although the list of useful features C lacks is long, this has in a way been important to its acceptance, because it allows new compilers to be written quickly for it on new platforms, keeps the programmer in close control of what the program is

doing, and allows solutions most natural for the particular platform. This is what often allows C code to run more efficiently than many other languages. Typically only hand-tuned assembly language code runs faster, since it has full control of the machine, but advances in C compilers and new complexity in modern processors have gradually narrowed this gap.

In some cases, a missing feature can be approximated within C. For example, the original implementation of C++ consisted of a preprocessor that translated the C++ syntax into C source code. Most object oriented functions include a special pointer, usually named "this", which refers to the current object. By passing this pointer as a function argument in C, the same functionality can be performed in C. C is used as an intermediate language by some high-level languages (Eiffel, Sather, Esterel) which do not output object or machine code, but output C source code only, to submit to a C compiler, which then outputs finished object or machine code. This is done to gain portability and optimization. C compilers exist for most or all processors and operating systems, and most C compilers output well optimized object or machine code. Thus, any language that outputs C source code suddenly becomes very portable, and able to yield optimized object or machine code. Unfortunately, C is designed as a programming language, not as a compiler target language, so is not ideal for use as an intermediate language, leading to development of C-based intermediate languages.

11. Find the answers to these questions in the text below.

1) Since when has C++ become the most popular commercial programming language?

2) What was it designed for? What rules were used to create it?

C++ PROGRAMMING LANGUAGE

C++ (pronounced "see plus plus", IPA: /si plʌs plʌs/) is a general-purpose computer programming language. It is a statically typed free-form multi-paradigm language supporting procedural programming, data abstraction, object-oriented programming, and generic programming. Since the 1990s, C++ has been one of the most popular commercial programming languages.

In *The Design and Evolution of C++* , Bjarne Stroustrup describes some rules that he uses for the design of C++. Knowing the rules helps to understand why C++ is the way it is. The following is a summary of the rules.

- C++ is designed to be a statically typed, general-purpose language that is as efficient and portable as C
- C++ is designed to directly and comprehensively support multiple programming styles (procedural programming, data abstraction, object-oriented programming, and generic programming)
- C++ is designed to give the programmer choice, even if this makes it possible for the programmer to choose incorrectly

- C++ is designed to be as compatible with C as possible, therefore providing a smooth transition from C
- C++ avoids features that are platform specific or not general purpose
- C++ does not incur overhead for features that are not used
- C++ is designed to function without a sophisticated programming environment

12. Study the text below and complete the table

THE DIFFERENCES BETWEEN C & C ++

	C	C ++
1		
2		
3, 4 ..		

The C++ programming language was originally derived from C. However, not every C program is a valid C++ program. As C and C++ have evolved independently, there has been an increase in the number of incompatibilities between the two languages. The latest revision of C, created a number of additional conflicting features. The differences make it hard to write programs and libraries that are compiled and function correctly as either C or C++ code, and confuse those who program in both languages. The disparity also makes it hard for either language to adopt features from the other one.

Bjarne Stroustrup, the creator of C++, has repeatedly suggested that the incompatibilities between C and C++ should be reduced as much as possible in order to maximize inter-operability between the two languages. Others have argued that since C and C++ are two different languages, compatibility between them is useful but not vital; according to this camp, efforts to reduce incompatibility should not hinder attempts to improve each language in isolation.

Today, the primary differences (as opposed to the additions of C++, such as classes, templates, namespaces, overloading) between the two languages are:

- **inline** — inline functions are in the global scope in C++, and in the file (so-called "static") scope in C. In simple terms, this means that in C++, any definition of any inline function (but irrespective of C++ function overloading) must conform to C++'s "One Definition Rule" or ODR, requiring that either there be a single definition of any inline function or that all definitions be semantically equivalent; but that in C, the same inline function could be defined differently in different *translation units* (translation unit typically refers to a file). (Note that Microsoft C++ compilers define inline functions as C99 ones)

- The **bool** type in C99 is in its own header, **<stdbool.h>**. Previous C standards did not define a boolean type, and various (incompatible) methods were used to simulate a boolean type.
- Single character constants (enclosed in single quotes) have the size of an int in C and a char in C++. So in C sizeof 'a' == sizeof(int) whereas in C++ sizeof 'a' == sizeof(char). Nevertheless, even in C they will never exceed the values that a char can store, so (char)'a' is a safe conversion that will only change the type of the expression (here it is changed from int to char), but not its value (which on systems using ASCII-encoded characters is 97).
- Additional keywords were introduced in C++, and thus they cannot be used as identifiers as they could in C. (for example, try, catch, template, new, delete, ...)
- In C++, the compiler automatically creates a "tag" for every struct, union or enum, so struct S {}; in C++ is equivalent to typedef struct S {} S; in C.

C99 adopted some features that first appeared in C++. Among them are:

- Mandatory prototype declarations for functions
- The **inline** keyword
- The removal of the "implicit int" return value

13. Read the texts to find out the answers to these questions

1) What derivative is Java of?
2) What was Java targeted first? Why was it retargeted for the Web?
3) What primary goals were there in creation of Java language?
4) Is Java still as popular as it was before? Where is it mostly used nowadays?

JAVA PROGRAMMING LANGUAGE

Java is an object-oriented programming language developed by James Gosling and colleagues at Sun Microsystems in the early 1990s. The language, which was designed to be platform independent, is a derivative of C++ with a simpler syntax, a more robust runtime environment and simplified memory management.

Java technology was created as a computer programming tool in a small, secret effort called "the Green Project" at Sun Microsystems in 1991.

The secret "Green Team," fully staffed at 13 people and led by James Gosling, locked themselves away in an anonymous office on Sand Hill Road in Menlo Park, cut off all regular communications with Sun, and worked around the clock for 18 months. They were trying to anticipate and plan for the "next wave" in computing. Their initial conclusion was that at least one significant trend would be the convergence of digitally controlled consumer devices and computers.

A device-independent programming language code-named "Oak" was the result. To demonstrate how this new language could power the future of digital devices, the Green Team developed an interactive, handheld home-entertainment device controller targeted at the digital cable television industry. But the idea was too far

ahead of its time, and the digital cable television industry wasn't ready for the leap forward that Java technology offered them.

As it turns out, the Internet was ready for Java technology, and just in time for its initial public introduction in 1995, the team was able to announce that the Netscape Navigator Internet browser would incorporate Java technology.

There were five primary goals in the creation of the Java language:

1. It should use the object-oriented programming methodology.
2. It should allow the same program to be executed on multiple operating systems.
3. It should contain built-in support for using computer networks.
4. It should be designed to execute code from remote sources securely.
5. It should be easy to use and borrow the good parts of older object-oriented languages like C++.

Recent history

After several years of popularity, Java's place in the browser has steadily eroded. For simple interactive animations, it has been almost completely superseded by Macromedia Flash and Shockwave. As of 2005 its use is mostly limited to more complex applications like Yahoo! Games. It has also suffered from a lack of support by Microsoft which no longer includes the Java platform with Internet Explorer or Windows.

By contrast, on the server side of the Web, Java is more popular than ever, with many websites using JavaServer Pages and other Java-based technologies. On the desktop, stand-alone Java applications remain relatively rare because of their large overhead. However, with the great advances in computer power in the last decade along with improvements in VM and compiler quality, several have gained widespread use, including the NetBeans and Eclipse Integrated development environments, and file sharing clients such as Limewire and Azureus. Java is also used in the Matlab mathematics program for rendering the user interface and for part of the calculation functionality. Java Swing desktop Now, nearing its tenth year, the Java platform has attracted over 4 million software developers, worldwide use in every major industry segment, and a presence in a wide range of devices, computers, and networks of any programming technology.

In fact, its versatility, efficiency, platform portability, and security have made it the ideal technology for network computing.

Today, you can find Java technology in networks and devices that range from the Internet and scientific supercomputers to laptops and cell phones, from Wall Street market simulators to home game players and credit cards -- just about everywhere. The Java programming language has been thoroughly refined, extended, tested, and proven by an active community of over four million software developers. Mature, extremely robust, and surprisingly versatile Java technology has become invaluable in allowing developers to:

- Write software on one platform and run it on practically any other platform

- Create programs to run within a web browser and web services
- Develop server-side applications for online forums, stores, polls, HTML forms processing, and more
- Combine Java technology-based applications or services to create highly customized applications or services
- Write powerful and efficient applications for mobile phones, remote processors, low-cost consumer products, and practically any device with a digital heartbeat

JAVA SERVER PAGES

14. What do JSP and ASP stand for?

15. Match definitions with abbreviations

HTML	a DOS program with com filename extension
ASP	extensible markup language
VC	Hyper Text Markup Language
JSP	visual basic
MVC	active server pages
XML	Java Server Pages

16. Work in groups A and B. Read the text below and fill the table. Group A finds the information about ASP technology and group B fills the information about JSP. Then report to the class.

	JSP	ASP
Portability		
Performance		
Development & Deployment		
Custom Tag Libraries		
MVC or Model 2 Architecture		

JavaServer Pages (**JSP**) is a Java technology that allows software developers to dynamically generate HTML, XML or other types of documents in response to a Web client request. The technology allows Java code and certain pre-defined actions to be embedded into static content.

A WEB DEVELOPERS PERSPECTIVE - "FROM ASP TO JSP"

Comparing these two technologies is both a difficult and sensitive task but it is important to appreciate the differences in the way that the various interfaces, and the applications that connect to them, work.

JavaServer Pages (JSP) and Microsoft Active Server Pages (ASP) technologies provide a simplified, fast way to create web pages that display dynamically generated content. While ASP and JSP technologies are similar in many ways, they also differ significantly in some ways.

Both the technologies follow the same model of separating programming logic from page design through the use of components that are called from the page itself. And both provide developers an easier and faster alternative to creating web applications using CGI scripts.

The main strengths of JSP as compared to ASP:

Portability

A Portable application environment gives organizations the flexibility to migrate servers and swap tools, as business needs change. Portability also enables developers to share their work with a wider audience.
Java Server Pages technology delivers "Write Once, Run Anywhere" capability, offering unprecedented reuse on any platform and on any server.
JSP is being developed through an industry-wide initiative led by Sun Microsystems and is designed to be both platform and server independent. In contrast, ASP is purely a Microsoft based technology deployed primarily on Windows NT servers. JSP technology was designed to support numerous servers, browsers and tools.

Performance

Pages built using JSP technology are typically implemented using a translation phase that is performed once, the first time the page is called. The page is compiled into a Java Servlet class and remains in server memory, so subsequent calls to the page have very fast response time whereas in ASP the page is recompiled for every request.

JSP implementations support a Java programming language-based scripting language, which provides inherent scalability and support for complex operations.
Most JSP pages rely on reusable, cross-platform components (JavaBeans or Enterprise JavaBeansTM components) to perform the more complex processing required of the application, instead of relying heavily on scripting within the page itself. Developers can share and exchange components that perform common operations, or make them available to larger customer communities. The component-based approach speeds overall development and lets organizations leverage their existing expertise and development efforts for optimal results.

Development & Deployment

As mentioned earlier, JSP follows the model of separating programming logic from page design through the use of components like JavaBeans, Enterprise JavaBeans (EJB) and custom JSP tags. Assuming that web page developers are not familiar with scripting languages, JSP technology encapsulates much of the

functionality required for dynamic content generation in easy-to-use JavaBeans components. The page developer can instantiate JavaBeans components, set or retrieve bean attributes and perform other functions that are otherwise more difficult and time-consuming to code. Microsoft's answer to component architecture relies on COM/DCOM to supplement the ASP technology. Given the complexity involved in developing COM components in VC++ or VB, it is by no means a comparison to the simplicity of JavaBeans, which can be easily developed using Java.

Custom Tag Libraries

The JSP technology is extensible through the development of customized tag libraries. This lets web page developers work with familiar tools and constructs, such as tags, to perform sophisticated functions. ASP does not directly support custom tags like JSP but supports XML.

MVC (Model-View-Controller) or Model 2 Architecture

Separation of Presentation and Business Logic has never been so easy with ASP or JSP. With increasing complexity the pages would clutter with Scriplets and processing code, making it hard to debug or make changes. To counter this problem, the JSP/Servlet's Model 2 architecture was introduced, providing a cleaner approach to code manageability. This is a hybrid approach for serving dynamic content combining the use of Servlets and JSP. It takes advantage of the strengths of both technologies: JSP is used to generate the presentation layer and Servlets to perform process-intensive tasks. The Servlet acts as the controller processing the requests, creating beans (models) or objects used by the JSP, and depending on the user's actions, dispatches the appropriate JSP page to the user. The JSP (view) page, which contains no processing logic, is simply responsible for extracting and inserting the dynamic content from the Servlet into static templates.

Conclusion

The JSP/Servlets Technology to be more than just an answer to Microsoft's ASP technology. JSP has become more robust and scalable with the release of J2EE. With an ever-growing support for the Java technology the JSP solution is gaining prominence and immense respect from the developer community. Its time to break free from the tyranny of Microsoft and embrace the technology from the Open Source world.

SPEAKING

17. Do you agree with this article? Give your own opinion on these both technologies.

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МЕТОДИЧЕСКАЯ РАЗРАБОТКА

по развитию навыков технического чтения
на английском языке для студентов 2-го курса
ИЭФ ФКСиС, ФИТУ
дневной формы обучения

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