COMPUTER SKILLS FOR BIOLOGISTS

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INTERNET AND ITS SERVICES

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*One of the remarkable aspects of recent thinking on economic and social management is the recognition of the importance of information as a key resource. The dawn of new millennium heralds revolution in Information Technology. IT is going through a **paradigm shift.** Paradigm shift means fundamentally new way of looking at some thing. It brings about fundamental challenges in almost every aspect of technology itself. Such fundamental changes demand change in conceptualization and it will have substantial impact on society too. Phenomenal growth of Internet has revolutionized the life with its vast potential resources and it is not too late to get equipped with Net for your own needs. You are a Netizen (Net Citizen), and exist as a citizen of the world thanks to the global connectivity that the Net makes possible. You consider everyone as your compatriot. This article gives some information about Internet and its popular tools.*

What is Internet?
Different people define Internet differently. The Internet can be defined as a network of tens of thousands of computer networks consisting of over a million computer systems. It is a platform where millions of people communicate electronically to share ideas and information.

Internet can also be thought of like a rapidly–growing global digital library built on a remarkably flexible communication technology. It offers a variety of services used to create, browse, access, search, view and communicate information on a diverse set of topics. It is a vast collection of information that can be searched and retrieved electronically. The Internet is a network of networks, all freely exchanging information.

How is Internet Different from Other Medium?
The Internet is quite different from the other communication media. People of all ages, color, caste, and location can freely share ideas, data, opinion and other information available on Internet.

One of the most important facts about the Internet is that anybody can access it making it probably the most open network in the world.
People use the Internet for some of the following things:
- Education
- Research
- Travel
- Finding People
- Finding business, products and services
- Exchanging Messages

History of the Internet
In 1970's the US Defense Department introduced a multiple network called ARPANET. (ARPA-Advanced Research Project Agency) The projects aimed at interconnecting WANs and LANs. The project and the prototype developed were known as Internet (internetwork) or network of networks. ARPANET became the backbone of the Internet. The ARPA group developed a set of network software. This integrated set of software are called Network protocols. The two groups of such software used for Internet are called TCP-Transmission Control Protocol and IP – Internet Protocol respectively. IP provides basic communication while TCP provides additional facilities that an application needs.

How Internet works?
Computer networks do not usually dedicate a single wire to each pair of communicating computers. Instead, the network system arranges for multiple computers to share the underlying hardware facilities. In the similar way, various computers connected to the Internet share a single transmission path to reduce the cost. Sharing introduces delay. It may cause other systems to wait for a long period of time when one has to transmit a long message. One solution to reduce the delay is to use multi-channel on a single wire using multiplexing.

Internet uses "packet switching" to reduce the delay by sharing the line. A long message is split up in to smaller groups called 'packets'. The amount of data computer can transfer on each turn is limited by the packet size. Hence no computer will hold the line for a long period.

Each packet is labeled with the address of the sending and receiving stations. These are added at the beginning of each packet and is called 'header'.

A packet transmission is so fast that a user feels that the message is transmitted continuously.

Internet Services
i)   **Electronic Mail (e-mail**)

It lets users communicate with other people electronically on the Internet. Electronic mail can be used to:

- Send a message to either one recipient or multiple recipients
- Send a message that includes text, graphics, images, voice or video.

On most of the computers, when an incoming e-mail message arrives, e-mail software informs the recipient about the same as soon as the user logs in.

ii)   **Usenet news or Net news**:
Provides the facility to exchange news among an interested group. It uses newsreader software to read and post messages.

iii)   Telnet:
Helps you to connect your terminal to a remote system and run your program in the remote system.

iv)   Anonymous FTP:
Provides the facility to transfer files to your system from remote systems wherever such free transfer of file is permitted.

v)   Archie:
Provides the side addresses of millions of files available to any one on the Internet using the service anonymous FTP

vi)   WAIS (Wide Area Information Server):
Helps to search and retrieve tens form database stored anywhere on the Internet. Search is made using one or more keywords.

vii)   Gopher:
A popular software for maneuvering through the Internet. Using appropriate menu you can get any information you want from the Internet.

viii)   WWW: World Wide Web:
A hypertext Internet service developed at CERN in Switzerland. It is a uniform means of accessing different types of information on the Internet. WWW provides hypertext multimedia information retrieval system. It is emerging as another powerful content-oriented search and information retrieval mechanism.

Ways to get Internet connection
There are three different ways to get Internet connection:

1. Dial-up connection using a modem and dialing up to some Internet Service Provider's (ISP's) computer via telephone lines. Your computer acts only as a terminal to a system, which is connected to the Internet. Under this dial-up connection, two types of Internet accounts are provided:
   - Shell Account (only text based services are available) Now it is rarely used
   - TCP/IP Account (Full Internet Connectivity).

2. Using leased or dedicated line connection with a computer connected to the Internet. Your personal computer can be networked to the host computer through the modem. There are two software available to connect your personal computer to the Internet as a host machine through modem – SLIP (Serial Line Interface Protocol) and PPP (Point-to-point protocol). With SLIP or PPP your system can access all the facilities including graphical information.

3. VSAT connection using a satellite connection to some Internet machine: The system will be connected as a host to the Internet (TCP/IP connection). All the Internet facilities ties are available.

Indian ISP's
1. National Informatics Centre
    a. NICNET – used mainly for official communications between the state and central governments.
    b. REN – A Network of Indian Educational and Research Institutions/Organizations
2. ERNET - Department of Electronics (DOE) maintains ERNET (Educational and Research Network).

Both NIC and ERNET are Internet Access Providers providing connection to non-commercial organizations.

3. VSNL (Videsh Sanchar Nigam Ltd.) maintains a backbone network called VSNLNET. This was the only agency offering Internet Access for public in India till recently.
    VSNL provides three types of connections
    -   Shell Account (Text based dial-up connection)
    -   TCP/IP Account (dial-up and/or leased line connection)
    -   ISDN dial-up access
4. Many private agencies were also given permission to provide Internet Access to the public. In Calicut, Satyam Online and ETH Dishnet are two such agencies apart from VSNL and BSNL to provide internet Connection.
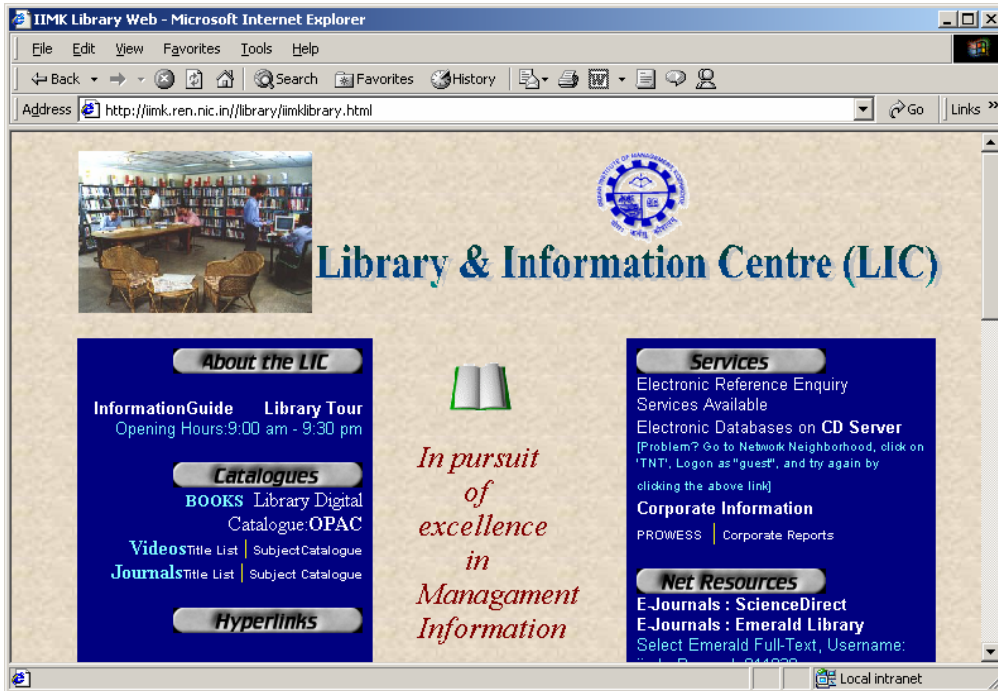
More About WWW
The World Wide Web may well be the most democratic mass medium ever created; in that Web users can create as well as consume contents.

The Web is a fastest growing system in human history. It's loaded with useful information. And, it's fun. Academics, in their professorial way, call it a global hypermedia system. For, you and me, it's an incredibly fun way that you can jump from one Internet computer to the next, just by clicking an underlined word or phrase called a ***hyperlink***. The Web is entertaining, useful, fun and increasingly indispensable.

The WWW or Web, as it is more frequently referred to as, is a collection of 'pages' of information connected to each other. Each page can be a combination of text, pictures, audio clips, video clips, animations and other stuff. What makes web pages interesting is that they contain links (actually called hyperlinks) to other web pages and when user selects/clicks on any link the Internet access software fetches the page the link points to. Each page the software fetches may have more links too.

This system of inter-linked documents is known as hypertext. Figure below shows a Web Page:

IIMK Library Web - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites History

Address http://iimk.ren.nic.in/library/iimklibrary.html   Go   Links

Library & Information Centre (LIC)

About the LIC

InformationGuide   Library Tour
Opening Hours:9:00 am - 9:30 pm

Catalogues
BOOKS Library Digital
Catalogue:OPAC
Videos Title List | Subject Catalogue
Journals Title List | Subject Catalogue

Hyperlinks

In pursuit of excellence in Managament Information

Services
Electronic Reference Enquiry
Services Available
Electronic Databases on **CD Server**
[Problem? Go to Network Neighborhood, click on
'TNT', Logon as "guest", and try again by
clicking the above link]
Corporate Information
PROWESS | Corporate Reports

Net Resources
E-Journals : ScienceDirect
E-Journals : Emerald Library
Select Emerald Full-Text, Username:

Local intranet

Each underlined phrase is a link (hyperlink) to another Web page. Hypertext is a way of connecting information in ways that makes it easy to find.

Browsing/Surfing the Internet

In order to find information on the Internet, one needs a browser, the software that goes and gets Web pages and displays them on the computer screen. A browser decodes the hidden symbols in Web documents, turning them into richly formatted documents replete with fonts and graphics. In addition, browser also originates messages that locate and retrieve documents every time you click a hyperlink. Microsoft Internet Explorer and Netscape Navigator are two very popular browsers.

Microsoft Internet Explorer 4.0 comes bundled with WINDOWS 98 software and Netscape Navigator is a shareware available on CDs coming with various computer/IT magazines or can be downloaded from the Internet itself provided you have access to any other browser.

Microsoft Internet Explorer can be downloaded from http://www.microsoft.com and Netscape Navigator can be downloaded from http://www.netscape.com sites.
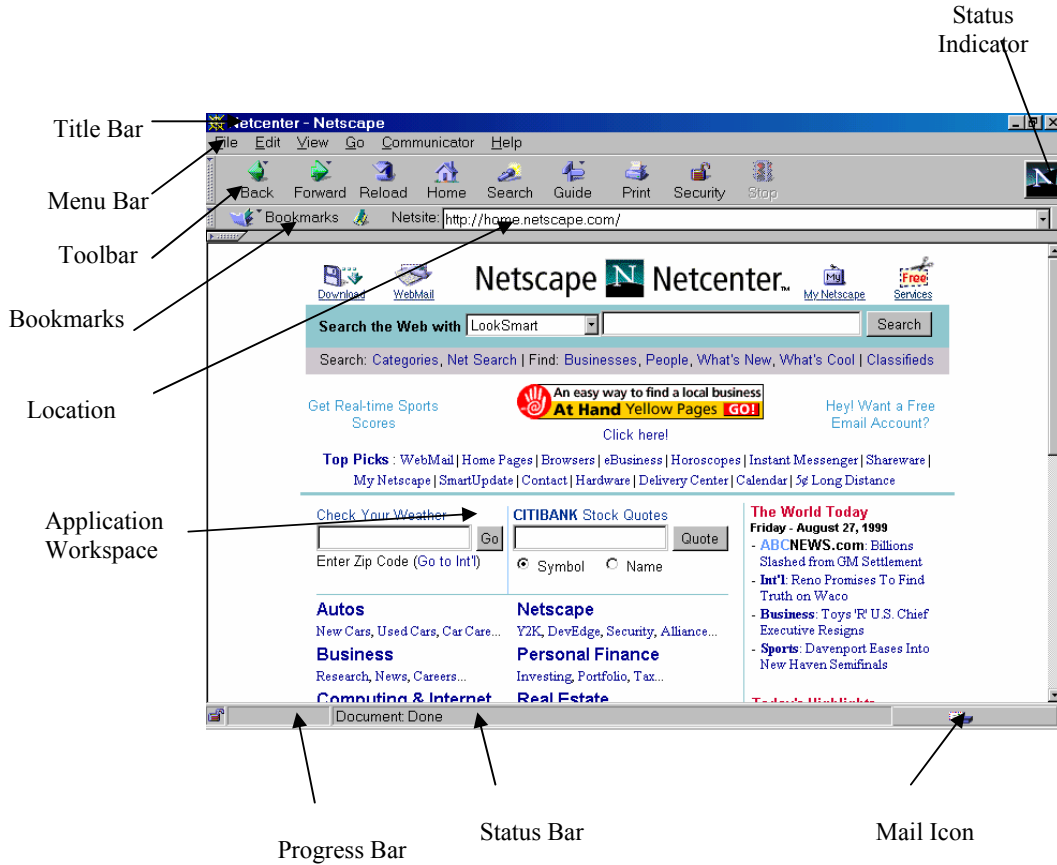
Surfing with Netscape Navigator

As described above there are many *browsers* that can be used for surfing the Internet. I have, however, selected Netscape Navigator as our browser for the discussions to follow.

Starting Netscape Navigator:

You can use the Start button available on the Task Bar of Windows 95/98 to start any program. Similarly, to start Netscape Navigator:

1. Click the Start button.
2. Point to Programs.
3. Point to Netscape Communicator.
4. Point to Netscape Navigator and click to start Netscape browser.

A window similar to the following opens:

Status Indicator

Title Bar

Menu Bar

Toolbar

Bookmarks

Location

Application Workspace

Progress Bar

Status Bar

Mail Icon

When Netscape Navigator starts, you see the program's window. The program icon (the big N) displays animation, informing you that Netscape is downloading information. In about a minute, you will see the default ***start page***, the page that appears when you start Netscape or click the Home button.

Netscape Navigator's program window has following parts:

Title bar:
At the top of Netscape's window is the title bar, a standard Windows feature. Here, Netscape displays the title of the page you are currently viewing in addition to its own name.

Menu Bar:
Below the title bar is the menu bar. On the menu bar, you will find the titles of Netscape's menus, from which you can choose additional options. This contains menus such as File, Edit, View, Go, Communicator and Help.

Tool Bar:
The Toolbar contains buttons or tools that enable easy access to frequently used Netscape commands. Following are some important buttons:

Back: Go back to the previous document in the history, which you have just visited.

Forward: Return to the document you went back from or move forward to next document in the history.

Reload: Retrieve the currently displayed document again.

Home: Go to the default home page.

Print: Print the document that Netscape is currently displaying.

Stop: Stop downloading the current document.

Bookmarks:
A bookmark is a saved document address that enables you to return to this document quickly, just by choosing it from the Bookmarks menu.

Location:
This box indicates the Web address (the URL) of the document you are currently viewing. An example of an URL is **http://www.netscape.com**. The first thing in a URL, the word before the colon (:), is the scheme, which describes the waya browser can get to the resource. The most common by far is http, the Hyper Text Transmission Protocol that is the Web's native transfer technique. Following the colon are two forward slashes and the name of the host computer on which the resource lives, in above example, **netscape.com**.

Status Indicator:
The big 'N' lets you know when Netscape is downloading a document from the Web-it plays an animation. When the document is finished downloading, you see 'Document Done' on the status bar at the bottom of the screen.

Application Workspace:
Here, Netscape displays the document you are currently viewing. You will see text, hyperlinks and in-line-images (graphics that appear along with the text).

Status Bar and Progress Bar:
Netscape uses the status bar to display messages about what the program is doing. Next to the status bar is a blank panel called the progress bar. When Netscape retrieves a document from the Internet, you will see a graphical display indicating how much of the document has been obtained.

Mail Icon:
If Netscape is set up to read Internet mail, you will know when there is mail waiting for you: you will see a little envelope followed by an exclamation point on the status bar. To open a mail window, just double click this mail icon.

Browsing/Going Places Using Netscape
To visit any Web page you require to know its Address or (URL). Once you know the URL of the Web page you want to visit to, click in the Location box of the Netscape browser. Type the URL in the box (when you type a Web address into this box directly, it changes its name to *Go To*). Press Enter

Following paragraphs briefly describe the procedure for performing some of the frequently needed tasks:

View Pages within the Page
Click highlighted words (coloured or underlined) in a page to bring another page of related information to your screen. Click **Back** and **Forward** toolbar buttons to go back (or forward) to a page you have previously seen.

To open URLs you have previously typed in and visited
Choose an item from the location field pop-up menu. To display this pop-up menu, click the pop-up menu arrow located to the right of the location field.

Bookmark
To Bookmark the current page for easy access in future, click on Bookmark button in the location toolbar display pages and click on Add Bookmark.

Open a new Navigator window
To open a new Navigator window click on the File menu, click on New, then Navigator Window. The new window displays another copy of your home page on the screen in a fully functional and independent Navigator window.

Opening Mail Box Window
Click the Mailbox icon (the second icon from the left in the component bar) to display the mail Inbox folder and retrieve new messages.

Composing New Mail
To open window for composing new mail click on the File menu, click on New, and then click on Message.

Searching and Finding
Navigator software offers two distinct tools to help you locate information: Internet "search" tools and page "find" tools. A search tool helps you locate information such as web pages and discussion group messages that resides on the Internet network. A find tool locates particular words or phrases within the page that you're currently viewing.

To search for information over the Internet click the Search button on the toolbar. This displays a page offering access to Internet search engines and

other search services. Follow the instructions on the search engine site. Typically, you'll type in search text, click a button, and then wait for the engine to locate occurrences of the text among a database of web pages.

To find information in the current page, open the Edit menu and choose Find in Page. In the resulting dialog, type the text you want to find, then click Find Next. Located text is highlighted and, if necessary, the page scrolls to the text's position. Click the Edit menu's Find Again item to search for more occurrences.

Opening a HTML Page available on Local PC
To view a HTML page available in the hard disk of the client PC, choose Open Page from the File menu. In the resulting dialog box, type the file name and its location or select a file using the Choose File button, if location of file not known. Click Open to display the page.

Stop a page transfer in progress
To stop a page transfer in progress, click the Stop button. Alternately, you can stop a link's action by choosing Stop Loading from the Go menu.

Display the home page
To display the default home page, click the Home button. The URL of your home page is designated in your preferences.

Viewing Images
To turn off automatic image loading, from the Edit menu, choose Preferences. Select the Advanced category. Deselect the Automatically load images item. When this checkbox is
unselected, the images in pages are replaced by small icons.

Selecting a Home Page
You can designate your own home page (the page Navigator first brings to the screen each time you open a new window) by supplying a URL as a preference panel item. The default home page, the page that Navigator is initially set to display, has this URL: http://home.netscape.com/index.html. (If you omit the pathname index.html, the file still loads by default). To change your home page, open the Edit menu and choose   Preferences. Select the Navigator category. Click the radio button Home page. In the Location field, type the URL of the new home page you want. Alternatively, you can select the radio button Blank page if you want the home page to be empty of content.

Saving a Page
To save the contents of the current page in a file, click on File, click on Save As or Save Frame and type a valid file name in the Save Window and click on OK.

Save an Image
To save an Image displayed in the current page, click the right-mouse button inside the image to display the pop-up menu. Choose Save Image As and type a name of the file in the Save As dialogue box.

Close Current Navigator window
To close current Navigator window click on File, click on Close. This closes the current Navigator window.

Printing Internet Pages
To print the contents of the current page from the File menu, choose Print, or click the Print button in the toolbar. A dialog box lets you select printing options and begin printing. On Windows, you can choose Print Preview from the File menu to see a screen display of a printed page.

To print a frame
When you view a page containing frames, in the File menu you'll see Print Frame in place of Print. The command lets you print only the page within a currently selected frame. The dialog box options for printing the page are unchanged.

Page Layout
When printing a page, Navigator formats content according to the size of the printed page rather than the size of the onscreen window. The Print command rearranges the page layout (text is word-wrapped and graphics are repositioned) in order to accommodate paper size.

To set up the page for printing from the File menu, choose Page Setup. You can use this command to choose page layout options including header and footer information.

EMAIL

Electronic mail is the fastest and cheapest way of communication today. Any type of files can be send to anybody through email. Computer networks are used to transmit electronic mails. Now people use the internet to send and receive emails. Following is a very brief discussion about the working of emails.

How Does E-Mail Reach its Destination?

Let us assume that you are at home, writing an electronic mail message to your uncle, who works on the other side of the world. You know that once you send your mail, it will somehow make itself to you uncle's computer. How exactly does this happen?

Step 1: Sending (uploading) mail

To connect to the Internet, you must have an account with an Internet Service Provider (ISP), a company that connects people to the Internet. Connection from your computer to the ISP's computers will probably be made through the phone, using a device called a modem. The modem enables your computer to transmit digital data over the phone lines, which are analog. The data passed between the two computers is decoded using computer protocols. In this case, various modem specific protocols (such as X.25) are used, as well as protocols from the Internet protocol suite (such as PPP and SLIP). Your mail program sends your mail through the use of yet another protocol - the Simple Mail Transfer Protocol (SMTP).

Step 2: At the ISP's

The ISP's modem converts data from the phone line back to digital pulses, and it server interprets the information. The server figures out the nature of your data, by decoding the SLIP/PPP data (in this case, the data is your e-mail).   The ISP has a local area network (LAN) (or specifically, an Ethernet LAN). The LAN connects computers in the ISP's office space. Once the data is interpreted, the server's first role is to figure out if the data you had just sent is destined for a computer in the ISP's LAN. Data not destined for a computer connected to the ISP's LAN, is forwarded to the Wide Area Network (WAN) - the Internet. For security reasons, the ISP had installed a firewall, a device that keeps unwanted people from tampering with data on it LAN. The firewall job is to receive all data going to/from the Internet, and filtering out it "bad" part.

Step 3: The WAN

Wide Area Network (WAN) is a general term that refers to a network that exceeds local boundaries. A WAN usually includes many LANs in it, which together form a huge network. The world's most famous WAN is the Internet.

Step 4: At your uncle's office

Your uncle's office has a local area network that's connected directly to the internet through a router. A router is a device that serves as a kind of electronic "yellow-pages" of computers. Every computer on the internet has

an "address", and routers are the devices that know how to get data to each computer using this address.

Email and your Browser

As discussed earlier, email is a means of sending messages from one person to another using the Internet as the transmission mechanism, much like using the postal service as your carrier.

How many times have you been surfing a web site and wanted to contact the author or webmaster and the only way to do so was via an email address? If you are like most people, your answer would be "Very often". So what do you do? You grab a piece of paper and write down the email address. Then you switch to your email program, enter the address, write your email and send it, then you return to your browser. Tedious to say the least.

This chapter will cover setting up Navigator and Explorer for email and newsgroups. In order to provide a clear distinction between the two browsers, we have separate sections for each of the browsers.

Email Addressing

Like real mail, sending email requires that you know the address of the individual or company you wish to send email to. Unlike real mail, an email address is fairly simple, composed of only two parts. The first part of the email address is the user's account name that you are sending the email to. Some ISPs will allow the user to pick a user name, others will follow a set pattern, like the first name followed by the first letter of their last name, or perhaps even a number.

   eg. ravi
        ravi001
        ravi_s

You also need to know the name of the server. In Ravi's case he logs into the Internet via a server called yahoo.com. Since we can't just merge the two pieces together, we need something to keep them apart, we use the "@" character to separate the user name from the server name. Hence Ravi's address now becomes one of these;

   ravi@yahoo.com
   ravi001@yahoo.com
   ravi_s@yahoo.com

Server names can be longer and more complex but basically it's safe to say that anything to the right of the "at" sign is the server name and everything to the left is the user name.

Setting up your browser for email

Before you begin setting up your browser to handle email, there are certain questions which only you and your Internet Service Provider (ISP) must answer. You must have this information on hand before you begin, so talk to your ISP. The information you need is;

   Your Email Directory.*

Your News Directory. *
Your Email Address. *
Your POP User name.**
Your Outgoing Mail (SMTP) Server Name. **
Your Incoming Mail (POP) Server Name. **
Your News (NNTP) Server Name.**

*You supply this information
** Your ISP must supply this information

Search Engines

These are softwares that help us to find our way around the billion or more pages that make up the Web. It is a service that indexes, organizes, and often rates and reviews web sites. There are significant differences in how search engines build their databases and rank sites. Some rely on people to maintain a catalog of web sites or pages. They are called General Topical Search Engines. Some use software called a spider or crawler to identify key information on sites across the Internet. They are known as Keyword Search Engines. Some others combine both types of services.

These differences make some search engines far more useful than others for searching science and technology websites. Key features to look at in a web search engines database building and indexing strategies are free URL submission, full-text indexing, automated, comprehensive web crawling, a fast 'refresh' rate and a sensible ranking strategy for results.

AltaVista: You can search for keywords or type your query in the form of a question. Other features include a facility to translate sites in several languages; photo and media finder which searches for images; and family filter which helps you to limit the types of results produced by the search.

Lycos: It is a search engine with a directory, organized by subject.

Google: Google is one of the best search engines, which is extremely comprehensive. Pages are ranked based on how many times they are linked from other pages. Google catches copies of web pages, so pages can be accessible even if the server is offline. It returns only pages that contain all the relevant search terms.

HotBot: For a new user HotBot is probably the best search engine. It is also relatively comprehensive, regularly updated and offers form-based query tools.

Excite: A hybrid search engine. It has the traditional search capacity because of using a software program but also has a directory.

Yahoo: This is actually a directory rather than a search engine, meaning human compile and categorize the sites it searches.

If you are looking for a broad, common topic use a search engine that tends to give you fewer results of higher quality 9usually the type that relies on people to catalog sites) eg. Yahoo.

If you are looking for a rare topic a site that may be less discriminating but yields more results (usually the type compiled by a software program) eg. Excite, Google.

As scientists we should know how to structure a query to weed out the majority of the junk that will come up in a search. Each search engine makes different default assumption when we enter a few keywords into its little box. If your

first search doesn't produce the results you want, try searching with at least one more search engine. Many search engines have a link that leads to detailed information about how it compiles and searches through information, and how to get the best results from it. Reading this page can save you a lot of time.

Effective searching is done when most of the planning, analyzing and keyword refining is done away from the computer. In order to find information effectively, you should plan your search by creating word webs or concept maps or idea maps on the topic. Combine these concepts or ideas depending on the kind of search engine that you will be using. Include distinctive names, acronyms, and abbreviations within your strategies. Include synonyms and variant spellings within your strategies.

Topical Search
With this kind of search, you begin with a broad topic, then you narrow it down. Eg. Science-Biology-Molecular Biology. This search is used with topical search engines such as Yahoo.

Keyword Search (boolean searching)
In order to search effectively, you need to use Boolean logic, which is an extremely simple way of stating how a group of things should be divided or combined into sets. Boolean queries restrict the results that are returned from a database by joining a series of search terms with the operators AND, OR and NOT; and mathematical signs + or -. The word **and** and the sign **+** will connect your concepts together by requiring that both of these words appear in the results. The word **or** will allow either word to appear in the results. The words **and not** and the minus sign (**-**) will exclude words to appear in the results. The word **adj** means "adjacent" and will generate results showing where those two words are next to each other in any order. The word **near** will generate results showing where those two words are close to each other. Quotation marks will generate results showing those web pages that show the exact phrasing contained within the quotation marks. If you want to broaden your search or you are unsure of the spelling for a particular word, many search engines will allow by suffixing the word with signs like ***, ?** and **$.**

Joining two keywords with AND finds documents that contain only *keyword 1* and *keyword 2*; using OR finds documents that contain either *keyword 1* or *keyword 2* (or both); and using NOT finds documents that contain *keyword 1* but not *keyword 2.* However, search engines differ in how they interpret a space or an implied operator. Some consider a space an OR, while others defaults to AND. Therefore, find out how the search engine you are using works before you formulate your query.

Boolean queries are read from left to right, just like text. Parentheses can structure more complex boolean queries. If you look for documents that contain *keyword 1* and one of either *keyword 2* or *keyword 3*, but not *keyword 4*, the query should be like : (*keyword 1* AND (*keyword 2* OR *keyword 3*)) NOT *keyword 4*. By using quotation marks you can specify a phrase in many search engines.

INTERNET RESOURCES IN BIOLOGICAL AND AGRICULTURAL SCIENCES

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Introduction

The explosive growth of the Internet and the World Wide Web (WWW) in recent years have its impacts on almost every field of human activity, and Biological Sciences is no exception. The secret to understanding the Internet is that it is populated by two types of computer programs: servers and clients. Servers are programs that provide resources and Clients are programs that we use to access these resources. E-Mail, LISTSERV/Mail lists, USENET/Newsgroups, FTP, Telnet, Gopher, Archie, WWW (World Wide Web) etc., are among the prominent services of the Internet. Each type of service in the Internet has its own client. For example, to access the WWW, we need to use a Web client such as "Netscape" or "Internet Explorer". As already mentioned, Internet is a collection of networks covering the world. These networks contain many different types of computers and there should be a tool to hold the whole thing together and that is "TCP/IP", which stands for Transmission Control Protocol/Internet Protocol. A protocol is a set of rules describing, in technical terms, how something should be done. TCP/IP is the common name for a collection of more than 100 protocols used to connect computers and networks.

The WWW is almost synonymous with the Net. It is a large system of servers which offers all kinds of information on the Net. The information can be in the form of regular text, as well as pictures, sounds, video clips, and other types of data. Invented in early 1990s by physicists under the leadership of Tim Berners-Lee, at the European Particle Physics Laboratory (CERN), Switzerland, the Web has rapidly become the Graphical User Interface (GUI) of the Net. In fact, the Web is just one Internet application, a way of using the vast interconnected network and view information from around the world. The main use of the Web is for information retrieval, whereby multi-media documents are copied over the Net for local viewing. It uses a protocol called HTTP (Hypertext Transfer Protocol). The Web is in fact a multi-media hypertext - any sort of digital data can be distributed inside a Web document, and each document contains links to other documents, as shown by highlighted or underlined text. Simply click on the word or the highlighted area (where the palm appears) and we can travel to the document in question. Web documents are written using a markup language called Hypertext Markup Language (HTML). HTML is independent of platforms. So it does not matter if you are using a Macintosh, a PC or a Sun workstation to access them. The Massachusetts Institute of Technology's (MIT) World Wide Web Consortium (W3C) is the international standardising agency for HTML and HTML 4.0 is the latest standard. HTML has tags for providing references to

other Web pages, which can be on the same server or any other server on the Net irrespective of the geographical location. This facilitates hypertext links across the documents on the Net. Web pages can contain references of images (GIF and JPEG formats), audio files (AU and WAV formats) and video files (MPEG format) which thus adds the multi-media dimension to the information provided on the Web. The clients or browsers access the Web pages on the servers, renders and formats them according to the HTML tags to display on the client's system. When the user selects a hypertext link (indicated by an underscore) on a Web page, client can follow the link and fetch the referred document irrespective of the location of the document on the Net. Every Web document has a unique address, called the Uniform Resource Locator (URL). It is a simple way of describing almost any information resource, using a standard format for locating information on the Net as :

<protocol>://<host.domain>:<port>/<protocol-specific>

It is an Internet address which is unique to that resource. It consists of a protocol, a host name, a port (optional), a directory and a file name. That is, the URL consists of the computer on which the document is stored and a file name. For example, the URL of the Indian Institute of Management at Kozhikode, is: "http://www.iimk.ac.in". Please note the file name is missing in the example, as it refers to the home page.

The key to the Web is a browser program, which is used to retrieve and display Web documents. The browser (HTML viewer) is an Internet compatible program that runs on our local computer, whether it is a Macintosh, IBM PC, UNIX Workstation, and does three things for the Web documents : 1. it uses the Internet to retrieve documents from other computers, called servers; 2. it displays these documents on our screen, using the formatting specified in the document; and 3. it makes the displayed documents active, so that pointing and clicking on a cross-referenced item in a document will take us to the reference. There are two popular Web browsers, viz., the Navigator of Netscape and the Internet Explorer, from Microsoft . However, Netscape has become the de facto standard for browsers.

Internet Information Infrastructure (III)
Look closer, the Internet has three major tasks in the handling of information. There is no second opinion, it is pro publishing and it is a content publisher. It acts as a content holder too. The Internet presents itself as the most logical repository for content because the Internet is accessible to applications, laptop and desktop computers, Internet appliances, cellular telephones, and personal digital assistants. Fortunately, the Internet can provide the information infrastructure necessary to provide secure, collaborative communication and access. Hence it also acts as a content communicator, with its hosts of protocols and standards.

The Internet Information Infrastructure can replace the basic functionality of a corporate extranet - minus an extranet's management cost and complexity. The Internet has become more than merely a platform for intercommunicating - the Internet with a set of federated services *is* the computer. The Internet Information Infrastructure provides the federated service set. With user devices acting as I^3 nodes, the "Internet-computer" connects users and applications, replacing the extranet. On a global perspective, the Unicode could play wonderful role in taking the fruits of technology across platforms and languages. The emerging metadata standards and systems are again rays of hope towards resource discovery in the Net.

Unicode is a *lingua franca* that enables a single software product or a single Website to be targeted across multiple platforms, languages, and countries without re-engineering, and for data to be transported through many different systems without corruption. Data processing industry leaders have adopted the Unicode standard. Unicode is required by modern

standards such as XML and Java, and is supported in many operating systems and all modern browsers. Incorporating Unicode into client/server or multi-tiered applications and Web sites offers significant cost savings over the use of legacy character sets. The Unicode Consortium operates with the International Standards Organization (ISO).

Metadata - that is, data about data - is information that describes content. Metadata works like a card catalog in a library, an entry in a book catalog, or the information in an online index. Metadata allows a user or application program to identify precisely what it is that the associated data represents and show the relationships among different pieces of content, even accommodating changing relationships. The best metadata system would be extensible, so that metadata types that can be anticipated easily - e.g., author, version, size - can be defined as files are uploaded; moreover, new types of metadata can be added after file creation, as needs dictate. The W3C's (World Wide Web Consortium) DCMI (Dublin Core Metadata Initiative) is a major development in this front.

Biological Literature

Finding the vast amounts of biological data related to the management, study, and use of biological resources cached in hundreds of databases around the world is difficult at best. Mostly a major part of this information sits unused because of a lack of efficient means to retrieve and derive comprehensible information from it. A solution is in the midst of development: The National Biological Information Infrastructure, an initiative of the US Geological Survey's Biological Resources Division (BRD), will eventually allow researchers, land and natural resource managers, students, and the general public to locate these databases, query multiple databases simultaneously, and retrieve data.

When NBII is completed, users will be able to draw from any number of databases to assess biological and environmental processes and conditions. NBII will also provide software to help users analyze these data. A "distributed electronic federation," NBII, in its current form (www.nbii.gov/index.html), has two components. The first is a set of links to a variety of government and nongovernment sites. Most of these sites do not provide direct access to biological information but instead direct the user to potential sources of information.

The second component is a "metadata clearinghouse," in which research products such as databases, published papers, and technical reports are cataloged using a standard set of descriptors known as "metadata". These metadata describe the subject matter, taxonomic subject, time span and spatial limits of the research, how the data were collected, who collected the data, and where the research product can be found on the Internet or elsewhere. In essence, the clearinghouse is an electronic card catalogue that allows users to find information across a wide variety of sources.

The Association of Systematic Collections (ASC) and the United States Geological Survey, Biological Resources Division (USGS-BRD), established a cooperative agreement to develop two resource databases. The databases were developed to support the National Biological Information Infrastructure (NBII), the electronic gateway to biological data and information, and the Integrated Taxonomic Information System (ITIS), a partnership dedicated to provide an on-line, scientifically credible list of biological names.

The Taxonomic Resources and Expertise Database (TRED) lists taxonomic experts for North America, north of Mexico, with their taxonomic, geographic, and habitat expertise, along with address and related information. The second database, the Directory of Research Systematic Collections (DRSC) was developed via the *Survey of Research Systematic Collections (SRSC)*. This database serves as a directory of research natural history collections and their databases.

Bioinformatics

Bioinformatics harnesses the power of computational and information technologies to organize and analyze biological data from research collections, experiments, remote sensing, modeling, database searches and instrumentation – and deliver them to users throughout the

world. Today, the Internet and World Wide Web are powerful tools for linking and utilizing the extraordinary assets of natural history and research institutions. In India, under the DBT, Bioinformatics Centres located in different parts of the country are catering to the needs of thousands of scientists in meeting their ever increasing information and computational needs.

BIOSIS

BIOSIS, established in 1926, is a not-for-profit organization whose mission is to foster the growth, communication and use of biological knowledge for the common good. By accumulating the world's largest collection of abstracts and bibliographic references to worldwide biological and medical literature and organizing this information for easy access, BIOSIS provides vital sources of information for life scientists.

1.3 million records from 1978 to the present. BIOSIS' print products are also available in CD-ROM and Web formats, along with *BIOSIS Previews®* on CD-ROM and Web. In addition to print, compact disc, and Web formats, BIOSIS' extensive database of citations can be accessed via an online service. Online products consist of *BIOSIS Previews®*, *Zoological Record Online®*, *BasicBIOSIS®*, and TOXLINE.

Biological Abstracts (BA)

The Biological Abstracts is the Key to the World's Life Sciences Journals. Comprehensive coverage and context-sensitive indexing make the information in *BA* essential for all life sciences researchers. *BA* directs users to information on life science topics from botany to microbiology to pharmacology, serving to connect researchers with critical journal coverage. Whether the topic of study is botany, pharmacology, biochemistry, or evolutionary ecology, *BA* has the journal articles that one's research depends on. Total Journal Coverage *BA* indexes articles from over 4,000 serials each

year. This publication also offers Over 360,000 new citations each year, Nearly 90% of citations include an abstract by the author, and almost 5.8 million archival records are available back to 1980. *BA* articles originate from journals all around the world, and cover topics in every life sciences discipline. If the information you need lies in the life sciences, *BA* should be part of your information solution. Plus, BIOSIS indexing, MESH® disease terminology, and CAS Registry Numbers® all help electronic BA users find the most relevant records efficiently. Subscribers can access *BA* on CD, through the Web, or in print. Electronic versions of *BA* are updated quarterly. Print versions are issued twice each month.

AGRIS

AGRIS, the international information system for the agricultural sciences and technology, was created by the Food and Agriculture Organization of the United Nations (FAO) in 1974, to facilitate information exchange and to identify world literature dealing with all aspects of agriculture. AGRIS is a cooperative system in which participating countries input references to the literature produced within their boundaries and, in return, draw on the information provided by the other participants. 199 national, international and intergovernmental centres participate and submit about 14.000 items per month. The system collects bibliographic references (to date, about 3 million) to either conventional (journal articles, books) or non-conventional materials (sometimes called "grey literature" e.g. theses, reports, etc.), not available through ordinary commercial channels. One of the main reasons for AGRIS' existence is to encourage the exchange of information among developing countries, whose literature would not be covered by other international systems. The AGRIS database is now on line at this site, as well as AGROVOC, the Multilingual Agricultural Thesaurus, which is directly accessible at "http://www.fao.org/agrovoc" Coming under WAICENT's "umbrella mechanism" will bring numerous advantages to participating countries such as a.) access to full text in electronic format; participant control of scope, coverage, description and distribution of local information; b.) faster access to information following elimination of centralized conversion and processing; and c.) greater exposure of national information and access to world agricultural data via the WAICENT server. FAO's primary role will be to assist countries in reaching the goal of self-sufficiency in information management. The Organization will continue, through WAICENT, to develop tools and methodologies which can be used at national, regional and international levels, as part of the global information exchange process; sensitize decision-makers about the importance of investing in information systems; and establish training courses both at FAO and in developing countries.

AGRICOLA
Compiled by the National Agricultural Library of the U.S. Department of Agriculture, and published on the Web by Community of Science (COS), AGRICOLA (Agricultural Online Access) is the most comprehensive source of U.S. agricultural and life sciences information. AGRICOLA serves as the

document locator and bibliographic control system for the National Agricultural Library (NAL) collection. It contains over 3.3 million bibliographic records of journal articles, monographs, theses, patents, software, audio-visual materials, and technical reports related to agriculture from 1979 to the present. Indexers regularly scan over 1,400 journals for input into the database. Since 1984, the database also has included some records produced by cooperating institutions for documents not held by the NAL. Data is provided to Community of Science under contract with the National Technical Information Service. AGRICOLA provides comprehensive coverage of newly acquired worldwide publications in agriculture and related fields, covering the field of agriculture in the broadest sense. Records are catalogued using the controlled vocabulary of Library of Congress Subject Headings and, since 1985, of the CAB Thesaurus.

AGRICOLA through Community of Science, enables you to:

- Select a search interface designed for your level of search experience.
- Search for abstracts in specific journals.
- Download search results in citation formats for use with most citation management software packages.
- Track your queries so that you can repeat past searches against current data.
- Search by MARC record field.

A database search produces a customized bibliography. Within seconds, the system provides a table of references found on a given topic. You can then specify which references you want to see.

CAB Abstracts

CAB ABSTRACTS® is a bibliographic database compiled by CAB (Commonwealth Agricultural Bureau) International. It covers the significant research and development literature in the fields of agriculture, forestry, aspects of human health, human nutrition, animal health and the management and conservation of natural resources. Over three million records have been added to the database since its computerization in 1973. These records are made available through a wide range of products and services both printed and electronic.

CAB International's Internet Products.

CABDirect® - A new combined CAB ABSTRACTS and CAB HEALTH database accessible via the Internet with links to full text via Ingenta Journals. Online Communities include i. Animalscience.com - A new online community for specialists in animal health and production; ii. Nutritiongate.com - A new online community providing access to information and facilities in the areas of human and animal nutrition; iii. Leisuretourism.com - A new online community for the leisure, tourism and recreation sectors; iv. organic-research.com - A new online community providing access to information on organic farming and worldwide research; v. Primary Journals - The content of CAB's primary and review journals is available with at least a one year backfile at no extra cost for organizations subscribing to the printed version; vi. CABI Online Abstract Journals - All the abstract journals are available on the Internet as fully searchable archival datasets - minimum 10 year back file; vii. Agricultural Engineering on the Web - an online service providing access to the world's published research literature in agricultural engineering; viii. AgBiotechNet - provides easy access to information on subjects such as genetic engineering, *in vitro* culture, biosafety, intellectual property rights and other key issues in agricultural biotechnology; ix. Animal Health and Production Compendium.

CABWeb®s

HORT CABWeb® - providing desktop access to the world's published scientific research literature covering all aspects of horticulture and seed science. PEST CABWeb® - providing desktop access to the world's literature on crop protection, including: entomology, nematology, weeds, biological control, pathology and other aspects of pest management. TREE CABWeb® - providing desktop access to the world's published scientific research literature in forest science, agroforestry and forest products.

The Agricultural Information Scenario in India

Under the auspices of the ICAR, the project "Agricultural Research Information System (ARIS)" is being implemented to bring information management culture to National Agricultural Research System (NARS) so that agricultural scientist can carry out research more effectively by having systematic access to research information available in India as well as in other countries, better project management of agricultural research, and modernization of the office tools. The basic infrastructure required for linking all ICAR institutes has already been created. The E-mail connectivity has been established to 72 out of 86 ICAR institutes by linking through dial-up including six institutes with VSAT connectivity using NICNET and ERNET services. ARIS has four information modules namely Agricultural Research Personnel Information System (ARPIS); Agricultural Research Financial Information System (ARFIS); Agricultural Research Library Information System (ARLIS) and Agricultural Research Management Information System (ARMIS). The ICAR is also running an Agricultural Research Information Centre (ARIC) as the Central source of information on all research projects and schemes financed by the ICAR. Databases on A.P. Cess Fund Schemes, Deputation reports and research projects of institutions were computerized and updating of the databases is taken up. The ARIC is the national input centre for the AGRIS and CARIS agricultural databases of the FAO, which is the largest information system of its kind in the world. The ARIC is also the national focal point for the SAARC Agricultural Information Centre (SAIC). It has published several directories in addition to a half-yearly Directory of conferences, seminars, symposia and workshops in agriculture. It is being upgraded to provide on line uplinking and downlinking facilities to the ICAR system, and to the agricultural information system of the entire world.

Agri Informatics and India

Agricultural Marketing Information: *A key step towards globalisation of Indian Agriculture* The availability of prompt and reliable information about what is happening in the market, what quantities are arriving and what prices are quoted for different commodities considerably improve the decision making capability of the farmers and strengthens their bargaining power. At present, the information is disseminated through various media like radio, newspapers, blackboard display and public address system at market yards. The information provided by these methods is stale and does not help the farmers sufficiently in taking decisions in marketing their produce. The farmers are also not able to know about the prices prevailing in other markets, as the Market Committees are able to disseminate information in respect of their own markets. The farmers are, therefore, left with no alternative but to dispose of their produce in the nearest market, even at uneconomic prices. Improvement in the present market information system by linking all important agricultural produce markets in the Country, the State Agricultural Marketing Boards & Departments, under Agricultural Marketing Information Network (AGMARKNET) will enable farmers to take market based decisions and benefit other market users as well.
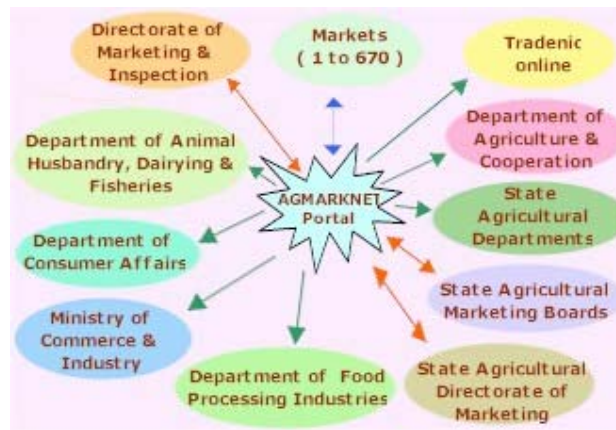
Access to world's scholarly literature : Electronic Journals - Direct, Second Party, and Aggregators

Electronic journals are the digital equivalent of their print counterparts. Whereas databases may contain only some full text or links to full text, electronic journals are literally the entire journal. For a good catalog of electronic journals currently available, see the World Wide Web Virtual Library: Electronic Journals. An electronic journal is the whole journal, and libraries can subscribe to electronic journals from publishers or through a second party (e.g. vendors) just like they subscribe to print journals. This distinction between publishers and second parties is an important one, as these are the two ways libraries get electronic journals. Some companies create collections of entire journals and sell access to these collections. Second party electronic journal databases are different from other databases because in a second party electronic journal database, the entire journal is collected, as opposed to a full text database like "Academic Search Elite", where all, some, or none of any given journal may be included. Examples of second party electronic journal databases include:

1. JSTOR, which specializes in making back issues of a wide variety of humanities and social science journals available electronically; 2. Ingenta, the most appreciated journal portal, facilitates users to read, print, and email articles from 4,500 electronic journals from 140 publishers. Ingenta is the world's largest website for the search and delivery of research articles and it offers access to article summaries from over 25,000 publications linked to the full text of over 5,200 titles. Full text access is set from over 170 publisher partners, but typically individual subscribers, or individuals within institutions that subscribe, can access the full text of their publications for free. For libraries and information professionals, Ingenta provides an extensive range of free and customized online services, from enabling authenticated campus-wide access to subscribed full text articles to creating branded library gateways incorporating management tools and deposit account facilities; 3. ProjectMUSE, which provides electronic access to journals in the fields of

literature and criticism, history, the visual and performing arts, cultural studies, education, political science, gender studies, and many others; Emerald Library, which contains over 140 electronic journal titles with full text articles published since 1994. In India, J-Gate of Informatics Ltd. is the best example for second party electronic journal providers.

Another category is aggregators. Aggregators use to buy the copyright of the journals in bulk and provide access to the journals through a single interface. Examples of aggregators include EBSCO Online and PROQUEST. EBSCO's Business Source Premier and Academic Search Elite are very popular services which attempt to provide management tools for full-text electronic journals. PROQUEST's ABI/Inform is yet another popular full-text journals service. There are advantages as well as drawbacks in each case. In the case of electronic journals, either sourced directly from the publisher or through a second party, the users have the advantage of accessing the journals direct. The disadvantage is that in the electronic journal services, search facilities are kept at a low profile. Whereas in the aggregated services, search facilities are fairly high, with low priority for content layout, get up etc.

The growing prominence of E-Journals and the swinging pricing models
For want of brevity and focus, this paper will concentrate on the issues of "E-journals" and aggregated scholarly literature, primarily and originally appearing in E-journals. About 10 years ago when Electronic Journals first appeared the publishers didn't know how to sell them, nor librarians knew how to handle them. The technology scenario prevailing those days were entirely different too. Technology kept advancing and after 10 years, today the e-journals are sold as hot cakes in the developed world. The trends in the developing world also are equally encouraging, especially in India. This fast change in mindset has taken many publishers by surprise. Earlier, negotiations that involved expanded access to electronic text usually began with print subscriptions as the bottom line of the deal. During the past couple of years, especially in the West, a number of consortia demanded that print and online be negotiated separately. They wanted online access at the core of pricing negotiations because their users clearly preferred online. They wanted an online-plus-print model, rather than print-plus-online. This is called "flip pricing." As a model, flip pricing is not new. Academic Press introduced the concept with its first e-journal package. Few publishers adopted that model, however, and most libraries have continued to receive print and online more or less as a package deal. This has resulted as a real blessing to the Indian libraries. The reflections of the flip pricing has started crystallizing of late and most of the leading publishers have started offering flip price models to Indian libraries too, mostly under the consortia banner.

The evolution of the deeply discounted prices (DDP) model is yet another significant development in the journals pricing front in the recent past. As DDP has evolved, three models have emerged that govern the relationship between agents and publishers. First, the publisher requires the customer to place electronic orders directly with them; with the second version, customers may place their orders with agent or publisher, but customers are given an

incentive to deal direct; and in the third scenario, customers are free to order either way.

In 2000, 75% of publishers offered online free with print, with the rest charging extra for online. But every year, publishers change their mind on this one issue, and last year the pendulum seemed to be swinging back in favor of charging extra for online with a print subscription. Of the 7,623 e-journals with set prices in EBSCO's reserve, 61% were offered free with a print subscription for this year (2001). The majority of major publishers still offer online "free" with print as a rule. The list includes Cambridge University Press, Elsevier, Emerald, Oxford, Routledge, Sage, Springer Verlag, and Taylor & Francis. Blackwell Science charges extra, but the other Blackwell imprints do not. University presses are split. Duke, Indiana, Johns Hopkins, and Penn State, charge; MIT, Chicago, and California do not. Society presses are also split, but the majority appear to charge for online with print. The list of STM publishers that charge extra include giants such as Academic, Wiley, Kluwer, Dekker, Nature, Plenum, and S. Karger.

Copyright and IPR Issues

Issues of copyright, intellectual property, and fair use are important to libraries, but librarians are struggling to make sense of all the issues in the new Digital Age. We need to learn a lot about the "tricks of the trade" so that our hands are not burnt in the process. The number of accessible electronic journals are fast growing steadily. Studies are going on to determine the trends in copyright policies among scholarly electronic journals. There are a number of issues which the Librarian should be highly careful while entering into digital subscriptions. Catches can come in multiple forms with the vague yet meticulously manipulated term "licensing". The audit and accounts are to be amply briefed about the problems and features of digital subscriptions. Proper measures and back-up agreements are to be assured from the publishers/vendors.

However, according to literature, the policies are found to be quite generous in the area of fair use and encouraged sharing of information. Some of the salient features of copyright issues of a select set of freely accessible electronic journals are as follows: (1) copyright policies are informal, (2) policies are common to print and electronic titles, (3) contributing authors generally retain copyright, (4) noncommercial uses permitted include browsing, printing personal copies, and downloading, and (5) republishing is not permitted. Several of these journals address library use.

Access related issues

Access to E-Journals could be arranged from the respective publishers against UserID/Password or through IP authentication. For a wider audience, IP based access is mostly preferred, as the users need not have to bother about the UserID and Password every time. A useful alternative is to provide the UserID/Password in the library's portal / website so that users can pick them up during usage, and over a period of time, they also by-heart them. Libraries need to take care of the 'site license' aspects of content access, as

some publishers lay stringent rules on this, making the life of the Librarian miserable. Before jumping into such services, the Librarian should ensure necessary Internet bandwidth also, failing which complaints will pile up, resulting in a growing aversion against the electronic services in general. For full-text access to E-Journals and datasets published online usually non-exclusive, non-transferable right and licenses are provided. Unlimited access is provided to Tables of Contents, article abstracts, chapter summaries and websites for other Electronic Products.

Another important aspect is the local administration of access management by the users. Users are to be properly oriented towards effective and efficient use of the Net as well as the journal sites. Unnecessary and unscrupulous hits, revisits and downloads can result in frequent choking of the Net connectivity, posing unwanted problems to the entire user community on campus.

JSTOR

JSTOR, a Journal Archive Service, has announced the release of its new Ecology & Botany Collection. Developed in cooperation with the Ecological Society of America (ESA), the collection will enable ecologists, conservationists, and scholars in related fields to access research, over the Internet, from journals that go back 130 years and which represent 1,500 cumulative years of academic literature in the biological sciences. The complete back-runs of 29 academic journals critical to researchers in the field have been converted by JSTOR from print to a full-text, searchable electronic format. In addition to serving as an important archive, the Ecology & Botany Collection creates a new level of access to a significant collection of valuable scientific literature. The historical material contained in this collection will be valuable to scholars and professionals around the world.
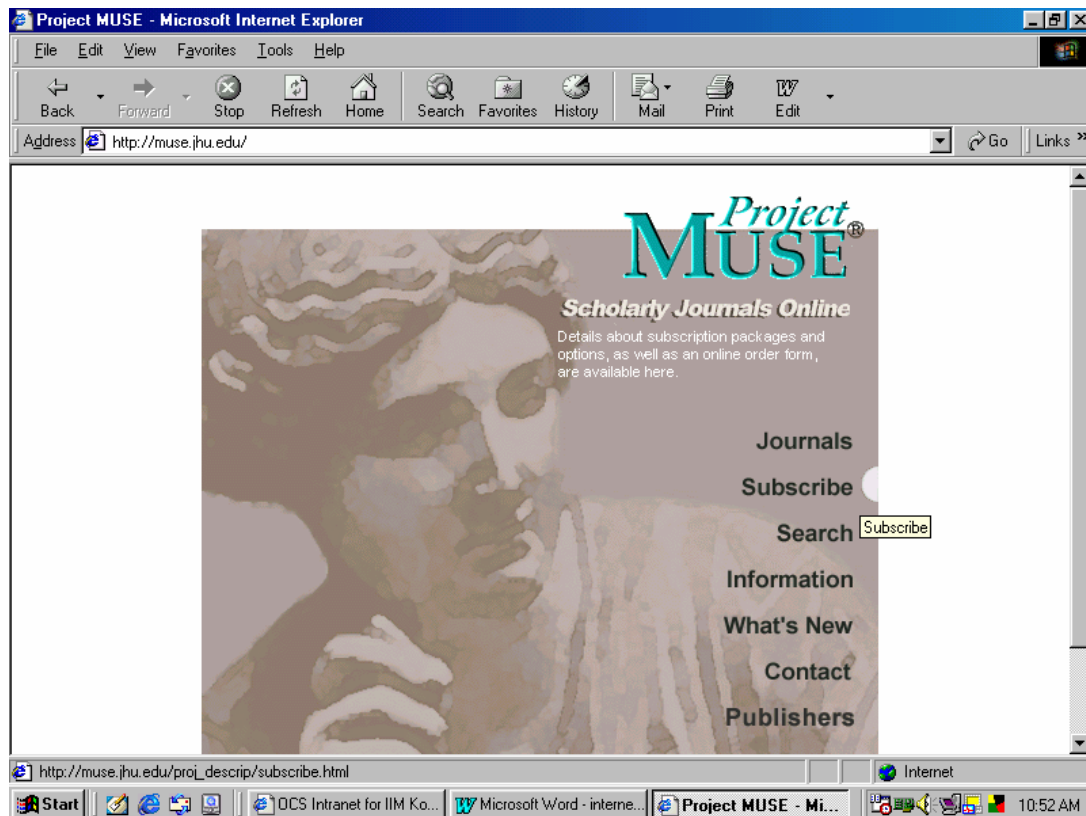
J-Gate: The Electronic Journal Gateway

J-Gate is an Internet gateway set up by Informatics for integrating e-content and e-commerce for journal literature. It envisages providing seamless access to journal articles at publisher's site, local site of the libraries, or at the J-gate archive, through a table-of-content (TOC) and abstract database as the search and link interface. It will also support online subscription to journals, and other related services. J-Gate is being implemented in a phased manner and when fully operational, it will offer several integrated services related to e-journals. For more details visit the J-Gate site j-gate. informindia.com, or Contact J-Gate team at j-gate@infomindia.com.
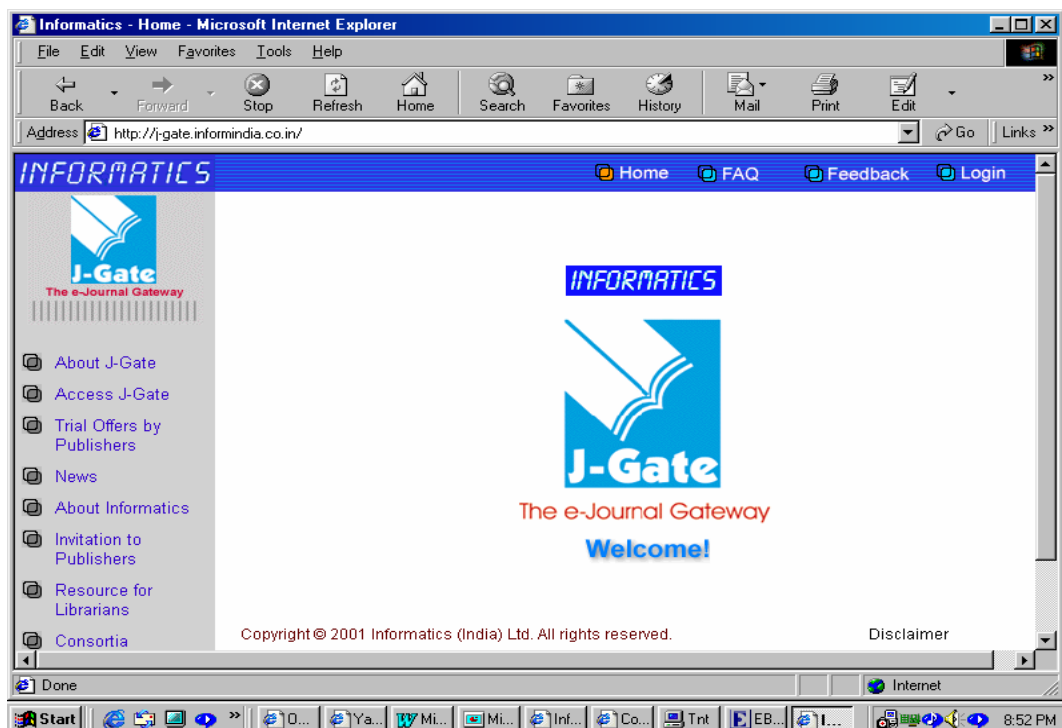
iii. Ingenta

Ingenta is the global research gateway serving the online information needs of over 1.4 million visitors a month. It provides a free online search service of published content from reliable research sources and is one of the UK's top 20 Web services. For publishers of professional and academic periodicals and journals, Ingenta provides a suite of services including data conversion, secure online hosting and distribution of this material to subscribers and pay-per-view customers. As well as providing Web users with a broad based article search and delivery service through www.ingenta.com, Ingenta also develops subject-focused websites, built in conjunction with societies, publishers and university presses.

Ingenta library services
For libraries and information professionals, Ingenta provides an extensive range of free and customized online services, from enabling authenticated campus-wide access to subscribed full text articles to creating branded library gateways incorporating management tools and deposit account facilities.

Ingenta.com
The world's largest website for the search and delivery of research articles, ingenta.com offers you access to article summaries from over 25,000 publications linked to the full text of over 5,200 titles. Full text access is set by each of our 170 publisher partners, but typically individual subscribers, or individuals within institutions that subscribe, can access the full text of their publications for free. Non-subscribers can, for the majority of articles, pay-per-view choosing from electronic, fax or Ariel delivery.

Acknowledgement

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References
1. World Wide Web Consortium - See: www.w3c.org
2. BIOSIS - See: http://www.biosis.org.uk/free_resources/resource_guide.html
3. See: http://biology.usgs.gov
4. See: http://www.nbii.gov
5. See: http://www.itis.usda.gov
6. See: http://www.nbii.gov/datainfo/syscollect/tred
7. See: http://www.nbii.gov/datainfo/syscollect/drsc/index.html
8. See: http://www.fao.org/agrovoc
9. See: http://agmarknet.nic.in/agmarknet1.htm
10. See: http://icar.org.in/icar4.htm
11. See: http://www.cabi-publishing.org/Products/Internet/Index.asp
12. See: http://www.animalscience.com/
13. See: http://www.nutritiongate.com/
14. See: http://www.leisuretourism.com/
15. See: http://www.organic-research.com/
16. See: http://asae.cabweb.org/
17. See: http://www.agbiotechnet.com/
18. See: http://www.cabdirect.org/
19. JSTOR - See: http://www.jstor.org
20. J-Gate - See: http:// j-gate.informindia.com
21. See: http://www.ingenta.com

MICROSOFT EXCEL

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What is Excel?
Excel is a powerful tool used to manipulate and organize data. It can be used for many things including formulas, creating charts, databases and integrating with other Microsoft products. Within Excel worksheets can be formatted to make data easy to understand.

The Excel Window

1. **Title Bar**
   o Displays application and workbook name
   o Control Buttons
2. **Menu Bar**
   o Pull Down Menus - personalized menus (Tools \ Customize \ Options - to turn on and off)
   o Dimmed commands - unavailable
   o Ellipsis (...) - activates a dialog box
   o Shortcut keys - [**alt, ctrl, or shift**] + letter
   o Demonstrate control buttons for workbook
3. **Standard & Formatting Toolbars**
   o Shortcut tools for menu commands
   o Tip boxes - display descriptions
   o Can add/remove toolbars by selecting desired toolbar under **View \ Toolbars**.

4. **Formula Bar**
    - o Name Box shows address of active cell
    - o Cancel/Confirm/Function
    - o Formula Bar shows contents of active cell
5. **Status Bar**
    - o Worksheet status (Ready, Wait, Messages)
    - o NUM, CAPS
6. **Worksheets**
    - o Sheets: up to 255 worksheets saved under one workbook
    - o Columns: 256 columns per worksheet (A to IV)
    - o Rows: 65,536 rows per worksheet
    - o Active cell: dark or highlighted border, cell reference displayed in **name box**
    - o Worksheet Tabs
        - ▪ Scroll through worksheets
        - ▪ Rename Tabs
        - ▪ Insert Worksheet
        - ▪ Delete Worksheet

Tips, Tricks & Terminology

Cell Contents
1. Text = labels, left aligned within cell
2. Numbers = value, right aligned within cell
3. Formulas = to be discussed later
4. After typing information into a cell:
    - o Click **Green Check Mark** on Formula Bar OR
    - o Press **Enter** (Enter automatically advances cell pointer down one row) OR
    - o Press **Tab** to insert information into cell
    - o Click **Red X** on formula bar to cancel cell entry

Undo Feature
- reverses <u>last</u> command or deletes <u>last</u> entry typed
- command reflects last action (e.g., Undo Cut or Undo Typing)
- choose **Edit** menu, **Undo** command or use ☒**Undo** tool

Navigating in Excel

Tab	Moves to next cell
Shift + Tab	Moves to previous cell
PgDn	Moves down one worksheet screen
PgUp	Moves up one worksheet screen
ALT + PgDn	Moves right one worksheet screen
ALT + PgUp	Moves left one worksheet screen
CTRL + End	Moves to the bottom right corner of the worksheet's active area (last cell containing data)
End + Directional Key	Moves in the direction of the arrow to the last cell containing data OR to the border of the worksheet
CTRL + Home	Moves to cell A1 of current worksheet
CTRL + PgDn	Moves to the next worksheet tab
CTRL + PgUp	Moves to the previous worksheet tab
CTRL + G	Go to a specific cell address

Selecting

Select Entire Row	Click Row Heading
Select Entire Column	Click Column Heading
Select Range of Cells	Point and Drag
Select Entire Worksheet	Click Select All Button in upper left corner of Row & Column Headings
Select a Range of Cells with Keyboard	Press Shift and arrow keys
Select a Range of Cells with Mouse	SHFT + Click to select first and last cells of desired range
Select Non-contiguous Cells with mouse	CTRL - Click to select desired random cells

Creating a Worksheet

1. Choose **File\ New** or use **New** tool Type desired Workbook name
2. To create a new, blank workbook, click the **General** tab, and then double-click the Workbook icon.

 EXERCISE

- Using the example below enter titles in cells A1:A4 and in cell A9

	A	**B**	**C**	**D**	**E**
1	Business Expenses				
2					
3	Day	Meals	Lodging	Phone	Total
4	Monday				
5					
6					
7					
8					
9	TOTAL				

Open a workbook on your hard disk or network

1. On the **File** menu, click **Open**.

2. In the **Look in** list, click the drive, folder, or FTP location that contains the workbook you want to open, and then locate and double-click the folder that contains the workbook.
3. Double-click the workbook you want to open.

Saving A Workbook

1. Choose **File\ Save** or use [×]**Save** tool Type desired Workbook name
2. Navigate to the desired folder before saving in the Save In field
3. Click **Save**

Save workbooks automatically as you work

1. On the **Tools** menu, click **AutoSave**.

   If the **AutoSave** command is not on the **Tools** menu, you must install the AutoSave add-in.
2. Select the **Automatic save every** check box.
3. In the **Minutes** box, enter how often you want Microsoft Excel to save workbooks.

Select any other options you want
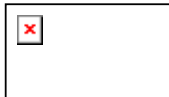
          EXERCISE

1. Click **File \ Save** or [×]
2. Change the "Save In" drop down to the **Desktop** (**note**: the complete path name may be typed in the file name box instead of navigating in the Save In field).
3. type "**my business expenses**" in the **File Name:** text box
4. When a worksheet is saved, the extension .xls will be automatically added to the file name.
5. Click **Save** (**NOTE**: Look for workbook name in title bar).

It is recommended to save frequently when creating or editing a document. Once your document has been saved, changes are saved over the original when you choose **File \ Save** or click [×].

AutoFill

Autofill is used to create a series of incremental fixed values like January - December, 1 - 31, days of the week, etc. Autofill lists are customizable by going to **tools \ options \ custom lists.**

          EXERCISE

o   select cell A4
o   Position the pointer on the AutoFill handle located in the bottom right corner of the cell. The pointer will change to a [×] crosshair.
o   Drag the AutoFill handle to cell A8
o   Enter remaining values and headings, cells B3 through D8 & E3

Auto sum

AutoSum [×] creates the "=SUM" function inside the cell it is inserted. It totals either cells to the left (default) or cells above. Before calculating it

places a dotted line around its targeted cells. You may accept the suggested cells or select the desired cells to total by clicking and dragging.

 EXERCISE

1. Click in cell C9 to enter AutoSum function to calculate weekly total for lodging
2. Click the **AutoSum** tool
3. Notice the selected cells and press **Enter** to accept
4. Insert **AutoSum** in cell E4
5. Fill Down, cells E4:E9 (automatically changes references when copied; examine each Total in Column E after Filling Down)
    o select cells E4:E9
    o Edit menu, **Fill Down** command
    o OR use AutoFill

Delete sheets from a workbook
1. Select the sheets you want to delete.
2. On the **Edit** menu, click **Delete Sheet**.

Delete a file
1. Click **Open**.
2. In the **Look in** box, click the drive or folder that contains the file you want to delete.
3. In the folder list, double-click folders until you open the folder that contains the file you want.
    If you can't find the file in the folder list, you can search for it.
4. Right-click the file you want to delete, and then click **Delete** on the shortcut menu

Editing a Worksheet

Column & Row Width and Height
*   Position the pointer on the line separating the column or rows until the pointer changes to
*   drag **separator line** between column heading or row
*   double-click separator line after data to determine best fit (**AutoFit**)
*   choose **Format** menu, select **Column** command, **Width** or **Row Height** selection **OR** Right-Click on heading

Cut/Copy & Paste
There are several ways to carry out copying or deleting text. When text is copied or cut that text is held on the Windows clipboard until it is replaced by other information. Some of the ways to copy or delete text include:
1. To Move Text: Select text, then choose **Edit \Copy** or **Cut** command
    o Copy will leave the text in its original location and place a copy on the Windows clipboard
    o Cut will remove the text from its original location and place it on the Windows clipboard
2. If you would like to place information copied to the Windows clipboard elsewhere:
    o Click in the desired targeted cell
    o Choose **Edit \Paste**
3. "Drag & drop" may be used to move information by selecting the desired information then dragging and dropping it to the desired location.

Inserting Or Deleting Rows And Columns

- **Insert a Row or Column** by selecting **Rows** or **Columns** from the **Insert** menu OR **right mouse-click** on the row or column heading
- **Delete a Row or Column** by selecting the desired row or column then choose **Delete** from the **Edit** menu OR right-click on the row or column heading and choose **Delete**.
- Formulas automatically adjusted to reflect change in cell references
1. Delete rows 19 and 20
    - Select row header for rows 19 and 20 (drag across row headings to select more than one row)
    - **Edit** menu, **Delete** command

Borders, Lines & Shading
1. **Format** menu, **Cells** command, **Border** tab
2. **Borders:** position (outline, inside, left, right, top, bottom between rows, between columns), style of line, color
3. **Format** menu, **Cells** command, **Patterns** tab to add **shading**
4. Add shading to Total Expenses and the amount
    - Select cells B27:C27
    - **Format** menu, **Cells** command, **Patterns** tab
    - Select **Pattern:** list and choose last shade on top row
    - Click **OK**
5. Draw a border around the worksheet
    - select cells A1:C27
    - **Format** menu, **Cells** command, **Border** tab
    - Select **Outline**
    - Click **OK**
6. Type your name in cell B1

Sorting Data In A List
When sorting data use the Data menu and Sort command. Any field name in the list can be used as a sort field for arranging the order of the list.

Terminology

Data List	Collection of related information
Record	All of the information pertaining to one particular individual or entity
Field	A single piece of information about the individual or entity
Field Names	Column headings or labels that describe the data items (up to 255 characters)

Sort rows in ascending order based on the contents of one column
If you previously sorted a list on the same worksheet, Microsoft Excel uses the same sorting options unless you change them.
1. Click a cell in the column you would like to sort by.
2. Click **Sort Ascending**

Sort rows in descending order based on the contents of one column
If you previously sorted a list on the same worksheet, Microsoft Excel uses the same sorting options unless you change them.
1. Click a cell in the column you would like to sort by.
2. Click **Sort Descending**

Sort rows based on the contents of two or more columns
For best results, the list you sort should have column labels.
1. Click a cell in the list you want to sort.
2. On the **Data** menu, click **Sort**.

3. In the **Sort by** and **Then by** boxes, click the columns you want to sort.

   If you need to sort by more than three columns, sort by the least important columns first. For example, if your list contains employee information and you need to organize it by Department, Title, Last Name, and First Name, sort the list twice. First, click **First Name** in the **Sort by** box and sort the list. Second, click **Department** in the **Sort by** box, click **Title** in the first **Then by** box, and click **Last Name** in the second **Then by** box, and sort the list.

4. Select any other sort options you want, and then click **OK**.

   Repeat steps 2 through 4 if needed, using the next most important columns

Sort columns based on the contents of rows

1. Click a cell in the list you want to sort.
2. On the **Data** menu, click **Sort**.
3. Click **Options**.
4. Under **Orientation**, click **Sort left to right**, and then click **OK**.
5. In the **Sort by** and **Then by** boxes, click the rows you want to sort

## Sort months, weekdays, or custom lists

1. Select a cell or range in the list you want to sort.
2. On the **Data** menu, click **Sort**.
3. Click **Options**.
4. Under **First key sort order**, click the custom sort order you want, and then click **OK**.
5. Click any other sorting options you want.

Emp.xls

Last Name	First Name	SS #	Department	Hours	Rate	Reg. Pay	OT Pay	Gross Pay
Smith	Jim	098-76-5432	Marketing	30	7.50	225.00	0.00	225.00
Alexander	Aaron	123-44-5566	Accounting	40	8.75	350.00	0.00	350.00
Evans	Nancy	123-45-6789	Administration	45	8.00	320.00	60.00	380.00
Jackson	Dot	234-56-7809	Accounting	40	####	400.00	0.00	400.00
Jones	Joe	234-56-7890	Marketing	43	7.75	310.00	34.88	344.88
Davis	Richard	321-65-9874	Administration	40	####	400.00	0.00	400.00
Walters	John	432-18-7654	Engineering	40	####	410.00	0.00	410.00
Edgar	Carl	456-77-9632	Administration	25	9.00	225.00	0.00	225.00
Gates	Michael	456-78-1234	Records	15	8.00	120.00	0.00	120.00
Ford	Micki	466-44-6666	Engineering	45	8.90	356.00	66.75	422.75
Waverly	Rita	616-61-6116	Administration	40	9.00	360.00	0.00	360.00
Phillips	Wesley	654-32-6547	Engineering	46	####	440.00	99.00	539.00
Johnson	James	654-47-7666	Marketing	40	####	400.00	0.00	400.00
Cochran	Steve	666-64-4664	Administration	40	####	440.00	0.00	440.00
Wilson	Susan	666-77-4456	Engineering	40	9.25	370.00	0.00	370.00
Mason	Mary	678-98-8888	Records	35	8.00	280.00	0.00	280.00
Wilson	Bob	765-43-2109	Engineering	20	6.00	120.00	0.00	120.00
Smith	Joe	789-32-1649	Records	15	9.25	138.75	0.00	138.75

Bates	Charles	789-46-8392	Administration	40	8.00	320.00	0.00	320.00
Cox	James	799-79-7979	Records	30	8.00	240.00	0.00	240.00
Brown	Sam	855-64-9874	Accounting	45	####	440.00	82.50	522.50
Hodges	Lynne	888-22-1111	Marketing	43	####	400.00	45.00	445.00
Davis	Susan	888-80-9876	Records	40	8.00	320.00	0.00	320.00
Smith	John	896-45-1236	Engineering	50	####	400.00	150.00	550.00
Sidney	David	901-23-7586	Engineering	20	9.00	180.00	0.00	180.00
Brown	Rebecca	907-38-7804	Administration	46	8.75	350.00	78.75	428.75
Brown	Chris	946-12-3987	Engineering	48	9.50	380.00	114.00	494.00
Thompson	Richard	987-65-4321	Engineering	40	####	480.00	0.00	480.00
Wilson	Wally	987-65-9876	Engineering	44	####	480.00	72.00	552.00
Jones	Lucy	999-55-3333	Accounting	40	####	440.00	0.00	440.00

1. Save the above worksheet as emp.xls
2. **Sort** the list by name
      - Select cells A4:I33
      - Choose **Data** menu, **Sort** command
      - From the **Sort By** list, select **Last Name**
      - From the **Then By** list, select **First Name**
      - Verify **Header Row** is selected for **My List Has** section
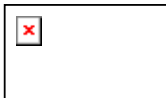   - Click **OK**
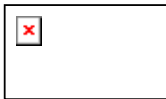
EXERCISE

1. Move E3:E9 to Column F
      - select cells E3:E9
            - **Edit \ Cut**
      - select cell F3
      - **Edit \ Paste**
      - OR use drag and drop
2. Enter **Average Expense** in cell E3
      - select cell E3
      - type: *Average Expense*
3. Widen Column E
      - drag separator line between Column E & F
      - OR double-click separator line after each column for Best Fit
      - double-click separator line (for best fit)
4. Paste **AVERAGE** function, cell E4
      - select cell E4
      - **Function Wizard** tool
      - select **Most Recently Used** category and choose **AVERAGE** function
      - click **OK**
      - highlight cells B4:D4
      - select **OK**
5. Copy to remaining cells
      - select cells E4:E9
      - **Edit \ Fill Down**
      - OR use AutoFill

Formating a Worksheet
1. Number Formatting

- o **Format \ Cells \ Number** tab
- o Examples of Formats
  - ▪ currency
  - ▪ date
  - ▪ time
  - ▪ percentage
2. Alignment Formatting
   - o **Format \ Cells \ Font** Tab
   - o Examples of Alignment
     - ▪ Horizontal
       - ▪ Left
       - ▪ Center
       - ▪ Right
       - ▪ Fill
     - ▪ Vertical
       - ▪ Top
       - ▪ Center
       - ▪ Bottom
       - ▪ Justify
3. Font Formatting
   - o **Format \ Cells \ Font Tab**
   - o Font Features
     - ▪ Font Type
     - ▪ Font Style
     - ▪ Font Size
     - ▪ Underlining
     - ▪ Color
4. Show formatting options on Formatting Toolbar.

EXERCISE

1. Format the worksheet
   - o select cells B4:F9
   - o choose **Format \ Cells \ Number** card
   - o select **Currency**
   - o Click **OK**
   - o Click the **Bold** button to Bold selected headings
   - o Click the **Align Right** button to right align contents of each selected cell
2. Enter your name in cell C1
   Quick Save your workbook (CTRL + S)

More About Formatting
1. Format numbers within the worksheet
   - ▪ Select cells D4:G8
   - ▪ Format menu, **Cells** command, **Numbers** card
   - ▪ Select **Number**
     - ▪ select 2 decimal places
     - ▪ use 1,000 separator
   - ▪ Click **OK**
2. Enter your name in cell D1.
3. Quick Save your worksheet (CTRL + S)
4. Preview the worksheet
   - ▪ **Print Preview** tool
   - ▪ click **Print** and **OK**
5. Close the workbook

Purchase.xls

	A	B	C	D	E	F	G
1	Discount Rate	15%					
2							
3	**Qty.**	**Unit**	**Description**	**Unit Price**	**Ext. Price**	**Disc. Amt.**	**Disc. Price**
4	1	Each	Wall Calendar #SOU-130	$ 13.25	$ 13.25	$ 1.99	$ 11.26
5	2	Boxes	Pens (Blue) #GSM11-BE	$ 3.60	$ 7.20	$ 1.08	$ 6.12
6	1	Box	Pens (Red) #GSM11-RD	$ 3.60	$ 3.60	$ 0.54	$ 3.06
7	4	Each	Hi-Liters #DFN2400	$ 0.85	$ 3.40	$ 0.51	$ 2.89
8	3	boxes	3.5" Diskettes, DSHD	$ 31.30	$ 93.90	$ 14.09	$ 79.82

Page Setup

Paper Size
1. Change the orientation and page centering
   - o Select the **Setup** Button in Print Preview
   - o Select **Page** tab
   - o Choose **Landscape** for Orientation
   - o Select **Margins** card
   - o Choose **Horizontally** and **Vertically** for **Center on Page**
   - o Click **OK**
2. Preview the worksheet

Margins
1. Choose the **Setup** button in Print Preview
2. Select the **Margins** Tab
3. Set left & right margins at 0.75"
4. Set top & bottom margins at 1"

Headers & Footers
To create a **header** that will display your name in the upper-left corner and the current date in the upper-right corner of the printed worksheet
1. Click the **Header / Footer** tab
2. Choose **Custom Header...** button
3. Type *Your Name* in the **Left Section** of the **Header:** boxes
4. In the **Right Section** box, select the **Date** button
5. Click **OK**

To create a **footer** to display "**Page**" and the current page number in the lower-left corner of the printed worksheet
1. Choose **Custom Footer...** button
2. In the **Left Section** of the **Footer:** boxes, type "**Page** "
3. Select [×] **Page Number** button
4. Delete codes in other section if existing
5. Click **OK** to close Header / Footer setup
6. Click **OK** to close Page Setup
   Close Print Preview

Sheet Setup

Row and Column Headings & Gridlines:
1. Choose **File \ Page Setup \ Sheet** tab
2. Select **Row to Repeat at Top** (select Row 3)
3. Select **Column to Repeat at Left** (select Column A)
4. Choose **Gridlines** to print gridlines between columns and rows
5. Print Preview (Next & Previous Page)
6. Close Print Preview

Working with Page Breaks
1. Adding Page Breaks **-** Manual page breaks are inserted before the pointer position.
   o To insert a manual page break :
     ▪ Click in Row 7's Heading
     ▪ choose **Insert \ Page Break**
   o Verify the page break was inserted between Pens (red) and Hi-Liters
     ▪ Perform a Page Break Preview
   o Close Print Preview
1. Removing Page Breaks **-** To remove manually inserted page breaks:
   o Position your cell pointer in a cell below the row containing the page break (click in Row 7)
   o Choose **Insert \ Remove Page Break** (remove page break in the exercise)
   o choose [**Print...**] button
   o Click **OK**
   o Save and Close the worksheet

Print Preview & Printing
1. Click the [×] **Print Preview** tool
   o **Zoom**: button to reduce/enlarge worksheet
   o **Setup**: change setup options
   o **Margins**: change margins
   o **Page Break Preview**: button to view page breaks on-screen and manually adjust them
   o **Close**: to close the print preview window
   o **Help**: to access Microsoft Excel's help on the print previewing topic
   o **Print**: print the worksheet

Printing
1. Preview and print the worksheet
   o choose **Print** button
   o **OK**
2. Save the worksheet
   o **File \ Save**
   o or [×] **Save button**
3. Close the worksheet
   o File \ Close or click the Close Button

Business Expenses example

	A	B	C	D	E	F
1	Business Expenses					
2						
3	Day	**Meals**	**Lodging**	**Phone**	**Average Expense**	**Total**
4	Monday	$18.50	$58.00	$1.75	$26.08	$78.25
5	Tuesday	$17.25	$65.50	$2.00	$28.25	$84.75
6	Wednesday	$16.75	$48.00	$4.50	$23.08	$69.25
7	Thursday	$18.00	$54.00	$3.95	$25.32	$75.95
8	Friday	$16.85	$0.00	$5.00	$7.28	$21.85
9	TOTAL	$87.35	$225.50	$17.20	$110.02	$330.05

Selection

Active Sheets
Entire Workbook
1. Select desired area to print (Descriptions & Unit Prices C4:D8)
2. Click **File \ Print**
3. Choose **Selection**
4. Choose **Preview**
5. Close Print Preview

Introduction to Formulas
Formulas are used to calculate information in a worksheet. Instead of entering a constant number, a formula can be created which allows automatic updating of results if the data changes. The cell and formula bar contain the formula; however, the result of the formula is displayed in the cell.

Rules of Creating a Formula
1. Must begin with equal sign (=)
2. Use cell references, rather than constants, and math operators
   - Math Operators
     - + = addition
     - - = subtraction
     - * = multiplication
     - / = division
   - Order of a Formula
     - "="
     - Cell reference
     - Math Operator
     - Cell reference
     - Example of a formula: +C5 + D4 - D3 / H14 * R32 (Values = 10, 20, 30, 10, 10)

- o order of precedence within formulas is: multiplication or division calculates first from left to right; then, addition or subtraction.
2. To override the order of precedence, put parentheses around the operation to be performed first. Use example formula to change order of calculation.

Purchase Order example

	A	B	C	D	E	F	G
1	Discount Rate	15%					
2							
3	Qty.	Unit	Description	Unit Price	Ext. Price	Disc. Amt.	Disc. Price
4	1	each	Wall Calendar #SOU-130	13.25			
5	2	boxes	Pens (Blue) #GSM11-BE	3.60			
6	1	box	Pens (Red) #GSM11-RD	3.60			
7	4	each	Hi-Liters #DFN2400	0.85			
8	3	boxes	3.5" Diskettes, DSHD	31.30			

1. Create a file named purchase.xls
2. Enter the formula to calculate Ext. Price (Qty. * Unit Price)
   - Select cell E4
   - Type: **=a4*d4**
   - Press **Enter**
3. Copy the formula from E4 to E5:E8.
   - Select cell E4
   - Edit menu, **Copy** command
   - Select cells E5:E8
   - Edit menu, **Paste** command; ECS
   - OR use AutoFill
4. Verify that Row cell references adjusted during copy (Relative Referencing)
   - Select cell E5
   - Formula should read **=A5*D5**
   - Also verify formulas in cells E6, E7, E8

Absolute Referencing

5. Enter the formula to calculate Disc. Amt. (Ext. Price * Discount Rate)
   - Select cell F4
   - Type: **=e4*b1**
   - Press **Enter**
   - AutoFit Column D
   - OR point to each cell to build the formula

6. Copy the formula from F4 to F5:F8
    - Select cell F4
    - **Edit** menu, **Copy** command
    - select cells F5:F8
    - **Edit** menu, **Paste** command
    - OR use AutoFill

    NOTE: **#VALUE**! error occurs if formula should have been absolute

7. Change original formula in cell F4 to include an absolute cell reference to cell B1
    - Select cell F4
    - Select the cell reference B1 on the formula bar
    - Press **F4** OR (**F4 key** adds absolute reference to cell address)
    - Type "B1"
    - Click **Enter**
8. Copy the revised formula from F4 to F5:F8 (Copy & Paste or AutoFill)
9. Enter the formula to calculate Disc. Price (Ext. Price - Disc. Amt.)
    - Select cell G4
    - Type: **=e4-f4**
    - Press **Enter**
10. Copy the formula from G4 to G5:G8 (Copy & Paste or AutoFill)
11. Quick Save Workbook (CTRL + S)

View Formulas

To assist in proofing your worksheet it is helpful to have the formulas displayed in each cell instead of the answer to the formula. To turn Formula Display on/off:
- Click **Tools** menu
- **Options** command
- **View** tab
- Select **Formulas** in the Window Options area.

NOTE: The columns automatically widened to display formulas within cells.

- Turn on your formulas to be viewed and proof your worksheet
  If the worksheet is correct, turn off the display of formulas by selecting **Tools** menu, **Options** command, **View** card and deselecting **Formulas.**
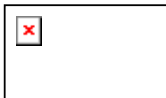
  EXERCISE

1. Enter formula, cell B9 to calculate the total for Meals
    - select cell B9
    - you may type or point to cell references
    - type: **= b4 + b5 + b6 + b7 + b8**
    - Click **Enter**

Create a formula together calculating an average of daily cost of meals.

Introduction to Functions

Functions are prewritten formulas available in Excel. Functions are organized in several categories including Financial, Date & Time, Statistical, and Database. Before creating a formula, you are encouraged to review the list of available Functions.

EXERCISE

1. Select cell D9 to enter the SUM function for the weekly phone total
2. Click the Function Wizard
3. Select the SUM function
4. Insert cells C4:C8
5. Click **OK**

Relative Referencing
Click on each total cell in column E and observe contents of the formula bar.
Each formula updates based on the position of the data in the worksheet.

More About Functions

Exercise: Payroll.xls

Last Name	First Name	SS #	Department	Hours	Rate	Reg. Pay	OT Pay	Gross Pay
Smith	Jim	098-76-5432	Marketing	30	7.50			
Alexander	Aaron	123-44-5566	Accounting	40	8.75			
Evans	Nancy	123-45-6789	Administration	45	8.00			
Jackson	Dot	234-56-7809	Accounting	40	10.00			
Jones	Joe	234-56-7890	Marketing	43	7.75			
Davis	Richard	321-65-9874	Administration	40	10.00			
Walters	John	432-18-7654	Engineering	40	10.25			
Edgar	Carl	456-77-9632	Administration	25	9.00			
Gates	Michael	456-78-1234	Records	15	8.00			
Ford	Micki	466-44-6666	Engineering	45	8.90			
Waverly	Rita	616-61-6116	Administration	40	9.00			
Phillips	Wesley	654-32-6547	Engineering	46	11.00			
Johnson	James	654-47-7666	Marketing	40	10.00			
Cochran	Steve	666-64-4664	Administration	40	11.00			
Wilson	Susan	666-77-4456	Engineering	40	9.25			
Mason	Mary	678-98-8888	Records	35	8.00			
Wilson	Bob	765-43-2109	Engineering	20	6.00			
Smith	Joe	789-32-1649	Records	15	9.25			
Bates	Charles	789-46-8392	Administration	40	8.00			
Cox	James	799-79-7979	Records	30	8.00			
Brown	Sam	855-64-9874	Accounting	45	11.00			
Hodges	Lynne	888-22-1111	Marketing	43	10.00			
Davis	Susan	888-80-9876	Records	40	8.00			
Smith	John	896-45-1236	Engineering	50	10.00			

Sidney	David	901-23-7586	Engineering	20	9.00			
Brown	Rebecca	907-38-7804	Administration	46	8.75			
Brown	Chris	946-12-3987	Engineering	48	9.50			
Thompson	Richard	987-65-4321	Engineering	40	12.00			
Wilson	Wally	987-65-9876	Engineering	44	12.00			
Jones	Lucy	999-55-3333	Accounting	40	11.00			

1. Save the above sheet as payroll.xls

Freezing Panes
   o Freezes row headings across the top of the worksheet or column headings at the left of the worksheet
   o Select **Window** menu, **Freeze Panes** command to set **Horizontal** (rows) or **Vertical** (columns)
   o Select **Window** menu, **Unfreeze Panes** command to unfreeze

To Freeze the row headings and names

   • select cell C4
   • choose **Window** menu, **Freeze Panes** command

NOTE: Freeze Pane marks do not print.
Functions are predefined formulas including math operators. You supply the necessary cell references.
   • format: equal sign, function name, cell references; e.g., =SUM(A1:A13)
     choose **Insert** menu, **Function** command to view functions available or use
     Function Wizard [×] tool
   • **IF** -- checks for True or False condition and returns a value; =IF(logical test, value if true, value if false)
   • **MAX** -- returns the highest value in a range; =MAX(range)
   • **MIN** -- returns the lowest value in a range; =MIN(range)
   • **COUNT** -- counts the number of entries in a range; =COUNT(range)
   • **ROUND** -- rounds a value to a specific number of decimal places; =ROUND(value, decimals)
   • **NOW** -- returns system date; =NOW( )
1. Choose the function to use in calculating **Reg. Pay**
   o Select cell G4
   o **Insert** menu, **Function** command
   o Select **Most Recently Used** and choose **IF** function
   o Click **OK**
2. Change the arguments within the function to formulas with cell references
   o In the "logical_test" area, enter (Hours <= 40)
   o In the "value_if_true" area, enter (Hours * Rate)
   o In the "value_if_false" area, enter (40 * Rate)
   o Select **OK**

NOTE: Completed formula should be =IF(E4<=40,E4*F4,40*F4)

3. Fill down, cells G4:G33
   o select cells G4:G33
   o **Edit** menu, **Fill Down** command
   o OR use AutoFill
4. Choose the function to use in calculating **OT Pay**
   o select cell H4

- Click the ☒ **Function Wizard** tool
- Select **Most Recently Used** category and choose **IF** function
- Select **OK**

5. Change the arguments within the function to formulas with cell references
   - In the "logical_test" area, enter (Hours > 40)
   - In the "value_if_true" area, enter (Hours-40) * (1.5 * Rate)
   - In the "value_if_false" area, enter (0)
   - Select **OK**

   NOTE: Completed formula should be =IF(E4>40,(E4-40)*(1.5*F4),0)

6. Fill down, cells H4:H33
   - Select cells H4:H33
   - **Edit** menu, **Fill Down** command
   - OR use AutoFill

7. Calculate **Gross Pay** select cell I4
   - **=g4+h4**
   - Press **Enter**

8. Fill down, cells I4:I33
   - Select cells I4:I33
   - **Edit** menu, **Fill Down** command
   - OR use AutoFill

9. Enter your name in cell A1
10. Quick Save your worksheet (CTRL + S)
11. Preview the worksheet
12. Close the worksheet

Payroll example

|	A	B	C	D	E	F	G	H	I
3	Last Name	First Name	SS #	Department	Hours	Rate	Reg. Pay	OT Pay	Gross Pay
4	Smith	Jim	098-76-5432	Marketing	30	7.50	225.00	0.00	225.00
5	Alexander	Aaron	123-44-5566	Accounting	40	8.75	350.00	0.00	350.00
6	Evans	Nancy	123-45-6789	Administration	45	8.00	320.00	60.00	380.00
7	Jackson	Dot	234-56-7809	Accounting	40	10.00	400.00	0.00	400.00
8	Jones	Joe	234-56-7890	Marketing	43	7.75	310.00	34.88	344.88

Excel's formatting and annotating features are extensive. However, data is often better displayed in a graphical form. This handout discusses how to create and edit graphs in Microsoft Excel.

Creating a Chart
With Excel's Chart Wizard, creating graphs is an easy point-and-click process.

Selecting data
The first step in creating a chart is to select the data you want to graph. Select both the numeric data and adjacent row and column labels; Excel uses the labels for legend and axis information. For example, in the figure below, select cells A4:D8 to graph the monthly figures for each city.
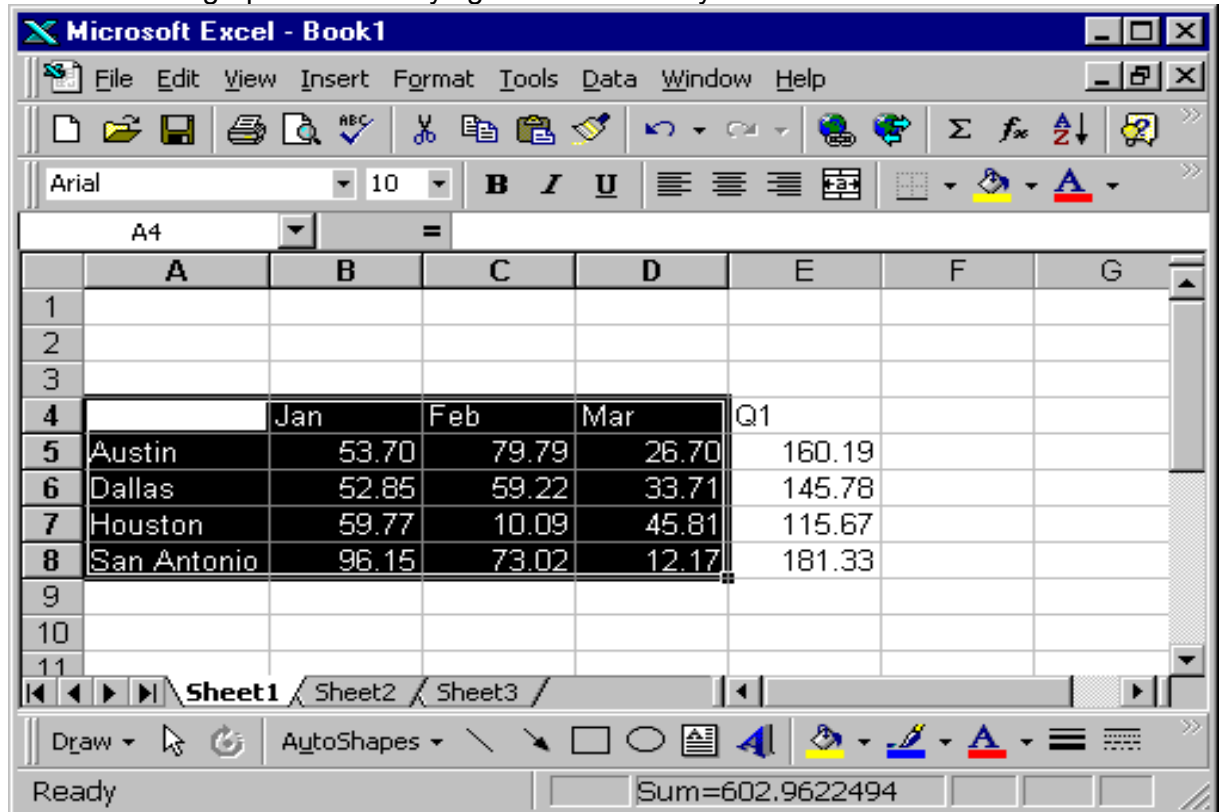

If the data is not contiguous, use Excel's multiple selection technique; select the first range of data, hold down the **Control** key then select the second range of data.

Chart Wizard
The Chart Wizard guides you through each of the steps necessary to create a professional-looking chart. After you select the data you want to chart, click the Chart Wizard button on the toolbar. The Chart Wizard displays a series of step-by-step questions and dialog boxes that prompt you for information about the chart.

Step 1 of the Chart Wizard lets you choose the type of chart you want. Select the type of chart in the left column, and then choose the sub-type in the right column. For example, to create a Column chart, select **Column** and then choose the Column chart sub-type.
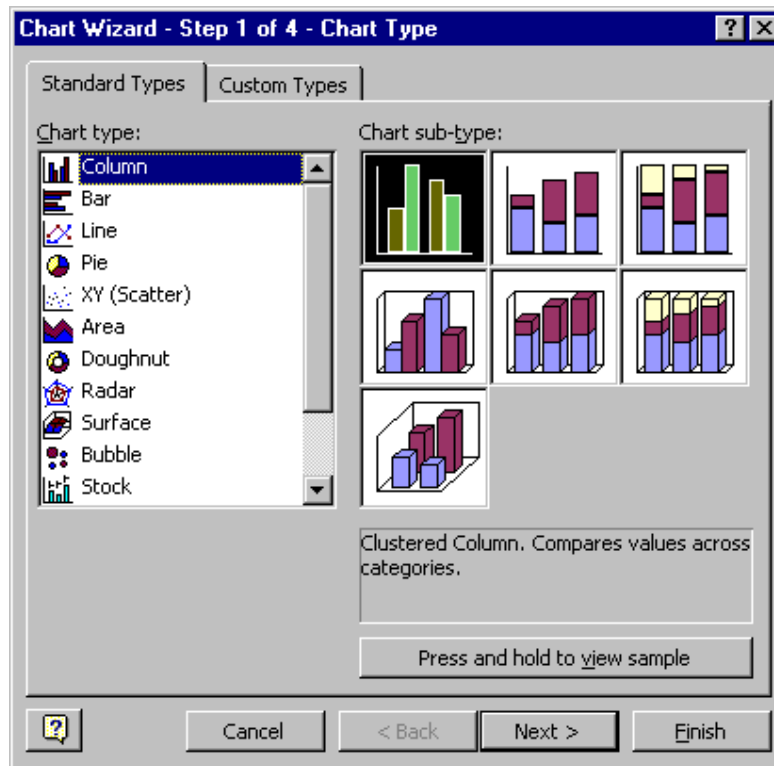
After you complete a step in the Chart Wizard, click the **Next** button to continue to the next step. In Step 2, specify the location and orientation of your data. If you selected data before clicking the Chart Wizard, those cells appear in the **Data Range** box. The **Series** section controls which labels appear on the X-axis. In the above example, if you choose Series in Rows, the month labels appear on the X-axis. Series in Columns creates a chart with the city labels appearing on the X-axis.

The **Series** Tab in Step 2 also lets you change labels for your data and axes. Step 3 of the Chart Wizard presents numerous options ranging from Chart Titles to Legends and Gridlines. To change one of these options click the tab at the top of the Step 3 dialog box. For example, to control where the Legend appears, click the **Legend** Tab and select the appropriate Legend placement.
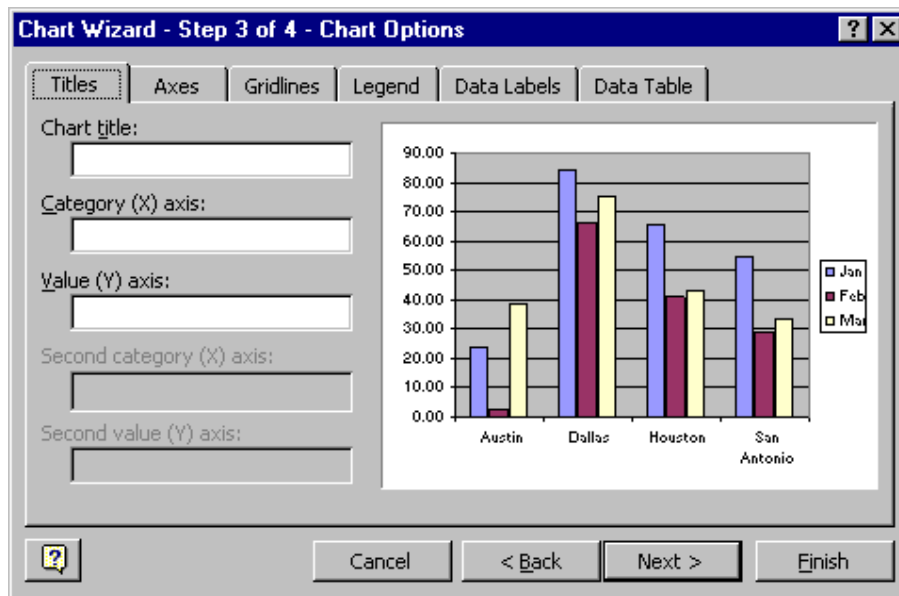
In Step 4, the Chart Wizard prompts you for a chart location. You can create the chart on the same worksheet as the data or on another worksheet. Click **Finish** after you select the location for your chart.
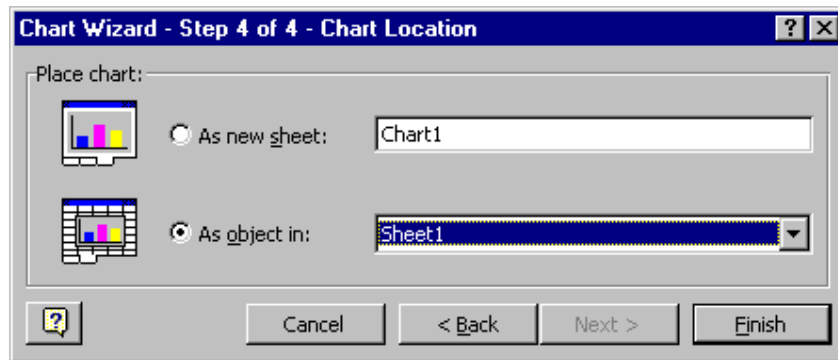
Manipulating the Chart
An Excel chart is a worksheet object. Like other worksheet objects, you can move it, change its size, delete it and place borders around it.

Changing the chart size
To change the size of a chart, click on the chart to select it. Small selection boxes appear on each corner of the chart. Drag one of the selection handles to make the chart larger or smaller.

Moving the chart
To move the chart, press the mouse on the border of the chart and drag the mouse.

Deleting a chart
Select the chart and press **Delete** or **Backspace** to delete it.

Changing charted data
Charts are linked to the selected data. Whenever the data changes, the chart adjusts to reflect those changes. For example, if the January Austin numbers increase to 100, the January Austin bar in the chart increases.

Editing and Formatting a Chart
The figure below illustrates the major components of a column chart. To modify any component of an Excel chart, double-click it. For example, to change the font of the chart title, double-click the title to activate a font dialog box. Double-click the y-axis to activate the **Format Axis** dialog box.
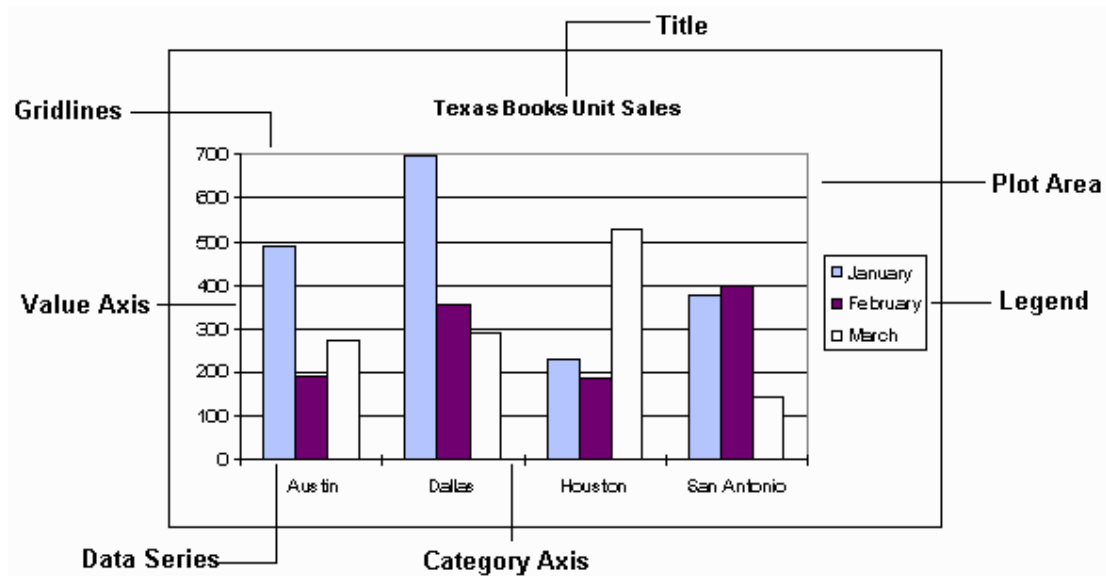
Using the Chart toolbar

Use the Chart toolbar (shown below) to change the chart type, add gridlines and a legend, or change the orientation of the chart. The Chart toolbar normally appears when you select a chart. If the Chart toolbar is not visible, use the **Toolbars** command on the **View** menu to display it.

Formatting a chart

When the chart is selected, the **Selected Chart Area** command on the **Format** menu lets you place a border around the chart or shade it with different colors and patterns.

Adding titles and labels

To add a title to the chart or one of the axes, choose **Chart Options** from the **Chart** menu. Note, the **Chart** menu is only visible when the chart is selected. Click the **Title** tab in the **Chart Options** dialog box and type the chart title and axis labels in the appropriate boxes.

Adding and deleting arrows

Often a chart contains information that you want to highlight or emphasize. To create an arrow on a chart, click the Arrow tool on the Drawing toolbar and drag a line where you want the arrow to appear. If the Drawing toolbar is not visible, use the **Toolbars** command on the **View** menu to display it. After Excel adds the arrow, change its length by dragging the selection handles at either end of the arrow. To delete an existing arrow, select it and press

Delete.

Bar patterns and colors
You can change the color and pattern of each column to accommodate different situations. If you print the chart, you might wish to select black and white patterns more suitable than the default choices. When you double-click any column or pie slice, Excel activates the **Format Data Series** dialog box. Use this option to change both the color and pattern of the selection.

Formatting the axes
Excel lets you change many characteristics of a chart axis. For example, you can change the font used on the axis labels or the scale. To choose different formats for an axis, double-click it and select the appropriate options from the **Format Axis** dialog box.
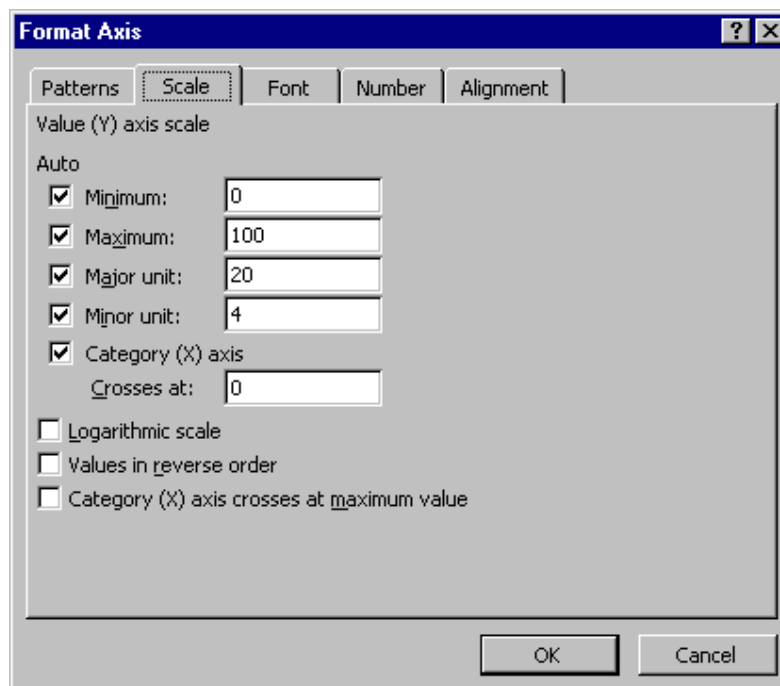
Adding new data to a chart
To add data to a chart, select the data on the worksheet and then, using the border of the selected data, drag it onto the chart. The **Add Data** command on the **Chart** menu can also be used to add data to an existing chart. To remove data from a chart, select **Source Data** from the **Chart** menu, click the **Series** Tab and click the **Remove** button.

Inserting data labels and trendlines
Data labels identify the precise value associated with a particular point on a chart. Choose **Chart** and **Chart Options**. The **Chart Options** dialog box has a tab called **Data Labels** used to include labels in a chart.

A trendline is a best-fit line for a series of data. To create a best-fit line, select a series of data and choose **Chart** then **Add Trendline**. Choose the Linear Option for a best-fit regression line.

<u>Printing a Chart</u>
You can print a chart on a worksheet by itself, or print the chart along with its accompanying data from a worksheet.

Printing a chart by itself
To print a chart by itself, select the chart and choose **File Print**. Make sure Selected Chart is chosen in the **Print** dialog box.

Printing charts with worksheet data
You might also want to print your chart with its accompanying data. You can include any worksheet object (chart, text field, clip art) in your printed report by simply selecting the cells underneath the worksheet object. When you choose **Print**, click Selection to print the selected cells, which will include the chart.

TOOLS
Check spelling
1. Select the range of cells you want to check.
   To check the entire sheet, click any cell.
2. Click Tools → Spelling
3.

Protect The Worksheet
On the **Tools** menu, point to **Protection**, and then click **Protect Sheet/Protect Workbook** and type password.

EXERCISE
1. Create a new worksheet **(Part I - Creating a Spreadsheet)**
2. Enter amounts and labels as shown in the "4th Quarter Sales" worksheet **(Part I - Creating a Spreadsheet)**
3. Add Bold to cells A1, A2:F3, A12, A18 **(Part I - Formatting the Worksheet; Font Formatting)**
4. Right-align cells B2:F3 and B4:B9 **(Part I - Formatting the Worksheet; Alignment Formatting)**
5. Format cells B14:B15 for % with zero decimals **(Part - I - Formatting the Worksheet; Number Formatting)**
6. Calculate Product Totals **(Part I - Introduction to Formulas)**
7. Calculate Total Sales by Employees **(Part I - AutoSum)**
8. Calculate % Total Sales as Total Sales by Employee / Total of Prod. Totals [ABS] **(Part I - More About Formulas)**
9. Format cells C13:E13 for % with zero decimals **(Part I - More About Formatting)**
10. Calculate Commissions as Commission % [ABS] * Total Sales of Employee **(Part I - More About Formatting)**
11. Calculate Bonus as If % Total Sales >= 20%, Total Sales * Rate [ABS] **(Part I - Additional Functions)**
12. Calculate Total Incentives as Commission + Bonus **(Part I - Additional Functions)**
13. Copy A4:B9 to A19 **(Part II - Cutting, Copying and Pasting Information)**
14. Calculate Average Amounts Sold **(Part II - Exercise in Cutting, Copying and Pasting)**

15. Format cells C4:F10, C14:E16, and C19:C24 as comma with two decimals **(Part II - Reviewing Formatting)**
16. Add double lines above Row 2 and below Row 3 **(Part II - Borders, Lines and Shading)**
17. Add single lines above and below Row 10 **(Part II - Borders, Lines and Shading)**
18. Enter your name in cell E1
19. Save as "4th Quarter Sales" **(Part I - Saving the Worksheet)**
20. Preview the worksheet **(Part I - Print Preview)**
21. Center the worksheet horizontally **(Part I - Formatting the Worksheet)**
22. Print the worksheet **(Part I - Printing)**
23. Save the worksheet **(Part I - Saving the Worksheet)**
24. Close the worksheet **(Part I - Printing)**

	A	B	C	D	E	F
1	**4th Quarter Sales**					
2						**Product**
3	**Product**	**Product #**	**Brown**	**Jones**	**Smith**	**Totals**
4	Stationery	127-45	450.25	300.00	100.00	850.25
5	Envelopes	138-45	300.50	150.90	75.10	526.50
6	Forms (1)	067-34	350.10	200.78	100.25	651.13
7	Forms (2)	238.34	275.75	125.50	75.50	476.75
8	Staples	011-12	50.80	75.75	100.00	226.55
9	Tape	345-12	75.30	50.00	150.00	275.30
10	TOTAL SALES BY EMPLOYEE		1,502.70	902.93	600.85	3,006.48
11						
12	**INCENTIVES**					
13	% Total Sales		50%	30%	20%	
14	Commissions	10%	150.27	90.29	60.09	
15	Bonus	18%	270.49	162.53	108.15	
16	Total Incentives		420.76	252.82	168.24	
17						
18	**AVERAGE AMOUNTS SOLD**					
19	Stationery	127-45	283.42			

20	Envelopes	138-45	175.50			
21	Forms (1)	067-34	217.04			
22	Forms (2)	238.34	158.92			
23	Staples	011-12	75.52			
24	Tape	345-12	91.77			

MS ACCESS

Ms. Rekha S.
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The popularity of the MS Office suite of applications has been pretty amazing over the past couple of years. However, the other applications included in this suite can be mastered with a little motivation and some training. However, the Access relational database application has put the creation of relational databases, that had previously been mostly in the hand of programmers, into the hands of common computer users in all walks of life. Of course, since Access is installed on your computer, you are probably required to at least have a working knowledge of what it will do for you and/or your boss!

The following are the specific objectives.

- Gain knowledge about relational databases in general.
- Understand when and why Access is useful to you.
- Learn basic terminology in Access to facilitate learning & other communication.
- Learn to design a database that is useful and appropriate for your needs.
- Create, manipulate, retrieve, and output data accurately & quickly.
- Understand the use of multiple tables.
- Create and use forms, reports, and queries.
- Understand a "relationship" in Access and how & why to create a "relationship".
- Use wizards & templates included in Access to assist you in creating objects.
- Learn how to successfully use Query & Reports in Access.

Introduction

What is a database?

A *database* is a collection of data, which is organized in a manner that can be easily retrieved. They consist of fields, records, and files, much like a telephone book. A *field* is a single piece of information (your last name is one field); a *record* is one complete set of fields (your entry in the telephone book is a record); and a *file* is a collection of records (the entire telephone book). When you look at the phone book for someone's telephone number, you are the "search engine" for the telephone book database. The only difference is that the search engine included with database programs is probably a little faster than you are at retrieving information.

What is a Relational Database?

A *relational database* is a single database spread across multiple tables. Think of a database as a file cabinet and each drawer of the file cabinet is a table.

Relational Database

all of
second
are kept
of these

one

Employee

Vendor
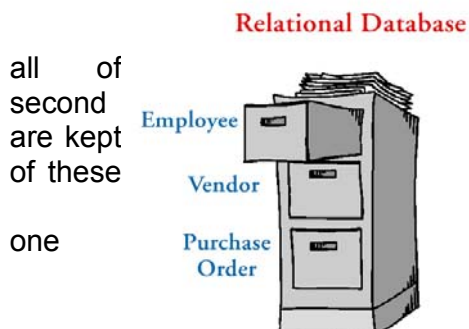
Purchase
Order

Example. All of the employee information is kept in the first drawer; the vendor information is kept in the drawer; and all of the purchase orders in the third drawer. To connect each drawers (which is what makes it "relational"), a set piece of data from drawer has to be present in one of the

other drawers.

For instance, a purchase order will have a vendor name, address, & phone number on it, along with the items purchased, purchase price, and any discounts. If the vendor name is the "set" piece of data, it is entered in the purchase order table, but the address & phone number are retrieved from the vendor table instead of having to re-type that information each time it is needed in the purchase order table.

When Should I Use Access to Store Data?

Databases, like Access, are used to store large quantities of information. The information can be viewed, sorted, manipulated, retrieved, and printed in various ways. The database gives you the flexibility to obtain this data in multiple formats. If the information you need to store is vast, interrelated, and you need to retrieve it fast & accurately, Access is probably the way to go.

Terms and Definitions

Field
The smallest piece of data in a table.

Cell
Where one row and one column intersect on a table.

Record
A collection of all fields relating to one person, place, or thing (i.e., Cindy Ireland's mailing address) occupying a single row of a table.

Table
A collection of records (i.e., all WSU employee's mailing address information) with one record occupying a single row with one or many fields per row. A database can consist of multiple tables.

Query
Asks specific questions about the data in the database.

Forms
A method of entering, displaying, and searching data in other than the spreadsheet-like environment of tables and queries (a graphical user interface).
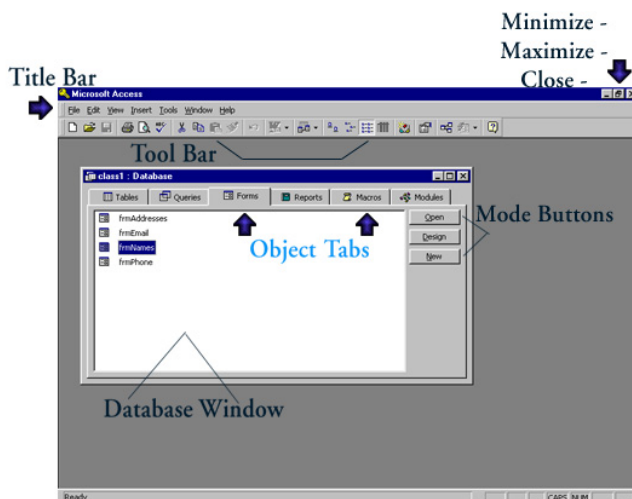
Reports
Summarizes and formats data in the "look" that you want for either table or query data.

Object
Components that make up a database (i.e., tables, forms, queries, reports, macros, & modules).

Let's Look At Access

The Access database window is the initial screen you are given. This is where all objects can be manipulated. As with all Windows 95 programs, you can close, maximize, and minimize your program window by clicking on the icons in the far upper right corner of the window (the X closes). The Title Bar is the area where the program name is

displayed - in this case, MS Access. The menu bar is between the Title Bar and the Tool Bar. You can select functions by selecting the options from the various menus.

Object Tabs allow you to select the object area you wish to work with (i.e., tables, forms, queries). Mode Buttons include Open, Design, and New -- these allow you to create new objects or edit existing ones. The window where the objects are located is also call the Database Window.

TIP: Place your pointer on any area of the Access database window and a text box will be displayed describing what that area is called. This is called a screen tip.

Naming Conventions

Consistency when naming the objects in your database is important. The LNC (Leszynski Naming Convention) is the most widely recognized. It states that one should precede each object name with a three letter tag to indicate the type of object. The object name should begin with a capital letter, no underscores or spaces are used.

The logic behind this type of naming convention is ease of use. Also, if you left your current job to accept another job that pays way more money, better benefits, brand new office furniture & computer, and your new boss is absolutely the most wonderful person to work for.....Well, you get the picture, you need to have your Access database setup so anyone could easily use it. Thus, the need to use this naming convention.

However, you may wish to continue using these conventions for your personal or business use.

Object Name	Access Tag
Table	tbl
Form	frm
Query	qry
Report	rpt
Macro	mcr

As an example, if we create several forms to aid in data entry, we might name the forms: frmEmployee, frmPhone, frmDepts, etc.

Designing a Database

Objectives
- Learn to sketch out your database prior to opening Access.
- Learn to create a new Access database.
- Understand the use of multiple tables in your database.
- Create multiple tables.
-

Designing Your Database
There are specific steps you should follow when designing your database:

1. **Determine the purpose of your database**. This will help you decide what data you want your Access database to store.
2. **Determine the tables you will need**. Once you have a clear purpose for your database, you can divide your information into separate subjects, such as "Employee" or "Orders". Each subject will be a table in your database.
3. **Determine the fields that you will need in your tables**. Decide what specific pieces of information you want to store in each table. Each category of information in table is called a field and is displayed as a column in the table. For example, one field in an Employee table should be Last Name; another could be Hire Date.
4. **Determine the relationships**. Look at each table and decide how the data in one table is related to the data in other tables. Add fields to tables or create new tables to clarify the relationships, as necessary.
5. **Refine your design**. Analyze your design for errors. Create the tables and add a few records of sample data. See if you can get the results you want from your tables. Make adjustments to the design as needed.

Complete these steps using a piece of paper and a pencil or a whiteboard - anything erasable. You will probably revise these many times before you have a final design. Experiment with sample data and models of your forms and reports. Make sure the database design stores the data in the manner you need, retrieves the data correctly, and gives you the output (printed document) that you require. It is much more difficult to make changes to the tables, forms, and reports after real data is entered. Double-check your design to make sure it contains all the data you will require BEFORE entering the real data.

Common Design Problems
There are several common pitfalls to keep in mind as you design your database. These problems can cause your data to be harder to use, maintain, and retrieve. The following are signs that you should reevaluate your database design:

- You have one table with a large number of fields that don't all relate to the same subject. For example, one table might contain fields pertaining to your customers as well as fields that contain sales information. Each table should contain data about only *one* subject.
- You have fields that are intentionally left blank in many records because they aren't applicable to those records. This usually means that the fields belong in another table.
- You have a large number of tables, many of which contain the *same fields*. For example, you have separate tables for January sales and February sales, or for local customers and remote customer, in which you store the *same type* of information. Try consolidating all the information pertaining to a single subject in one table. You may also need to add an extra field, for example, to identify the sales date.

<u>Creating a Database Part I</u>
Open your Access program. Click the Start button - highlight Programs - find your reference to Microsoft Access and click on it. The Access program will start.

Select Blank Database from the window that appears. Select the folder or directory that you want your database saved to and give it a filename. Click Create.

A database window will be displayed. You can also use the Access wizards to create a new database if you wish; The Database Wizard creates all objects needed for your database as well as other objects that we will not be using in this workshop.

> ***Exercise 1: Create a new Blank Database now.*** *Use the directions in the above paragraph to complete.*

Creating Multiple Tables

> ***Exercise 2: Create a table named tblStudents.***
> To create a table in a new database, click on the Tables tab in the database window. Click on the New button on the right side of the window. A "New Table" window is displayed. Select Table Wizard from this list and click OK. [NOTE: the wizard **is** a quick and easy way to create new objects.]
> Select Students from Sample Tables list and then each of the following fields (highlight field and click the arrow that points to the right): StudentID, LastName, FirstName, Major, PhoneNumber, EmailName, and StudentNumber. Highlight StudentNumber and click the RenameField button at the bottom of the field list. Rename it to AdvisorNumber and click OK. Click the Next button to go on.
>
> Rename this table to tblStudents and leave the "Yes, sets the primary key for me." from the center of the window. Click Next to proceed. StudentID will be the field that is unique on each record and let Access automatically number this field (is much easier). Click Next.
>
> The final screen of this wizard allows you to begin entering data immediately, make design changes to the table, or enter data using a form that the wizard will automatically create. Select "Enter the data into the table using a form the wizard creates for me" and click Finish. Exit the form when it is displayed.
>
> Click on the Form tab, highlight the form that was automatically created, right click on the form name, select Rename from the menu, and rename it frmStudent.

Navigating Tables

There are numerous ways to maneuver through an Access table. If you want to just look through the table without moving the cursor/highlight, use the scroll bar on the right side of the table. However, if you want to move the highlight as you move down the table, you can use the down arrow <Dn> or

the page down <PgDn> keys. The same is true if you are moving up the table - use the up arrow <Up> or the page up <PgUp> keys.

If you want to move the highlight to the very first cell of the table (A1), press <Ctrl-Home>. Conversely, if you want to move the highlight to the very last cell of the table, press <Ctrl-End>. To move the highlight from field to field, use either the <Tab> or <Enter> keys.

Additional keystrokes & navigation tips will be discussed when first mentioned in the documentation.

Defining Relationships

Primary Key

Relationships between tables is a vital part of what makes Access work so well. This one point makes a difference between having a bunch of data and having a relational database that helps you be more efficient and effective at your job.

Let's use an example to help clarify the relationship issue. We have information regarding both Students and Advisors in the College of Agriculture & Home Economics. There is **related** data in these pieces of information because each advisor has students to advise and every student has an advisor. Of course, this database could be one massive table that might contain all the necessary fields:
Student Last Name
Student First Name
Student Major
Student Phone
Student Email
Advisor Last Name
Advisor First Name
Advisor Building/Rm
Advisor Phone
Advisor Email

The difficulties of this approach are fairly obvious. Suppose one advisor works with 20 students. As information on each student is entered, the information for the advisor must also be entered. Entering the exact same information is tedious work to say the least. Remember: You should only enter any one piece of data ONCE. So, instead of entering the same advisor information for each of the 20 students, let's separate the data into two different tables with a relationship established.

Advisor Table
Last Name
First Name
Building/Rm
Phone
Email

Student Table
Last Name
First Name
Major
Phone
Email

So, how do we identify which students belong to which advisor? We would use a **Primary Key**. A Primary Key is a unique record identifier in each table. In our Advisor/Student database example above, there is no field that can be used as a Primary Key. Last name for either table is not a good choice - we could have duplicates for different individuals. First name in either table is not a possibility for the same reason - duplicates are possible. Address, phone, and email are not good choices because there can be duplicates but more importantly, they can change. Any field that can change is not a good choice for the Primary Key. The Primary Key should stay the same from the very beginning.

FLASH A standard, traditional database practice is to assign an ID number to each record. Access provides us with AutoNumber. This is an integer that is incremented with each new record; the first record has an ID of 1, the next has an ID of 2, etc. Our ID field in each table becomes the Primary Key, the unique identifier for each record. This number stays the same regardless of how it is sorted or queried or printed. It is a static field.

Relationships
Now we need to look at how these two tables are related, how exactly advisors are related to students. Each student has *one* advisor but each advisor can have *many* students. This is called **One-To-Many Relationship**. Wow, something that makes sense!

The basic rule for establishing a One-To-Many Relationship is: make the table with the many point to the table with the one. In our example, Student is the table with many (remember, one advisor has many students) so we want to add a field to the Student table that points to the Advisor table. The new field we create needs to point to the Primary Key (ID) of the Advisor table. The Advisor ID field in the Student table, since it refers to the Primary Key of another table, is known as a **Foreign Key**. The Foreign Key must be the same field type (Number) as the Primary Key.

FLASH The easiest way to set a primary key is to let Access set it for you in the Table Wizard.

Designing a Database (Part II)

Objectives
- Learn to create a table from scratch.
- Learn to a create a form.
- Become familiar with entering data into a table and a form.

- Create a logical relationship between tblStudent and tblAdvisor.
- Set Primary Keys & Foreign Key in tables.
-

Creating a Table from Scratch

In order to gain much more control over the development of a database table, you can create it from scratch using Design View. In Design View, you enter your own field names, descriptions, and choose your own data type to associate with each field. You also set your own Primary Key.

Before creating a table entirely from scratch, you should write down your basic table structure on paper, focusing particularly on field names and data types. Access fields can have one of the following data types:

Data Types	Definition
Text	Stores text or combinations of text and numbers (i.e., addresses) up to 255 characters.
Memo	Stores text and numbers with up to 64,000 characters; used for detailed, descriptive fields.
Number	Stores numeric data that you can use in calculations.
Date/Time	Stores a field in date or time format.
Currency	Stores currency data that you can use in calculations.
AutoNumber	Stores a sequential number for each record.
Yes/No	Stores only one of two values such as Yes/No, True/False, or On/Off.
OLE Object	Stores objects created in another application, such as Word or Excel , that you can link to or embed in an Access table.
Hyperlink	Stores a link to a URL.
Lookup Wizard	Stores a lookup column that you can use as a lookup in another table.

While it will not be necessary for you to know all of these data types it is a good idea to have a general knowledge of the possibilities in defining the data fields.

Exercise 1: Create a new table from scratch.
Click on the Tables tab in the Database Window. Click on the New button; a New Table dialog box opens. Click on the Design View option and click OK. A blank table will open in Design View.

Type **ID** in the first Field Name column, press <Tab> to go to the Data Type column. [**Text** automatically appears in the Data Type field as soon as you press the <Tab> key but you can select from any of the 11 options on the list.] Click the down arrow to the right of the field & select AutoNumber from the list. <Tab> to the Description column & type in a brief description of this field (i.e., Advisor Last Name, Advisor Office Phone).

Repeat the steps in the above paragraph for each of the following field names, all are Text data types: LastName,

FirstName, Address, PhoneNumber, and EmailName. When you are finished, your screen should look similar to this picture.

Exercise 2: Set a Primary Key

Click on the ID field. [Remember, **Primary Key** is a field that is unique in each record of the table.] An arrow will appear in the field selector column (far left). Click the Primary Key button on the menu bar. [See screen capture to identify exact location.] The arrow in the field selector column will turn into a key symbol. This is a toggle field so if you need to remove the primary key from this field, select the primary key field and click the Primary Key button on the toolbar again.

Exercise 3: Set Format Properties

Access always sets each field with the default format for its data type. This format defines how the field displays in tables, forms, and reports. You may want to change this format to one of the other options. For example, a date/time data type can be changed to display long (Tuesday, July 7, 1998) or short (7/7/98).

In Design View, add a new field (Date) to the existing table. The Data Type should be Date/Time. Make sure this field name is selected (the arrow should be displayed in the field selector column). The General tab should be displayed below. Click on the Format field. A down arrow is displayed at the right edge of that field, click on the arrow. A list of possible formats is displayed. Select the format of your choosing. A diagram might help.

Exercise 4: Set Field Size Properties for Text Fields

The default field size for a text field is 50 characters. You can change this size to any amount from 0 to 255 characters.
Click the field selector column of the field name you wish to change. Click the General tab in the Field Properties. Enter the new field size in the Field Size text box. A picture is worth 1,000 words!

Save your table [File-Save] as tblAdvisors.

Entering Data

There are a couple of notes of interest before you begin the next group of exercises. Telephone number fields will include the area code parentheses when using the wizard - not a huge deal.

Exercise 5: Enter Advisor Data

Enter the following information directly into the tblAdvisor previously created. Notice that you can use the <Tab> or <Enter> keys to move from field to field. Use the arrow keys to move around the table fields as well.

Joe Smith, 423 Hulbert, 335-1111, joe_smith@xwsu.edu
Jane Zane, 211 Food Science, 335-7777, jane_zane@xwsu.edu
Bryan Brown, 333 Clark, 335-6666, bryan_brown@xwsu.edu
Access will create an ID number automatically for each of these
records as you create them. Do NOT type a number in the ID
field, it contains the words (AutoNumber). After you have
entered the above data, close the table. Save and close the
table.

Exercise 6: Enter Student Data
Now enter the following data using the form, frmStudent. Find
the Advisor number from the table above and enter that, not the
advisor's name, in the Advisor ID field.

Shawna Davis, 335-7676, Ag Econ, sdavis@stu.wsu.edu, Joe
Smith (advisor)

Jerry Turner, 333-2222, Food Science, jturner@stu.wsu.edu,
Bryan Brown (advisor)

Sherry Vineyard, 333-1111, Natural Resources,
vineyard@stu.wsu.edu, Jane Zane (advisor)
Deke Einstein, 335-7799, Ag Econ, einstein@stu.wsu.edu, Joe
Smith (advisor)

Jay Terry, 333-0000, Natural Resources, jterry@stu.wsu.edu,
Jane Zane (advisor)

Save and close the table.

Creating a Relationship
In order to create the relationship between the two tables in our example, you
need to identify the primary key and the foreign key.

Exercise 7: Set the Foreign Key
You have allowed Access to set your Primary Key and you have
set the Primary Key on your own .

The Foreign Key in the tblStudent table must be the same data
type (Number) as the Primary Key in the tblAdvisor because that
is the link between the two tables. To check this, from the
database window, highlight tblAdvisor and click the Design
button.

The ID field is highlighted. The data type is "AutoNumber" and
the Field Size is "long integer". Find those two fields. Close this
window.

Highlight the tblStudents from the database window and click
the Design button. Highlight the AdvisorNumber field. Click the

Data Type in the AdvisorNumber field and a pull-down arrow appears. Click on that arrow and select "number" from the list; "long integer" should appear in the Field Size field automatically. This step MUST be completed before progressing to Exercise 8.

In some database programs, this is sufficient - defining the Primary and Foreign Keys. But with Access, we have to specifically define the relation between these tables.

Exercise 8: Create a relationship between tblStudent and tblAdvisor

From the Tools menu, select Relationship. A "Show Table" window is displayed. Add the tblAdvisor and tblStudent to the Relationships screen and close the window. Two lists are displayed - each containing the field names in each of the tables.
To actually join the two tables, use the mouse and click the ID field in the Advisory table (our Primary Key). While holding down the mouse button, move the cursor over to the Advisory Number field (our Foreign Key) in the Student table list.

A "Relationships" window is displayed (**NOTE**: If you click on the "Tables aren't related" option, you can undo a table relationship you previously made.)You'll notice that under Relationship Type that One-To-Many is already selected. Also, check the Enforce Referential Integrity to insure that data entered in the Student Advisor ID field can not be a value that does not exist in the Advisor table. Click the Create button.

After the relationship is created, the Relationships screen shows a connection between the Primary Key and Foreign Key fields. Notice that the Advisor table has a 1 while the Student table has an infinity sign. Together, this signifies the One-To-Many relationship.

Save and Close. Exit the database.

Now that the relationships are defined, it is easy to begin creating queries, forms, and reports.

Wizards & Templates

Objectives
- Learn how wizards can make quick work of designing objects.
- Learn to modify the wizards' work.
- Learn how to change the default template.
-

Using the Wizards
You have already used the wizards to create Tables and Forms. Most of the wizards are fairly similar in their operation with some obvious differences in regards to specific information. The Wizards will walk you through the basic

process of creating an object without you having to know the exact steps. They can make working with Access much easier, especially for the novice. Suppose we want to build a form so we see the advisor information listed once along with information on each of the students assigned to that advisor.

Exercise 1: Create a form & subform.
1. To create a new form, click the Form tab in the Database window, then click the New mode button.
2. Since we have already designed the tables and defined their relationship, we can run the Form Wizard and let Access do most of our work for us. You can select the Advisor table from the field designated or leave it blank.
3. The first question the Wizard asks is: Which fields do you want on your form? For this example, let's select all the fields from both the Advisor table and the Student table. [**A quick tip**: the double arrows take everything from one side to the side where the arrows are pointing.] Click the **Next** button to continue with the Wizard.
4. The next question the Wizard asks is: How do you want to view your data? The default view is a form with a subform. This is the best option for what we want in this exercise. The advisor will be listed once in the main part of the form and all students advised by the advisor will be listed in a subform underneath.
5. For the layout option of the subform, the choice is an aesthetic one between the datasheet and tabular options.
6. Finally, the Wizard asks us for a style (again a purely aesthetic choice) and then asks us what we want to name our forms.
7. Change the Form name to frmAdvisors and the Subform name to frmStudtsSub. Click the Finish button to complete the Wizard.
8. When the Wizard does its work, a very nice looking form is generated. Notice that the advisor is listed once at the top of the form, and all his advisees are listed below in the inset window.
9.

Access has a great feature at the bottom of the form screen, it is a record number bar that allows you go to the next record, the first record, the last record, or any specific record you choose. The arrow keys take you to (from left to right) the first record, the previous record, the number field where you can type in a specific record number & press <Enter> to move to that record above, the next record, the last record, & the * creates a new record.

Making Changes
After creating an object using a wizard, you may find that you need to make a change, either minor or major. Access allows us to edit the objects that are created with the Wizard.

Exercise 2: Modify Object
Part A: Change the name of the form we just created to frmAdv/Stu and change the name of the Student subform to frmStuSubform. [To rename an object, right click on the object name, and select Rename from the pop-up menu.] Now when you **open** the Adv/Stu form you get an error that says it can't find the old form name -- major problem!

First thing you have to do is to edit the part of the frmAdv/Stu that points to the old student subform name. To do this, highlight the frmAdv/Stu from the database window, Form tab. Click the

Design mode button on the right. The same error about not finding the student subform is displayed - click the button to continue. Inside the inset subform is the name of the subform form. Click the cursor on that name and change it to the correct form name (frmStuSubform). Click File - Save.

Part B: While still in Design mode, you can also change the field labels (aka captions). Click once on the field label to select it, right click to access the pop-up menu, and select Properties. The Caption field is the second item, double-click on it and change it to a caption of your choice. Click the X in the upper right corner of the dialog box to close. Your change will immediately be displayed on your form.

Using Templates

When you create a form or report without using a wizard, Microsoft Access uses a template to define the default characteristics of the form or report. The template determines which sections a form or report will have and defines each section's dimensions. The template also contains all the default property settings for the form or report and its sections and controls.

The default templates for forms and reports are called Normal. However, you can use any existing form or report as a template. You can also create a form or report to use only as a template.

Specify a new template for forms and reports:

1. On the Tools menu, click Options.
2. Click the Forms/Reports tab.
3. Type the name of the new template in the Form Template or Report Template box. Note: You can use an existing form or report as a template, or you can create a form or report specifically for use as a template.
4. Click OK.

Notes

- Changing the template doesn't have any effect on existing forms or reports.
- A template doesn't create controls on a new form or report.
- Microsoft Access saves the settings for the Form Template and Report Template options in your Microsoft Access workgroup information file, not in your user database (the .mdb file). When you change an option setting, the change applies to any database you open or create. To see the name of the template that is currently used for new forms or reports, click Options on the Tools menu, and then click the Forms/Reports tab.
- To use your templates in other databases, copy or export the templates to them. If your templates are not in a database, Microsoft Access uses the Normal template for any new forms and reports you create. However, the names of your templates appear in the Form Template and Report Template options in every database in your database system, even if the templates are not in every database.

Query and Reports

Objectives

- Create a query from scratch (no wizards).
- Learn the importance and usefulness of the Datasheet View.
- Revise existing queries.
- Create and revise a report.

What Is A Query?

A query is the question you ask, such as "Who are the students that Bryan Brown advises?", not the results (i.e., Jerry Turner). You may have several queries created as they may ask different specific questions. Once you have created a query, you can run it as often as needed because the results will change each time the table data is changed.

When you begin to design your queries, ask yourself:

- What specific question do I want to answer?
- What pieces of data (fields) do I need displayed?
- What sort order will help me the most?

Datasheet View Explained

The Datasheet View is where you design and revise your queries. It allows you to select which tables and/or queries you will use in the Query (upper pane). You can also select the fields to use in the results or in filtering specific records to include or exclude, and how the results are sorted (by which field).

Exercise 1: Create a New Query

1. From the Query tab of the Database Window, click the New button.
2. From the New Query dialog box, select Design View and click OK.
3. From the Show Table dialog box, select the table (tab), query (tab), or the both (tab). Then select the object(s) you wish to use in this query - you will select tblAdvisors from the Table tab, click Add button. Select tblStudents and click Add button again. Then click Close button.
4. Select the following fields to include in the query. Remember that the fields appear in the same order in the design grid as they will in the result. Drag field name from upper pane to lower pane or click in blank field box (lower pane), click the drop-down arrow to see all possibilities, select appropriate field.

*Advisor	First	&	Last	Name
*Advisor				Email
*Student	First	&	Last	Name
*Student Major				

5. Decide to include all field in results (click Show box to display).
6. Select File - Save and name it qryClass - click OK.
7. Run (click the ! button in the toolbar). Results are displayed in Datasheet View.
8. You can print the results at this point. Click the X in the upper right corner of the results screen to exit.

Controlling the Order of Records (Sorting)

Sorting records based on the contents of one or more fields can make reviewing and editing easier (i.e., alphabetical order by student name). By controlling the order that records are displayed and/or printed, you can create a document that would be helpful to you, your boss, or your clients.

Exercise 2: Sorting

1. To add a sort to your query, click the Query tab from the Database Window, highlight the query you wish to add the sort to, and click the Design mode button on the right.
2. In the lower pane, click on the sort box of the field (Advisor Last Name) you wish to sort by.
3. Click the drop-down arrow to see the list of sort options. Select Ascending from the list.

4. Run the query (click the ! in the toolbar). Note the differences in how the data is displayed.

Include Only Specific Records

"Criteria" acts like a filter - it filters out certain records and lets others through (the ones that meet the criteria stipulations). If you want to limit the results of your query, you can set up a specific criteria. If the record meets that criteria, it is included in the results. For example, if you only wanted the records for the advisor, Jane Zane, you can set the Criteria on the Advisor Last Name column to Zane. Only the records with Jane Zane will be displayed in the results.

Exercise 3: Using Criteria to Select Records
1. Return to the Design View of your query.
2. In the Advisor Last Name column, click on the Criteria field & type Brown.
3. Run the query.
4. Save this query.

Save the Query

Remember that when you save a query, you are saving the question, NOT the answer (or result). While in the Design View of your query, click the File menu option. Select Save from the menu. OR, click the diskette icon on the toolbar to save.

Creating & Revising Reports

You can create new reports based on one or more queries or tables. A report is a way for you to display data from a query and/or table in an appealing way (i.e., for a presentation). Using the Report Wizard is a great way to create a basic report but to revise it, let's walk through an example.

Exercise 4: Create New Report
1. From the Report tab, click the New mode button.
2. Select Report Wizard, select tblAdvisors (click the down arrow on the right of the blank field), and click OK.
3. Select all fields from the tblAdvisors and the tblStudents tables (remember to use the double arrows to move all the fields over at once). Click Next.
4. Answer the question "How do you want to view your data" by leaving it at the default and just clicking the Next button.
5. Answer the question "Do you want to add any grouping levels" by leaving this dialog box at its defaults. Click Next.
6. Sort by student last name. Click Next.
7. Leave layout dialog at its defaults but change it to Landscape instead of Portrait & click Next to continue.
8. Select Casual for the title style and click Next.
9. Change the report name to rptStuAdv and click Finish.

Don't worry about how your report displays at this point. It contains a lot more information than you would probably include in any one report.

Exercise 5: Revising an Existing Report
1. Click on the Report tab and highlight the rptStuAdv report.
2. Click the Design mode button on the right.
3. The Design View of the existing report will be displayed.

4. Highlight the text in the Report Header and replace it with Students and Advisors '98. Right click on the Report Header field and select Properties from the list. (If right click doesn't give you a menu, click off of the Report Header and then try again.)
5. Take the slider and move it to the bottom of the Label property dialog box. Under Text Align, click your cursor, click on the pull-down arrow, and select Center from the choices.
6. Select the Report Header field (black boxes along edge show it is selected) and drag the box, using the right center box, to the right edge of the design, and let go of the mouse button. Your title should be centered over the text fields now.
7. Select File-Save and save the report under the same name (rptStuAdv).

MICROSOFT POWERPOINT

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Overview of Microsoft PowerPoint
Presentation software programs, like PowerPoint, have become quite popular in the last several years, because they are relatively easy programs to learn and people can create attractive materials for giving talks. Keep in mind, that there are various ways to use Microsoft PowerPoint:

- To create a "slide show" on the computer that can either run on a stand alone computer, like at a general meeting or open house display, or can be projected if you have a computer and some type of projection device (like an LCD panel and overhead).
- To create a set of overheads that can be projected using a normal overhead. These overheads, however, have more pizzazz then just a Word document using large fonts, since there can be a common color scheme throughout the overheads, and a consistent use of particular font styles and sizes. If you have access to a color printer and can make color overheads, your overheads can be quite impressive. Even if you do not have a color printer, if you select your background carefully, the overheads will look nicer than if you used Word, and creating them will take less time.
- To create traditional 35mm slides by printing slides to a film recorder (you print to this special device and then take the 35mm film to a developer). Since this film recorder is fairly expensive, and you may not own one or have access to one, you can elect to take your slide file to a company that provides this service A third alternative is to run your slide show on your computer and photograph the screen with a good camera. However, this requires experimenting with lens openings and room light settings.

To take advantage of all of the features offered by PowerPoint, like transitions and sounds, you need to be giving a "live" talk using a computer equipped with special hardware. Even if you don't have the necessary hardware, PowerPoint offers features to help you create great looking overheads and handouts.

With this background information in mind, you are now ready to move on to creating a presentation.

A First Look at the PowerPoint Window
- Double-click the PowerPoint icon to open PowerPoint.
- Click **Blank Presentation**; click **OK.**
- Click the **Blank Slide** layout; click **OK**.

Note the following components.
       Menu bar - access to menu and commands.
       Toolbars - icons for frequently used commands.
           right-mouse click to add or remove toolbars.
       New slide button - adds new slides.
       Slide Changer (move from slide to slide) - vertical scroll box or

> Previous/Next slide buttons or Page Up/Page Down buttons on the keyboard.

View buttons - access to different views.

A Closer Look at Views

a. Examine the **Normal View**.
    Displays three panes: outline pane, slide pane, and notes pane.
    View and work with one slide at a time.
    Can add titles and body text, graphs, clip art, pictures, and draw shapes.
    Access to all tools and buttons.

b. Examine the **Outline View**.
    Information created and organized for all slides in an outline format.
    Displays all titles and body text.
    Access to tools and buttons.

c. Examine the **Slide View**.
    View and work with one slide at a time.
    Can add titles and body text, graphs, clip art, pictures, and drawn shapes.
    Access to all tools and buttons.

d. Examine the **Slide Sorter View**.
    Displays organization of all slides in miniature.
    Can rearrange order of slides, copy slides, and delete slides.
    Add transitions, build effects and timings.

e. Examine the **Slide Show View**.
    Displays slides as an electronic presentation on the full screen.
    Allows you to see the effect of transitions, timings, and animations.

f. Examine the **Notes View.**
    Select Notes Page from the View menu.
    Can create speaker notes.
    Displays page containing an image of the slide and a place to add notes.

View an Existing Slide Show
- Double-click the **PowerPoint folder** on the Desktop.
- Double-click the file named **demo.ppt**.
- Choose **Slide Show** from **View** menu.
- Left mouse click to **advance** to the next slide **OR** press the space bar.
- Right-mouse click and choose **previous slide OR press P** to return to previous slide.
- F1 to see more options.

▪ Examine these features of the slide show:
Animated text
Picture that appears on each slide (Master
Slide)
How bullet points "fly in from the top"
Esc to leave slide show.

Creating a New Slide Show
The "New Presentation" dialog box appears. There are three tabs in this dialog box. Select the "presentation design" tab to select a template for the presentation. By clicking on the various icons that appear as choices, it is possible to preview the templates in the box to the right. Select the template you wish to use and click the [OK] button to continue.

Design Template Options
The templates are background patterns created by a graphic artist. After picking one of the backgrounds, all the elements in a slide "fit" into the colors for that background. That is, the colors for titles and bullets and charts "relate" to the color scheme for that template. Typically, the design template also has some graphic element that is repeated on all slides, to further help the slide set look like a related unit. The template feature is one of the appealing aspects of using PowerPoint. *You* do not have to be an artist to create attractive slides. Once you have identified a design template that you would like to use, with it selected click the [OK] button.

Layout Options
The next screen that appears is the "New Slide" dialog box, for selecting a layout. Slide layouts are pre-created formats for a slide. There are twenty four layouts with the 7.0 release. Two of the most commonly used layouts are title slide and bulleted list. Just keep in mind that the layout for a slide has existing placeholders for information.

Exercise 1
Start the Presentations program. When the "PowerPoint" dialog box appears, select the option of creating a new presentation using a template. Select the "Presentations Designs" tab in the "New Presentation" dialog box and click on the template called "Side Bar". This is a template in blue with a pink line separating the title of each slide from the text below. When you click on the design, its appearance is displayed in the preview window to the right. After you select your design template, click the [OK] button.

The "New Side" dialog box will appear next. Change the auto layout to Bulleted List for now (the second from the left on the first row of options), and click the [OK] button to go on to the next display

More About Slide Templates
When you are creating a new presentation, in the "New Slide" dialog box you select an auto layout before typing in any text. In Exercise 2 you picked a

bulleted list, which has a title and a bulleted text area. When you look at your slides in Slide View, you can see placeholders for the parts of the slides even if they are not in use. When the slide is printed or played, empty placeholders are not displayed.

There are twenty four slide layouts that you can use in PowerPoint 7.0. They are:

- Title Slide
- Text & Object
- Bulleted List
- Object & Text
- 2 Column Text
- Large Object
- Table
- Object
- Text & Graph
- Text & Media Clip
- Graph & Text
- Media Clip & Text
- Organization Chart
- Object over Text
- Graph
- Text over Object
- Text & Clip Art
- Text & 2 Objects
- Clip Art & Text
- 2 Objects & Text
- Title Only
- Text over 2 Objects
- Blank
- 4 Objects

Even after entering text in Outline View, you can change the slide layout. You do this by selecting the slide, and then clicking on the [Slide Layout] button on the Status bar, located near the bottom of the display. Select the slide layout you would like to use, and then click the [Apply] button to accept the changes. Changing the slide layout will not cause you to lose any information on your slide, but additional editing may be required.

Exercise 2

Change the view to Slide View for your "newsletter tips" slide show. Use the buttons on the vertical scroll bar to move to Slide

Click on the [Slide Layout] button on the Status bar and change the template for Slide 1 to Title Slide. Take a look at the result on the screen. You could leave the new sub-title area blank, but instead, add the text "Building Blocks for a Newsletter" to that area. Do this by following the instructions displayed on the slide; click in the sub-title box, and enter the text. Save this version of "newsletter tips."

Changing Layouts in the Slide Sorter View
If you have several slides you want to change as a group, this can be done easily from the Slide Sorter View. This view lets you see several slides at once, and allows you reorganize, select and change attributes of multiple slides.

While holding the <Shift> key, select each slide that you want to change to a similar layout. If all slides are to be changed, you can use **EDIT, Select All** from the menu bar. Next click the [Slide Layout] button on the Status bar, and select a different layout, or use **FORMAT, Slide Layout** from the menu bar. The layout you choose will be applied to all selected slides. When you add a new slide to your presentation, it will use the layout of the previous slide, by default.

Changing The Design Template
In the "PowerPoint" dialog box when you begin creating a file, you pick out a design template for the slide background. However, you can apply another design template at any point. You will probably want to be using Slide View so you can see the effect. There are several ways to change the design template. The design template currently in use is displayed on the Status bar. By double-clicking on this area, you are taken to the "Apply Design Template" dialog box, where you can select a different template. As you select different templates, you can preview them in the box to the right. When you find a template you like, simply click on the [Apply] button. Two other ways to reach the "Apply Design Template" dialog box are by clicking the [Apply Design Template] button 🖼 on the Standard toolbar, or by selecting **FORMAT, Apply Design Template** from the menu bar. Keep in mind that you cannot apply more than one background to a slide show.

Exercise 3
> Using your "newsletter tips" slide show, click on the [Apply Design Template] button on the Standard toolbar. Select the "Multiple Bars" template and click on [Apply]. Using the buttons on the vertical scroll bar, move through the slides and look at the effect.
>
> Change the template to "Color Boxes" and view your slide show again. Finally, change the template to "Soaring" and view your slide show. Feel free to try other templates, if you wish.
>
> What is your reaction to these various backgrounds? When would you want to use one and not another?
>
> You do not need to save this new version of "newsletter tips." Close the screen display by clicking on *FILE*, then *Close*.

The steps for creating a presentation is :
   a. Click on New button.

Choose the Title Slide layout.
Click the Apply Design button from the Common Tasks button on the formatting toolbar.
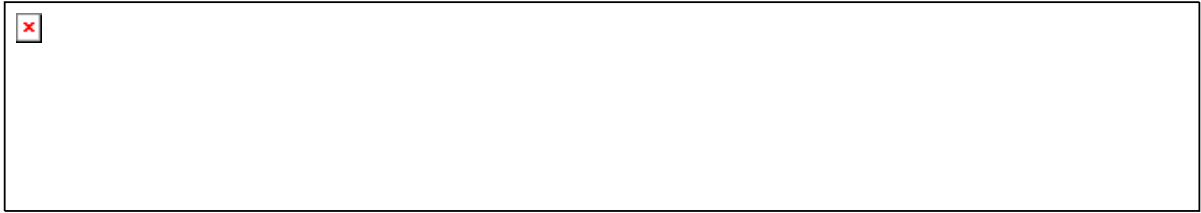
Select a **design** (template).
Click **Apply**.

b. Complete the **Title Slide**
Type your Title text (The Truth about Cats and Dogs).
Type your name in the **Sub-Title** box.
Add **Bold** to Title, if necessary.
Move and Resize sub-title box up to make room for clip art in lower right corner.

c. Complete a **Bulleted List Slide**

Click on the **New Slide** button.
Select the **Bulleted List** layout.
Type your Title text **(The Truth about Cats)**.
Type your list of "truths" about cats in the Bulleted List box.
Press enter to insert additional bullet
Press enter two times to double-space bullets
Backspace to delete extra bullets
Tab to increase indent
Shift + Tab to decrease indent

d. Duplicate and Edit Your **Bulleted List Slide**
Click on the **Slide Sorter View**.
Click on the **second slide**.
Select **Duplicate** from the **Edit** menu.
Double-click on your **new slide (#3)**.
Double-click the word **Cats**.
Type **Dogs**.
Type your list of "truths" about dogs in the Bulleted List box.

Creating Data Charts
Three important slide layouts are Graph, Text & Graph, and Graph & Text. Graph layout has a title area with a graph area that nearly fills up the slide. The Text & Graph layout has a bulleted list to the left side of the graph, and the Graph & Text layout has a bulleted list to the right side of the graph. The more complex the data chart, the more likely you would need to use the "full size" chart for your audience to read the chart.

Starting a Column Chart
An easy way to begin creating column charts is in the Slide View. Add a new slide, selecting the Graph layout. Next add a title to the slide, and then double-click on the graph "placeholder" to start Microsoft Graph. The "Datasheet" dialog box will appear. Move it out of the way, to the upper-left corner of the window, by clicking and dragging on the title bar.

With Microsoft Graph running, *VIEW, INSERT, FORMAT*, and *TOOLS* on the menu bar will have different options. *DATA* also appears on the menu bar, and is unique to Microsoft Graph, as well as the Microsoft Graph toolbar.
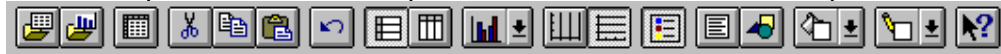
While the default chart type is a column chart, under *FORMAT, Chart Type* on the menu bar, or the [Chart Type] button on the Microsoft Graph toolbar, there are eight options in the "Chart Type" dialog box for 2-D charts, and six options for 3-D charts. A sample for each type of chart is displayed.

It is easy to accidentally exit the "Datasheet" dialog box and return to Slide View, by clicking on the slide outside of the chart area. If you have done this, simply double-click on the chart to reopen Microsoft Graph. If you still don't see the datasheet, click the [View Datasheet] button on the Microsoft Graph toolbar, or select *VIEW, Datasheet* from the menu bar.

Working with the datasheet area is similar to working in a spreadsheet program. You can highlight the current data in the datasheet and press <Delete> to clear the data, or click the corner control box--in the upper-left corner of the datasheet--to delete all of the data at once. The datasheet will be blank and the resulting chart will disappear, since there is no data to create the chart.

You can enter text labels and numbers in the datasheet just as you would in a spreadsheet. Use the arrow keys to move around. Once the data is entered, you can close the display of the datasheet in a variety of ways. Perhaps the easiest is clicking the [Close] button (X) in the "Datasheet" dialog box, but you can also click on the [View Datasheet] button on the Microsoft Graph toolbar, or select *VIEW, Datasheet* from the menu bar to toggle the datasheet display off.

Exercise 4

In order for you to practice creating a chart for your presentation, we will assume you have conducted a survey of users in your organization, finding out what type of images they use in their newsletters now, versus what they were using five years ago.

Use Slide View and move to Slide 10 on "Graphic accents." Click the [New slide] button and select a Graph layout. For the title of the slide type: Types of images used.

Double-click on the chart placeholder and pick the a 2-D Bar format by selecting *FORMAT, Chart Type, Bar* from the menu bar. Keep in mind that Bar is a 2-D chart. Take a look at the resulting datasheet that appears and how the data is entered.

Notice there is a column for legend labels and a row for labels (text to explain the X-axis).

Click the corner control box in the upper-left corner of the datasheet to delete all of the data at once. Replace it with the information provided below:

	A	B	C	D
	Photos	**Clip art**	**Illustrations**	**No images**
1 1996	15	20	20	3
2 1991	5	35	3	8
3				
4				

As you type in data, you can see the resulting chart being created. As you type "Illustrations," you see that the column is not wide enough, but the entire text item appears on the chart. You can drag the vertical line between columns in the header area (where the column letters appears) to make the column wider.

When you are through entering data, click on *VIEW, Datasheet* and close this window, or close it by clicking the [Close] button.
To complete the chart and return to the Slide View, click twice (once to return to Slide View, and the second time to deselect the graph) anywhere on the slide outside the chart area. The Microsoft Graph toolbar disappears and the normal toolbars reappear.

The Datasheet and resulting graph should look like
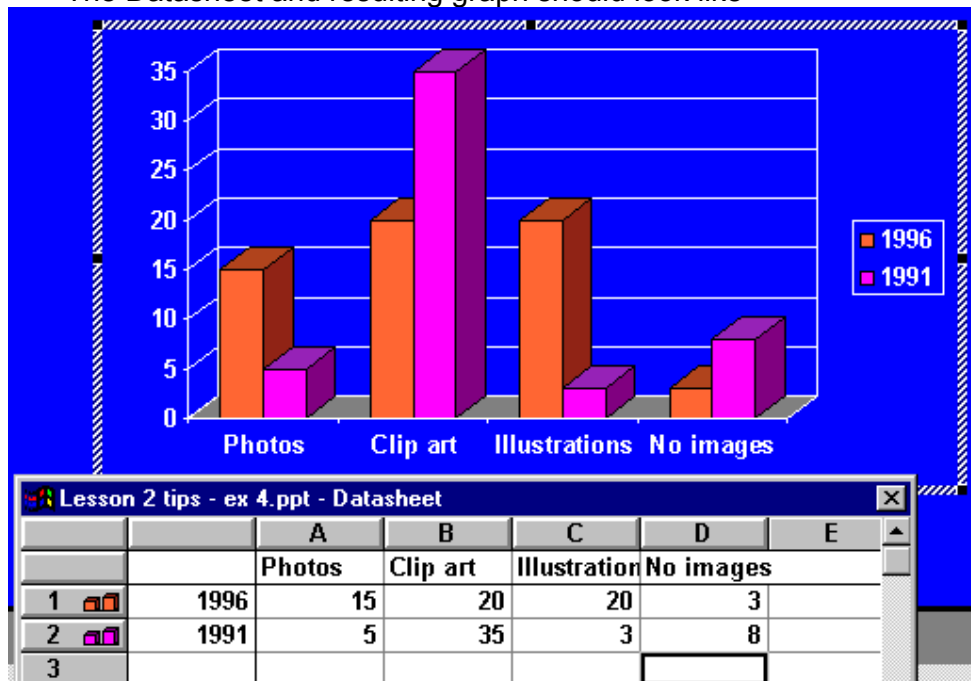
Save this version of "newsletter tips." There are now 12 slides in your set.

With the chart slide showing and using Slide View, change the layout to Text & Graph or Graph & Text by using the [Slide Layout] button on the status bar, or *FORMAT, Slide Layout* on the menu bar. What do you think of these slides as compared to the Graph layout? Change the layout back to Graph.

Adding a Picture to the Master Slide

Hold down **Shift** and click the **Slide View** button.
Select the **Insert** Menu, **Picture, Clip Art** command.
Click once on the picture to select it, then click on the **Insert Clip** button.
Close **Clip Art** Box.

Resize the picture if necessary (by dragging with the **two-headed resize   arrows**).
Move the picture to the bottom right (by dragging with the **four-headed arrows**).

Exercise 5

Move to the "Clip art" slide. Using the Slide View, click on the [Insert Clip Art] button on the standard toolbar. Select the Tortoise Slow image from the Animals category and click on the [Insert] button in the dialog box to place that image in your slide. Practice moving the image around on the slide, and then move it to the bottom on the left side of the slide by clicking and dragging anywhere within the box area (but not on a handle). Use *INSERT, Clip Art* from the menu bar to place another animal image--Hare Fast--on the bottom right side of the slide.

Both of these images are vector images.
Save your revised presentation.

Adding Speaker Notes
▪ Open the **View** menu.
▪ Choose **Notes Page**.

- Add comments to yourself.

Adding Custom Animation
- Double-click the chart slide.
- Right-mouse click the chart.
- Select **Custom Animation**.
- Click the **Order & Timing** tab.
- Check mark **Chart 2**.
- Select **On Mouse Click** in the Start Animation area.
- Click **OK**.
- If necessary, add animation to the arrow and text box. Rearrange the animation order.

Saving Your File
- Click on the **Save** button.
- Save to your **(C:)** directory, **Temp** subdirectory.
- Name your file **catdog.ppt.**

Saving Your File as a HTML document
- Select the **File, Save as Web Page.**
- Upload the file to your web page.

Viewing Your Slide Show
- Go to or Select the **first slide**.
- Click on the **Slide Show View** button.
- *Click the left mouse button* to advance to the next slide.

Printing Options
What Can Be Printed?
Before looking at the "Print" dialog box, you need to know that there are various items that can be printed through PowerPoint:

|	
Slides (with builds)	For slides with a build effect turned on, adds a bulleted item (beginning with the slide title) on each subsequent page until the entire slide is printed.
Slides (without builds)	Prints one page per slide, with all the bulleted items present, even if a build effect is in place. This is the default setting.
Handouts (2, 3 or 6 slides per page)	Prints "thumbnail" or smaller versions of the slides with multiple slides per page. You may select the number of slides per page; choices are 2, 3, and 6 slides per page.
Notes Pages	Prints the Notes Pages to be used as speaker notes, or as a reference for the audience.
Outline View	Prints an outline just as it appears on your screen.

The option you select when printing depends on your situation and preference.

Printing Basics

You can bring up the "Print" dialog box by selecting *FILE* on the menu bar, then *Print*, or by pressing the <Ctrl> and <P> keys together. Clicking the [Print] 🖨 button on the standard toolbar prints the entire presentation using the default settings, without taking you to the "Print" dialog box first.

There are various options in the "Print" dialog box. The "Printer" box lets you select from the various Windows 95 printers installed for your computer. The "Print range" box allows you to print all of the slides in your presentation (default), just the current slide, or a specific range of slides. For a range of slides, use a "," separator to specify individual slides, and a "-" separator to indicate a range of slides. If you have selected slides in the Slide Sorter View, you may also indicate that you wish to print this selection. The third box-- "Copies"--allows you to indicate the number of copies, and for multiple copies, if they should be collated.

At the bottom of the "Print" dialog box you can select, from the choices described above, what it is you wish to print in the "Print what:" drop-down box.
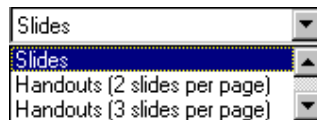
If you check the "Black & White" option, then all of the slides in the presentation will be printed in black ink on a white background. If you have a color printer, this is a quick way to print a draft copy of your presentation. The "Scale to Fit Paper" option automatically sizes slides to fit the paper loaded in the printer, and the "Frame Slides" option adds a thin frame around the border of everything except the Outline View. If you have created a presentation with hidden slides, an option to "Print Hidden Slides" will also appear.

Exercise 6

Open the "demo.ppt" or a presentation you have created. Experiment with options under the "Print" dialog box. Change the print item to "Handouts (6 slides per page)," and print your presentation using your regular printer. Change the number of slides to "3 per page" and print your presentation again.

Print a single full page slide using your regular printer. Try printing a second and third slide, experimenting with the "Black & White" and "Frame Slides" options.

Command Summary

FILE, New	To create a new presentation
FILE, Open	To open an existing presentation file
FILE, Close	To close a presentation file
FILE, Exit	To exit from PowerPoint
FILE, Save presentation	To save a new or existing under the same name

FILE, Save As	To change the name of a presentation or save in another folder or drive
FORMAT, Apply Design Template	One way to pick another design template
FORMAT, Slide Layout	One way to change the layout for one slide, or to apply a layout to a group of contiguous slides
VIEW, Slide Show	One way to play the slide show as it will appear, without placeholders
VIEW, Slides **VIEW, Outline**	One way to change the view mode on the screen
DRAW, Scale	One way to resize clip art
EDIT, Delete Slide	One way to delete the active slide or selected slides
FORMAT, Chart Type	One way to select the chart type in Microsoft Graph
INSERT, Clip Art	Use to draw an area on a slide where an existing image or clip art is placed
INSERT, Picture	Use to place images or pictures not found in the Clip Art Gallery
INSERT, New Slide	One way to add slides
TOOLS, Crop Picture	Use to trim a clip art object
VIEW, Datasheet	One way to toggle the datasheet on and off in Microsoft Graph
VIEW, Notes Pages	Bring up a special box for entering notes about a particular slide
VIEW, Slide Sorter	One way to display thumbnail versions of multiple slides
FILE, Print	To bring up the dialog box for selecting what should be printed and other options
FILE, Slide Setup	Use to change slide size, orientation, and numbering
FORMAT, Alignment	Use this to change justification in an object, like a title or bulleted area
FORMAT, Bullet	Use to format bullets
FORMAT, Custom Background	Use to create a custom background for one or more slides
FORMAT, Font	One way to bring up the dialog box to pick font traits
FORMAT, Slide Color Scheme	To make changes in the color scheme of one or more slides
TOOLS, Build Slide Text	To select the build effect for a bulleted list on one or more slides
TOOLS, Hide Slide	To prevent a slide from being displayed during a presentation
TOOLS, Slide Transition	To bring up the dialog box to apply transitions to one or more slides
INSERT, Sound	To bring up the dialog box to apply a sound file to the active

	slide or selected slides
VIEW, Slide Sorter	To see the transitions and sounds associated with each slide
VIEW, Master	Use to view and change masters
VIEW, Ruler	Use to view ruler for adjusting bullet indents
VIEW, Slides	Use to select Slide View

Computer Networking Basics & Maintenance

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Introduction

The computer revolution is said to be the next big thing, which is going to downsize the achievements of the earlier revolution.

Computer revolution has arrived in part and parcels in the 21st century and it is just going to grow bigger by the minute. Every minute at least a hundred PC's are bought all around the world, and majority of them are nowadays connected to the Internet. When its all about connecting two or more computer systems, in different parts of the world, bang comes the need for networking.

Networking allows various intelligent devices like computers, PDA, mobile phones to communicate with each other either through physical wires or wireless signals. This is nothing but the much used word "convergence" of technology.

We all send emails, don't we? But have we ever wondered how this email knows where to go? Well devices like routers act like postmen, who look at the IP address the email address originated from and they then forward it to the destination IP address, who is the actually intended recipient of the email. Networking basically explains one how this sequence of occurs happens in real time world and as to how the data packets reach where they have to.

Software and Networking are inter-dependant. A Client Server application created by the tireless programmer can run only on a network, formed by your hardware guy, whose majority of the time goes into tripping about CAT5 cables and sorting them out. The operating system (network operating system) used by the system administrator is actually the successful execution of the code of a software programmer, at runtime.

Networking is all about troubleshooting in real life situations. No matter how badly one messes up with a computer system, the networking guy has to get the machine up and running ASAP.

In the forthcoming section, you will get to know more about the standard models over which the internet was built, a preview on the various devices that make a network work, like your hub, router, repeater, switch and also about the various networking operating systems. Useful tips regarding cracking certifications like CCNA, MCSE will also be given.

So watch out for this space, where you can quench your thirst for technical knowledge, with a cherry of philosophy and real life examples on top.

Computer Network– Basics

An Internet work is a collection of individual networks, connected by intermediate networking devices, those functions as a single large network. The networking devices are the vital tools for communication. Whenever you have a set of computers or networking devices to be connected, you make the connections, depending on the physical layout and your requirements Depending on the physical layout or topology of the network, there are three types of networks.

LAN
LAN stands for Local Area Network. These networks evolved around the PC revolution. LANs enabled multiple users in a relatively small geographical area to exchange files and messages, as well as access shared resources such as file servers.

WAN
WAN stands for Wide Area Network. The interconnection of various LAN's through telephone network, which unites geographically distributed users is achieved through WAN. In short when we log on to the Internet, we become a part of a WAN.

MAN
MAN stands for Metropolitan Area Network. It is usually the interconnection between various LAN's in a particular geographical area like a metropolitan city like Bombay. Hence the name.

Internetworking evolved as a solution to three key problems: isolated LANs, duplication of resources, and a lack of network management. Isolated LANS made electronic communication between different offices or departments impossible. Duplication of resources meant that the same hardware and software had to be supplied to each office or department, as did a separate support staff. This lack of network management meant that no centralized method of managing and troubleshooting networks existed.

Open Systems Interconnection Model
The OSI model is the basic model describing the data movement through a network. The Open Systems Interconnection (OSI) reference model describes how information from a software application in one computer moves through a network medium to a software application in another computer. The OSI reference model is a conceptual model composed of seven layers, each specifying particular network functions. The OSI model divides the tasks involved with moving information between networked computers into seven smaller, more manageable task groups. A task or group of tasks is then assigned to each of the seven OSI layers.

The following list details the seven layers of the Open System Interconnection (OSI) reference model:
- Layer 7—Application layer (A)
- Layer 6—Presentation layer (P)

- Layer 5—Session layer (S)
- Layer 4—Transport layer (T)
- Layer 3—Network layer (N)
- Layer 2—Data Link layer (D)
- Layer 1—Physical layer (P)

Tip To Remember
People **D**o **N**eed **T**o **S**end **P**ackets **A**way.
The first letter of each word is related to the alphabet associated with the name of the OSI layer. P of People stands for Physical Layer of the OSI model and so on.

Protocol
The OSI model provides a conceptual framework for communication between computers, but the model itself is not a method of communication. Actual communication is made possible by using communication protocols. In the context of data networking, a *protocol* is a formal set of rules and conventions that governs how computers exchange information over a network medium. A protocol implements the functions of one or more of the OSI layers. A wide variety of communication protocols exist, but all tend to fall into one of the following groups: *LAN protocols*, *WAN protocols*, *network protocols*, and *routing protocols. LAN protocols* operate at the network and data link layers of the OSI model and define communication over the various LAN media. *WAN protocols* operate at the lowest three layers of the OSI model and define communication over the various wide-area media. *Routing protocols* are network-layer protocols that are responsible for path determination and traffic switching. Finally, *network protocols* are the various upper-layer protocols that exist in a given protocol suite.

This being the beginning session, I haven't dwelled into the details. Lets start small and end big! So till then get these fundamentals ingrained in your mind.

OSI Model and TCP/IP Mode
The OSI model by IBM is the biggest boon that systems developer can have had for their karma in the past life.

What exactly is the OSI model?
As I had mentioned it is actually a layered stack, with 7 layers. Each of these 7 layers are implemented by different protocols for each layer. But keep in mind, its not necessary that all these layers have to be used, when trying to device a system. A system can also make away with any of the 7 layers like say the Session Layer or the Application Layer.

Consider a Router for example. A Router is a device, which works in the Network Layer of the OSI Model. Its main function is to route packets that arrive at its ports. Router takes a routing decision for each of the packet that arrives at its port, on the basis of Routing Tables.

Routing Tables are somewhat similar to the Time Table we follow while attending our courses in college. Depending on the subject scheduled in the timetable for a particular day, we decide whether to attend the lecture or not.

In a similar way the Router looks at the destination address (which is the IP address) of the packet that is to be routed.

Now remember that an IP address is made up of a Host ID and a Network ID (I will cover IP addresses in depth in the future articles). The Router looks at the Network ID and compares it with the other Network ID's present in its Routing Tables. If the particular Network ID is found to be present in the Router's Table, the packet is routed to the appropriate destination successfully. If the Network ID of the packet is not present in the Router's Routing Table, then the router forwards the packet to the next nearest router and this process continues till the packet reaches its intended destination.

This is very similar to what you do when you are asked where someone stays, while walking on the road. You are shown the address by the person, who wants to reach a place (Consider this Address as the Destination IP address). Now what you do is directly look at the name of the street. This is because the name of the building is not something you will be immediately familiar with, as a building with the same name will surely exist in thousand different streets.

If you are very well aware of the geography of the place, then by looking at the Street (Network ID) you tell the person where the street is. (similar to a Router finding that the Network ID field of the IP address of the packet is present in its Routing Table). If you don't know the street or the address, you tell the person to ask some one else (that is you forward him to the next nearest Router).

OSI model doesn't say you do things this way. It just tells you " Hey keep in mind that these things should be covered while designing a feasible network solution ".

TCP/IP Model
The TCP/ IP model superseded the OSI model. This is the model that is currently most widely used. The various layers in the TCP/IP model are :
     5) Application
     4) Transport
     3) Internet work
     2) Data Link
     1) Physical
Note that the Sessions and Application Layer present in the OSI Model are absent in the TCP/IP Model.

In the 1990's, TCP/IP has become firmly established as the dominant commercial architecture and as the protocol suite upon which the bulk of new protocol development is to be done.

There are a number of reasons for the success of the TCP/IP model over the OSI model:
1. Internet is built on the foundation of the TCP/IP suite. The tentacles of the Internet and the World Wide Web have spread throughout the world and that is the main reason for the success of TCP/IP model over the OSI model.

2. TCP/IP protocols were initially researched under a project in the Department of Defense (DOD). DOD was committed to international standards and most of its operational requirements couldn't be met by the OSI model. So it started to develop the TCP/IP. Since the DOD is the largest consumer of software products in the world, the vendors were encouraged to develop TCP/IP based products.

In the next article I will cover more about the various layers in the OSI Model and the TCP/IP Model.

TECHNICAL GLOSSARY

Ethernet
A local-area network (LAN) protocol developed in 1976. Ethernet supports data transfer rates of 10 Mbps. Ethernet is one of the most widely implemented LAN standards.
A newer version of Ethernet, called 100Base-T supports data transfer rates of 100 Mbps. The newest version, Gigabit Ethernet supports data rates of 1 gigabit (1,000 megabits) per second.

LAN
Local Area Network (LAN) A local area network is a number of devices, typically PC's, fileservers and printers, connected to one or more "segments" of cable.

Matrix Switching
Network management tools, which provide access to data circuits in the wide area network to allow fault detection, monitoring and reconfigurations.

Spoofing
Many network and server operating systems send "keepalive" packets to check the state of connected clients, to ensure that they really are still connected. During periods of inactivity this can result in unnecessary calls being made. For this reason, ISDN routers are normally configured to spoof these connections, and reply to keep alive packets on behalf of the remote client.

Structured Cabling
A very versatile and cost effective cabling system which can be used (with adapters where appropriate) for a number of different services.

Voice over IP
Voice transport over IP networks, such as the Internet. This could allow your company to make enormous savings on telecomm costs by sending voice traffic anywhere around the world via your internet connection.

Virtual Private Network
Your own VPN can be created between two sites which are connected only via the Internet. This is far more secure than sending your traffic as IP over the Internet as it is encrypted, and can only be decrypted by the partner device the other end.

Wide Area Network
A computer network that spans a relatively large geographical area.

Typically, a WAN consists of two or more local-area networks (LANs). Computers connected to a wide-area network are often connected through public networks, such as the telephone system. They can also be connected through leased lines or satellites. The largest WAN in existence is the Internet.

X.25
X.25 is a layer 3, packet based protocol typically run over a LAPB (Link Access Procedure Balanced) layer 2 protocol. It is generally a wide area protocol. The protocol has a large amount of built in resilience, and as such can guarantee delivery and integrity of data from one node to another.

GLOSSARY

AACE
The Association for the Advancement of Computing in Education (founded in 1981) is an international, education, and professional organization dedicated to the advancement of the knowledge, theory, and quality of learning and teaching at all levels with information technology:

AAHE
The American Association for Higher Education (AAHE) envisions a higher education enterprise that helps all Americans achieve the deep, lifelong learning they need to grow as individuals, participate in the democratic process, and succeed in a global economy:

Absolute Path
Absolute paths spell out the location of a file by starting at the highest level and listing each directory needed to find the file itself. Example: C:\Windows\Profiles\jdoe1\Desktop\myfile.doc

Academic Systems
Department of IS which operates the Training Center, houses the Web Group, and provides instructional and research technology consulting:

Address
Either (1) an induvidual's e-mail address, or (2) an organization's address on the Internet and World Wide Web. Usually indicated by an uninterrupted series of numbers and/or letters, punctuated by periods, slashes and @'s.

ADMIN1
A node of the VMS cluster reserved for administrative use. Allows authorized users to access SIS+, FRS, and HRS. This node is a Digital OpenVMS V6.2 VAX 7620: **ADMIN2**
A node of the VMS cluster reserved for administrative use. Allows authorized users to access SIS+, FRS, and HRS. This node is a Digital OpenVMS V6.2 VAX 7620: **ADMIN3**
A node of the VMS cluster reserved for administrative use. Allows authorized users to access SIS+, FRS, and HRS. This node is a Digital OpenVMS V6.2 AlphaServer 4000: **Administrative Systems**
Department of IS which maintains, develops, administers, and programs the University's administrative computing systems:

ADNET
The name of a Windows NT Server used by university administrators and IS staff. Some have selected username@adnet.memphis.eduas their preferred e-mail address. However, e-mail sent to username@memphis.edu will still reach them.

ADS
Alumni Development System. One of the databases available from the administrative nodes of the VMS cluster. It is used by Advancement to track essential information about University alumni constituents.

Adobe Acrobat
Adobe's suite of softwares that allow you to convert a file created in a variety of softwares into a PDF file. PDF files can be read by anyone with the free Acrobat Reader. Adobe Acrobat includes Distiller, Exchange, and Reader:

Adobe Acrobat Capture
Adobe's software that allows you to scan books and other materials, make them searchable, and save them as PDF files. PDF files can be read by anyone with the free Acrobat Reader:

Adobe Acrobat Distiller
Adobe's software that converts a file created in a variety of softwares into a PDF file. PDF files can be read by anyone with the free Acrobat Reader. Adobe Acrobat Distiller PE comes with Adobe Pagemaker:

Adobe Acrobat Reader
Adobe's free reader for PDF files:

Adobe Pagemaker
Adobe's desktop publishing software. It is a technology standard. The current version for both the PC and the Macintosh is 6.5:

Adobe Photoshop
Adobe's photo design and production software. It is not a technology standard. The current version for both the PC and the Macintosh is 5.0:

Analog
A signal that is continuously variable, a flowing line or wave. Analog signals must be translated into digital signals before a computer can process them.

Anchor
Text and graphics can link to places within the same document. These links require two parts: the anchor and the link. The anchor identifies the place to jump to.

Anonymous FTP
FTP transactions that do not require a unique login name or password. Use the name anonymous to login and use your e-mail address as a password:

Applet
A program designed to be executed from within another application. Unlike an application, applets cannot be executed directly from the operating system.

ArcInfo
A GIS database:

ArcView
A GIS software that The U of M has a site license for.

Argument
Words or numbers you can enter as part of an HTML tag to expand or modify how that tag operates.

ARS
Action Request System by Remedy Corporation. The university uses this software to keep track of service calls routed through the Helpdesk or through Local Service Providers (LSPs). ARS provides an efficient way to filter information to people that work on the service calls.

ARWeb
The web interface for ARS. Anyone can use ARWeb to enter a service call or track progress on a call:

ASCII
Acronym for *American Standard Code for Information Interchange.* ASCII (Pronounced *as-kee*) is a standard that says which computer-readable number is associated with each letter, digit, and punctuation mark. An ASCII file is a text file that can be read by almost any program. Most computers use

ASCII codes to represent text, which makes it possible to transfer data from one computer to another.

Asynchronous

Communication in which interaction betwen parties does not take place simultaneously (e.g. electronic mail and voice mail).

Attachment

A computer file electronically stapled to an e-mail message and sent along with it.

Authoring Software

Computer programs that aid in creating HTML documents by inserting the code for tags. Netscape Composer and Microsoft FrontPage are two of the authoring softwares used on campus.

Backbone

A primary communication path connecting multiple users.

Bandwidth

A measure of the capacity of a communications channel. The higher a channel's bandwidth the more information it can carry.

BASIC

(Beginners All-Purpose Symbolic Instruction Code) A language that employs familiar English phrases to direct the operation of a computer.

Batch Processing

A mode of processing in which a file containing a program, data, and certain command lines is submitted to the system, and execution proceeds without any user interaction.

Better Telnet

The terminal emulation software which is the standard for the Macintosh at the university.

Binary Digit

A digit, 0 or 1, in the binary number system.

Binary Number System

A number system, using only the binary digits 0 and 1, that is commonly used for internal computer representation.

Bit

A binary digit. The unit of information that can take one of two values, such as true or false; zero or one.

Body

HTML tag used to enclose the body (all the text and tags) of the HTML document.

Bookmark

The address of a Web page to which you may want to return. Netscape lets you maintain a list of bookmarks to make it easy to go back to your favorite Web pages.

Boolean Logic

Term used to describe certain operations that combine or limit search options.

Browser

Software that allows you to find and view information on the Internet(e.g Internet Explorer, Netscape). Browsers are often referred to as "client software."

Bug

A program error.

Button
A small screen object, labeled with text or icon or both, used to initiate instantaneous action, such as completing an operation.

Byte
The smallest addressable unit of digital storage larger than a bit and smaller than a word. A byte now consists of eight bits.

Cache Memory
A small area in RAM (Random Access Memory) used for temporary storage.

Calendar Express
A web interface for calendar.memphis.edu which allows the calendar account user to view his or her calendar from any web browser

Calendar.memphis.edu
Web server providing Netscape Calendar services (scheduling, collaboration) to U of M faculty and staff members. Faculty or staff interested in acquiring a calendar account should contact their Local Service Provider:

Campus Pipeline
Campus Pipeline is a web based Enterprise Information Portal (EIP) for the higher ed community that creates a campus that never closes. It provides students, faculty, staff and alumni convenient access to campus resources through a personalized user interface. In addition to bringing new applications, Campus Pipeline is designed to be the framework for existing applications. The U of M is currently a pilot school for this new software solution.

Card-Swipe
A machine used to build VMS, PH, and TigerLAN accounts and to reset passwords on those accounts. A faculty member, staff member, or student swipes his/her student ID card through the machine and follow the directions on the screen. Card swipe machines are located in AD124, SM110/112, SM414, McWherter Library 100, ET236, LW114, RB102, DH230/232, BB385, FH162, RT118, RA100, ED314/316, CL219, and PT229.

CashNet
New bursar system

C++
This is an extension of the C programming language. It is more advanced than C.

CBT
Computer based training. Usually CBT training uses a CD-ROM or a web browser.

CBTWeb
SmartForce (formerly CBT Systems) provides this web interface product for its CBT training. The university's contract with Smart Force allows anyone with a PH account to access 300 training titles

cc.memphis.edu
A generic name for the VMS cluster. Mail sent to cc.memphis.edu may actually come to any of the five clustered machines - admin1.memphis.edu, admin2.memphis.edu, admin3.memphis.edu, latte.memphis.edu, mocha.memphis.edu. IS recommends that you give your e-mail address to others as uuid@memphis.edu. If the VMS cluster is where you receive mail, all mail sent to uuid@memphis.edu will be routed to uuid@cc.memphis.edu .

CD Burner
A device used to record data on CD-R or CD-RW disks.

CD-ROM
A high capacity compact disc used to hold graphics, text and audio.

CD-R
A recordable CD. CD-R disks are available through the University Bookstore. To create a CD, the user must use a CD-writable drive. CD-R disks can be recorded only once. CDs created from CD-R disks can be played on any CD drive.

CD-RW
A rewritable CD. CD-RW disks can only be used on CD-writable drives. They can be recorded multiple times.

Central Processing Unit (CPU)
Controls the operation of the entire computer system, performs arithmetic/logic operations, stores, and retrieves instructions and data.

Character
Any symbol including letters, both uppercase and lowercase, digits, and various special symbols.

Chat
To type live to other network users from any and all parts of the world. To chat on the Internet, you use an Internet Relay chat (IRC) program like mIRC or Microsoft Chat. America Online and CompuServe have similar services.

Check Boxes
Used in forms to make it possible to select one or more non-exclusive options in a list.

Circe
A server used to test software at The University of Memphis.

Clementine
SPSS's datamining software. The university has a site license that allows installation home and office computers for faculty and staff. Clementine is available on TigerLAN PC computers.

Client
The client part of a client-server architecture. Typically, a client is an application that runs on a personal computer or workstation and relies on a server to perform some operations. For example, an e-mail client is an application that enables you to send and receive e-mail.

Client Services
An area of Information Systems which includes Computer Systems Support, Academic Systems, Client Support Services, and Administrative Systems.

Client Support Services
This department of IS operates the Helpdesk, manages the student labs, and coordinates software licensing

Coding
Writing a program or subprogram in a high level language.

.com
A type of Internet domain assigned to business or commercial entities.

Compiler
A compiler translates a computer program from one language into another, catching any errors in syntax along the way. Most commonly, you translate some high level language, such as C++ into optimized machine language. This form of compilation puts your programs into a form that your computer can understand.

Compression
The shrinking of digital image and video information to achieve smaller file size and so make possible, for instance, the computerized transmission of a two-hour feature film that would require 158 gigabytes of storage without compression. The best compression ratios currently hover around 200**:**1

Computer
A device that performs computations automatically, accurately and at high speed.

Computer Conferencing
Interactive sessions between networked computers whereby data, documents, and/or video and audio are shared.

Computer-Mediated Communication (CMC)
Transmission and reception of messages using computers as input, storage, output and routing devices. CMC includes information retrieval, electronic mail, bulletin boards, and computer conferencing.

Computer Systems Support
Department of IS which services lab hardware, offers hardware training and support to Local Service Providers (LSPs), and coordinates hardware purchase:

Connected Education
A vision of education in which learners and teachers are better connected to information, ideas and each other via effective combinations of pedagogy and technology – both old and new. Educational purposes and techniques are made more visible to all participants,and everyone has more options for contributing to the improvement of teaching and learning.

Cookie
A "cookie" is a small amount of information that a web site copies to your hard disk. A cookie can help a web site identify you the next time you visit. For instance, if you shop for books online, the bookstore's web site might use a cookie to store information about your favorite subjects, and later use that information to recommend particular books.

Coordinates
Pairs of numbers used to define the edges of the clickable areas in clickable image maps.

Corel WordPerfect
Corel's word processing software. It is not the university's technology standard. However, it is used in several areas of the university (e.g., the law school): **CourseInfo**
A course development tool by Blackboard. Faculty can fill-in-the-blanks to create an online course with many interactive features such as a chat and a discussion board. Many UofM faculty are currently using version 4.09:

Courseinfo.memphis.edu
The name of the server running CourseInfo 4.09

CREN
Corporation for Research and Educational Networking; CREN's strategic mission is to support low-cost access to worldwide electronic networking and its use for the benefit of education and research communities.

Cryptography

The conversion of data into code for transmission over a network. The original data is converted into code using an envryption algorithm, and is decoded (decrypted) at the receiving end.

Cursor

Computer position indicator; either(1) a symbol on the screen, or (2) a handheld device for entering coordinates.

Cyberspace

The nebulous "place" where humans interact over computer networks, same as virtual space. Coined by William Gibson in Neuromancer.

Database

A large collection of data organized for search and retrieval by computers.

Database Application

Programs that allow collection and organization of data for easy access and retrieval. Microsoft Access is the standard for PCs at The U Of M, while Filemaker Pro is the standard for the Macintosh.

Data Infrastructure and Internet2

A new area within IS which focuses on the university's networking capability for new Internet technologies.

DataNET

A major IS project to provide every office, meeting room, and conference room, approximately 40% of all classrooms, and approximately 40% of all residence hall rooms with a connection to the campus network. DataNET is now completed.

Data Warehouse

A collection of data designed to support management decision making. Data warehouses contain a wide variety of data that present a coherent picture of business conditions at a single point in time.

DBA

Data Base Administration.

DCL ($ prompt)

Digital Command Language. It is used to issue commands to VMS.

Debug

To locate and correct errors (bugs) in a program.

Default

The initial value of any input type (text field, check box, radio button, selection list) used in a form.

Defragment

To optimize a disk by unfragmenting files. See

Desktop

A metaphor used to portray file systems. A desktop consists of pictures, called icons, that show cabinets, files, folders, and various types of documents. You can arrange the icons on the electronic desktop just as you can arrange real objects on a real desktop -- moving them around, putting one on top of another, reshuffling them, and throwing them away.

Desktop Publishing Software

Applications used o produce high quality printed documents. A desktop publishing system allows you to use different typefaces, specify various margins and justifications, and embed illustrations and graphs directly into the

text. Adobe Pagemaker is the standard at The U of M, both for the PC and the Mac.

DialUM

DialUM is the Direct Internet Access Link to The University of Memphis provided through campusCWIX. DialUM guarantees access to the Internet and The University of Memphis, allowing users to avoid busy signals 24 hours a day. DialUM provides the user with appropriate software for Windows 3.1, Windows 95, and Macintosh: **Dial-Up Access**

Connecting to another computer or network using a modem over a regular telephone line.

Dial-Up Connections

Accessing the Internet by means of a modem and communication software.

Digital

An electrical signal that varies in discrete steps in voltage, frequency, amplitude, locations, etc. Digital signals can be transmitted faster and more accurately than analog signals.

Digital Camera

A camera that produces photographs that can be saved as files on your PC. No film is required

Digital Certificate

The electronic equivalent of an ID card, used in conjunction with a public key envcyption system. Also called digital IDs, digital passports, X.509 certificates, or public key certificates.

Digital Signatures

Digital signatures work just like paper-and-ink signatures, allowing document recipients to confirm the source of a document. Digital signatures are generated by digital certificates

Directory

A major division on the hard drive or server used to divide and organize files.

Discussion Board

An interactive feature to a web site. Unlike newsgroups, it allows separate discussions on specific topics. At the UofM, currently most active discussion boards were created using CourseInfo

Disk

A round plate on which data can be encoded. There are two basic types of disks: magnetic disks (e.g., floppy drive or hard drive) and optical disks (e.g., CD-ROM).

Distance Learning

A type of education where students work on their own at home or at the office and communicate with faculty and other students via e-mail, electronic forums, videoconferencing and other forms of computer-based communication.

DNS (Domain Name System)

When you send email or point a browser to an Internet domain such as cnet.com, the domain name system translates the names into Internet addresses (a series of numbers looking something like this: 123.123.23.2). The term refers to two things: the conventions for naming hosts and the way the names are handled across the Internet.

Document Camera
Also called a visual presenter or a video visualizer. This equipment offers the functionality of an overhead projector but also allows you to display nontransparent objects. Several classrooms on campus have document cameras.

Domain
The name for a company, organization, or individual's Internet connection. Individual computers within this domain all end with the domain as a part of their host name.

Domain Name
The internet address of the computer where a Web page is located.

Download
To obtain an electronic file from another computer.

ds.memphis.edu
The LDAP server for the University of Memphis. It contains the same information as the PH (phonebook) database, but it is easier to use with e-mail packages such as Netscape Messenger

Dynamic HTML (DHTML)
Refers to new HTML extensions that will enable a Web page to react to user input without sending requests to the Webserver. Microsoft and Netscape have submitted competing Dynamic HTML proposals to W3C, which is producing the final specification. There are many technologies for producing dynamic HTML, including CGI scripts, cookies, Java, JavaScript, and ActiveX.

.edu
A type of Internet domain assigned to educational entities.

EASI
Equal Access to Software and Information. Using information technology to enable people with disabilities to participate fully and effectively in educational activities.

Encryption
A method of encoding data for security purposes. Some methods of encrypting , such as 128-bit encryption, are so difficult to break that U.S. export laws permit them to be used only within the United States. Netscape Communicator provides the option of securing U.S.documents using 128-bit encyption.

Educause
"Transforming education through information technology"

EduCart (also known as WebLearner)
 A complete, portable system with all the basic technology needed for classroom and web-based learning developed by Tegrity. Enables virtual touch panel navigation, streaming display of whiteboard writing and 3D images, virtual pointing, audio and video of the instructor and automatic indexing.

EIP
Enterprise Information Portal

E-Mail (Electronic Mail)
A communication system that allows you to send an electronic "letter"(message) from one computer user to one or more users. At the UofM, Netscape Messenger is the supported e-mail client.

Electronic Phone Book
The University of Memphis electronic phone book is a computerized database that contains information about all of the UofM faculty, staff, and students.
Embedding
To insert information (an object) that was created in one document (the source) into another document (the destination).
EUIT
Educational Uses of Information Technology. A useful acronym with a broad definition.
EVE
A VMS text editor. It is the default editor on the VMS cluster.
Extension
In DOS or Windows, a short abbreviation (often 3 letters) after the file name, separated from the file name by a period. The extension corresponds to a file type, helping the computer determine which program to use to open the file. Example: Letter.doc corresponds to a Microsoft Word file called "Letter".
External Files
Any files that are not directly loadable by a browser such as some image formats, sounds, videos, or even program files.
FAQ
Frequently Asked Questions
FAM
Financial Aid Management
Favorites
A list of files or Web pages you plan to use frequently. Microsoft Interner Explorer lets you maintain a list of your favorite items to make it easy to see them again.
FDDI (Fiber Distributed Data Interface)
A type of high-speed dedicated connection to the Internet with a speed of 45 MB per second.
Fetch
The FTP software which is the standard for Mac-users at the university
Fiber Optic
A cable technology used for telecommunication and computer networks with very high capacity, allowing high-speed transmission of data and non-voice information like video.
File
A collection of data items kept in a storage medium such as a floppy or hard disk. Files may contain programs, data, text, images, or other information.
File Extensions
In DOS and some other operating systems, one or several letters at the end of a filename. Filename extensions usually follow a period (dot) and indicate the type of information stored in the file. For example, in the filename EDIT.TXT, the extension is TXT, which indicates that the file is a text file.
File Formats
The patterns and standards used to store a program on a disk. Example: PHOTO.GIF.
Filemaker Pro
A relational database software. It is the technology standard for the Macintosh. It is also available for the PC; however, it is not the university's

technology standard for the PC. The IS Training Center has a CBT training CD-ROM on Filemaker 4.1, the current version.

File Transfer

A process to send electronic files from one computer to another.

Filter

Hardware or sofware designed to restrict access to certain areas on the Internet.

Firewall

A network security barrier designed to protect a local network from being accessed by unauthorized persons vis the Internet.

Flame

An inflammatory e-mail usually directed against the poster of a message.

Form

A part of HTML documents that contains fill-in text boxes, lists of options, and other elements that allow the user of the form to send information back to the Web server.

Fragmentation

Refers to the condition of a disk in which files are divided into pieces scattered around the disk. Fragmentation occurs naturally when you use a disk frequently, creating, deleting, and modifying files.

Freeware

Software that is distributed at no cost to the user (the author maintains the copyright).

Frequently Asked Questions(FAQ)

A collection of information on the basics of any given subject, often used on the WWW.

FRC

Faculty Resource Center. An area within the IS Training Center where faculty can use computers, a scanner, video conferencing equipment, a CD burner, and other equipment.

FRS

Financial Records System. FRS is one of the databases available on the administrative nodes of the VMS cluster. Access is restricted.

FTP (File Transfer Protocol)

The standard method of transferring files from one computer to another via the Internet. Some Internet sites specialize in just this kind of transfer. Users can sign on to this type of server and copy files to their own computers. FTP can require user ID's and passwords, or it can be open to all via "anonymous FTP".

Gateway

A computer system that links two networks, allowing information to pass from one to the other.

Gateway Script

A program that is run on a Web server that processes the input from forms.

GIF(Graphics Interchange Format)

A popular type of image file format for compression of images. . Images on webpages are commonly stored in the **GIF** or **JPEG** formats. GIFs can be transparent.

GIS
Geographic (or Geographical) Information Systems are an extremely important area of applied computing, representing a multi-billion dollar industry worldwide. Seen originally as computer mapping and display tools (automated cartography, CAD, etc.), they are much more than that today. GIS have become indispensable tools in environmental management and planning, infrastructure development, resource extraction industries, and more. Geographic Information Systems (GIS) is an organised collection of computer hardware, software, geographic data, and personnel designed to efficiently capture, store, update, manipulate, analyse, and display all forms of geographically referenced data.

Gopher
A text-only menu-based tool for finding, accessing, and organizing Internet resources. Any Internet address that begins with "gopher:" points to such a site. Gopher predates the WWW. The university no longer offers a main gopher site. However, other gopher sites can be accessed through Netscape.

.gov
A type of Internet domain assigned to government entities.

Graphical Browser
A program used to view formatted HTML documents and navigate the World Wide Web. Graphical browsers can display inline images and display text in various type styles. Example: Netscape Navigator and Internet Explorer.

Groupware
A type of software designed to allow users on a network to use the software and work on the same project at the same time.

GUI
Graphical User Interface- The use of graphics, menus and icons to carry out computer functions. Before this was available, specific command lines had to be used.

Hardware
The actual physical components of a computer system such as disk drives, printers, central processing unit, memory, and so on.

Head
The HTML tag used to enclose the beginning elements in the HTML document, including the title.

Helper Application
A program whose purpose it is to extend the capabilities of another program, such as plugins for Web browsers.

Help Desk
The university's "One-Stop-Shop" for technology help.

Hertz
Standard measuring unit for frequency measured in cycles per second. Abbreviation **:** Hz

Home Page
The first HTML document that you intend people to see at your Web site is known as a home page.

Host
A network computer that can receive information from other computers.

Host Name
The name of a computer on the Internet, used to identify it in the URL naming scheme.
HRS
Human Resource System. HRS is one of the databases available on the administrative nodes of the VMS cluster. Access is tightly restricted.
HTML (Hypertext Markup Language)
The code used to create a home page and to access documents over the World Wide Web.
HTTP (Hypertext Transport Protocol)
The transmission standard used to send HTML documents across the World Wide Web. It signifies that an Internet site is a WWW site, i.e, HTTP is a WWW address.
Hypertext
The text and images that enable users to "jump" from one Web site or Web document to another. Hypertext usually is underlined and displayed in blue, while hypertext images are sometimes surrounded by a blue border. Also known as a *hot link* or *link*.
Icon
A picture used on a computer screen to convey a purpose or a function.
ils.memphis.edu
The university's NetMeeting server. Microsoft Netmeeting is a free videoconferencing tool for PC users. NetMeeting is available in SM110.
Information Systems (IS)
A division of the university which provides information technology leadership for the campus. It coordinates a campus-wide IT planning process to complement the institution's strategic plan.
Interactive
Any computer-based system in which the user's input directly affects the system's behavior and the resulting output is directly communicated to the user.
Internet
The general term used to describe the worldwide network of computers and services encompassing well over 50 million computer users and dozens of information systems including e-mail, Gopher, FTP, and World Wide Web .
Internet2
A collaborative effort to develop advanced Internet technology and applications vital to the research and education missions of higher education. Over 140 U.S. universities (including the University of Memphis) are working with partners in industry and government. Internet2 is working to enable applications, such as telemedicine, digital libraries and virtual laboratories that are not possible with the technology underlying today's Internet. As a project of the University. Corporation for Advanced Internet Development (UCAID), the Internet2 project is not a single separate network, but rather joins member network application and engineering development efforts together with many advanced campus, regional, and national networks
Internet Explorer
An example of browser software that allows you to design a home page and to browse links on the WWW.

Internet Protocol(IP)
The international standard for addressing and sending data via the Internet.

Interoperability
The ability of software and hardware on different machines from different vendors to share data.

Intranet
A private version of the Internet that lets people within an organization exchange data by using popular Internet tools, such as browsers.

I/O Room (**I**nput/**O**utput)
Computer Operation's I/O Room is an area within IS located in the Administration Building, Room 112. They provide the following services: report distribution, data entry services, test scoring/scanning services, tape/ cartridge library services, shipping and receiving services, receptionist functions.

IP Address
An identifier for a computer or device on a TCP/IP network. Networks using the TCP/IP protocol route messages based on the IP address of the destination. The format of an IP address is a 32-bit numeric address written as four numbers separated by periods. Each number can be zero to 255. For example, 1.160.10.240 could be an IP address.

ISDN (Intergrated Digital Services Network)
A high-speed dialable, digital service available to most residences and businesses, offering much higher bandwidth than plain old telephone service when connecting to the Internet. ISDN lines come in two basic capabilities: 128K bandwidth and 1472K bandwidth.

ISIR
Information **S**ystems **I**mpact **R**eport- electronic messages sent to all IS staff and other relevant university personnel. Reports any pertinent problems that affect our clients.

ISP (Internet Service Provider)
A network, commercial or otherwise, trough whih a client machine can connect to the Internet. For a monthly fee, the service provider gives you a software package, username, password and access phone number. Equipped with a modem, you can then log on to the Internet, browse the World Wide Web, and send and receive e-mail. The university offers a free service but also encourages faculty, staff, and students to take advantage of DialUM, a low-cost solution through campusCWIX. CWIX is the ISP for users of DialUM.

IT Strategic Plan
A supplement to the university's strategic plan. Its goal is to "Take the lead in using computing and telecommunications in higher education and the community." It sets forth general guidelines, strategies, goals, and objectives for the operation of the Division of Information Systems (IS), the technological elements of the University Libraries, Extended Education, and the other academic and administrative units of the university

IVR
Interactive **V**oice **R**esponse
Java
A programming language that has the distinction of being a cross-platform language, meaning that it can be used to write programs on any Java capable

operating system, such as Windows 95 or the Mac OS. Java is often used to add fancy additions to Web pages.

JavaScript

A scripting language, distinct from the Java programming language, that is embedded in HTML Web pages, allowing greater interactivity with the user than HTML alone is capable of.

JPEG(Joint Photograhic Experts Group)

A popular type of image file format for compression of images. Images on webpages are commonly stored in the JPEG or GIF formats. Named after the group who developed the JPEG.

Keyboard

A device used to enter data into the CPU by means of typing.

Lab Monitor

IS personnel that supply help and support to clients for computer labs throughtout the U of M campus community.

LAN (Local Area Network)

Two or more local computers that are physically connected within one office or department that typically share printers, servers, and the ability to send e-mail within the group.

Latte

A node of the VMS cluster available to faculty, staff, and students. Menu system offers e-mail, text-based Internet access, McWherter Library catalog access, and other services. Programming packages and editors are also available. Access to disk space for personal WWW pages. This node is a Digital OpenVMS V6.2 AlphaServer 2100: **LDAP (Lightweight Directory Access Protocol)**

A way to access information directories. The university's LDAP server is ds.memphis.edu. When properly configured with information about the LDAP server, Netscape's address book can let you search the university's LDAP directory and quickly address e-mails or add users into the address book:

libaccess.memphis.edu

The university's proxy server which allows authenticated users (people who have entered their user name and PH password) to access materials which otherwise can only be accessed by machines that have an on-campus IP address. Anyone using an ISP other than the university's modem pool needs to configure their browser with proxy information in order to access the library's electronic databases:

Link

Image, icon, or on-screen text(usually colored and underlined) that when you click on it, leads from one page to another on the World Wide Web.

Listserv

A e-mail program that allows multiple computer users to connect onto a single system, creating an on-line discussion.

Load time

The amount of time it takes a user to retrieve a Web page and view it in a browser on their computer.

Localtalk

A local area network standard used by Macintosh computers.

LSP (Local Service Provider)
The primary contact for computing support and technology issues for an individual college or department. The LSP is an employee of that college or department. All trouble reports or service requests should go through the Information Systems Helpdesk. The report is then forwarded to the appropriate LSP for resolution:

Lurk
To read, without posting, message to a news group or a discussion list. Recommended behavior for people new to a list or group.

Lynx
A non-graphical browser for UNIX and DOS systems. It is available from the VMS cluster (select Internet Resources and World Wide Web)

Mac OS
The operating system used by the Apple Macintosh computer. The current version is 8.1.

Macintosh
A brand of personal computers manufactured by Apple Computer. Most users on campus use IBM-compatible machines (also called PCs). However, Macintosh is the preferred platform for several departments (e.g., English, Art, and Nursing).

Macro
A series of commands recorded and later carried out at the request of the user, used primarily to automate repetitive tasks. Unfortunately, macros also can serve as carriers and transmitters of computer viruses.

Magnetic Disk
A secondary mass storage medium that stores information on rotating disks coated with a substance that can be magnetized.

Mailing List
Allows people to join a group that sends and receives e-mail on a given topic. Members receive every message that is posted to the group.

Mathematica
An interactive system for doing mathematical computation. It handles numeric, symbolic, and graphical calculations and incorporates a high-level programming language. Mathematica reads lines of input, waiting until a syntactically complete expression has been entered, then evaluates the expression and prints the result. Mathematica is accessed from the VMS cluster. It is also available for a Windows environment. The university has a site license for Mathematica, and consulting is available.

Menu
A on-screen display that lists available choices.

Merlot
Is a collection of high quality interactive online learning materials, assignments, reviews, and people.

Microsoft Access
Microsoft's relational database software. A part of Microsoft Office Professional, it is a technology standard at the university and it is included in the Microsoft Campus Agreement. The current version for the PC is Access 97. There is no version for the Macintosh.

Microsoft Campus Agreement

An agreement between The University of Memphis and Microsoft which allows faculty and staff to use a number of Microsoft products on their office and home computer.

Microsoft Excel

Microsoft's spreadsheet software. A part of Microsoft Office Professional, it is a technology standard at the university and it is included in the Microsoft Campus Agreement. The current version for the PC is Excel 97. The current version for the Macintosh is Excel 98.

Microsoft FrontPage

Microsoft's HTML authoring software. It is not the technology standard at the university; however, it is included in the Microsoft Campus Agreement. The current version for the PC is FrontPage 98. The current version for the Macintosh is Frontpage 1.0.

Microsoft Outlook

Microsoft's calendaring and e-mail software. It is not the technology standard at the university; however, it is included in the Microsoft Campus Agreement. The current version for the PC is Outlook 97. The comparable product for the Macintosh is Exchange Client.

Microsoft PowerPoint

Microsoft's presentation software. A part of Microsoft Office Professional, it is a technology standard at the university and it is included in the Microsoft Campus Agreement. The current version for the PC is PowerPoint 97. The current version for the Macintosh is PowerPoint 98.

Microsoft Project

Microsoft's project management software. It is not included in Microsoft Campus Agreement and it is not a technology standard.

Microsoft Publisher

Microsoft's tool to help small businesses create professional-looking publications, including newsletters, fliers, web pages and brochures. It is part of Microsoft Office - Small Business Edition. It is not the desktop publishing software standard for the university.

Microsoft VisualStudio

Microsoft's suite of development tools - Microsoft Visual Studio: Visual Basic 6.0, Visual C++ 6.0, Visual J++ 6.0, Visual InterDev 6.0, and Visual FoxPro 6.0. It is not a technology standard at the university; however, it is included in the Microsoft Campus Agreement.

Microsoft Windows

A family of operating systems for personal computers. It is supported as a technology standard. Installations on university-owned machines are included in the Microsoft Campus Agreement. Like the Macintosh operating environment, Windows provides a graphical user interface (GUI), virtual memory management, multitasking, and support for many peripheral devices. In addition to Windows 3.x and Windows 95, which run on Intel -based machines, Microsoft also sells Windows NT, a more advanced operating system that runs on a variety of hardware platforms.

Microsoft Word

Microsoft's word processing software. A part of Microsoft Office Professional, it is a technology standard at the university and it is included in the Microsoft

Campus Agreement. The current version for the PC is Word 97. The current version for the Macintosh is Word 98.

MIDI (Musical Instrument Digital Interface)

The standard protocol between musical instruments and computers.

Mocha

A node of the VMS cluster available to faculty, staff, and students. Menu system offers e-mail, text-based Internet access, McWherter Library catalog access, and other services. Programming packages and editors are also available. Access to disk space for personal WWW pages. This node is a Digital OpenVMS V6.2 AlphaServer 2100.

Modem

A piece of equipment that allows computers to interact with each other via telephone lines by converting digital information from a computer to analog information that can be sent over telephone lines.

Modem Pool

For those who do not wish to use DialUM, the University maintains a small modem pool for remote access.

> 96 28.8 modem lines for use by Students, Faculty, and Staff. Dial 678-3600.
> 28 14.4 modem lines for use by Faculty and Staff only. Dial 678-4600.

Mosaic

The first graphical browser. Developed by the NCSA, this browser helped fueled the growth of the Web, but was later eclipsed by Netscape and Internet Explorer. It is still available in versions for Windows, Mac, and Unix.

MPEG (Motion Picture Experts Group)

A standard file format for motion video on computers.

Multimedia

Applications that use graphics, video, and audio in addition to text.

mx.memphis.edu

The name of the outgoing mail server (SMTP) for most university e-mail accounts. Unless your LSP has told you otherwise, your Netscape mail settings must specify mx.memphis.edu as the outgoing mail server. Any other entry will cause your e-mail to be undeliverable.

NLII

Its mission is to create new collegiate learning environments that harness the power of information technology to improve the quality of teaching and learning, contain or reduce rising costs, and provide greater access to American higher education. EDUCAUSE's role is to serve as a catalyst to bring together the affected parties to create joint solutions to the problems inhibiting the creation of a National Learning Infrastructure.

.net

A type of Internet domain assigned to network organizations.

Netiquette

Network etiquette- a proper way to behave on the Internet.

NetMeeting

Proprietary software that allows participants to communicate synchronously via the computer and to view the same file while doing so. It is used in IWU's online MBA courses for class discussions and group project accomplishment. Software is available from Microsoft, via the Internet, at no cost.

Netscape Calendar

A scheduling collaboration tool used by U of M faculty and staff members. Faculty or staff interested in acquiring a calendar account should contact their Local Service Provider.

Netscape or Netscape Navigator

An example of browser software that allows you to design a home page and to browse links on the WWW.

Netscape Communicator

A suite of internet communication tools (Navigator, Messenger, Composer, and Calendar). It is currently free. It is the university's standard.

Netscape Composer

An HTML authoring software which allows you to create and upload web pages without knowing HTML.

Netscape Messenger

An e-mail client software that can be configured so that you can read your university e-mail.

Netscape Messenger Express (not included in Communicator but another Netscape product)

The U of M's Web-based e-mail express systems designed to access your u of M e-mail account from off campus. There are actually two systems:

1. Postoffice users
2. VMS cluster users

It is currently free and is the university's standard.

Netscape Navigator

A popular commercial graphical browser. It is the university's technology standard: **Network**

A series of points connected by communication channels in different locations.

Network Places

Network Places displays all of the shared computers, printers, and other resources on the network to which your computer is connected. You can use the Add Network Place wizard to create shortcuts to network, Web, and FTP servers.

Network Services

A department of Information Systems that has the task of keeping the University's voice, data, and video networks running and secure. Telecommunications is part of Network Services/

Newsgroup

An electronic bulletin board that facilitates communication.

Node

- In networks, a processing location. A node can be a computer or some other device, such as a printer. Every node has a unique network address, sometimes called a DataLink Control (DLC) address or Media Access Control (MAC) adress.
- In tree structures, a point where two or more lines meet.

Non-graphical browser

A program used to view HTML documents and navigate the World Wide Web. Non-graphical browsers do not display inline images and do not display formatted text. An example is Lynx.

Non-linear document

A type of organization for HTML documents in which one HTML file contains links to more than one other HTML file. The person browsing the files determines the order in which the information is presented.

nsweb.memphis.edu
A web server that contains information about IS Network Services:

OCR
Optical character recognition refers to the branch of computer science that involves reading text from paper and translating the images into a form that the computer can manipulate (for example, into ASCII codes). An OCR system enables you to take a book or a magazine article, feed it directly into an electronic computer file, and then edit the file using a word processor. OCR software is available for faculty use in the Faculty Resource Center.

Opeartions
A division within IS that includes Computer Operations, Technical Support and Database Administration. Services provided include: cluster availability, centralized printing services, report distribution, data entry services, test scoring/scanning services, file backup and restore services and administartive form creation and maintenance.

Operating system
A master control program for a computer. Examples are DOS, UNIX, and the MacOS.(Technically speaking, Microsoft Windows 3.x is an operating environment as it still requires the separate DOS operating system to run. Microsoft's Windows95 is a true operating system as DOS is built-in to it.)

.org
A type of Internet domain assigned to organization,usually nonprofit.

Path Name
The place where a file is stored on a computer program for a computer, indicated by the drive or volume name and the subdirectories needed to find the file.

PC
Personal computer. Generally refers to an IBM-compatible computer.

PDF
Portable Document Format, a file format developed by Adobe Systems. PDF captures formatting information from a variety of desktop publishing applications, making it possible to send formatted documents and have them appear on the recipient's monitor or printer as they were intended. To view a file in PDF format, you need Adobe Acrobat Reader, a free application distributed by Adobe Systems.

Peripherals
System hardware devices such as monitors, modems, network cards, sound cards, graphics cards and CD-ROM drives.

Ph
The Ph database can be used to look up information on faculty, staff, and students at the University of Memphis. You can access Ph through your VAX account.

Ph Password
Password for an entry in the Ph (phonebook) database. The Ph database is used to authenticate users trying to make a dialup connection to the UofM dialup server. It is also used for authentication with Postoffice e-mail

accounts, Campus Pipeline, Netscape Calendar accounts, the library's proxy server, and CBT access.

Post

To place an HTML file on the Web server to make it available for browsing.

postoffice.memphis.edu

The university's Netscape mail server.

Preference Setting

Program options in browsers that allow the user to determine such things as which fonts are used for various HTML styles, whether or not inline images are displayed, what other applications are used to view movies, and so on.

Presentation Software

Software that simplifies the process of creating a visual presentation. Microsoft PowerPoint is the presentation standard at UofM.

ProfWeb

Another facility that includes the Faculty Resource Center.

Protocol

A formal set of standars, rules, or formats for exchanging data that assures uniformity between computers and applications.

Proxy Server

A server that sits between a client application, such as a Web browser, and a real server. It intercepts all requests to the real server to see if it can fulfill the requests itself. If not, it forwards the request to the real server. The UofM operates a proxy server that enables users using other ISPs (such as Compuserv or AOL) to access web pages which otherwise would only be available from computers with an on-campus IP address. The university's proxy server is ds.memphis.edu.

RAM (Random Access Memory)

The computer's primary working memory in which program instructions and data are stored.

Relational Database

A type of database management system (DBMS) that stores data in the form of related tables. Relational databases are powerful because they require few assumptions about how data is related or how it will be extracted from the database. As a result, the same database can be viewed in many different ways. At the UofM, Access is the standard relational database for the PC and Filemaker Pro is the standard relational database for the Mac.

Relative Path

Relative paths spell out the location of the file based on the current document location.

Resolution

Refers to the sharpness and clarity of an image. The term is most often used to describe monitors, printers, and bit-mapped graphic images. In the case of dot-matrix and laser printers, the resolution indicates the number of dots per inch. For example, a 300-dpi (dots per inch) printer is one that is capable of printing 300 distinct dots in a line 1inch long. This means it can print 90,000 dots per square inch. The higher the number of dots per inch, the more clarity of the image on the screen.

RGB Monitors

Short for red, green, blue monitor, a monitor that requires separate signals for each of the three colors. This differs from color televisions, for example, which

use composite video signals, in which all the colors are mixed together. All color computer monitors are RGB monitors.

Root Domains

The main domain names assigned by the root domain of the Internet. The main root domains in the U.S. are *.com, .edu, .gov, .mil, .org, and .us*. The other root domains are the two-letter country codes, such as *.ca* (for Canada) and *.jp* (for Japan).

Router

A device connecting a LAN to the Internet that routes transmissions between the two.

SAS

A family of software that provides the tools, procedures and commands for comprehensive statistical and data analysis. The SAS command language is easy to use for simple problems, yet flexible and powerful enough for complex applications. SAS is available on the VMS cluster. The university also owns a site license for SAS for Windows. Consulting is available.

Scanner

A device that can read text or illustrations printed on paper and translate the information into a form the computer can use. A scanner works by digitizing an image -- dividing it into a grid of boxes and representing each box with either a zero or a one, depending on whether the box is filled in. Scanners are available in SM112 and the McWherter Library lab. A scanner is available in the FRC (SM416) for faculty use.

SCT

System & **C**omputer **T**echnology- The Tennessee Board of Regents' approved company that supplies administrative software to the University.

SDRAM

Short for Synchronous DRAM, a new type of DRAM that can run at much higher clock speeds than conventional memory. SDRAM actually synchronizes itself with the CPU's bus and is capable of running at 133 MHz.

Searchable Index

Indexes of World Wide Web documents that you can submit a query to and the Index will search to find pages matching your specification.

Search Engines

An automated Web site that uses advanced searching software to locate other Web sites and Internet files based on search criteria entered by the user. Examples of such sites include AltaVista, Infoseek, Lycos, Yahoo! and HotBot, though there are many others. The software relies on Boolean logic to deliver search results based on the occurence of words or search terms entered by the user.

Server

A computer with a special service function on a network, generally receiving and connecting incoming information traffic. It manages the network resources. For example, a file server is a computer and storage device dedicated to storing files. Any user on the network can store files on the server. A print server is a computer that manages one or more printers, and a network server is a computer that manages network traffic. A database server is a computer system that processes database queries. Most servers on campus are maintained by IS. However, departmental servers are maintained by Local Service Providers.

SGML

Abbreviation of Standard Generalized Markup Language, a system for organizing and tagging elements of a document. SGML was developed and standardized by the International Organization for Standards (ISO) in 1986. SGML itself does not specify any particular formatting; rather, it specifies the rules for tagging elements. These tags can then be interpreted to format elements in different ways. Because it is a large and complex system, it is not yet widely used on personal computers. However, the growth of Internet, and especially the World Wide Web, is creating renewed interest in SGML because the World Wide Web uses HTML, which is one way of defining and interpreting tags according to SGML rules.

Shareware

Software that you can obtain for free (often by downloading from the Internet) on a trial basis but that may require some payment or registration for continued use.

Shortcut

An icon that contains a direct route to a special object; an arrow located in the lower-left corner of the icon can identify the icon.

SIS

Sudent Information Services. One of the databases on the administrative nodes of the VMS cluster, it is only available to approved faculty and staff.

SmartBoard

A brand of interactive whiteboard used at the UofM. It can be used as a whiteboard or as a projection screen. However, it has additional capabilities. Professors can project the computer image onto the Smartboard and then use their finger to follow hyperlinks in the computer file. They can use SmartMarkers to add comments to the image. Images can be printed or saved as web documents.

Smart Classroom

The university's term for a classroom that has an instructor computer, a projection system, other equipment, and computers for students.

Smart Lecture Hall

The university's term for a large classroom that has an instructor computer, a projection system, other equipment, but no computers for students.

Sound Card

Hardware used to play sound files on computers.

Spam

Unrequested e-mail sent to many recipients.

Spreadsheet Software

Computer programs that let you create and manipulate spreadsheets electronically. A spreadsheet is a table of values arranged in rows and columns. In a spreadsheet application, each value sits in a cell. You can define what type of data is in each cell and how different cells depend on one another. The relationships between cells are called formulas, and the names of the cells are called labels. Microsoft Excel is the university's standard for both the PC and the Mac.

SPSS

A family of software that provides the tools, procedures and commands for comprehensive statistical and data analysis. SPSS is available on the VMS

cluster. The university also owns a site license for SPSS for Windows. Consulting is available.

SSL (Secure Sockets Layer)

The leading security protocol for the Internet, developed by Netscape. When a user navigates to a secure site on the Web, his or her broowser sends its public key to the site so the site's server can securely send a secret key to the browser. The browser and server are then able to exchange data using secret key encryption. SSL has been combined with other protocols and authentication methods into a new protocol known as Transport Layer Security.

Standards

Also called technology standards. Software and hardware which have been selected to receive support at the university. Standard Level 1 software are the softwares for which training and support are available. Level 2 softwares have limited support. Level 3 softwares are acceptable for individual use. Level 4 softwares are unacceptable.

Streaming

Playing video or sound in real time as it is downloaded over the Internet. Data is decompressed and played (by use of a web browser plug-in) as it is transferred to your computer over the WWW. Streaming requires a powerful computer and fast connection since the file is not stored on your computer.

Stripes

Student **T**elephone **R**egistration **I**nformation **P**rocession **E**xchange - Avaialble at 901-324-7000, provides registration functions from any touch tone telephone.

Submit

To send a completed form to a Web server.

Surfing

Exploring the Internet without a definite goal in mind, but ready to investigate anything interesting that happens to come along.

Symantec Anti-Virus

The university's technology standard for anti-virus software.

Synchronous

Communication in which interaction between participants is simultaneous.

T-1(DS-1)

A high-speed dedicated connection to the Internet which is a digital data channel that is a high volume carrier of voice and/or data. It provides data transmission rates of 1.5 MB per second. Often compressed video teleconferencing T-1 has 24 voice channels.

T-3(DS-3)

A digital channel that communicates at a significantly faster rate than T-1.

TAF

Technology Access Fee. This component of the General Access Fee is included in the Maintenance Fee which is paid by each student based on the course level and the number of hours enrolled. This fee provides certain services for all students. It is administered by IS, in conjunction with the Provost's office.

TAF Grants

Grants awarded to recipients selected by the IT Academic Advisory Committee. These grants are funded through TAF.

Tag

The HTML codes used to specify text styles, links, graphics, and other HTML elements.

Technical Support

A department of IS which works with Network Services to manage central computing resources (including OpenVMS, UNIX, Windows NT, and NetWare platforms). It also coordinates networking protocols in use on campus (including TCP/IP, DECnet, LAT, IPX, and others).

Technology Standards

Software and hardware which have been selected to receive support at the university. Standard Level 1 software are the softwares for which training and support are available. Level 2 softwares have limited support. Level 3 softwares are acceptable for individual use. Level 4 softwares are unacceptable.

Tegrity

Developer of the EduCarts..

Telecommunication

The science of information transport using wire, radio, optical or electromagnetic channels to transmit and receive signals for voice or data communications using electrical means.

Telnet

Is an Internet protocol that allows a local (or client) user to log on to a remote server or host as if it were just another terminal to that server (terminal emulation).

Terminal Emulation Software

Terminal emulation programs allow you to access a mainframe computer or bulletin board service with a personal computer. On the PC platform, QVTTerm is used at the university. On the Mac platform, Better Telnet is used.

Text Fields

Form elements that allow users to insert a single line text.

Tiger-LAN

A network of computer labs which provide access to software, hardware, and information for University of Memphis faculty and students. Tiger-LAN includes software for Windows 3.1 and Macintosh, such as: word-processing, spreadsheet, database, publication/presentation, internet, and statistical software.

TigerLine

A code provided for Universit of Memphis employees to use for making long distance calls and tracking for billing purpose.

TigerWeb

Provides registration functions over the web.

Title

The HTML tag used to give each HTML document a title.

TLT Group

The TLT Group's mission is to motivate and enable institutions and individuals to improve teaching and learning with technology, while helping them cope with continual change. The TLT Group's products and services support individuals and organizations in their efforts to understand, envision, and direct the transformation of education and society. Begun in 1995 as AAHE's

Technology Projects, the TLT Group is now an independent, nonprofit organization affiliated with AAHE. **Transmission Line**

The physical connection from your computer to the Internet such as a telephone line or a T1.

Transparent Graphics

Graphic images that have a clear background, which makes the graphic appear to float in the browser screen.

Trojan Horse

A program that appears valid, but when activated performs unauthorized activity. Such a program can be used to locate a person's password, or make a computer vulnerable to future illicit entry. A Trojan horse can also simply destroy programs or data on the person's computer. A Trojan horse is similar to a virus, except that it does not replicate itself.

UM Virtual

The nickname of a web server that is available to TAF grant recipients: **umvirtual2.memphis.edu**

Also known as http://cbt.memphis.edu, the web server that serves up over 250 free computer-based training titles to UofM faculty, staff, and students.

Universal UserID (UUID)

The Universal UserID is a common username shared among the VMS cluster, Tiger-LAN, and Ph directory at The University of Memphis, as well as certain other systems.

UNIX

An operating system used on a variety of computers from personal computers to mainframe. Many computers and servers connected to the Internet use UNIX.

upload

To transfer a file from your computer to an FTP, gopher or World Wide Web site. For example, if you use a personal computer to log on to a network and you want to send files across the network, you must upload the files from your PC to the network.

URL (Uniform Resource Locator)

The standard used to identify files on the Internet and World Wide Web using the type of server, the host name of the computer the file is on, and the complete path to the file i.e. an address on the WWW. For example the URL for Indiana Wesleyan University is http://www.indwes.edu/.

USENET

A distributed electronic bulletin board system that allows users to post and read articles thereon. It is international in scope and is probably the largest decentralized information utility in existence. Newsgroups, postings on Usenet, provide a mechanism for class collaboration and communication.

USENET newsgroups

Discussion groups devoted to talking about specific topics.

USR

User **S**ervice **R**equest- Request to process production jobs, (batch jobs) for university administrative users.

VAX

Virtual Address Extension. It's a machine that supports VMS. Consists of numerous tasks such as e-mail, ftp, telnet, Gopher, Lynx or text based internet access, McWherter Library catalog access, programming packages,

editors and more.(Also referred to mistakenly with VMS). Access to disk space for personal webpages (LATTE). This node is a Digital OpenVMS V6.2 AlphaServer 2100.

Ventana

Maker of a groupware software in use in the College of Business. GroupSystems is a suite of team-based, decision support software tools that shorten the cycle time for strategic planning, product development, problem solving, and other business processes.

Video Conferencing

Conducting a conference between two or more participants at different sites by using computer networks to transmit audio and video data. For example, a point-to-point (two-person) video conferencing system works much like a video telephone. Each participant has a video camera, microphone, and speakers mounted on his or her computer. As the two participants speak to one another, their voices are carried over the network and delivered to the other's speakers, and whatever images appear in front of the video camera appear in a window on the other participant's monitor. Video conferencing using NetMeeting can be set up by special request in SM110 or SM414:

Video Player

Hardware used to play movie files on computers, such as QuickTime.

Video visualizer

Also called a visual presenter or document camera. This equipment offers the functionality of an overhead projector but also allows you to display nontransparent objects. Several classrooms on campus have document cameras

Virtual

Not real. The term virtual is used in a wide variety of situations. For example, virtual learning might refer to learning at a distance and not in the traditional classroom.

Virus

A program or piece of code that is loaded onto your computer without your knowledge and runs against your wishes. Most viruses can also replicate themselves. All computer viruses are manmade. A simple virus that can make a copy of itself over and over again is relatively easy to produce. Even such a simple virus is dangerous because it will quickly use all available memory and bring the system to a halt. An even more dangerous type of virus is one capable of transmitting itself across networks and bypassing security systems. IS recommends the use of Symantec's Norton Anti-Virus.

Visual Presenter

Also called a document camera or a video visualizer. This equipment offers the functionality of an overhead projector but also allows you to display nontransparent objects. Several classrooms on campus have document cameras.

VMS Cluster

VMS stands for *Virtual Memory System*. It is the operating system used to communicate with the mainframe computers which serve as the central academic and administrative systems at the University of Memphis. There are five mainframe computers in the university's VMS cluster, ADMIN1, ADMIN2, ADMIN3, MOCHA, and LATTE.

WAV
A popular sound file format used primarily by Windows-based computers.
WebBoard
Proprietary software that allows participants to communicate either synchronously or asynchronously via the computer. IWU purchased the software and integrated it in all their online courses for class discussions.
WebLearner
Please see *EduCart*.
Web Server
The hardware and software used to store and deliver HTML documents for use on the World Wide Web.
Web Site
A person or company's collection of HTML documents on the Web server. A single Web server may contain one or more Web sites.
Whiteboard
An area on a display screen that multiple users can write or draw on. Whiteboards are a principal component of teleconferencing applications because they enable visual as well as audio communication.
Windows
An operating system for the IBM PC-compatible platform that allows multiple programs to run at once and utilizes icons and menus for program control.
Windows NT
A version of Windows specially designed for use on networked computers.
Word Processor
A program used to create and edit text documents, such as Microsoft Word or Corel WordPerfect.
World Wide Web (WWW)
A graphical hypertext-based Internet tool that provides access to home pages created by induviduals, business and other organizations.
WS-FTP
The FTP software which is the standard for PC-users at the university. It is free to educational institutions.
XML
Abbreviation for eXtensible Markup Language, a specification developed by the W3C. XML is a pared-down version of SGML, designed especially for Web documents. It allows designers to create their own customized tags, enabling the definition, transmission, validation, and interpretation of data between applications and between organizations. Whether XML eventually supplants HTML as the standard Web formatting specification depends a lot on whether it is supported by future Web browsers. Microsoft Internet Explorer version 5 handles XML, but renders it as CSS, and Netscape (Mozilla) is still in experimenting with XML support.
Y2K
Year 2000 problem or bug which does not differentiate between 20th century and 21st century dates. Affecting primarily spreadsheets and databases, this problem can in most cases be fixed.