



Kampala International University Uganda

BACHELOR OF ARTS IN PUBLIC ADMINISTRATION

MODULE

INTRODUCTION TO COMPUTER FUNDAMENTALS

UCC1100

By

Mr. Muyanja Lawrence (Msc, PGMIS, BscFST)

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Unit 1

INTRODUCTION TO COMPUTER FUNDAMENTALS

1.1 Introduction

The first use of the word "computer" was recorded in 1613, referring to a person who carried out calculations, or computations, and the word continued to be used in that sense until the middle of the 20th century. From the end of the 19th century onwards though, the word began to take on its more familiar meaning, describing a machine that carries out computations.

The history of the modern computer begins with two separate technologies—automated calculation and programmability—but no single device can be identified as the earliest computer, partly because of the inconsistent application of that term. Examples of early mechanical calculating devices include the abacus, the slide rule and arguably the astrolabe and the Antikythera mechanism (which dates from about 150–100 BC). Hero of Alexandria (c. 10–70 AD) built a mechanical theater which performed a play lasting 10 minutes and was operated by a complex system of ropes and drums that might be considered to be a means of deciding which parts of the mechanism performed which actions and when. This is the essence of programmability.

Although mechanical examples of computers have existed through much of recorded human history, the first electronic computers were developed in the mid-20th century (1940–1945). These were the size of a large room, consuming as much power as several hundred modern personal computers (PCs). Modern computers based on integrated circuits are millions to billions of times more capable than the early machines, and occupy a fraction of the space.^[2] Simple computers are small enough to fit into a wristwatch, and can be powered by a watch battery. Personal computers in their various forms are icons of the Information Age and are what most people think of as "computers". The embedded computers found in many devices from MP3 players to fighter aircraft and from toys to industrial robots are however the most numerous.

Computer

A *computer* is an electronic machine/device capable of accepting data (input), works with the data arithmetically and logically (processing) and produce output as a result of processing and the results may be stored for future use. Most computers that sit on a desktop as well as Laptops are called Personal Computers (PCs)

The ability to store and execute lists of instructions called programs makes computers extremely versatile, distinguishing them from calculators. Therefore computers ranging from a mobile phone to a supercomputer are all able to perform the same computational tasks, given enough time and storage capacity.

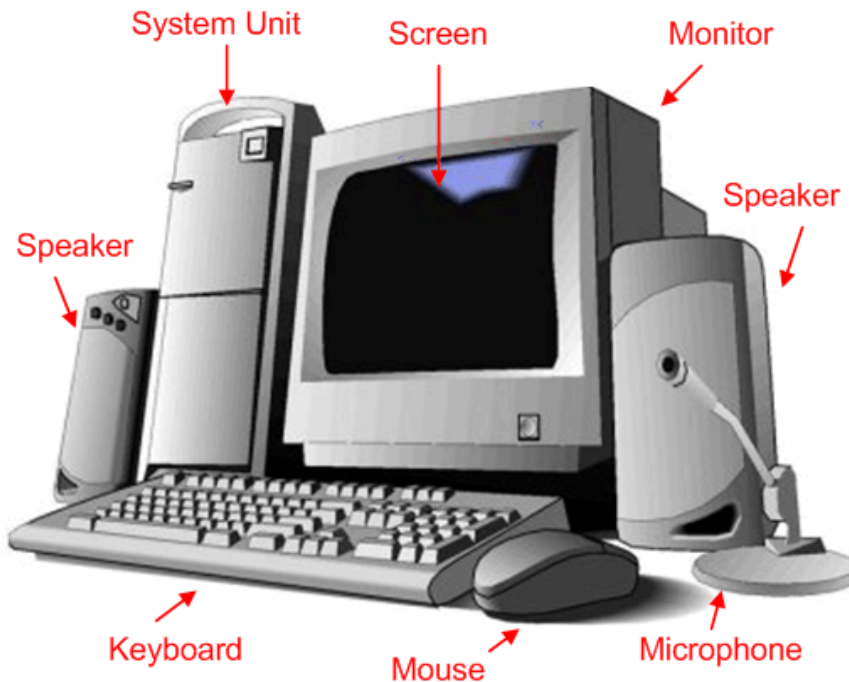


Figure 1: Basic parts of a Computer

1.1.1 Data and Information

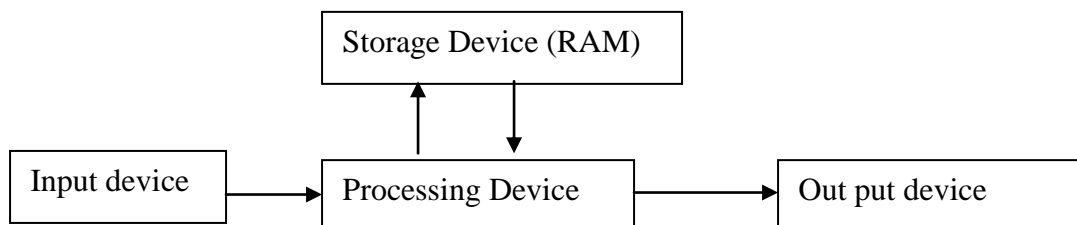
Data is an unevaluated facts or figures. *Information* is the processed data. Data should not be confused with a computer program which is a set of instructions that detail a task for the computer to perform

1.1.2 Information Technology Communication (ICT)

ICT means the scientific means of sending and receiving information using scientific means that includes computers, networks, internet etc which requires sending and getting feedbacks

1.1.3 How a Computer Works

Data is entered into the computer through the input devices like keyboard then its received by the main memory (RAM) which stores it temporary as it waits to be processed, its then sent to the CPU for processing and finally its outputted through the out put devices like the monitor.



1.1.4 Advantages and Disadvantages of Using Computers

1.1.4.1 Advantage s of Computers

- **Speed:** Computers work at a very high speed and are much faster than humans in computation. A second is very large time period time for computer. A computer can perform billions of calculations in a second. The time used by a computer to perform an operation is called the processing speed. Computer speed is measured in Mega Hertz (MHz) million of clock ticks per second.
- **Storage:** A computer can store a large amount of data permanently. Users can use this data at any time. We can store any type of data in a computer for example Text, graphic, pictures, audio and video files can be stored easily. The storage capacity of the computer is increasing rapidly. Memory is measured in megabytes (million bytes)
- **Processing:** A computer can process the given instructions. It can perform different types of processing like addition, subtraction, multiplication and division. It can also perform logical functions like comparing two numbers to decide which one is the bigger.
- **Accuracy:** Accuracy means to provide results without any error. Computers can process large amount of data and generate error-free results. A modern computer performs millions of operations in one second without any error.
- **Communication:** Most computers today have the capability of communicating with other computers. We can connect two or more computers by a communication device such as modem. These computers can then share data, instructions, and information. The connected computer are said to be networked.
- **Flexible:** Computers are flexible as they be part of other machines such as radio, phone, planes, car
- **Recreational:** Computer offers recreational facilities like game and movies.
- **Consistence:** Computers can perform a similar task over and over again without getting tired or bored and in this way computers are diligent

1.1.4.2 Disadvantage of Using Computers

- i.) **Unemployment** where a job that could be done by 100 people is now being done by one person using the computer and within a short time.
- ii.) **Cost** .The cost of computers can be subdivided into three section, cost of Training the user, cost of purchasing the computer and cost of maintaining the computers.
- iii.) **Delicate** computers are delicate and must be handled with lot of care

- iv.) **Viruses**, programs designed to disorganize the proper functioning of computer system, Viruses can be spread easily using the internet or networked computers
- v.) **Pornography** Easy Access to pornographic and other offensive materials more especially computers on internet which even show violent scenes as well as sexual acts to children.
- vi.) **Crackers**: is a person who access information illegally on the network and goes on to carry out malicious actions on it.

1.2 Computers In Society

1.2.1 Uses in our Society

There are various uses of computers in our everyday life to accomplish various tasks. A few of them are outlined below:

1.2.1.1 Computers in Education

With “digital divide” in this era, many education sectors have emphasized the use of computers. This in turn has been accelerated by world’s adoption of the use of Internet. Many institutions have linked up with other universities and libraries overseas hence facilitating training, research and access to online libraries. This has further led to the creation of Virtual Universities (virtual universities are universities with no physical buildings for lecture rooms or halls of residence, but provides necessary lectures on the computer via the internet.

Computer Assisted Instruction (CAI) is the name given to a teaching system (program) which operates on a drill-and-practice principle. For example when learning the meaning of English words, a student sits on a computer and is presented with a word and its meaning. The student studies this and when satisfied, tells the computer that (s) he is ready for examination or questions.

Computers are being used in universities, secondary schools and other institutions to teach other subjects. For example, in subjects like physics or chemistry, laboratory experiments can be simulated on the computer. Experiments can be repeated many times without having to use actual chemicals or equipment. Potentially dangerous experiments or expensive experiments can be performed with little danger or expense.

Another type of system is Computer Assisted Learning (CAL). CAL tries to teach in the traditional sense. The computer presents material, asks questions and based on student’s performance, determines whether to present new material or review topics already covered.

1.2.1.2 Computers in Business

The way businesses were conducted some years back has changed tremendously with the evolution of Internet. You only need to sit in front of your computer, whether in your office or at home and trade shares with the various centers worldwide — without going to those particular stock centers physically. This is what we call e-business. Very many businesses including Banks, Travel Agencies, Insurance Companies and many others have realized the benefits of computers. They can use them for word processing, database management, production control and stock taking to mention but a few.

1.2.1.3 Banking industry

One of the earliest uses of computers was in the banking industry. Initially, a typical bank had a central computer center which processed data from various branches. For example, the withdrawal/deposit slips collected by a branch during the day would be forwarded to the computer center (usually located at the head office) at the end of the day. The customer's accounts would be updated and a report on the status of the accounts would be prepared for use the next day.

Nowadays, the teller enters transactions directly via the terminal. The terminal is connected to the computer which accesses the files of customers' accounts. Accounts are then queried and/or updated in a few seconds. Today, Automated Teller Machines have become popular in the banking industry. This is a computer controlled device from which a customer can make withdrawals and deposits, check account balance or make an appointment with the loans officer, all without human involvement. In order to use this system, a customer is issued a plastic card bearing his name and account number. A Personal Identity Number (PIN) which does not appear on the card is also issued. A combination of the two is used to access the customer's account.

1.2.1.4 Commercial Enterprises

Many businesses, large and small, use computers to help them in the control of daily activities. Some of these are:

- Storing Employee records; all organizations keep records of their employees. An employee record may contain information such as name, address, telephone number, and present job classification, date of start of a job, contract period, salary scale, allowances, and deductions.
- Payroll Processing
- Accounts Receivables
- Accounts Payable Stock Control

- General Ledger

1.2.1.5 Industrial Enterprises

In many industries, for example chemical plants, steel mills and oil refineries, computers are used to monitor and / or control the processes which convert raw materials into useful products. This aspect of computer use is called process control. Various instruments relay information, such as temperature and pressure, to the computer. The computer monitors these values and, if any abnormalities are found, can either;

- a) Inform the human supervisor who would then take correct action or
- b) Direct the regulating devices to make the necessary adjustments.

1.2.1.6 Computers in Medicine

Computers are part of everyone's daily life and have changed the way we live and the way medicine is practiced. They are being used in hospitals at the reception for billing, admission and patient management in wards. The use of hospital information systems and laboratory information systems are increasingly becoming the norm.

They can be used by doctors for their practice management-recording patient's history, writing prescriptions, maintaining treatment history, accounts and billing, scheduling appointments , managing correspondences and Telemedicine for specialist vs. to reach rural areas .

The use of computers in most spheres of medicine has rendered the use of Internet for medical research and Telemedicine.

1.2.1.7 Computers in Entertainment

Computers are used for playing games, making films and music. Look for programs like windows media player, iTunes, Music Match and many others in a computer.

1.2.1.8 Computers in Communication

Communication using e-mail and the Internet has greatly enhanced the lives of those who are housebound. For example advances in technology have enabled people to work, join special interest groups, shop and pay their bills just from their homes. For people with disabilities, there are already computers that convert typed input into simulated voice and enlarge letters for the visually impaired.

1.2.1.9 Computer in Science and Engineering

Recent advances in scientific research have been possible mainly due to the use of computers. Computers are used for land surveying, quality control simulation and research.

1.2.1.10 Computer in Military

They are used for warfare planning, research monitoring and emergency response. Recently American and other Western countries use unmanned fighter jets to attack enemy targets with pin point precision in Libya to topple Col. Muammar Gaddafi.

1.2.2 Limitations of Computers in our Society

1.2.2.1 Computers are Delicate

Computers are delicate and need proper handling. Their parts are fragile and cannot survive under harsh conditions such as extremely high or low temperatures, poor handling during transportation, abnormal power supply etc.

1.2.2.2 Computers are Vulnerable to Data Loss

Another limitation of computers is that they are vulnerable to data loss and this can be due to the following reasons:

- i.) Ever-increasing virus attacks to both system and application software
- ii.) Power fluctuations that may cause/bring errors on to the storage device such as a floppy disk, flash disk or even the hard disk.
- iii.) Disgruntled employees may access the data and completely destroy it as it can be accessed via the network without the knowledge of the owner.

1.2.2.3 Computers Have no Common Sense

By saying that a computer has no common sense, we mean that it does not make subjective judgments. It has to be told exactly what to do. If you give it wrong inputs it will give wrong results and similarly if you give right inputs it will give you correct results hence the adage Garbage in Garbage Out (GIGO).

1.2.2.4 Needs Power in Order to Operate

Computers can only work where there is power- a reason why developing countries such as Uganda computers are concentrated in urban areas.

1.2.2.5 Technology Changes Very Often

Life expectancy can hardly be 5 years because of the ever-changing technology.

1.3 Characteristics of Computers

1.3.1 **Speed**

Computers are quite fast in their operation in that their speeds are measured in Mega hertz (MHz) which means million cycles per second. Some modern computers have their speeds measured in Giga Hertz (GHz) i.e. billion cycles per second which means that many of the modern computers work at speed greater than that of light. Computers are capable of handling large tasks in the shortest possible time.

1.3.2 Accuracy and Reliability

Computers are characterized with a high degree of accuracy that they can hardly make any mistake. This accuracy depends on the accuracy of the data the user is feeding into the computer. In fact, computers are not capable of detecting and correcting mistakes made. It follows therefore that if wrong data is fed into the computer, wrong results are given out. Hence the saying "Garbage in garbage out" (GIGO)

1.3.3 Ability to Store and Retrieve Data

Computers have the ability to store a lot of data in a small space. This storage can either be on Random Access Memory (temporary storage unit) or on a permanent basis (hard disk, floppies, compact disks, flash disks, etc). For a computer to be able to work it must have some form of workspace where data is stored before being processed or where information is stored before being output to particular devices.

1.3.4 Diligence

This is the ability of a computer to perform the same task "over and over" without getting tired or bored.

1.3.5 Artificial intelligence

Computers have an in-built artificial intelligence. They can respond to requests given to them and provide solutions. This is accomplished by the "power" of programs installed in them. Evidence of this is again in industrial robotics.

1.3.6 Automation

Computers can perform a number of operations and functions automatically so long as they are programmed. They do not need any supervision in order to perform program routines.

1.4 Evolution of Computers

The history of computer development is often referred to in reference to the different generations of computing devices. Each generation of computer is characterized by a major technological development that fundamentally changed the way computers operate, resulting in increasingly smaller, cheaper, and more powerful and more efficient and reliable devices. At the moment we have five computer generations

1.4.1 First Generation

- 1940-1956: Vacuum Tubes

Characteristics of First Generation computers

- Existed between 1940-1956
- They used vacuum tubes for circuitry
- They used magnetic drums for memory
- They were enormous and therefore took up entire rooms
- They were very expensive to operate, buy and maintain
- They generated a lot of heat which was often the cause of malfunctions
- They relied on machine language to perform operations
- They could only solve one problem at a time
- They used punched cards for input
- They used printouts for output
- They were very slow
- They used a lot of electricity

Examples include The UNIVAC and ENIAC computers are examples of first-generation computing devices. The UNIVAC was the first commercial computer delivered to a business client, the U.S. Census Bureau in 1951.



ENIAC performed ballistics trajectory calculations with 160 kW of power

1.4.2 Second Generation

- 1956-1963: Transistors

Characteristics of Second Generation computers

- Existed between 1956-1963
- Vacuum tubes were replaced with transistors for the circuitry
- These computers were relatively smaller than their predecessors
- They were faster
- They were cheaper
- They used less power
- Still generated a lot of heat
- They still used punched cards for input
- They still used printouts for output
- Cryptic binary machine language was replaced with symbolic or assembly language which allowed programmers to specify instructions in words
- These were the first computers to store instructions in their memory
- High-level programming languages were also developed at this time, such as early versions of COBOL and FORTRAN

1.4.3 Third Generation

- 1964-1971: Integrated Circuits

Characteristics of Second Generation computers

- These existed between 1964-1971
- They used large integrated circuits for circuitry i.e. Transistors were miniaturized and placed on silicon chips, called semiconductors
- These computers worked at an increased speed
- They were more efficient
- They were the first computers to use key boards for input
- They were the first computers to use monitors for output and hence interfacing with an operating system
- They could run more than one application at the seemingly the same time
- Computers became accessible to mass audience because they were small and cheaper than their predecessors

NB: These were the computers that accomplished the voyage to the moon by Armstrong in 1969

1.4.4 Fourth Generation

- 1971-Present: Microprocessors

Characteristics of Second Generation computers

- These existed between 1971-Present
- These use microprocessors which involve bringing together thousands of integrated circuits onto a single silicon chip
- These computers are small that can fit in the palm of the hand moving from those computers that filled entire rooms
- Microprocessors also moved out of the realm of desktop computers and into many areas of life as more and more everyday products began to use microprocessors.
- These small computers became more powerful
- They could be linked together to form networks
- They led to the development of the Internet and the World Wide Web (WWW)
- They saw the development of Graphical user interfaces (GUIs)
- They saw the development of hand held devices such as mouse and joysticks

1.4.5 **Fifth Generation**

Present and Beyond: Artificial Intelligence

Characteristics of Second Generation computers

- These exist today and beyond
- They use artificial intelligence
- They are still in development though the developed world has embraced them already
- They are capable of voice recognition
- They use parallel processing
- Quantum computation and molecular and nanotechnology will radically change the face of computers in years to come
- The goal of fifth-generation computing is to develop devices that respond to natural language input
- These computers will be capable of learning and self-organization.

1.5 Classification of Computers

Basically computers can be categorized under the following classifications

- i.) Classification by capacity
- ii.) Classification by function
- iii.) Classification by purpose
- iv.) Classification by power

1.5.1 Capacity/Size

Under this we look at the physical size of a computer (its Volume) and the number of people a computer can accommodate at a time, under this category we have the following

- Main frame computers
- Mini computers
- Micro computers
- Super computers

1.5.2 Main frame computers

- They were the earliest computers which were around up to 1960's.
- They were very large almost to fill a room
- They were water or air cooled computers
- They were very expensive
- It's could accommodate up to 1000 users at ago

1.5.3 Mini computers

- They are small versions of main frame
- They are less powerful in operation than main frame computers
- They have fewer processors and they can support up to 100 users at ago
- They can be used in Banking, Education and Industrial areas
- They have the same basic structures as the larger main frame computers
- Mini computers are heavily used as network servers in the business industry

1.5.4 Super computers

- i.) These are very powerful micro computers
- ii.) They are computers with a high mathematical capabilities,
- iii.) These computers are used primarily for research purposes, oil exploration, and weather forecasting
- iv.) They are large computers with faster processing using multiple processors and superior technology.

1.5.5 Micro computers

- i.) These are small computers which support only one user at a time
- ii.) They are mainly used in homes and can commonly referred to as personal computers (PC)
- iii.) Examples of micro computers are Tower PC, Desk Top computers, Laptops, Notebooks and personal Digital Assistants or palm tops

1.6 Functions

Function here refers to how computers are designed to operate, this method of classification give three major categories of computers i.e

Digital, analog and hybrid

1.6.1 Digital computers

These are computers which carry out there operation in distinct steps using digits. These computers deal with data represented as a series of zero's and ones .They perform there operation by noting the presence or absence of physical signal in a particular position. This On or off condition represents binary data that can be manipulated arithmetically or logically to produce a solution.

Digital computers are used primarily for administrative data processing and mathematical computation and the most commonly used computers.

1.6.2 Analog computers:

These are computers which operate by measurement and they use continuous values as opposed to discrete values.

They are sensitive to the environment, and they measure physical quantities such as temperature, pressure, length, weight, voltage, speed, humidity e.tc,

They are special-purpose computers designed to solve scientific or technical applications and are quite rare in commercial fields

Analog computers perform there task by measuring continuous physical variable (e.g Pressure, length and voltage), manipulating those physical variables to obtain a solution in transforming the solution into numerical equivalent examples are:

Thermometer, Car speedometer and barometer.

Analog computers are mainly used for scientific and engineering purposes

1.6.3 Hybrid computers

These are computers which combine the feature of digital and analog .a hybrid computer is a combination of analog and digital computers liked together by an interface system for converting analog data to digital data and vice versa, they are used in scientific research and other specialized application

1.7 Purpose

Here computers are classified according to what they were designed to do, some computers are designed to perform a specific task (Special Purpose computers), while others are designed to perform a number of tasks (general purpose computers)

1.7.1 Special Purpose computers

These are computers which were designed to carry out a specific purpose or for a particular specific purpose. Such computers might be found in a scientific laboratory where they perform complicated mathematical operations.

Examples include missiles, building lifts and aero plane simulators. Although usually highly efficient and much faster than general purpose computers, they perform only limited number of functions compared to general purpose computers.

1.7.2 General purpose computers

These are computers which were designed to perform wide variety of operations using wide programming languages, such computers could be found in Universities where many different types of programs are written for a variety of purposes, such as research by professors, class assignment by students and registration by staff.

1.7.3 Classification by power

In this case computers are classified according to the processor's power and PC clock speed. Examples include: 386 processor running at less than 33mghz speed, 486 processor with speed ranging between 33mhz to 66 MHz , Pentium 1, Pentium 11, Pentium iii, Pentium iv the speed ranges between 77mghz to 2.5GHZ and above.

Review questions

Define the term computer

Describe the technological characteristics of the five computer generations

Unit 2 Computer System

A System is a set of interrelated elements working together in an integrated way to achieve a set of objectives. The computer system components include:- Hardware, Software, Data/Information, Procedures and Human ware/People

When a computer system is set into a network another component is created called Connectivity

1.7.4 Computer Hardware/software

Hardware is the tangible or physical computer equipment such as a CPU, keyboard, mouse, monitor, etc. Software is a set of instructions, routines, and symbolic languages that control the functioning of the hardware, such as Windows, Word processors, Spreadsheets, AutoCAD etc

1.7.5 Categories of Computer Hardware

They are divided into four according to their function

1. Input devices
2. Processing devices
3. Storage devices
4. Output devices

1.7.5.1 Input devices

These are devices which input data and instructions in computers. The main input devices are the Keyboard and the Mouse. Others include Scanner for graphics, and Joystick for playing games, microphone for sound input, modems etc

A modem: it's a device which is used to translate data signals from digital data to analog data and from analog to digital data

1.7.5.1.1 Keyboard

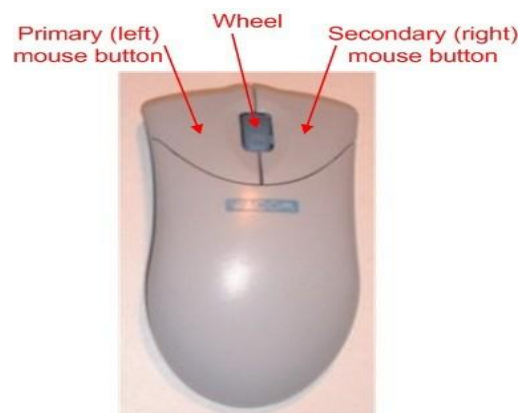
The keyboard allows you to enter information into your computer. Like the mouse, the keyboard is a means of interacting with your computer. You really only need to use the keyboard when you're typing text and most of the keys on the keyboard are laid out like the keys on a typewriter. But there are some special keys like Esc (Escape), Ctrl (Control), and Alt (Alternate). There are also some keys across the top of the keyboard labeled F1, F2, F3, and so forth. Those are called the function keys, and the exact role they play depends on which program you happen to be using at the moment.

Most keyboards also have a numeric keypad with the keys laid out like the keys on a typical adding machine. If you're accustomed to using an adding machine, you might want to use the numeric keypad, rather than the numbers across the top of the keyboard, to type numbers. It doesn't really matter which keys you use. The numeric keypad is just there as a convenience to people who are accustomed to adding machines.



1.7.5.1.2 **Mouse**

The mouse is a pointing device that allows you to select and manipulate objects you see on your monitor. Mouse probably has at least two buttons on it. The button on the left is called the primary mouse button; the button on the right is called the secondary mouse button or just the right mouse button. The buttons can be referred to as the left and right mouse buttons. Many mice have a small wheel between the two mouse buttons, as illustrated in Figure below



How is the mouse used?

Ideally rest your hand comfortably on the mouse, with your index finger touching (but not pressing on) the left mouse button. Then, as you move the mouse, the mouse pointer (the little arrow on the screen) moves in the same direction. When moving the mouse, try to keep the buttons aimed

toward the monitor -- don't "twist" the mouse as that just makes it all the harder to control the position of the mouse pointer.

If you find yourself reaching too far to get the mouse pointer where you want it to be on the screen, just pick up the mouse, move it to where it's comfortable to hold it, and place it back down on the mouse pad or desk. The buzzwords that describe how you use the mouse are as follows:

- **Point:** To point to an item means to move the mouse pointer so that it's touching the item.
- **Click:** Point to the item, then tap (press and release) the left mouse button.
- **Double-click:** Point to the item, and tap the left mouse button twice in rapid succession - click-click as fast as you can.
- **Right-click:** Point to the item, then tap the mouse button on the right.
- **Drag:** Point to an item, then hold down the left mouse button as you move the mouse. To *drop* the item, release the left mouse button.

1.7.5.2 Other input devices include:

1.7.5.2.1 **Scanner**

A scanner allows you to scan documents, pictures, or graphics and view them on the computer. You can also use software to edit the items you scan.

- Used to put printed pictures and text into a computer
- Converts an image into dots that the computer can understand
- To scan text, optical character recognition (OCR) software is needed



1.7.5.2.2 **Joy Stick**

The joy stick is used to play video games and offers easy and quick movements in all directions on the screen

1.7.5.2.3 **Digital Camera**

- Used to take electronic pictures of an object
- The pictures taken by a digital camera can be used directly by a computer



1.7.5.2.4 **Microphone**

- Used to put sound into a computer
- Need sound recording software



1.8 Computer Storage devices and Memory

Enables a computer to store, at least temporarily, data and programs for example RAM. Memory is the internal storage areas in the computer. The term identifies data storage that comes in the form of chips, and the word storage is used for the memory that exists on tapes or disks. Moreover, the term memory is usually used as shorthand for physical memory, which refers to the actual chips capable of holding data. Therefore, memory is both

hardware and software. However they are two types of memory, which include primary and secondary memory.

1.8.1 Primary storage device

These are the internal memory in computers and they include the following:

1.8.1.1 Read-Only Memory (ROM)



ROM is computer memory on which data has been prerecorded. Once data has been written on a ROM chip, it cannot be removed and can only be read. ROM retains its contents even when the computer is turned off. ROM is referred to as being **nonvolatile**. Most personal computers contain a small amount of ROM that stores critical programs such as the program that boots the computer. In addition, ROM is used extensively in calculators and peripheral devices such as laser printers, whose fonts are often stored in ROM.

ROM/EEPROM is built in memory that permanently stores instructions and data. The instructions and data in ROM are created when it is manufactured and it cannot be changed except for EEPROM which are programmable ROM and stands for Electrically Erasable programmable read only memory.

1.8.1.2 Random-Access Memory (RAM)

RAM is a type of memory that can be accessed randomly and is the most common type of memory found in computers and other devices, such as printers. Also called the main memory or Primary storage Device. It is a primary memory that holds data and instructions while the computer is in use. Can be thought of as the memory the computer uses to obey instructions. Can be written to and read from.

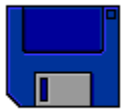
Important to remember that if you do not save the information in RAM to a storage device (such as a floppy disk or hard drive) before turning off the computer the information will be lost. Ram modules are shown in the diagram below



1.8.2 Secondary storage

Mass Storage device (Backup devices) allows a computer to permanently store large amounts of data. For example floppy disk, Hard disk, CD and Flash that are usually external devices.

1.8.2.1 Floppy Disk (A: drive)



Floppy disks go in the A: drive of your computer. They are removable storage on which your computer can read or write files.

Floppy disks are approximately 3 1/2 inches in size and hold 1.4MB (1,400,000 bytes). While these disks don't seem *floppy* like their name would suggest, there is a disk inside, which is *floppy*. The disk is encased in a hard plastic case to protect it. (When purchasing floppy disk make sure you buy IBM or PC compatible disks versus Mac or MAC disks. Mac or MAC disks can only be used in an Apple/Macintosh computer. IBM or PC compatible disks can be used with Windows.)

Floppy disks allow information to be transported easily from one computer to another.

Floppy disks have limited storage capacity, generally 1.44 MB.

Saving and retrieving information from a floppy disk is slower than on a hard drive.

They are more susceptible to physical damage and viruses than the hard. They are becoming obsolete as USB flash disk become more popular

1.8.2.2 CD-ROM (D: drive)



The CD-ROM disks are inserted into your system's D: drive. They can store much more information than a floppy disk, but your computer cannot write to them. This is because they are Read-Only Memory (ROM).

CD ROM:

CD ROM stands for compact disk read only memory. CD ROMs have much more storage space than disks, but are read only, which means that data can only be read from it. CD ROM drives, such as the D: drive read the data from the CD. CD ROMs are very versatile and can store anything from music to computer programs. When handling the CD ROM, remember to only touch it on its edges and in the very center.

CD ROMs are read only storage medium. Typically, a CD ROM holds up to 700 MB of information. While information retrieval is faster than from a floppy disk, it is also being replaced in usage by USB flash disks.



CD-R: Compact disk recordable

A CD-R is highly effective for storing a large amount of data.

CD-R can hold up to 700MB of information.

A CD-R is a one time recordable compact disc.



CD-RW: stands for Compact Disk Read /writable

A CD-RW allows you to read, write, erase and write again. Writing takes place in a single pass of the focused laser beam. This is sometimes referred to as direct overwriting and can be repeated several thousand times per disc.



1.8.2.3 Flash drive

A **flash drive** is a removable storage device that connects to a USB port. A flash drive uses a type of memory that requires no power to maintain the data.



1.8.2.4 Hard Disk (C: drive)



A permanent data storage device built into PCs that permits you to save and retrieve information.

Also, stores the computer's operating system and other software. The size of a hard drive is usually expressed in terms of megabytes (MB) and gigabytes (GB) and typically ranges between 160GB and 500GB.

The hard disk is located inside the System unit and is similar to a floppy disk in that data in both is magnetically stored. The only difference is that it cannot easily be removed stores more data or files, and contains important files or programs.

1.9 Processing Devices

1.9.1 Central processing unit (CPU)

The brain of the computer, this is the component that actually executes instructions. Below is a diagram of a typical CPU



The CPU comprise of three major components

- i.) Control Unit (CU)
- ii.) ALU(Arithmetic Logic Unit)
- iii.) Registers

1.9.1.1 Functions of control unit

Control all the activities within the computer for example controls the inputting, storing, processing and outputting of data.

It interprets instructions stored in the main memory (RAM) and gives instructions to the relevant parts of the computer system like out put devices to the Monitor, Storage devices to floppy, Hard disk, flash etc.

1.9.1.2 Arithmetic Logic Unit (ALU)

The Main function of the ALU is to handle carry out arithmetic and logical operations of the computer system such as additions, subtraction and bitwise logic operations (AND, NOT, OR, XOR).

1.9.1.3 Registers

This is a component which stores instructions temporarily in the CPU while waiting to be executed by ALU. The contents of the registers can be accessed more easily and quickly by the CPU.

1.10 Output device

These devices output results of the processing outcomes .For example display screens, printers, or speakers let you see or hear what the computer has accomplished. Monitors or Video Display units (VDU) and Printers are the most used of all output devices

1.10.1 Monitors or Video Display units (VDU)

The monitor displays the text and graphics generated by the computer on a screen

Types of monitors are:

CRT (Cathode Ray Tube) which are large and bulky and cheaper but are being phased out due to environmental concerns as well as being robust, power consuming and the inability to use batteries as well as poor picture display quality



TFT screens commonly referred to as flat screens are becoming more popular although more expensive.



1.10.2 **Printers**

- Printers produce a hard copy
- The information is printed on paper and can be used when the device is off.
- It is also called a printout Dot-matrix printers (impact printer)



- Uses metal pins to strike an inked ribbon to make dots on a piece of paper.
 - Can see the dots that make up the letters or images.
 - Lowest print quality of all of the printers.
 - Very low in cost per page to use.
- Rarely used today because of the poor print quality, but still used in business to print multi-part forms.
- Ink jet printers (non-impact printer)



- Use drops of magnetic ink to produce dots on a page to produce text or images.
 - The print quality is almost the same as a laser printer's.
 - Problems with the ink
 - The ink is very expensive
 - The ink is water soluble and will run if the paper gets wet
 - Highest cost per page of all the printers
 - For producing color documents, it has the highest quality at a reasonable price.
- Laser printers (non-impact printer)



- How the laser printer produces an image
 - A laser or LEDs make dots on a light sensitive drum
 - Toner (very tiny particles of plastic) stick to the drum where the dots were made
 - Paper is pressed against the drum and the toner is placed on the paper
 - The paper is heated and the toner melts into the paper
- Produces the highest quality printout
- For black and white printouts, very low cost per page
- Printout is permanent
- Color laser printers are still fairly expensive (\$3,000 to \$10,000)

1.10.3 **Speakers or headphones**

The headphones and speakers allow the user to hear the audio portion of a program i.e. output sound



1.10.4 Storage Capacity (Bit, Byte, KB, MB, and GB)

1.10.4.1 Bits and Bytes

A bit is short for binary digit. A bit contains a single value of 0 or 1. A consecutive group of bits makes up a unit. For instance, there are 8 bits in one byte. A byte is more commonly referred to when discussing space. A byte represents a single character. (For example, there are 10 bytes in the phrase, I love you. This is because there are 8 letters and two spaces between the three words.) There is a finite amount of space on a computer and disk. Bytes are commonly identified in thousands, millions, and billions:

KB for a thousand bytes

MB for a million bytes

GB for a billion bytes

TB for trillion bytes

These are pronounced kilobytes (KB); megabytes (MB); and gigabytes (GB).

Floppy Disks

Floppy disks are approximately 3 1/2 inches in size and holds 1.4MB (1,400,000 bytes).

1.11 Factors to consider while buying computers

Below is a listing of the various components likely to be found in computers and recommendations and tips when considering any of the below components.

1.11.1 Case

While the case may not be important to some computer users, it is a consideration to be thought about before purchasing a desktop computer.

What type of case should be purchased or is needed? Do you want a desktop or tower case?

Does the case support the standards of motherboards, for example, the ATX motherboard standard?

Will the case fit on top (Desktop model) of or below your desk (Tower model)?

Will the drives be accessible or will they be positioned the way you wish them to be positioned?

1.11.2 CD Media

The type of CD drive in the computer is becoming an important consideration when purchasing a computer. When looking to buy a new or used computer, inspect the type of drive included.

Is it a standard drive? If so what speed?

Or is it a DVD / CD-R / CD-RW drive?

If the drive is a DVD, is it hardware or software decoding?

If the drive is a CD-R / CD-RW drive, does it include software?



1.11.3 Hard Drive

Hard drives have and will always be an important consideration to think about when purchasing a new computer or used computer. The hard drive will be the destination of all your files and information, and if that drive is to become full, that drive will need to be replaced or another drive will need to be added to the computer. When looking at the space of the hard drive, always get the maximum size hard drive eg 20GB, 40GB, 100GB etc, considering you will eventually always run out of space.



1.11.4 Memory

Memory is becoming more and more an important consideration when looking at purchasing a computer. Determine the amount of memory included in the computer as well as verify if that memory can be upgraded in the future. The more memory in the computer, the more efficient the computer will run. Consider memory of 1GB and above.



1.11.5 Network Card

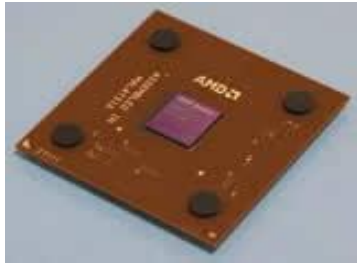
Network cards allow users to connect to other computers. This allows for data transfer, file sharing, Internet connection sharing, printer sharing, and various other helpful uses. With the increase of computers in the house, workplace and with broad band solutions sometimes requiring a network card, a network card is becoming an important consideration when purchasing a computer.

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1.11.6 Processor

The computer processor is the most important consideration when purchasing a computer. Today, with multiple CPU/Processor manufacturers, it may be more confusing as well as more cost efficient to look at the different processor manufacturers as well as the type of computer processors. Common processors are Intel Pentium and AMo. Speed is of essence and the higher the speed the better, consider processors of size 3 GHz and above with a big fan for cooling. The latest processor technology has resulted in CPU manufacturers finding ways to incorporate more than one CPU core onto a single chip. Single core CPU and Dual core CPU. Dual core are efficient in processing. The family of the processor also matters e.g. Intel Pentium is better Intel Celeron



1.11.7 Sound Card

Sound cards are important when looking at purchasing a computer; however, the majority of all computer users will find that most standard sound cards will suite their needs. However, some users may enjoy purchase more advanced sounds cards that will increase the amount of speakers that can be used, and in some games and programs, the sound quality and capabilities.



1.11.8 Video Card

While this may surprise some, a video card can make or the usefulness of a computer break a computer when it comes to playing games on the computer. Most games today require additional video memory as well as special video modes such as OpenGL. With a video card with little video memory or without these modes, the computer will be unable to play modern games. In addition, the advances in video cards can dramatically increase the user enjoyment of the game being played.

USB ports



1.11.9 USB (Universal serial bus)

This helps the user to connect the USB devices to the computers for example the flash disks, USB mouse. The more USB ports computer has, the more USB devices it accommodate at ago. Most computers come with 6 USB ports as standard (2 at the front and 4 at the back)

1.11.10 Monitor Size

The monitor displays the text and graphics generated by the computer and their sizes determine the visualization effect by the user. The large the size, the clearer the visualization and vise versa. Common sizes are 15, 24 and 32 inches. LCD monitors are better CRT monitors



1.12 Other factors to consider while buying a Computer include:

Add-ons-Some computer manufacturers may try to sell additional add-ons when purchasing a computer. Unless you have done your research on the additional add-on, do not consider the add-on. While in some cases it may be beneficial to get a printer, scanner or maybe a camera with a computer, you may be paying premium for the additional add-on, or in the case of the printer you may have to pay premium on the ink in the future. Do your research; ensure that if you get an additional hardware / add-ons that the hardware will suite your needs and that it does not end up being something that you are not going to use.

1.12.1 **Free add-ons**

Some computer companies may entice you into purchasing a computer by giving you free add-ons. These add-ons may be advertised as free, but ensure or ask if the add-on price is not just being added to the overall computer price.

Add-ons that should not be of concern are hardware peripherals such as a mouse or keyboard. These are almost always included with a computer package and are really of no additional cost to the user.

1.12.2 **Documentation**

While most manufacturers today are reducing the amount of documentation included with their computer, an excellent question, especially if the computer is being purchased by a new computer user, is "what type of documentation is included with the computer?"

All computer manufacturers will include some type of paper documentation or paper inserts; however, does this information include documentation about upgrading the computer in the future? How to connect the cables to the computer? Documentation on how to use the software, such as the additional included software

Note: It is important to distinguish between paper documentation and on-line documentation. On-line documentation that is common today is information that is either locally on the computer or can be accessed via the Internet. If the information is available over the Internet, see how that information suites your needs before purchasing the computer.

1.12.3 **Location**

We use location as a description to describe several different topics. First, what is the location of where the computer is purchased: If the computer is purchased at a local retail store, can the computer be returned if unsatisfactory to that store? If the computer is purchased through mail order or directly through the computer manufacturer or reseller, where can the computer be returned if unsatisfactory?

Second, can the store location of where the computer was purchased service the computer? If not, where is the closest location to where the computer can be serviced?

Third, if the computer is purchased directly from the computer manufacturer and is shipped through mail, how is it shipped? What is the time period for the computer to arrive to your destination? What happens if the computer is damaged during shipping?

1.12.4 **Refurbished**

Refurbished is a term used to describe a computer or a hardware device or component in a computer that has been used, looked at and determined to be in working order. However, because the product has been used or purchased, it cannot be sold as new.

Refurbished computers will have a lower price and are generally a good deal for users who may not have a lot of money to spend on a new computer. It is important, however, to compare the price of the refurbished computer to a new computer as well as to review all of the tips on this page as all the same rules, tricks and tips still apply.

1.12.5 **Return**

Verify with the computer manufacturer if it is possible to return or have a money refund for the computer. Many computer manufacturers will not refund your money but instead may offer an exchange for another computer. Verify with the manufacturer of the computer or the reseller what their return / refund / exchange policy is.

1.12.6 **Service**

Service is an important consideration to look at when looking to purchase a computer, new or used. The service is how many companies describe the repair of a computer if it or a component within it is to become broken. Below is a listing of what type of service to look for:

- i. What type of service is offered? Is the service onsite, meaning a technician will come to your location to replace or fix a bad component. If the service is onsite, is it for the **complete** time of the warranty?
- ii. If onsite is not offered, what is and for how long?
- iii. Can the computer be taken to a local service center? If yes, what is the closest authorized service center?
- iv. What is the time frame the service takes to occur? For example, if the computer has a bad component, what is the time it will take for a technician to come onsite and replace that component, or what is the time it will take to have the computer sent in to be fixed? Finally, if that time frame is not accomplished, what is the company willing to do, for example, are they willing to provide you with a loaned computer.

1.12.7 **Software**

Software for many computer users, especially new users, is thought to be an important consideration when purchasing a new computer. Granted there is software that we highly recommend looking for when purchasing a computer, such as word processor or spread sheet program, some computer companies may over hype the software package. Below is a listing of what to look for when looking at the software included with a computer.

- i. Does the software include a word processor and/or a spread sheet? For the majority of all users, this should be an important consideration.
- ii. Are the software full versions of the software or is the software demo program or shareware programs?

1.12.8 **Support**

While you can always contact Computer Hope for support, manufacturer support for most users will be a very important consideration as if an issue arises with the computer you must be able to contact a support representative. Things to consider when looking at the support options of a computer are:

- 1. Is support open 24 hours, 7 days a week? If not, what are the hours?
- 2. Is support open on holidays? If not, what days are it closed?
- 3. What support options are available? Phone? E-mail? Web? Chat?

1.12.9 Upgrade ability

While this option may not be considered at first when purchasing a computer, it is an important consideration. Below is a listing of different options to look for when looking to upgrade a computer.

- i. What can be upgraded in the computer? RAM? CPU? Hard Drive? Video Card? If available to upgrade, what are the maximum amounts or is it specified within documentation provided with the computer?
- ii. Does the computer have on-board hardware, such as an on-board video card? If yes, can these be disabled with a jumper or through CMOS? This is a very important as many computers will disable the device when a new device is added. However, this does not always work and may cause future issues. Ensure it can be disabled and that it is not a device that auto-disables.
- iii. Is the case a standard case? Some computer manufacturers have proprietary cases, causing difficulty when trying to add new hardware. Most commonly this occurs with the video card.
- iv. What motherboard form factors is the case? The most common motherboard form factor today is ATX; does the case support this factor so the motherboard could be swapped in the future?

1.12.10 Warranty

Finally, what warranty is offered by the computer manufacturer? How long is the warranty? Does the warranty cover both hardware and software issues?

Warranty can cause frustrations for most users; we highly recommend that a computer only be considered if it has at least a one-year warranty. Many cheap computers will only come with a 90 day warranty. Meaning if a part goes bad, you will have to pay for the part as well as the service. This may not be an issue for users who just need a cheap computer and are willing to replace parts and service the computer.

1.13 SCAMS

Unfortunately, like anything, it is possible to be tricked or for computer companies to scam you. Below is a listing of what to look for when purchasing a computer.

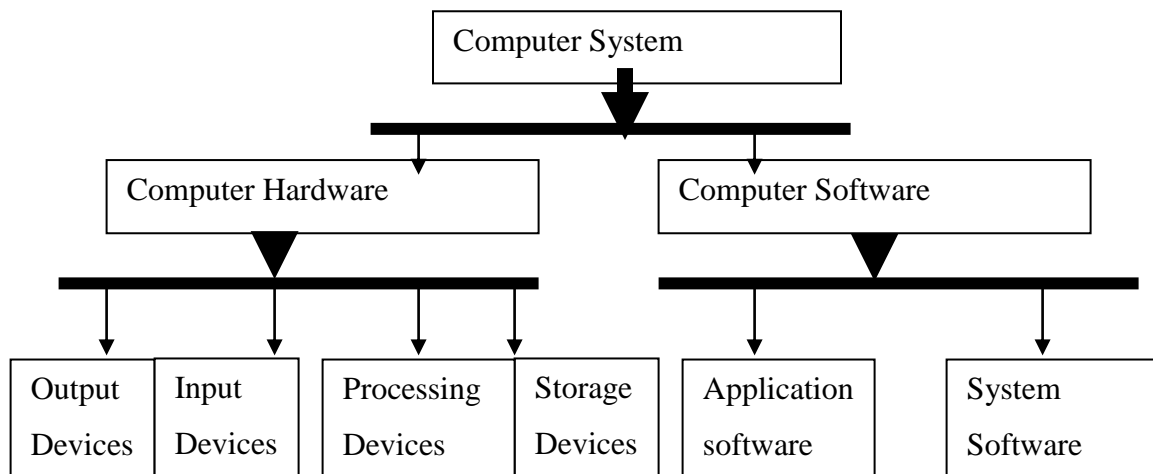
- **Get what you pay for** - Ensure that the product you are purchasing is what you are paying for. It has been known that computer companies may list a processor being a specific speed, however, actually have a totally different speed of processor in the computer.

This unfortunately can be very easy as any user can 'over clock' a processor making it appear as one speed but in reality being a completely different speed. For example, you may buy a 733MHz processor but instead get a 500MHz.

To determine the processor speed, open the computer and look at the processor itself. Do not look at the processor through a software program or through BIOS as these values can be changed or tricked.

- **Legal software** - When purchasing a computer, ensure it comes with legal software. Many end-users or small computer companies who build or sell computers may not provide you with legal copies of the software that is illegal. Verify that the software that came with your computer is on a standard CD and not a burnt CD. A burnt or home-made CD will generally be a different looking CD and have a gold or green bottom. Ensure that if the software requires a license or registration number that it was included with the computer. An example of software that includes these certificates is Microsoft Office and Windows.

2 Computer Software



2.1 Definition

Refers to a set of instructions which enable computer hardware to function/operate effectively, i.e., a software that instructs the hardware on what to do and how to do it.

Examples include, MS word, MS excel, Windows, MS DOS, UNIX, Linux

Program: This is a series of step by step instructions that provide solutions and tell the computer what to do.

2.2 Types of software:

Software is basically divided into two types:

- System software
- Application software

2.2.1 **System software**

These are programs which control and support all other computer programs and the hardware i.e., they manage the computer resources and ensure efficient running of the computer system.

System software is divided into

- i. Operating system
- ii. System utilities
- iii. Languages

2.2.1.1 Operating system (OS)

These are the programs that manage the computer hardware resources and other software programs like application software e.g. MS word, Ms Excel. An operating system is the basic software that a computer must have for it to work because it manages and supervises the CPU. The operating system supervises and manages the different activities that take place in a computer like the say software use the hardware for example saving on a floppy disk.

Examples of operating system

Ms DOS (Microsoft Disk Operating System)

MS Windows 3.1

MS Windows 95

MS Windows 98

MS Windows 2000

MS Windows XP

Windows NT (New technology)

Windows ME (Millennium Edition)

Linux and UNIX

2.2.1.1.1 Functions of operating systems:

- i. Memory allocation and loading of programs, before processing commences, operating system load the program to be used in RAM from the hard disk.

- File management: the OS controls and manages the use and access of files on connected computers (network)
- The OS starts and shut down the computer
- Errors reporting, during the program execution, if there occurs errors of any sort, the operating system furnishes a message to the user e.g., saving on the floppy disk which is not there , the errors comes as “floppy disk not in the drive”.
- The OS provides an interface between the user and the computer hardware,
- Memory management , the OS manages the use of memory (RAM) by allocating it for use and de allocating after at shut down
- System security , the OS is responsible for the system security by making sure that only the authorized users are allowed to assess the files
- Process management, The OS manages the functioning of the processor and all the processing job or activities

2.2.1.2 Utility programs

These are system software programs which perform the following tasks,

- Leaking of programs together to form a ready executable program
- Copying of files
- Deleting of files
- Maintaining and repairing of file, computer Hardware etc
- Loading programs in memory with the help of operating system

2.2.2 **Application software**

These are generally categorized into two main types, specialized application packages (in house/custom programs) and General application packages

2.2.2.1 Specialized application packages

Include payroll, grading system used in school, registration system etc, they are generally used to perform a single minded task.

- They meet special needs for an organization or company therefore they are dependable i.e. make life easy for the users
- These packages are expensive in terms of paying the programmer to design a program
- They are not flexible since they were designed for special tasks

2.2.2.2 General application packages

These are programs which are used to perform general tasks in an organization such as

Ms Access, Ms Excel, Ms Word

- General purpose packages are cheap
- They are flexible since they were designed for many tasks

The only shortcoming is:

They don't help you achieve a specific goal broadly

2.3 Computer Virus

2.3.1 Definition

A *computer virus* is a computer program that can copy itself and infect a computer without the permission or knowledge of the owner with the purpose of damaging the computer system or its resources. The term "virus" is also commonly but erroneously used to refer to other types of malware, adware, and spyware programs that do not have the reproductive ability. A true virus can only spread from one computer to another (in some form of executable code) when its host is taken to the target computer; for instance because a user sent it over a network or the Internet, or carried it on a removable medium such as a floppy disk, CD, DVD, or USB drive. Viruses can increase their chances of spreading to other computers by infecting files on a network file system or a file system that is accessed by another computer.

2.3.2 Malware

"**Computer virus**" is sometimes used as a catch-all phrase to include all types of malware. Malware includes computer viruses, worms, trojan horses, most rootkits, spyware, dishonest adware, crimeware, and other malicious and unwanted software, including true viruses. Viruses are sometimes confused with computer worms and Trojan horses, which are technically different. A worm can exploit security vulnerabilities to spread itself to other computers without needing to be transferred as part of a host, and a Trojan horse is a program that appears harmless but has a hidden agenda. Worms and Trojans, like viruses, may cause harm to either a computer system's hosted data, functional performance, or networking throughput, when they are executed. Some viruses have symptoms noticeable to the computer user, but many work unnoticed with marked stealth.

Most personal computers are now connected to the Internet and to local area networks, facilitating the spread of malicious code. Today's viruses may also take advantage of network services such as the World Wide Web, e-mail, Instant Messaging, and file sharing systems to spread.

A computer virus is usually hard to detect if it's disguised as a harmless file, in the case of a Trojan horse virus. This type of virus doesn't replicate itself like most viruses, but instead opens your computer up to malicious imposters. Leaving you to wonder, how you can tell if you're computer is infected?

Luckily, your computer after coming in contact with a virus or worm will display some symptoms and signs of infection. It is particularly useful to know the signs that indicate an infection. Because you can unintentionally introduce a virus to your computer at anytime when you run an infected program or open an email attachment. To guard against this you need a good *anti-virus program*

2.3.2.1 Signs of a Computer Infection

Some signs that may indicate that your computer is infected include:

1. Your computer functions slower than normal
2. Your computer responds slowly and freezes often
3. Your computer restarts itself often
4. You see uncommon error messages, distorted menus, and dialog boxes
5. You notice applications on your computer fail to work correctly
6. You fail to print correctly
7. The computer makes abnormal sounds
8. Files and folders disappear
9. Memory becomes inaccessible

2.3.2.2 Types of Viruses

What are the types of computer viruses and worms that you're computer can come into contact with? The list of viruses is quite long and complex. So, we simplified the list by mentioning few broad categories of viruses that can put your computer and all your personal data on it, in danger. These computer viruses include:

2.3.2.2.1 Boot Sector viruses

A boot sector virus infects diskettes and hard drives. All disks and hard drives contain smaller sections called sectors. The first sector is called the boot. The boot carries the Master Boot Record (MBR). MBR functions to read and load the operating system. So, if a virus infects the boot or MBR of a disk, such as a floppy disk, your hard drive can become infected, if you re-boot your computer while the infected disk is in the drive. Once your hard drive is infected all diskettes that you use in your computer will be infected. Boot sector viruses often spread to other computers by the use of shared infected disks and pirated software applications. The best way to disinfect your computer of the boot sector virus is by using antivirus software.

2.3.2.2.2 Program viruses

A program virus becomes active when the program files (usually with extensions .BIN, .COM, .EXE, .OVL, .DRV) carrying the virus is opened. Once active, the virus will make copies of it and will infect other programs on the computer.

2.3.2.2.3 Multipartite viruses

A multipartite virus is a hybrid of a Boot Sector and Program viruses. It infects program files and when the infected program is active it will affect the boot record. So the next time you start up your computer it'll infect your local drive and other programs on your computer.

2.3.2.2.4 Stealth viruses

A stealth virus can disguise itself by using certain tactics to prevent being detected by antivirus software. These tactics include altering its file size, concealing itself in memory, and so on. This type of virus is nothing new, in fact, the first computer virus, dubbed Brain, was a stealth virus. A good antivirus should be able to detect a stealth virus lurking on your hard drive by checking the areas the virus infected and evidence in memory.

2.3.2.2.5 Polymorphic viruses

A polymorphic virus acts like a chameleon, changing its virus signature (also known as binary pattern) every time it multiplies and infects a new

file. By changing binary patterns, a polymorphic virus becomes hard to detect by an antivirus program.

2.3.2.2.6 Macro Viruses

A macro virus is programmed as a macro embedded in a document. Many applications, such as Microsoft Word and Excel, support macro languages. Once a macro virus gets on to your computer, every document you produce will become infected. This type of virus is relatively new and may slip by your antivirus software if you don't have the most recent version installed on your computer. .

2.3.2.3 Active X and Java Control

Some users do not know how to manage and control their web browser to allow or prohibit certain functions to work, such as enabling or disabling sound, pop ups, and so on. Leaving your computer in danger of being targeted by unwanted software or adware floating in cyberspace.

2.3.3 Computer Safety Precautions

What safety precautions should be undertaken in order to protect your computer from frequent break down?

- Never use the computer in a dusty environment
- Water or moisture should be avoided near computers or in a computer room.
- Never eat or drink in a computer room. Liquids might splash on the machines.
- Do not smoke near computers.
- Do not block the ventilation holes on a computer when it is hot.
- Use a dry, clean cloth to clean not a wet cloth.
- Computer rooms must be well ventilated. Computers hate heat or stuff atmosphere.
- Do not allow or bring diskettes from outside. They may have viruses.
- Do not switch the computer on and off abruptly or irresponsibly.
- Protect the machines using UPS and stabilizers.
- When In Doubt? Please Ask An Expert.

2.3.4 Protect yourself: Computer Health and Safety issues

The information in this guide will help you to develop good working practices when using a personal computer or workstation.
If you learn good habits now, it saves you from experiencing problems in the future.

2.3.4.1 Adopt a good posture

A good working posture is one which can be sustained with the minimum of static muscular effort. In general, a varied working position is better than a fixed working posture.

However, a working position which is static and relaxed is better than one which is static and tense.

Your upper body is most comfortable when:

- Your back is supported.
- Your head is up.
- Your upper arms are relaxed.

Your hands and wrists are most comfortable when:

- Your forearm is nearly at a right angle to your upper arm.
- Your wrist is in a straight line with your hand and forearm.

Adjust your seating position

In order to improve your posture, adjust your chair so that:

- Your lower back is supported.
- Your knees are level with your hips.
- Your feet are flat on the floor.
- Your eye level is just above the top of the screen. Tilt your screen if necessary.
- The screen is directly in front of you, not at an angle.

Type using both hands ... or better still, learn to touch type

If your arms are raised or your wrists are bent for long periods of keyboarding, tendon and nerve disorders can result.

It is worth learning to touch type because typing encourages the correct positioning of your hand and wrist so you will not overstrain your forefingers.

Remember that using the mouse a great deal can put a strain on your hand and wrist muscles.

2.3.4.2 Repetitive Strain Injury - RSI

Keyboard-induced RSI is caused by a combination of rapid keyboard movements, by arms in a static position, over a long period of time.

There are several factors that can lead to keyboard-related RSI.

These include:

- Rapid, repetitive movements.
- An awkward working position.
- An excessive work- load.
- Tight deadlines.
- Inadequate rest breaks.

To prevent the symptoms of RSI, watch your posture, work at a steady rate and take regular breaks from the screen.

2.3.4.3 Eyes right

According to medical evidence, computer use is not associated with damage to your eyes or eyesight; nor does it make existing defects worse.

However, eye muscles that shift focus between your source document and a screen for a long period of time can tire.

The symptoms of eye strain include:

- Headaches
- Itching eyes
- Burning eyes
- Blurring
- Nausea
- Fatigue.

If you wear contact lenses you may experience the sensation of dry eyes whilst using a computer. This is because you may blink less often than usual.

2.3.4.4 Radiation

The Health and Safety Executive state that there is no evidence that electromagnetic radiation emitted from computers causes miscarriages, cataracts or skin diseases.

2.3.4.5 Take a break

To prevent the onset of fatigue, you should have a break, or change of activity, for about 10 minutes after every uninterrupted 60 minutes of computer work.

2.3.4.6 Short, frequent breaks are more satisfactory than occasional, longer breaks.

If possible, breaks should be taken away from the screen.

In between breaks, look into the distance and stretch occasionally.

Your safety in the computer laboratory

- Please refrain from eating and drinking in the labs.
- Avoid obstructing gangways with your bags, coats or belongings.
- Remove your printout from the printers before you leave the lab.

Reviewquestion

Unit 3

GENERAL OPERATION OF A COMPUTER

2.4 Starting (Booting) a Computer

Booting is the process of starting a computer and loading the operating system into RAM in order the computer to be used.

Types of Booting

2.4.1 Cold Booting

Is the process of starting your Computer and loading the operating system by turning power on (Main power supply, UPS, System unit, Monitor). It involves starting a computer that has been previous off.

2.4.2 Warm Booting

is the process of restating your computer and loading the operating system after it has been running, you just press restart button or using a three key combination i.e. Ctrl+Alt+Del. This can be after a computer has hanged i.e. when it's not responding to any command

2.5 Computer peripherals

Refers devices connected to the computer system unit and controlled by the CPU such as keyboard, mouse, printer, card reader etc. The point of connection is called the port.

2.6 System Unit



The unit houses the brain of your computer, including the memory, power supply, and central processor. All other components are considered *peripheral*.

Turning on the Computer



To turn on the computer, press the power button on the front of the System Unit. The power button has this symbol.

Depress the button and the computer will begin to *boot up*.

The term *boot up* refers to the loading of the operating system and other basic software. The procedure also determines what peripheral devices are connected to the computer.

2.6.1 Lights on the Front

Green lights indicate that the power is on and the equipment is running. *Orange lights* indicate that the equipment is in a low-power or *sleep* mode. The equipment is still *on* but not running.

Note: Computers should be plugged into a surge protector (suppressor) or UPS (Uninterruptible Power Supply). A surge protector protects the computer from power surges that can occur in electrical lines. An UPS has a battery that will maintain power for a period of time in the event of a power outage. This enables the user to shut the computer down properly before the discontinuation of power from the source.

2.6.2 Keyboard Operation



Alphabet keys

The letters of the alphabet and some punctuation marks are in these three rows. The order of the keys is called QWERTY from the order of the keys on the top row. This arrangement of the letters was inherited from the typewriter. It is not the most efficient layout. With the first typewriters, the typists had trouble with the mechanical keys jamming each other because the typists could strike the keys faster than the keys could get out of each others' way. So the letters were arranged to slow down the typists' speed. Now that electric typewriters and computer keyboards no longer have mechanical keys, a more efficient layout could be used. But so many people are familiar and skilled with the old way that it doesn't seem likely that the layout will change.

Alt

The Alt key does things by itself. But if you hold it down while pressing another key, the effect of that key may be different from usual. Exactly what will happen will depend on what program is running at the time.



Arrow keys

These four keys are used to move the cursor on the screen. The up and down arrows move the cursor up or down one line. The left and right arrows move the cursor one character.



Keyboard

When you press the Tab key, the cursor navigates around the screen in a predetermined path. The Tab key scrolls from the top to the bottom of the screen. If you want to scroll up, hold down the Shift key and press the Tab key.

Some computer users prefer to use the keyboard to accomplish various tasks on the screen. They rely on the Alt, Ctrl, Tab, and Enter keys to activate the same functions as the mouse. With both the mouse and keyboard, you can accomplish nearly every task.

2.6.2.1 Keyboard Tips

Press - Push down on a key to initiate an action on a screen in Cyber LAB.

- **Underlined Letters** - When a letter in a button name is underlined, it indicates that you can use a shortcut key to do a task.

For example, to activate the OK button, click it or press the Alt key and the underlined letter of "O," namely Alt + O.

Keyboard key functions are:

- **Alt Key** - A key on the keyboard that is used in combination with a letter to produce an action in the application.
- **Arrows** - You can use the up and down arrows on your keyboard to move up and down a drop-down list on the screen or a selection list. Use the left and right arrows to move in text boxes.
- **Backspace Key** - You can use the Backspace key to delete individual characters that you entered in a text box.
- Two other ways to delete text in a text box are:
 - 1) Double-click to highlight all the text in a text box and then press the Delete key,

or

2) In a text box that offers an options list, double-click to highlight the text in a text box and then select another option from the list that displays.

- **End Key** - Use the End key to navigate to last text typed in a line or to the end of a line in a text box.
- **Enter Key** - After you enter information in a text box, use the Enter key to accept the information into Cyber LAB.
- **Home Key** - Use the Home key to navigate to the left-hand margin of a text box or screen.
- **Tab Key** - Use the Tab key on the keyboard to move down a screen and the Tab and Shift keys to move up the screen.

2.7 Other Equipments

The monitor must also be powered along with any other peripheral devices (such as a printer or scanner), other than the keyboard and mouse. The keyboard and mouse receive power from the CPU.

2.8 Windows Desktop

The windows desktop contains various icons, which access programs operating in the Windows operating system. An icon is a symbol or graphic representing a program or command.

2.8.1 Moving around the Windows Desktop

To move around the Windows Desktop, use the mouse. The mouse will move the arrow on the screen.

2.8.2 Windows Buttons

There are buttons on the screen, which enable you to perform commands within a window. Buttons usually are smallish gray squares that contain an icon. Buttons are activated by moving the mouse pointer so that the tip of the pointer is pointing to the center of a button, then click the mouse.



Three buttons found on almost every window are the minimize, resize, and close buttons. These are found in the upper right corner of each window. The minimize button allows you to *minimize* or set aside a program, so it remains open or active, but allows you to see the Windows Desktop. The resize button (also called the maximize or restore button) allows you to change the size of the window on the screen. The close button closes the window and program. You would need to restart the program if you click on the close button.

2.9 Computer Rules and Lab care

- 1) A computers must rest on a firm table to avoid shaking , shaking may damage the disk
- 2) Never abstract the ventilation of the computer casing
- 3) Never connect computer when the system unit is on
- 4) Never move the system unit when power is on
- 5) Avoid diskettes coming from outside, because they may come with Virus
- 6) Ensure that the computer is in an open space where there is free air circulation
- 7) Ensure that there is Antivirus
- 8) Always use stabilizers to protect your computer from damage by power fluctuations
- 9) Ensure that the connection is firm
- 10) Service your computer at least twice in a year
- 11) Do not open a computer for inside cleaning , unless you are qualified person(Technician)

2.10 Precautions taken in keeping diskettes

- 1) Do not fold a disk
- 2) Do not place a diskette near magnetic field such as near a radio speaker or on top of your CPU or near electronic motor
- 3) Keep the diskette away from intense heat
- 4) Do not expose it to x-Ray
- 5) Do not drop water on the exposed surface of a diskette
- 6) Do not force it into the drive , it should slip in with little or no resistance
- 7) Do not remove or insert it from its drive when the drive active light is on
- 8) Do not drop it on a hard surface e.g. on a floor

2.11 Important Keyboard Shortcuts

2.11.1 Windows system key combinations

- F1: Help
- CTRL+ESC: Open **Start** menu
- ALT+TAB: Switch between open programs
- ALT+F4: Quit program
- SHIFT+DELETE: Delete item permanently

2.11.2 Windows program key combinations

- CTRL+C: Copy
- CTRL+X: Cut
- CTRL+V: Paste
- CTRL+Z: Undo
- CTRL+B: Bold
- CTRL+U: Underline
- CTRL+I: Italic
- CTRL+O: open
- CTRL+P: print

3 Internet

3.1 Introduction

By the turn of the century, information, including access to the Internet, will be the basis for personal, economic, and political advancement. The popular name for the Internet is the information superhighway. Whether you want to find the latest financial news, browse through library catalogs, exchange information with colleagues, or join in a lively political debate, the Internet is the tool that will take you beyond telephones, faxes; The Internet supplements the traditional tools you use to gather information

3.2 Definition of Internet

The Internet links are computer networks all over the world so that users can share resources and communicate with each other. Some computers have direct access to all the facilities on the Internet such as the universities. And other computers, e.g. privately-owned ones, have indirect links through a commercial service provider, who offers some or all of the

Internet facilities. In order to be connected to Internet, you must go through service suppliers. Many options are offered with monthly rates. Depending on the option chosen, access time may vary.

The Internet is what we call a met network, that is, a network of networks that spans the globe. It's impossible to give an exact count of the number of networks or users that comprise the Internet, but it is easily in the thousands and millions respectively. The Internet employs a set of standardized protocols which allow for the sharing of resources among different kinds of computers that communicate with each other on the network. These standards, sometimes referred to as the Internet Protocol Suite, are the rules that developers adhere to when creating new functions for the Internet.

The Internet is also what we call a distributed system; there is no central archive. Technically, no one runs the Internet. Rather, the Internet is made up of thousands of smaller networks. The Internet thrives and develops as its many users find new ways to create, display and retrieve the information that constitutes the Internet.

An intranet is a private computer network that uses Internet protocols and network connectivity to securely share part of an organization's information or operations with its employees.

3.3 History & Development of the Internet

In its infancy, the Internet was originally conceived by the Department of Defense as a way to protect government communications systems in the event of a military strike. The original network, dubbed Arpanet (for the Advanced Research Projects Agency that developed it) evolved into a communications channel among contractors, military personnel, and university researchers who were contributing to ARPA projects.

The network employed a set of standard protocols to create an effective way for these people to communicate and share data with each other.

ARPAnet's popularity continued to spread among researchers and in the 1980 the National Science Foundation, who's NSFNet, linked several high speed computers, and took charge of what had come to be known as the Internet. By the late 1980's, thousands of cooperating networks were participating in the Internet.

In 1991, the U.S. High Performance Computing Act established the NREN (National Research & Education Network). NREN's goal was to develop and

maintain high-speed networks for research and education, and to investigate commercial uses for the Internet. The rest, as they say, is history in the making. The Internet has been improved through the developments of such services as Gopher and the World Wide Web. Even though the Internet is predominantly thought of as a research oriented network, it continues to grow as an informational, creative, and commercial resource every day and all over the world.

3.4 Advantages and Disadvantages of Using Internet

3.4.1 **Advantages**

3.4.1.1 Email

Email is now an essential communication tools in business. It is also excellent for keeping in touch with family and friends. The advantages to email is that it is free (no charge per use) when compared to telephone, fax and postal services.

3.4.1.2 Information

There is a huge amount of information available on the internet for just about every subject known to man, ranging from government law and services, trade fairs and conferences, market information, new ideas and technical support.

3.4.1.3 Services

Many services are now provided on the internet such as online banking, job seeking and applications, and hotel reservations. Often these services are not available off-line or cost more.

3.4.1.4 Buy or sell products

The internet is a very effective way to buy and sell products all over the world.

Communities

Communities of all types have sprung up on the internet. It's a great way to meet up with people of similar interest and discuss common issues

3.4.2 Disadvantages

3.4.2.1 Theft of Personal information

If you use the Internet, you may be facing grave danger as your personal information such as name, address, credit card number etc. can be accessed by other culprits to make your problems worse.

3.4.2.2 Spamming

Spamming refers to sending unwanted e-mails in bulk, which provide no purpose and needlessly obstruct the entire system. Such illegal activities can be very frustrating for you, and so instead of just ignoring it, you should make an effort to try and stop these activities so that using the Internet can become that much safer.

3.4.2.3 Virus threat

Virus is nothing but a program which disrupts the normal functioning of your computer systems. Computers attached to internet are more prone to virus attacks and they can end up into crashing your whole hard disk, causing you considerable headache.

3.4.2.4 Pornography

This is perhaps the biggest threat related to your children's healthy mental life. A very serious issue concerning the Internet. There are thousands of pornographic sites on the Internet that can be easily found and can be a detrimental factor to letting children use the Internet.

3.5 Advantages and Disadvantages of Networking Computers

3.5.1 Advantages of Networking

3.5.1.1 Connectivity and Communication

Networks connect computers and the users of those computers. Individuals within a building or work group can be connected into *local area networks (LANs)*; LANs in distant locations can be interconnected into larger *wide area networks (WANs)*. Once connected, it is possible for network users to communicate with each other using technologies such as electronic mail. This makes the transmission of business (or non-business) information easier, more efficient and less expensive than it would be without the network.

3.5.1.2 Data Sharing

One of the most important uses of networking is to allow the sharing of data. Before networking was common, an accounting employee who wanted to prepare a report for her manager would have to produce it on his PC, put it on a floppy disk, and then walk it over to the manager, who would transfer the data to her PC's hard disk.

3.5.1.3 Hardware Sharing

Networks facilitate the sharing of hardware devices. For example, instead of giving each of 10 employees in a department an expensive printer, one printer can be placed on the network for everyone to share.

3.5.1.4 Internet Access

The Internet is itself an enormous network, so whenever you access the Internet, you are using a network. The significance of the Internet on modern society is hard to exaggerate, especially for those of us in technical fields.

3.5.1.5 Internet Access Sharing

Small computer networks allow multiple users to share a single Internet connection. Special hardware devices allow the bandwidth of the connection to be easily allocated to various individuals as they need it, and permit an organization to purchase one high-speed connection instead of many slower ones.

3.5.1.6 Data Security and Management

In a business environment, a network allows the administrators to much better manage the company's critical data. Instead of having this data spread over dozens or even hundreds of small computers in a haphazard fashion as their users create it, data can be centralized on shared servers. This makes it easy for everyone to find the data, makes it possible for the administrators to ensure that the data is regularly backed up, and also allows for the implementation of security measures to control that can read or change various pieces of critical information.

3.5.1.7 Entertainment

Networks facilitate many types of games and entertainment. The Internet itself offers many sources of entertainment, of course. In addition, many multi-player games exist that operate over a local area network. Many home networks are set up for this reason, and gaming across wide area networks (including the Internet) has also become quite popular. Of course, if you are running a business and have easily-amused employees, you might insist that this is really a *disadvantage* of networking and not an advantage!

3.5.2 Disadvantages of Networking

- i. If Server develops a fault then users may not be able to run the application programs.
- ii. A fault in the network can cause user to lose the data.
- iii. If the network stops operating then it may not be possible to access to various computers.
- iv. It is difficult to make the system secure from hackers,
- v. Easy spread of Virus because of sharing resources
- vi. Decisions on resource planning tend to become centralized.
- vii. As traffic increases on a network the performance degrades unless it is designed properly.
- viii. The larger the network becomes difficult to manage.

3.6 What makes the internet work?

The unique thing about the Internet is that it allows many different computers to connect and talk to each other. This is possible because of a set of standards, known as protocols that govern the transmission of data over the network:

TCP/IP (Transmission Control Protocol/Internet Protocol). Most people who use the Internet aren't so interested in details related to these protocols. They do, however, want to know what they can do on the Internet and how to do it effectively.

3.7 Components of the Internet

3.7.1 **World Wide Web**

The World Wide Web (abbreviated as the Web or WWW) is a system of Internet servers that supports hypertext to access several Internet protocols on a single interface. Almost every protocol type available on the Internet is accessible on the Web. This includes e-mail, FTP, Telnet, and Usenet News. In addition to these, the World Wide Web has its own protocol: HyperText Transfer Protocol, or HTTP. These protocols will be explained below.

The World Wide Web provides a single interface for accessing all these protocols. This creates a convenient and user-friendly environment. It is not necessary to be conversant in these protocols within separate, command-level environments, as was typical in the early days of the Internet. The Web gathers together these protocols into a single system. Because of this feature, and because of the Web's ability to work with multimedia and advanced programming languages, the Web is the most popular component of the Internet.

The operation of the Web relies primarily on hypertext as its means of information retrieval. HyperText is a document containing words that connect to other documents. These words are called links and are selectable by the user. A single hypertext document can contain links to many documents. In the context of the Web, words or graphics may serve as links to other documents, images, video, and sound. Links may or may not follow a logical path, as each connection is programmed by the creator of the source document. Overall, the Web contains a complex virtual web of connections among a vast number of documents, graphics, videos, and sounds.

Producing hypertext for the Web is accomplished by creating documents with a language called HyperText Markup Language, or HTML. With HTML, tags are placed within the text to accomplish document formatting, visual features such as font size, italics and bold, and the creation of hypertext links. Graphics and multimedia may also be incorporated into an HTML document.

HTML is an evolving language, with new tags being added as each upgrade of the language is developed and released. For example, visual formatting features are now often separated from the HTML document and placed into Cascading Style Sheets (CSS). This has several advantages, including the fact that an external style sheet can centrally control the formatting of multiple documents. The World Wide Web Consortium (W3C), led by Web

founder Tim Berners-Lee, coordinates the efforts of standardizing HTML. The W3C now calls the language XHTML and considers it to be an application of the XML language standard.

The World Wide Web consists of files, called pages or home pages, containing links to documents and resources throughout the Internet.

The Web provides a vast array of experiences including multimedia presentations, real-time collaboration, interactive pages, radio and television broadcasts, and the automatic "push" of information to a client computer or to an RSS reader. Programming languages such as Java, JavaScript, Visual Basic, Cold Fusion and XML extend the capabilities of the Web. Much information on the Web is served dynamically from content stored in databases. The Web is therefore not a fixed entity, but one that is in a constant state of development and flux.

3.7.2 E-mail

Electronic mail, or e-mail, allows computer users locally and worldwide to exchange messages. Each user of e-mail has a mailbox address to which messages are sent. Messages sent through e-mail can arrive within a matter of seconds.

A powerful aspect of e-mail is the option to send electronic files to a person's e-mail address. Non-ASCII files, known as binary files, may be attached to e-mail messages. These files are referred to as MIME attachments. MIME stands for Multimedia Internet Mail Extension, and was developed to help e-mail software handle a variety of file types. For example, a document created in Microsoft Word can be attached to an e-mail message and retrieved by the recipient with the appropriate e-mail program. Many e-mail programs offer the ability to read files written in HTML, which is itself a MIME type.

3.7.3 Telnet

Telnet is a program that allows you to log into computers on the Internet and use online databases, library catalogs, chat services, and more. There are no graphics in Telnet sessions, just text. To Telnet to a computer, you must know its address. This can consist of words (locis.loc.gov) or numbers (140.147.254.3). Some services require you to connect to a specific port on the remote computer. In this case, type the port number after the Internet address. Example: telnet nri.reston.va.us 185.

Telnet is available on the World Wide Web. Probably the most common Web-based resources available through Telnet have been library catalogs, though most catalogs have since migrated to the Web. A link to a Telnet resource may look like any other link, but it will launch a Telnet session to make the connection. A Telnet program must be installed on your local computer and configured to your Web browser in order to work.

With the popularity of the Web, Telnet is less frequently used as a means of access to information on the Internet.

3.7.4 FTP

FTP stands for File Transfer Protocol. This is both a program and the method used to transfer files between computers. Anonymous FTP is an option that allows users to transfer files from thousands of host computers on the Internet to their personal computer account. FTP sites contain books, articles, software, games, images, sounds, multimedia, course work, data sets, and more.

If your computer is directly connected to the Internet via an Ethernet cable, you can use one of several PC software programs, such as WS_FTP for Windows, to conduct a file transfer.

FTP transfers can be performed on the World Wide Web without the need for special software. In this case, the Web browser will suffice. Whenever you download software from a Web site to your local machine, you are using FTP. You can also retrieve FTP files via search engines.

3.7.4.1 E-mail Discussion Groups

One of the benefits of the Internet is the opportunity it offers to people worldwide to communicate via e-mail. The Internet is home to a large community of individuals who carry out active discussions organized around topic-oriented forums distributed by e-mail. These are administered by various types of software programs.

A great variety of topics are covered by discussion groups. When you subscribe to a group, messages from other subscribers are automatically sent to your electronic mailbox. You subscribe by sending an e-mail message to the address of the group. You must have a e-mail account to participate in a listserv discussion group.

Listserv, majordomo and Listproc are among the programs that administer e-mail discussion groups. The commands for subscribing to and managing your list memberships are similar to those of listserv.

3.7.4.2 Usenet News

Usenet News is a global electronic bulletin board system in which millions of computer users exchange information on a vast range of topics. The major difference between Usenet News and e-mail discussion groups is the fact that Usenet messages are stored on central computers, and users must connect to these computers to read or download the messages posted to these groups. This is distinct from e-mail distribution, in which messages arrive in the electronic mailboxes of each list member.

Usenet itself is a set of machines that exchanges messages, or articles, from Usenet discussion forums, called newsgroups. Usenet administrators control their own sites, and decide which (if any) newsgroups to sponsor and which remote newsgroups to allow into the system.

There are thousands of Usenet newsgroups. These range from academic to recreational topics. Serious computer-related work takes place in Usenet discussions. A small number of e-mail discussion groups also exist as Usenet newsgroups.

The Usenet newsfeed can be read by a variety of newsreader software programs. For example, the Netscape suite comes with a newsreader program called Messenger. Newsreaders are also available as standalone products.

Usenet is not as popular nowadays as it once was. Blogs and RSS feeds are newer modes of communication that have caught the interest of Internet users.

3.7.4.3 Chat & Instant Messaging

Chat programs allow users on the Internet to communicate with each other by typing in real time. They are sometimes included as a feature of a Web site, where users can log into the "chat room" to exchange comments and information about the topics addressed on the site. Chat may take other, more wide-ranging forms. For example, America Online is well known for sponsoring a number of topical chat rooms.

Internet Relay Chat (IRC) is a service through which participants can communicate to each other on hundreds of channels. These channels are usually based on specific topics. While many topics are frivolous, substantive conversations are also taking place. To access IRC, you must use an IRC software program.

A variation of chat is the phenomenon of instant messaging. With instant messaging, a user on the Web can contact another user currently logged in and type a conversation. Most famous is America Online's Instant Messenger. ICQ, MSN and Yahoo also offer chat programs. Open Source chat programs include GAIM and Jabber.

3.7.5 E-mail (detailed description)

Electronic mail, or e-mail, is probably the most popular and widely used Internet function. E-mail, email, or just mail, is a fast and efficient way to communicate with friends or colleagues. You can communicate with one person at a time or thousands; you can receive and send files and other information. You can even subscribe to electronic journals and newsletters. You can send an e-mail message to a person in the same building or on the other side of the world.

3.7.5.1 Advantages of E-mail

- i. Email is effective in providing quick answers to yes and no, type questions. eg. Do you do international delivery?
- ii. Email is effective in finding the right person in an organization or company to answer your question.
- iii. Email is good to make appointments for busy people.
- iv. Email can distribute information quickly to many people for the time it takes to email one person.

3.7.5.2 Disadvantages of E-mail

- i. Email can become time-consuming for answering complicated questions and misunderstandings can arise because cultural differences in the interpretation of certain words. The telephone is much better for providing detailed answers or if you feel that the question is not absolutely clear.
- ii. Email can compromise the security of an organization because sensitive information can be easily distributed accidentally or deliberately. Email should be entrusted to well trained and trusted staff members.
- iii. You can only send to a person who has the e-mail and you can't send something physical like money

3.7.5.3 How does E-mail Work?

E-mail is an asynchronous form of communication, meaning that the person whom you want to read your message doesn't have to be available at the precise moment you send your message. This is a great convenience for both you and the recipient.

On the other hand, the telephone, which is a synchronous communication medium, requires that both you and your listener be on the line at the same time in order for you to communicate (unless you leave a voice message). It will be impossible to discuss all the details of the many e-mail packages available to Internet users.

Fortunately, however, most of these programs share basic functionality which allows you to:

- *send and receive mail messages

- *save your messages in a file

- *print mail messages

- *reply to mail messages

- *attach a file to a mail message

3.7.5.3.1 *Parts of an E-mail address*

Senders address

Receivers address

Subject

Message

3.7.5.3.2 *Reading an Internet Address*

Sample Internet Address: custcare@aucegypt.edu

The Internet address has three parts:

- A user name [custcare in the example above]
- An "at" sign (@)
- The address of the user's mail server [aucegypt.edu in the example above] Sometimes it's useful to read an Internet address (like custcare@aucegypt.edu) or a domain name from right to left because it helps you determine information about the source of the address. An address like 201B6DQF@asu.edu doesn't tell me much about the person who's sending me a message, but I can deduce that the sender is affiliated with an educational institution because of the suffix edu

EDU Educational sites in the United States

COM Commercial sites in the United States and Uganda

GOV Government sites in the United States

NET Network administrative organizations

MIL Military sites in the United States

ORG Organizations in the U.S. not covered by the categories above (e.g., non-profit organizations).

3.8 Introduction to the World Wide Web

The World Wide Web (also referred to as WWW or W3) is the fastest growing area of the Internet. While gopher was an important step in allowing users to "browse" through the Internet's vast resources, the World Wide Web has raised excitement about the Internet to new heights.

What makes the World Wide Web appealing and innovative is its use of hypertext as a way of linking documents to each other. A highlighted word or phrase in one document acts as a pointer to another document that amplifies or relates to the first document. When looking at a WWW document, the reader doesn't have to follow every pointer, or link (also called a hypertext link), only those that look interesting or useful. In this way, the user tailors the experience to suit his or her needs or interests. The other very appealing aspect of the World Wide Web is the use of graphics and sound capabilities. Documents on the WWW include text, but they may also include still images, video, and audio for a very exciting presentation. People who create WWW documents often include a photograph of themselves along with detailed professional information and personal interests. (This is often called a person's home page.)

3.8.1 What makes the WWW work?

WWW is another example of client/server computing. Each time a link is followed, the client is requesting a document (or graphic or sound file) from a server (also called a Web server) that's part of the World Wide Web that "serves" up the document. The server uses a protocol called HTTP or *Hypertext Transfer Protocol*. The standard for creating hypertext documents for the WWW is *Hypertext Markup Language* or HTML. HTML essentially codes plain text documents so they can be viewed on the Web.

3.8.2 Uniform Resource Locators or URLs:

A Uniform Resource Locator or URL is the address of a document you'll find on the WWW. Your WWW browser interprets the information in the URL in order to connect to the proper Internet server and to retrieve your desired document. Each time you click on a hyperlink in a WWW document, you're actually instructing your browser to find the URL that's embedded within the hyperlink.

The elements in a URL: Protocol: //server's address/filename

Hypertext protocol: <http://www.aucegypt.edu>

File Transfer Protocol: <ftp://ftp.dartmouth.edu>

3.8.3 WWW Clients or "Browsers"

The program you use to access the WWW is known as a browser because it "browses" the WWW and requests these hypertext documents. Browsers can be graphical, like Netscape and Mosaic, allowing you to see and hear the graphics and audio; text-only browsers (i.e., those with no sound or graphics capability) are also available. All of these programs understand http and other Internet protocols such as FTP, gopher, mail, and news, making the WWW a kind of "one stop shopping" for Internet users.

3.8.4 Search Engines

Search Engines, Help you to look for the information you a searching: These search engines search through the Web documents, identifying text that is the basis for keyword searching. Each search engine works in a different way. Some engines scan for information in the title or header of the document; others look at the bold "headings" on the page for their information. The fact that search engines gather information differently means that each will probably yield different results. Therefore, it's wise to try more than one search engine when doing Web searching.

- i. Yahoo
- ii. Google
- iii. Met search etc

3.9 Internet Connection

3.9.1 Choosing an Internet Provider?

What should one look for when choosing an Internet Provider?

As internet professionals, we are often asked "Can you help me find an internet provider?" The answer is "Yes, we can." Whether looking for a new internet service provider (ISP) or simply replacing your old one, there are several key factors to consider. People are different and so are their needs in internet providers. Some people need only residential access while other road warriors need local phone numbers across the entire continent. Regardless of what kind of internet user you are, here are some of the key factors to consider when choosing a new internet provider:

- i. Local Access Numbers
- ii. High Speed Connections
- iii. Stability
- iv. Reliability
- v. Free Technical Support
- vi. Free Email
- vii. Free Spam Filtering
- viii. Web Hosting

3.9.1.1 Local Access Numbers

It is important that you are able to get to the internet from your choice of locations. If you only want to connect to the internet from your home, a local internet service provider may be a good choice or a national service provider that has local access numbers in your area may better serve your needs. However, if you will be traveling and using your computer on the road, then a national provider will be your best choice.

3.9.1.2 High Speed Connections

High speed internet access can come in many shapes and sizes. Many internet providers tout their high speed technology such as cable. Some ISPs can provide **dial up accelerators** directly over an existing phone line at a much lower cost by using advanced data compression technology.

3.9.1.3 Stability

You want to choose an internet service provider that will meet your needs for years to come. Many internet service providers disappeared in the dot com crash of the last few years. Many others were built just to make a quick buck. You should choose a company that is built to last for the long run. The long run is a foreign concept to much start up internet providers.

3.9.1.4 Reliability

A fast, cheap connection is no good if you get disconnected every 10 minutes. Your internet service provider should keep you connected.

3.9.1.5 Free Technical Support

Many ISPs provide only online support. This can be effective and it keeps costs down. Sometimes though, you just need to talk to a person. The best internet service providers have 24 hour toll free support available at no cost to you.

3.9.1.6 Free Email

Most ISPs give you a number of email accounts when you sign up. The important question is do you have control of the accounts? The internet service provider should give you a customer control panel to administer you own email accounts.

3.9.1.7 Free Spam Filtering

Do you get tired of junk email filling up your in box? While no one can completely stop it, quality internet providers automatically filter incoming email and prevent known offenders from getting through. Look for ISPs with quality spam filtering.

3.9.1.8 Free Website Hosting

Your internet service provider should provide free website hosting for your personal website. Five to ten megabytes is plenty. This space is great for personal sites, but is not the best place to put your business website. Business sites should have their own dedicated web address such as www.your-business.com.

3.10 Internet Connection Options

Until recently, the two primary methods of accessing the Internet were through a **network connection**, allowing users of local area networks (LANs) to go online through their school or workplace systems, and **dial-up connections** through a modem and phone line. However, new connection options allow for greater speeds and flexibility, while keeping costs to a minimum.

3.11 Newer connection options

3.11.1.1 **Cable Internet**

These systems allow your computer to connect to the Internet through the same cable that carries your TV signal. Monthly service charges are usually not much more than standard modem connection costs, but you have to rent or purchase a "cable modem." Additionally, your computer will need an Ethernet card (a special circuit board that allows for network connections). Not all cable service operators offer this service; call your local operator for more information.

3.11.1.2 **Satellite connections**

DirecPC (<http://www.direcpc.com/>) allows you to download Internet files via a satellite connection. This is an efficient method for receiving large Web graphics and other items, but you still need a modem connection for other features. You must purchase the connection hardware as well as subscribe to the service.

3.11.1.3 **Integrated Services Digital Network (ISDN)**

An ISDN line is a type of digital phone line that can transmit data many times faster than a conventional modem and phone line. To learn more about ISDN, go to <http://www.isdn.ocn.com/index.shtml>

3.11.1.4 **Wireless connections**

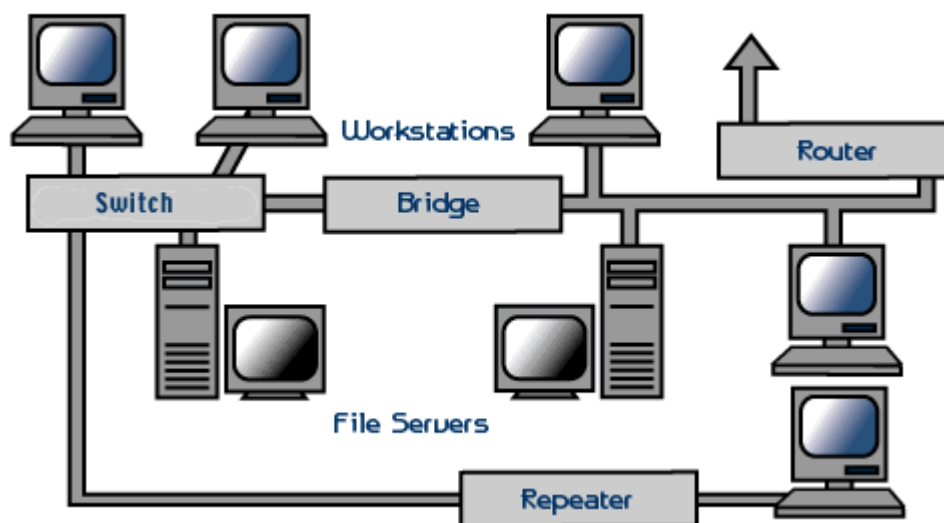
Pagers, cellular phones and personal digital assistants (PDAs) now allow varying levels of Internet access, from notification of E-mail to limited Web connections. Many of these services remain in the experimental stage.

3.11.1.5 WebTV

Introduced in late 1996, WebTV (<http://www.webtv.net/>) provides Web and E-mail access through ordinary television sets. The connection is made through a custom high-speed modem. You must purchase a special set-top unit for your TV, plus subscribe to the connection service. Recently, similar systems by other manufacturers have appeared on the market to compete with WebTV.

3.12 Networking Hardware

Networking hardware includes all computers, peripherals, interface cards and other equipment needed to perform data-processing and communications within the network. CLICK on the terms below to learn more about those pieces of networking hardware.



This section provides information on the following components:

- File Servers
- Workstations
- Network Interface Cards
- Switches
- Repeaters
- Bridges
- Routers

3.12.1 **File Servers**

A file server stands at the heart of most networks. It is a very fast computer with a large amount of RAM and storage space, along with a fast network interface card. The network operating system software resides on this computer, along with any software applications and data files that need to be shared.

The file server controls the communication of information between the nodes on a network. For example, it may be asked to send a word processor program to one workstation, receive a database file from another workstation, and store an e-mail message during the same time period. This requires a computer that can store a lot of information and share it very quickly. File servers should have at least the following characteristics:

- 800 megahertz or faster microprocessor (Pentium 3 or 4, G4 or G5)
- A fast hard drive with at least 120 gigabytes of storage
- A RAID (Redundant Array of Inexpensive Disks) to preserve data after a disk casualty
- A tape back-up unit (i.e. DAT, JAZ, Zip, or CD-RW drive)
- Numerous expansion slots
- Fast network interface card
- At least of 512 MB of RAM

3.12.2 **Workstations**

All of the user computers connected to a network are called workstations. A typical workstation is a computer that is configured with a network interface card, networking software, and the appropriate cables. Workstations do not necessarily need floppy disk drives because files can be saved on the file server. Almost any computer can serve as a network workstation.

3.12.3 **Network Interface Cards**

The network interface card (NIC) provides the physical connection between the network and the computer workstation. Most NICs are internal, with the card fitting into an expansion slot inside the computer. Some computers, such as Mac Classics,

use external boxes which are attached to a serial port or a SCSI port. Laptop computers can now be purchased with a network interface card built-in or with network cards that slip into a PCMCIA slot.

Network interface cards are a major factor in determining the speed and performance of a network. It is a good idea to use the fastest network card available for the type of workstation you are using.

The three most common network interface connections are Ethernet cards, LocalTalk connectors, and Token Ring cards. According to a International Data Corporation study, Ethernet is the most popular, followed by Token Ring and LocalTalk (Sant'Angelo, R. (1995). *NetWare Unleashed*, Indianapolis, IN: Sams Publishing).

3.12.4 Ethernet Cards

Ethernet cards are usually purchased separately from a computer, although many computers (such as the Macintosh) now include an option for a pre-installed Ethernet card. Ethernet cards contain connections for either coaxial or twisted pair cables (or both) (See fig. 1). If it is designed for coaxial cable, the connection will be BNC. If it is designed for twisted pair, it will have a RJ-45 connection. Some Ethernet cards also contain an AUI connector. This can be used to attach coaxial, twisted pair, or fiber optics cable to an Ethernet card. When this method is used there is always an external transceiver attached to the workstation. (See the Cabling section for more information on connectors.)

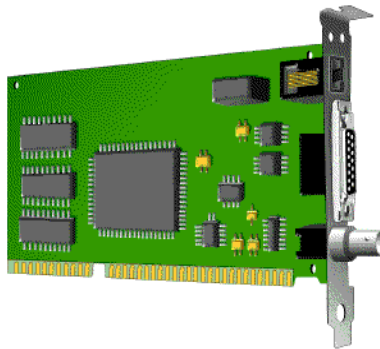


Fig. 1. Ethernet card.
From top to bottom:
RJ-45, AUI, and BNC connectors

3.12.5 LocalTalk Connectors

LocalTalk is Apple's built-in solution for networking Macintosh computers. It utilizes a special adapter box and a cable that plugs into the printer port of a Macintosh (See fig. 2). A major disadvantage of LocalTalk is that it is slow in comparison to Ethernet. Most Ethernet connections operate at 10 Mbps (Megabits per second). In contrast, LocalTalk operates at only 230 Kbps (or .23 Mbps).

Fig.2. LocalTalk connectors

Ethernet Cards vs. LocalTalk Connections	
Ethernet	LocalTalk
Fast data transfer (10 to 100 Mbps)	Slow data transfer (.23 Mbps)
Expensive - purchased separately	Built into Macintosh computers
Requires computer slot	No computer slot necessary
Available for most computers	Works only on Macintosh computers

3.12.6 Token Ring Cards

Token Ring network cards look similar to Ethernet cards. One visible difference is the type of connector on the back end of the card. Token Ring cards generally have a nine pin DIN type connector to attach the card to the network cable.

3.12.7 Switch

A concentrator is a device that provides a central connection point for cables from workstations, servers, and peripherals. In a star topology, twisted-pair wire is run from each workstation to a

central switch/hub. Most switches are active that is they electrically amplify the signal as it moves from one device to another. Switches no longer broadcast network packets as hubs did in the past, they memorize addressing of computers and send the information to the correct location directly. Switches are:

- Usually configured with 8, 12, or 24 RJ-45 ports
- Often used in a star or star-wired ring topology
- Sold with specialized software for port management
- Also called hubs
- Usually installed in a standardized metal rack that also may store netmodems, bridges, or routers

3.12.8 **Repeaters**

Since a signal loses strength as it passes along a cable, it is often necessary to boost the signal with a device called a repeater. The repeater electrically amplifies the signal it receives and rebroadcasts it. Repeaters can be separate devices or they can be incorporated into a concentrator. They are used when the total length of your network cable exceeds the standards set for the type of cable being used.

A good example of the use of repeaters would be in a local area network using a star topology with unshielded twisted-pair cabling. The length limit for unshielded twisted-pair cable is 100 meters. The most common configuration is for each workstation to be connected by twisted-pair cable to a multi-port active concentrator. The concentrator amplifies all the signals that pass through it allowing for the total length of cable on the network to exceed the 100-meter limit.

3.12.9 **Bridges**

A bridge is a device that allows you to segment a large network into two smaller, more efficient networks. If you are adding to an older wiring scheme and want the new network to be up-to-date, a bridge can connect the two.

A bridge monitors the information traffic on both sides of the network so that it can pass packets of information to the correct location. Most bridges can "listen" to the network and

automatically figure out the address of each computer on both sides of the bridge. The bridge can inspect each message and, if necessary, broadcast it on the other side of the network.

The bridge manages the traffic to maintain optimum performance on both sides of the network. You might say that the bridge is like a traffic cop at a busy intersection during rush hour. It keeps information flowing on both sides of the network, but it does not allow unnecessary traffic through. Bridges can be used to connect different types of cabling, or physical topologies. They must, however, be used between networks with the same protocol.

3.12.10 **Routers**

A router translates information from one network to another; it is similar to a super intelligent bridge. Routers select the best path to route a message, based on the destination address and origin. The router can direct traffic to prevent head-on collisions, and is smart enough to know when to direct traffic along back roads and shortcuts.

While bridges know the addresses of all computers on each side of the network, routers know the addresses of computers, bridges, and other routers on the network. Routers can even "listen" to the entire network to determine which sections are busiest -- they can then redirect data around those sections until they clear up.

If you have a school LAN that you want to connect to the Internet, you will need to purchase a router. In this case, the router serves as the translator between the information on your LAN and the Internet. It also determines the best route to send the data over the Internet. Routers can:

- Direct signal traffic efficiently
- Route messages between any two protocols
- Route messages between linear bus, star, and star-wired ring topologies
- Route messages across fiber optic, coaxial, and twisted-pair cabling

4 Computer Crime

Introduction

There are no precise, reliable statistics on the amount of computer crime and the economic loss to victims, partly because many of these crimes are apparently not detected by victims, many of these crimes are never reported to authorities, and partly because the losses are often difficult to calculate. Nevertheless, there is a consensus among both law enforcement personnel and computer scientists who specialize in security that *both* the number of computer crime incidents *and* the sophistication of computer criminals is increasing rapidly. Estimates are that computer crime costs victims in the USA *at least* US\$ 5×10^8 /year and the true value of such crime might be substantially higher. Experts in computer security, who are *not* attorneys, speak of "information warfare". While such "information warfare" is just another name for computer crime, the word "warfare" does fairly denote the amount of damage inflicted on society.

4.1 Internet and computer security

It is a fact; the Internet is just not a safe place to connect your computer to. There are worms constantly scanning for vulnerable computers to infect, Trojans disguised as helpful programs but actually install malicious ones, spyware that reports your activities back to their makers, and hijackers that take control of your web browser and browsing experience. For those people who have been the victim of one of these mentioned infections, removing them and getting your computer back in your control can be a daunting and frustrating experience. The purpose of this is to teach you how to setup your computer in such a way that you minimize as much as possible the risks of contracting one of these infections. Each step is very easy to do and regardless of your computer experience you will have no trouble following along. It is also important to note that there is not one step listed below that is more important than the other. They are all equally important to keeping your computer safe and secure.

Educate yourself and be smart about where you visit and what you click on - Understanding how you can get infected and what to avoid when using the Internet will be the most important step in keeping your computer clean and secure. The majority of people who have infections on their machines were infected due to lack of knowledge and clicking on things that they should not. I will provide a list of actions under this step that you should not do:

- i. Do not open attachments from users that you do not know. This is one of the most effective ways for viruses to infect you. If you do not know the user, then simply do not open the email and delete it.
- ii. Never open an attachment that is a .exe, .pif, .com, or .bat unless you specifically know the file is clean. The majority of these are always bad!
- iii. If you visit a site and a popup appears saying that your computer is unsafe, ignore it! These are gimmicks that are used to make you click on the ad which then can potentially install unwanted malware.
- iv. When you go to a site and a popup occurs, many times they will make them look like a normal Windows message box in order to trick you into clicking on them. Instead just close them by clicking on the X.
- v. Do not visit porn sites! I know some of you may not be happy about this, but the reality is that the majority of spyware and browser hijackers are put on your computer through porn sites.
- vi. Read the license agreement for any software that you install. Many free downloads are offered with spyware and other programs that you DO NOT want on your computer. Reading the agreement may help you to spot them.
- vii. **Use an AntiVirus Software** - It is very important that your computer has an antivirus software running on your machine. By having an antivirus program running, files and emails will be scanned as you use them, download them, or open them. If a virus is found in one of the items you are about to use, the antivirus program will stop you from being able to run that program and therefore infect yourself.
- viii. **Update your AntiVirus Software** - There is no point running an antivirus program if you do not make sure it has all the latest updates available to it. If you do not update the software, it will not know about any new viruses, trojans, worms, etc that have been released into the wild since you installed the program. Then if a new infection appears in your computer, the antivirus program will not know that it is bad, and not alert you when you run it and become infected. Therefore it is imperative that you update your Antivirus software at least once a week (Even more if you wish) so that you are protected from all the latest threats.
- ix. **Occasionally Run Online Virus Scans** - Unfortunately not all antivirus programs are created equal. Each program may find infections that other antivirus programs do not and vice-versa. It is

therefore recommended that you occasionally run some free online antivirus scanners to make sure that you are not infected with items that your particular antivirus program does not know how to find. Two online scanners that we recommend are:

<http://housecall.antivirus.com/>
<http://www.pandasoftware.com/activescan/>

Every once in a while, maybe once every 2 weeks, run one or both of these scanners to see if they find anything that may have been missed by your locally installed antivirus software.

- x. **Use a Firewall** - I can not stress how important it is that you use a Firewall on your computer. Without a firewall your computer is susceptible to being hacked and taken over. You may say "Why do I need a firewall?" I have all the latest updates for my programs and operating system, so nobody should be able to hack into my computer". Unfortunately that reasoning is not valid. Many times hackers discover new security holes in software or operating system long before the software company does and therefore many people get hacked before a security patch is released. By using a firewall the majority of these security holes will not be accessible as the firewall will block the attempt.
- xi. **Update your security programs regularly** - As always if you do not update your programs, your programs will not be able to find the newest infections that may be racing around the Internet. It is therefore important that you upgrade the software and spyware/virus definitions for a particular program so that they are running the most effectively.
- xii. **Switch to another browser, like Firefox, or make your Internet Explorer more secure** - Internet Explorer as shipped is by default insecure. With that said you have two choices; either make Internet Explorer more secure or switch another browser like **Mozilla Firefox**. It's an excellent browser and is secure right after installing it. You can find more info on switching from Internet Explorer to Firefox.

4.2 New crimes in cyberspace

There are three major classes of criminal activity with computers:

- *Unauthorized* use of a computer

- This might involve stealing a username and password, or might involve accessing the victim's computer via the Internet through a backdoor operated by a Trojan Horse program.
- Creating or releasing a malicious computer program (e.g., computer virus, worm, Trojan horse).
- Harassment and stalking in cyberspace.

4.3 Old crimes

Similarly, many crimes involving computers are no different from crimes without computers: the computer is only a tool that a criminal uses to commit a crime. For example,

- Using a computer, a scanner, graphics software, and a high-quality color laser or ink jet printer for forgery or counterfeiting is the same crime as using an old-fashioned printing press with ink.
- Stealing a laptop computer with proprietary information stored on the hard disk inside the computer is the same crime as stealing a briefcase that contains papers with proprietary information.
- Using the Internet or online services to solicit sex is similar to other forms of solicitation of sex, and so is not a new crime.
- Using computers can be another way to commit either fraud.

4.3.1 False origin

There are many instances of messages sent in the name of someone who neither wrote the content nor authorized the sending of the message. For example:

- i. E-mails with bogus addresses are sent automatically by **malicious programs** (e.g., the Melissa virus in 1999, the BadTrans worm in 2001, the Klez program in 2002).
- ii. Posting messages in an Internet newsgroup or online bulletin board with a false author's name that is intended to harm the reputation of the real person of that name.

These acts might be punishable by existing criminal statutes that prohibit impersonation, forgery, deceit, or fraud. However, a judge might decide that the specific language in old statutes about writing or signature does not

apply to e-mail. Rather than write new statutes for forged e-mail addresses or unauthorized sending of e-mail in someone else's name. Legislatures therefore need to broaden the existing criminal statutes for analogous crimes with paper and ink.

Similar issues arise in both: (1) fictitious addresses in some unsolicited commercial e-mail, also called spam or junk e-mail, and (2) fictitious source IP addresses in denial of service attacks.

4.3.2 **Unauthorized Use**

Unauthorized use of computers tends generally takes the following forms:

- i. Computer voyeur
- ii. The criminal reads (or copies) confidential or proprietary information, but data is neither deleted nor changed.
 - a. In 1999, the Melissa virus infected a [possibly confidential] document on a victim's computer, then automatically sent that document and copy of the virus via e-mail to other people. Subsequently, the SirCam and Klez malicious programs made a similar release of [possibly confidential] documents from a victim's computer. These malicious programs are a new way to release confidential information from a victim's computer, with the confidential information going *not* to the author of the malicious program, but to some person unknown to the author of the malicious program.

iii. *Changing data*

For example, change a grade on a school transcript; add "money" to a checking account, etc. Unauthorized changing of data is generally a fraudulent act.

iv. *Deleting data*

Deleting entire files could be an act of vandalism or sabotage.

v. *Denying service to authorized users*

On a modern time-sharing computer, *any* user takes some time and disk space, which is then not available to other users. By "denying service to authorized users", I mean gobbling unreasonably large amounts of computer time or disk space, for example:

- a. By sending large amounts of junk e-mail in one day, a so-called "mail bomb",
- b. By having the computer execute a malicious program that puts the processing unit into an infinite loop, *or*,
- c. By flooding an Internet server with bogus requests for webpages, thereby denying legitimate users an opportunity to download a page and also possibly crashing the server. This is called a denial of service **(DoS)** attack.

During 1950-1975, computer programs and data were generally stored on cardboard cards with holes punched in them. If a vandal were to break into an office and either damage or steal the punch cards, the vandal could be adequately punished under traditional law of breaking and entering, vandalism, or theft.

However, after about 1975, it became common to enter programs and data from remote terminals (a keyboard and monitor) using a modem and a telephone line. This same technology allowed banks to retrieve a customer's current balance from the bank's central computer, and merchants to process credit card billing without sending paper forms. But this change in technology also meant that a criminal could alter data and programs from his home, without physical entry into the victim's building. The traditional laws were no longer adequate to punish criminals who used computer modems.

Most unauthorized use of a computer is accomplished by a person in his home, who uses a modem to access a remote computer. In this way, the computer criminal is acting analogous to a burglar. The classic definition of a burglary is:

The breaking and entering of a building with the intent to commit a felony therein.

In traditional burglaries, the felony was typically an unlawful taking of another person's property. However, in the unauthorized use of another's computer, the criminal "enters" the computer via the telephone lines, which is *not* breaking into the building. Either the burglary statute needed to be made more general or new criminal statute(s) needed to be enacted for unauthorized access to a computer. Legislatures chose to enact totally new statutes.

To successfully use a remote computer, any user (including criminals) must have both a valid user name and valid password. There are several basic ways to get these data:

- a. Call up a legitimate user, pretend to be a system administrator, and ask for the user name and password. This sounds ridiculous, but many people will give out such valuable information to anyone who pretends to have a good reason. Not only should you refuse to provide such information, but please report such requests to the management of the online service or the local police, so they can be alert to an active criminal.
- b. Search user's offices for such data, as many people post their user name and password on the side of their monitor or filing cabinet, where these data can be conveniently seen.
- c. Write a program that tries different combinations of user names and passwords until one is accepted.
- d. Use a packet "sniffer" program to find user names and passwords as they travel through networks.
- e. Search through a garbage bin behind the computer building in a university or corporate campus, find trash paper that lists user names and passwords.

A disgruntled employee can use his legitimate computer account and password for unauthorized uses of his employer's computer. This can be particularly damaging when the disgruntled employee is the computer system administrator, who knows master password(s) and can enter any user's file area. Such disgruntled employees can perpetrate an "inside job", working from within the employer's building, instead of accessing a computer via modem.

The computer voyeurs, like petty criminals who peek in other people's windows, generally hack into other people's computers for the thrill of it. In the 1970s and early 1980s, many of these computer voyeurs also used technology to make long-distance telephone calls for free, which technology also concealed their location when they were hacking into computers. Many of these voyeurs take a special thrill from hacking into military computers, bank computers, and telephone operating system computers, because the security is allegedly higher at these computers, so it is a greater technical challenge to hack into these machines.

The criminals who change or delete data, or who deliberately gobble large amounts of computer resources, have a more sinister motive and are capable of doing immense damage.

4.3.3 Altering websites

In recent years, there have been a large number of attacks on websites by hackers who are angry with the owner of the website. Victims of such attacks include various U.S. Government agencies, including the White House and FBI. Attacking the FBI website is like poking a lion with a stick.

In a typical attack, the hacker will delete some pages or graphics, then upload new pages with the same name as the old file, so that the hacker controls the message conveyed by the site.

This is not the worst kind of computer crime. The proper owner of the site can always close the website temporarily, restore *all* of the files from backup media, improve the security at the site, and then re-open the site. Nonetheless, the perpetrator has committed a computer crime by making an *unauthorized* use of someone else's computer or computer account.

One example of punishment for the crime of defacing a website is the case of Dennis M. Moran. On 9 March 2001, Moran (alias "Coolio"), a high school dropout, was sentenced in New Hampshire state court to nine months incarceration and ordered to pay a total of US\$ 15000 restitution to his victims for defacing two websites:

1. In November 1999, he defaced the website of DARE America, an organization that campaigns against use of illicit drugs, whose website was in Los Angeles, California.
2. In February 2000, he defaced the website of RSA Security in Massachusetts.
3. In February 2000, he made "unauthorized intrusions" into computers at four different U.S. Army and Air Force installations.

4.3.4 Denial of Service (DoS) Attacks

A denial of service attack occurs when an Internet server is flooded with a nearly continuous stream of bogus requests for WebPages, thereby denying legitimate users an opportunity to download a page and also possibly crashing the web server.

Criminals have developed a simple technique for executing a distributed DoS attack:

- i. The criminal first plants remote-control programs on dozens of computers that have broadband access to the Internet. The remote-control program will, at the command of the criminal, issue a nearly continuous series of *pings* to a specified victim's website.
- ii. When the criminal is ready to attack, he instructs the programs to begin pinging a specific target address. The computers containing the remote-control programs act as "zombies".
- iii. The victim computer responds to each ping, but because the zombie computers gave false source addresses for their pings, the victim computer is unable to establish a connection with the zombie computers. Because the victim computer waits for a response to its return ping, and because there are more zombie computers than victims, the victim computer becomes overwhelmed and either (a) does nothing except respond to bogus pings or (b) crashes.
- iv. Typically, after one or two hours, the criminal instructs his programs to stop pinging the victim. This brief duration is not because the criminal is a nice person, but because long-duration attacks make it easier for engineers at the victim's website to promptly trace the source of the attacks.

The following is one case involving a famous series of DoS attacks:

- The Yahoo website was attacked at 10:30 PST on Monday, 7 Feb 2000. The attack lasted three hours. Yahoo was pinged at the rate of one gigabyte/second.
- The websites of amazon.com, buy.com, cnn.com, eBay.com were attacked on Tuesday, 8 Feb 2000. Each attack lasted between one and four hours. CNN reported that the attack on its website was the first major attack since its website went online in August 1995.
- About fifty computers at Stanford University, and also computers at the University of California at Santa Barbara, were amongst the zombie computers sending pings in these DoS attacks.
- The attacks received the attention of President Clinton and the U.S. Attorney General, Janet Reno. The FBI began to investigate. A CNN news report posted at 18:44 EST on 9 Feb 2000 quotes Ron Dick of the FBI's National Infrastructure Protection Center as saying "A 15-year-old kid could launch these attacks. It doesn't take a great deal of sophistication to do."
- His remark was prophetic, because, on 18 April 2000, a 15-year-old pupil in Montréal Canada was arrested and charged with two counts of "mischief to data" arising from his DoS attack on CNN. Because he was a juvenile, his name can not be publicly disclosed, so he was called by his Internet pseudonym *Mafiaboy*. The Royal Canadian Mounted Police seized Mafiaboy's computer.

- CNN reported that Mafiaboy was granted bail, with the following conditions:
 - "May only use computers under the direct supervision of a teacher."
 - "Prohibited from connecting to the Internet"
 - Prohibited from entering "a store or company where computer services or parts are sold."
 - "Barred from communicating with three of his closest friends."

4.3.5 Malicious Computer Programs

The following are general terms for any computer program that is designed to harm its victim(s):

Malicious code

Malicious program

Malware (by analogy with "software")

Rogue program

Malicious computer programs are divided into the following classes:

- i. A **virus** is a program that "infects" an executable file. After infection, the executable file functions in a different way than before: maybe only displaying a benign message on the monitor, maybe deleting some or all files on the user's hard drive, maybe altering data files.

The word "virus" is also commonly used broadly to include computer viruses, worms, and Trojan Horse programs. For example, so-called "anti-virus software" will remove all three classes of these malicious programs.

- ii. A **worm** is a program that copies itself. The distinction between a virus and worm is that a virus never copies itself – a virus is copied only when the infected executable file is run.

In the pure, original form, a worm neither deleted nor changed files on the victim's computer — the worm simply made multiple copies of itself and sent those copies from the victim's computer, thus clogging disk drives and the Internet with multiple copies of the worm. Releasing such a worm into the Internet will slow the legitimate traffic on the Internet, as continuously increasing amounts of traffic are mere copies of the worm.

Beginning with the Klez worm in early 2002, a worm could drop a virus into the victim's computer. This kind of worm became known as a

blended threat, because it combined two different types of malicious code.

- iii. A **Trojan horse** is a deceptively labeled program that contains at least one function that is unknown to the user and that harms the user. A Trojan horse does *not* replicate, which distinguishes it from viruses and worms.

Some of the more serious Trojan horses allow a hacker to remotely control the victim's computer, perhaps to collect passwords and credit card numbers and send them to the hacker, or perhaps to launch denial of service attacks on websites.

Some Trojan Horses are installed on a victim's computer by an intruder, without any knowledge of the victim. Other Trojan Horses are downloaded (perhaps in an attachment in e-mail) and installed by the user, who intends to acquire a benefit that is quite different from the undisclosed true purpose of the Trojan horse.

- iv. A **logic bomb** is a program that "detonates" when some event occurs. The detonated program might stop working (e.g., go into an infinite loop), crash the computer, release a virus, delete data files, or any of many other harmful possibilities. A **time bomb** is a type of logic bomb, in which the program detonates when the computer's clock reaches some target date.
- v. A **hoax** is a warning about a nonexistent malicious program.

5 MICROSOFT WORD

5.1 Introduction to Microsoft Word

Microsoft Word is a powerful tool to create professional looking documents.

This information will help you get started with Microsoft Word and may solve some of your problems, but it is a very good idea to use the Help Files that come with Microsoft Word.

5.2 Starting Microsoft Word

Two Ways

1. Double click on the Microsoft Word icon on the desktop.



2. Click on Start --> Programs --> Microsoft Word

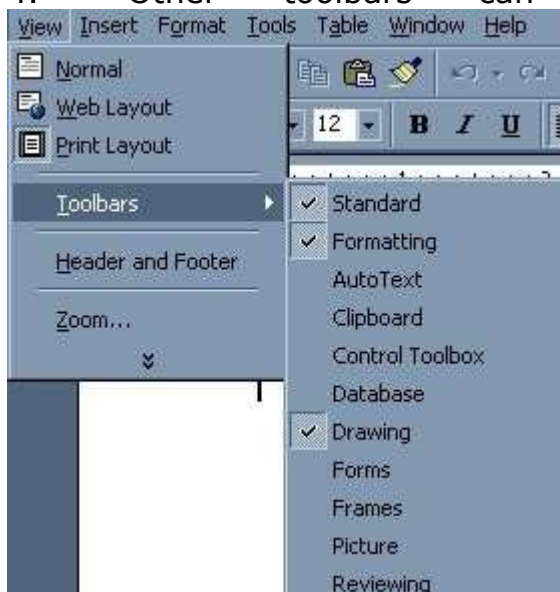








5.3 Viewing the toolbars












The toolbars in Microsoft Word provide easy access and functionality to the user. There are many shortcuts that can be taken by using the


toolbar. First, make sure that the proper toolbars are visible on the screen.

1. Click **View**
2. Select **Toolbars**
3. Select **Standard, Formatting, and Drawing**
4. Other toolbars can be selected if you wish



Name	Icon	Description
New Blank Document		Creates a new, blank file based on the default template.
Open (File menu)		Opens or finds a file.
Save (File menu)		Saves the active file with its current file name, location, and file format.
Mail Recipient		Sends the contents of the document as the body of the e-mail message.
Print (File menu)		Prints the active file or selected items. To select print options, on the File menu, click Print.
Print Preview (File menu)		Shows how a file will look when you print it.
Spelling and Grammar (Tools menu)		Checks the active document for possible spelling, grammar, and writing style errors, and displays suggestions for correcting them. To

			set spelling and grammar checking options, click Options on the Tools menu, and then click the Spelling and Grammar tab.
Cut menu)	(Edit		Removes the selection from the active document and places it on the Clipboard.
Copy menu)	(Edit		Copies the selection to the Clipboard.
Paste menu)	(Edit		Inserts the contents of the Clipboard at the insertion point, and replaces any selection. This command is available only if you have cut or copied an object, text, or contents of a cell.
Format Painter (Standard toolbar)			Copies the format from a selected object or text and applies it to the object or text you click. To copy the formatting to more than one item, double-click  , and then click each item you want to format. When you are finished, press ESC or click  again to turn off the Format Painter.
Undo menu)	(Edit		Reverses the last command or deletes the last entry you typed.
Redo menu)	(Edit		Reverses the action of the Undo command.
Hyperlink			Inserts a new hyperlink or edits the selected hyperlink.
Tables and Borders			Displays the Tables and Borders toolbar, which contains tools for creating, editing, and sorting a table and for adding or changing borders to selected text, paragraphs, cells, or objects.
Zoom			Enter a magnification between 10 and 400 percent to reduce or enlarge the display of the active document.

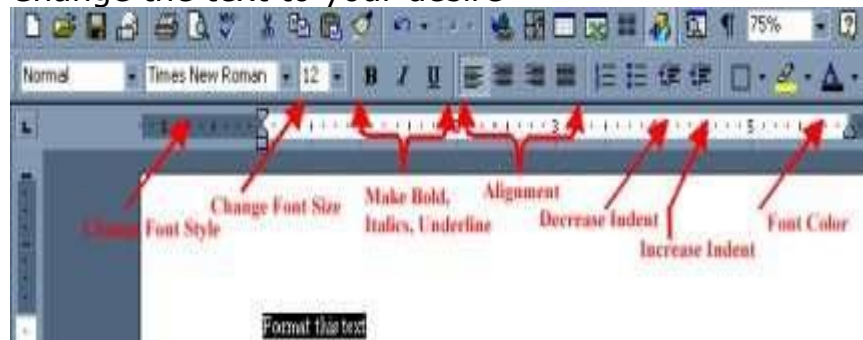
Office Assistant		The Office Assistant provides Help topics and tips to help you accomplish your tasks.
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5.4 Creating A New Document

1. Click on File
2. Select New
 - To create a blank document, simply select **Blank Document**. To create a document based on one of the templates provided in Microsoft Word, select which one you would like to create and select **OK**

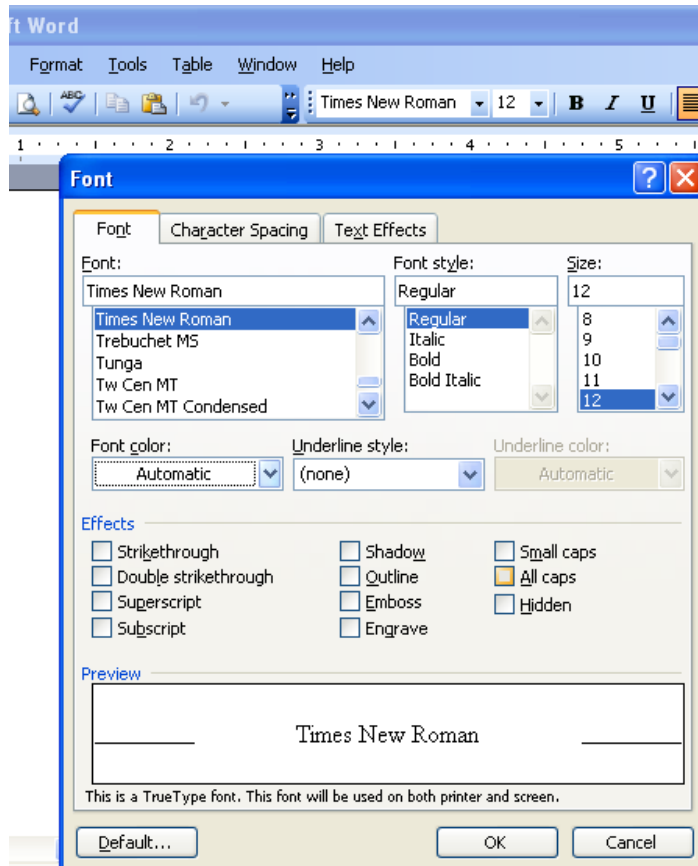
5.5 Formatting Text

1. Highlight the text that you want to format by dragging your mouse over while holding down the left mouse button
2. Change the text to your desire



Or

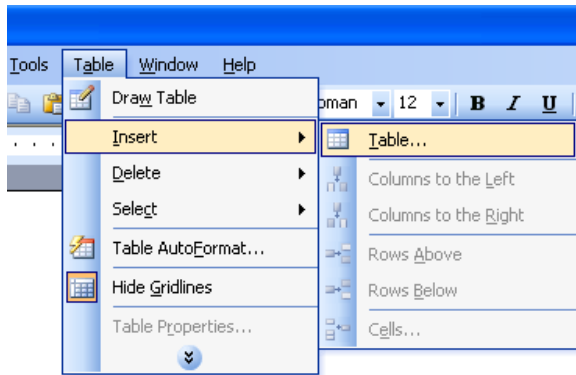
You can go to format then click Font and make choice of what you want to format for example , font size, font color, font type, font style, underline e.t.c.



5.6 Inserting Items in Word Documents

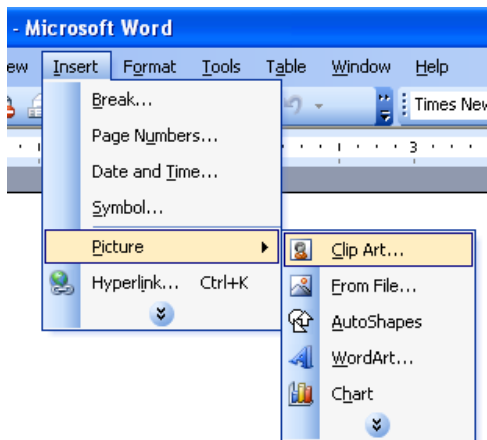
5.6.1 Inserting a Table

1. Click where you want your table to go
2. Click **Table** at top of screen
3. Select **Insert**
4. Select Table
5. Give your table dimensions



5.6.2 Inserting a Picture

1. Click where you want your picture to go
2. Click **Insert** at top of screen
3. Select **Picture**
4. Select **Clip Art or From File**
5. Select picture and click **Insert**

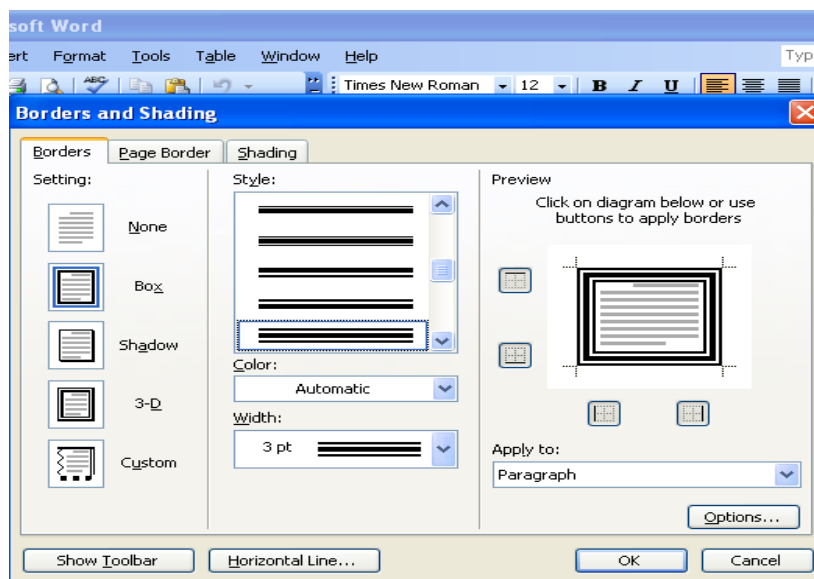


5.6.3 Inserting Page Numbers and Date/Time

1. Click **Insert** at top of screen
2. Select **Page Numbers and/or Date & Time**

5.6.4 Using Borders in your Document

1. Click format on the menu bar
2. Select Borders and Shading
3. Select the Box
4. Choose the Border Style you need
5. Click OK.



5.6.5 Spell Checking Your Document

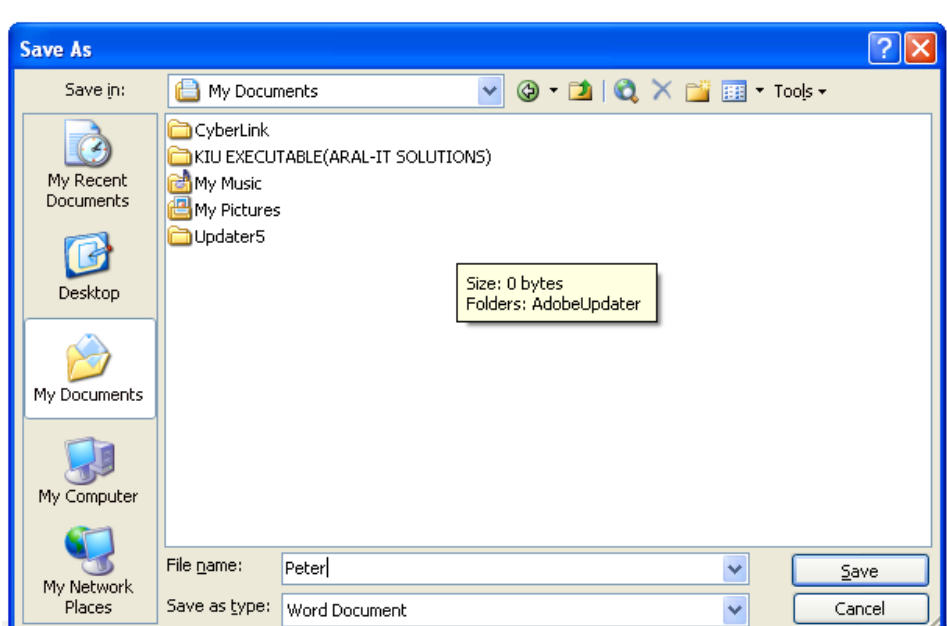
1. Click **Tools** at top of screen
2. Select **Spelling and Grammar**

5.6.6 Saving and Moving Text

5.6.6.1 Saving Your Document

In order to save your file for the first time, you need to follow the following procedures.

1. Click File on the Menu bar
2. Click Save AS
3. Choose the location i.e my documents, Flash, Desk Top, Floppy drives e.t.c
4. Type the file Name e.g Peter
5. Click Save.



After Saving your work with the name, then you can make continuous saving by clicking on File , Save ,by clicking on the save Icon on the Standard tool bar of Pressing CTL +S

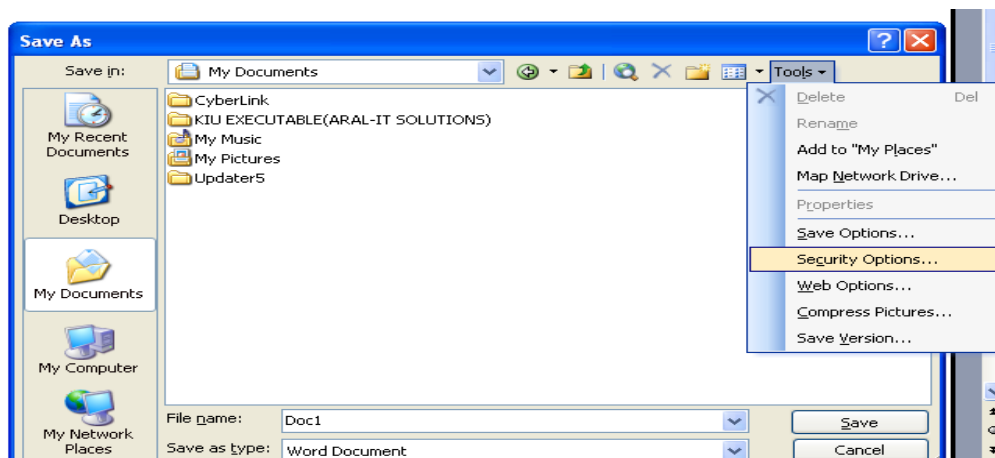
5.6.6.2 Saving Your Document Using Password

Data or Information should be protected from unauthorized users and in this case you can achieve this by putting password on your file.

Click File on the menu bar

Click on SAVE AS

Select TOOLS on the Dialog box as shown bellow



Enter any character or Number as your PASSWORD to open , You need to confirm the Exact password by re entering as the computer will be requesting you and finally click SAVE

5.6.6.3 Moving (cutting) text

Highlight the text that will be moved and select edit/ cut from the menu bar, click the cut button on the standard bar, or press CTRL + X at once. This will move the text to a clipboard.

To move a small amount of text a short distance, the drag and drop method may be quicker. Highlight the text you want to move click the selection with the mouse, drag the selection to the new location, and release the mouse button.

5.6.7 Copying text

To copy text, choose edit/copy, click the copy button on the standard toolbar, or press CTRL + C to copy the text to the clipboard.

5.6.8 Paste text

To paste cut or copied text, move the cursor to the location you want to move the text to and select edit /paste button on the standard toolbar, or press CTRL +V.

5.6.9 Columns

To quickly place text in a column format, click the columns button on the standard toolbar and select the number of columns by dragging the mouse over the diagram.

For more columns options, select format / columns from the menu bar. The columns dialog box allows you to choose the properties of the columns. Select the number and width of the columns from the dialog box.

5.6.10 Drop caps

A drop cap is a large letter that begins a paragraph and drops through several lines of text.

5.6.10.1 Adding a drop cap

- i. Place the cursor within the paragraph whose first letter will be dropped or highlight the letter to be dropped.
- ii. Select format / drop cap from the menu bar.
- iii. The drop cap dialog box allows you to select the position of the drop cap, the font, the number of lines to drop, and the distance from the body text.
- iv. Click OK when all selections have been made.
- v. To modify a drop cap, select format / drop cap again to change the attributes, click on the letter and use the handles to move and resize the letter.

5.6.11 Bulleted and Numbered lists

- i. Click the bulleted list button or numbered list button on the formatting tool bar.
- ii. Type the first entry and press ENTER. This will create a new bullet or number on the next line. If you want to start anew line with out adding another bullet or number, hold down the SHIFT key while, press ENTER.
- iii. Continue typing entries and press ENTER twice when you are finishing typing to the end the list.

5.6.12 Addition

Use the increase indent and decrease indent buttons on the formatting tool bar to create lists of multiple levels.

NOTE; You can also type the text first, highlight the section, and press the bulleted or numbered list buttons to add the bullets or numbers.

5.6.13 Nested list

To create a nested list, such as a numbered list inside of a bulleted list, follow these steps;

1. Type the list and increase the indentation of the items that will make up the nested list by clicking the increase indent button for each item.

5.6.13.1 Lists

Bulleted and numbered lists

Nested list

Formatting list

5.6.13.1.1 Formatting list

Using the bullets and numbering dialog box can change the bullet image and numbering format.

1. Highlight the entire list to change all the bullets or numbers or place the cursor on one line within the list to change a single bullet.

Access the dialog box by selecting format/ bullets and numbering from the menu bar or by right clicking within the list and selecting bullets and numbering from the dialog box.

5.6.14 Auto shapes

The auto shapes toolbar will allow you to draw many different geometrical shapes, arrows, flow chart symbols, stars, and banners on the document. Activate the auto shape as toolbar by selecting insert / picture / auto shapes or view / toolbars / auto shapes from the menu bar or clicking the auto shapes button on the drawing tool bar click each button on the tool bar to view the options for drawing the shape.

5.6.15 Headers and Footers

- A header is text that is added to the top margin of every page such as a document title or page number and footer is text added to the bottom margin. Follow these steps to add or edit headers and footers in the document.
- select view/ header and footer from the menu bar. The header and footer tool bar will appear and the top of the page will be highlighted.
- Type the heading in the headerbox. You may use many of the standard text formatting options such as font face, size, bold, italics.
- Click the Insert Auto text button to view a list of quick options available.
- Use the other options on the toolbar to add page number, the current date and time.
- To edit the footer, click the switch between header and footer button on the tool bar.
- When you are finished adding headers, and footers, click the close button on the toolbar

5.6.16 Printing Your Document

In order to get a hard copy from what you have typed, you need a Printer connect to your computer and Installed or save your work on any Secondary

Storage device e.g flash ,CD e.t.c then Open your File and follow the following procedures.

- i. Click on file
- ii. Select Print
- iii. Select the printer Name or Type connect to your computer
- iv. Specify the number of pages to be printed for example if you want to print all pages, choose ALL from print Range, if you want to print the Current page only , then choose Current Page from the print Range and if you want to specific pages to be printed , then specify the page numbers e.g 2-6 or 2,3,5,6 e.t.c
- v. Specify the Number of copies per page you would like to be printed.
- vi. Specify the page layout either Portrait or Landscape by clicking on Properties then make selection.
- vii. Finally click Print

6 SPREAD SHEETS USING MICROSOFT EXCEL

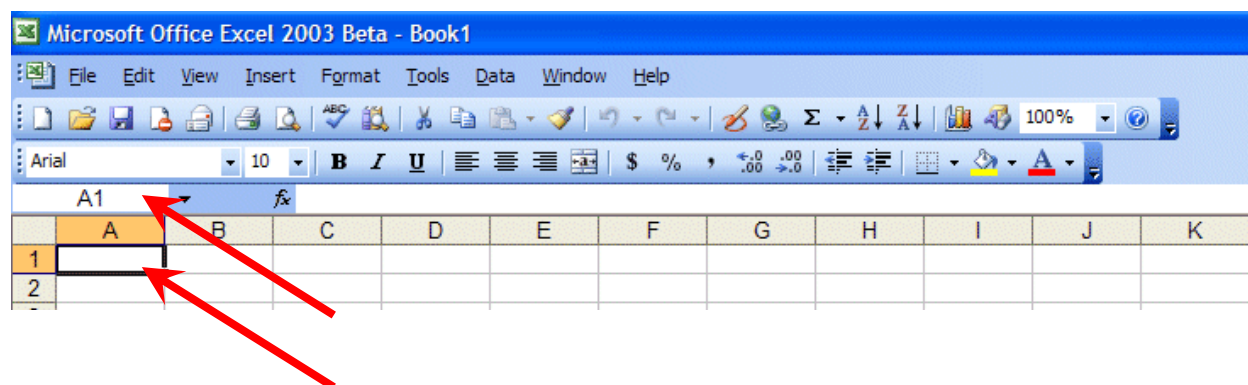
6.1 Starting Excel 2003

In the following exercises you will **learn** some of the necessary steps to **create a spreadsheet** using **Microsoft Excel 2003** for Windows 2000, Me, and XP. You will learn not only how to type various items into the spreadsheet, but also how to copy columns, widen columns, fill columns, add, subtract, multiply, divide, do graphics and a variety of other “things.”

To begin, **load** the spreadsheet by **quickly clicking twice** on the **Excel 2003 Windows Icon** in the **Windows Screen**. If you **do not see** an **Excel Icon**, **click-on** the **Start Button** in the **lower left corner** of the screen, move the cursor up to **Programs**, and then move to **Microsoft Excel 2003** and **click-on** it.



A **spreadsheet** is a “**number manipulator**.” To make the manipulation of numbers easier **all spreadsheets** are organized into **rows** and **columns**. Your initial spreadsheet will look something like the one below:



Notice that the “**main**” part of the spreadsheet is composed of **Rows (Labeled 1, 2, 3, 4, etc.)** and **Columns (Labeled A, B, C, D, etc.)**. There are a lot of rows and columns in a spreadsheet. The “**intersection**” of **each row** and **column** is called a **cell**. In the image above the **cursor is on** the “**home**” cell – **A1**. **Notice Row 1 and Column A are “bold,” and colored “orange.”** This **indicates** what is called the “**address** of the **cell**.” **Notice right above cell A1**, that **A1** is **displayed** in a **small box** called the **Name Box**. Whenever you “**click**” on a cell the address of that cell will be shown in the Name Box.

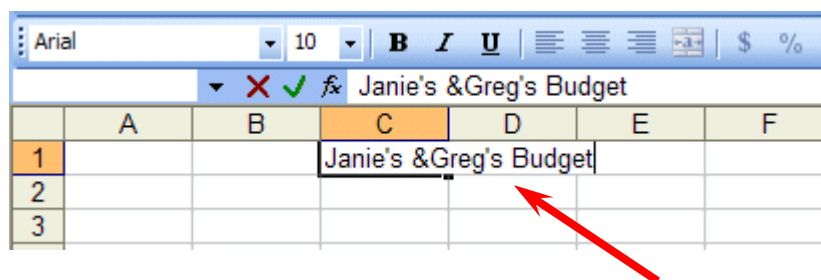
In this tutorial, whenever we indicate that you need to click the mouse, it will mean to click the left mouse button – unless we indicate that you should click the right mouse button. So, always “click left” unless we tell you otherwise.

6.2 Moving Around the Spreadsheet

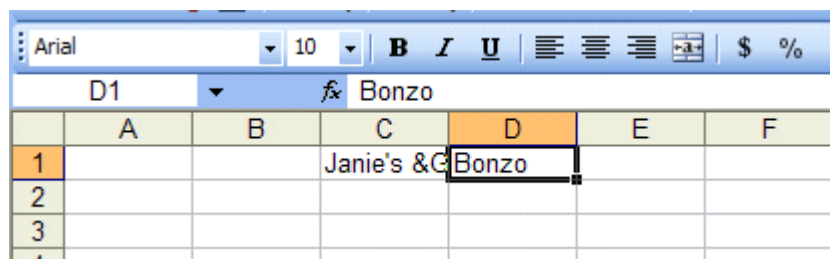
You can move around the spreadsheet/cells by **clicking** your mouse **on** various **cells**, or by using the **up, down, right and left arrow movement keys on the keyboard**. Or, you can move up and down by using the “elevator” bars on the **right** and **bottom** of the spreadsheet. Go ahead and **move around the spreadsheet**. **Hold down the down arrow key** on the **keyboard** for a few seconds – then **click-on a cell**. **Notice** how the **Name Box** always **tells** you “**where you are**.” Now hold down the **right arrow key** on the keyboard for a few seconds. **Notice** how the **alphabet changes** from **single letters (A, B, C, ..., Z)** to **several letter combinations (AA, AB, AC)**. There are **hundreds of columns** and **thousands of rows** in a spreadsheet. **Anytime** you desire to **return** to the **Home Cell (A1)** simply **click-in** the **Name Box** and **type-in A1**. Then **tap** the **Enter key** and you will **go** to cell **A1**. You can go to any cell by this method. Simply type-in a row and column, tap the Enter key, and you’ll go to that cell.

Now that you have the “feel” of how to move around Excel spreadsheet, **go to the cells as indicated below** and **type-in** the following:

Cl (Your Name)'s Budget. It should **look similar to the image below**. **Do not tap Enter** when you finish

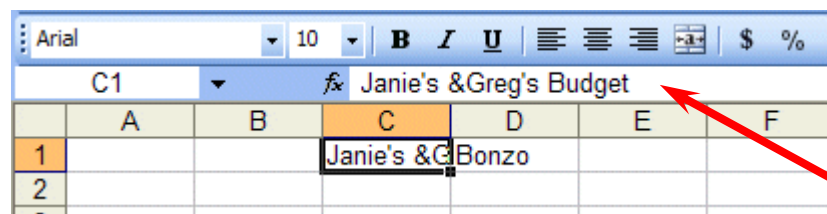


Look at cells **C1** and **D1**. Notice how your **entry has spilled over from C1 into D1**. Sometimes this is a problem, and sometimes it is not. **Tap** the **Enter key** and then **click-on cell D1** and **type-in** the word **BONZO** and **tap Enter** key.





Notice how **Bonzo** now **COVERS** the **right part of your original entry!!** Now **move back** to cell **C1** and **click-on it**. Look at the upper part of the spreadsheet, just above the cells where you typed Bonzo. Your name and the word budget are still there! Bonzo only **COVERED** the **portion in cell D1**. See the image and arrow below.



There are **several ways** to **take care** of this. For the moment **move back** to cell **D1** and **click-on cell D1**. Tap the **Delete** key (above the arrow movement keys on the **keyboard**). Notice that **Bonzo disappears** and your **entire entry reappears**. This is one way to expose the entry. We'll look at some others as we go along.

Now we'll continue making some entries. **Move** to the **following cells** and **type-in** the **information indicated**. You can click-on each cell and then type-in the entries.

If you happen to **make a mistake** simply **retype the entries**. Later on we'll see how to edit mistakes. Any time you want to replace something in a cell you can simply retype a new entry and it will replace the old one.

Cell Type-in

A3 Income

B4 Parents

B5 Job

B6

B7 Total

A10 Expenses

B11 Food

B12 Beverages

B13 Parties

B14

B15 Total

	A	B	C	D	E
1			Janie's & Greg's Budget		
2					
3	INCOME				
4		Parents			
5		Job			
6		Investments			
7		Total			
8					
9					
10	EXPENSES				
11		Food			
12		Beverages			
13		Parties			
14		Miscellaneous			
15		Total			
16					

Investments

Miscellaneous

Your **spreadsheet** should now **look like** the **picture** on the **right**.

At this point you probably have noticed, the words "Investments" and "Miscellaneous" run over the spaces given in the cells. Do not be concerned at this point. We'll soon fix this.

Now, **type** the **numbers** in the **cells indicated**:

C4 300

C5 50

C6 150

When you **type-in** the **150**, tap **Enter**.

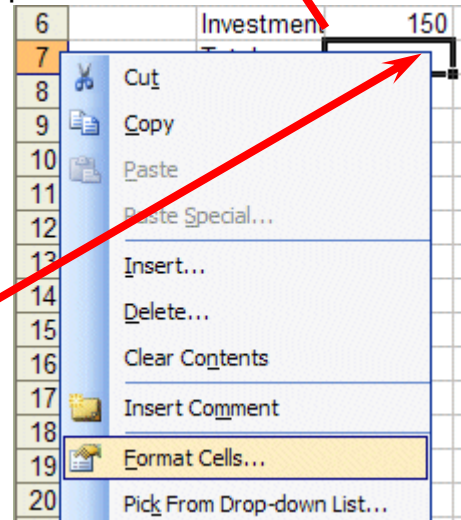
	A	B	C	D	E
1			Janie's & Greg's Budget		
2					
3	INCOME				
4		Parents	\$300.00		
5		Job	\$50.00		
6		Investment	\$150.00		
7		Total			
8					
9					
10	EXPENSES				
11		Food			
12		Beverages			
13		Parties			
14		Miscellaneous			
15		Total			
16					

Your **spreadsheet** should **look like** the one on the **right**. We would like to **place an underline** at the **bottom of the** **three figures** so that we can **indicate a total below** – in cell **C7**. Point to cell **C7** with the mouse. That's where we want the line -- **always move the cursor to the place where you want to insert a line**. With the Arrow on cell **C7** tap the **RIGHT mouse**

button.

A sub-menu with a caption **Format Cells** appears.

The **right click** will “**always bring up**” a **menu** that is “**tailored**” to the “**place**” where you click. This will work in any Microsoft Windows product. You can always **tell “where” you click the right mouse** button for the **cursor arrow will always be in a corner of the menu that** appears – exactly where you clicked the right mouse button..



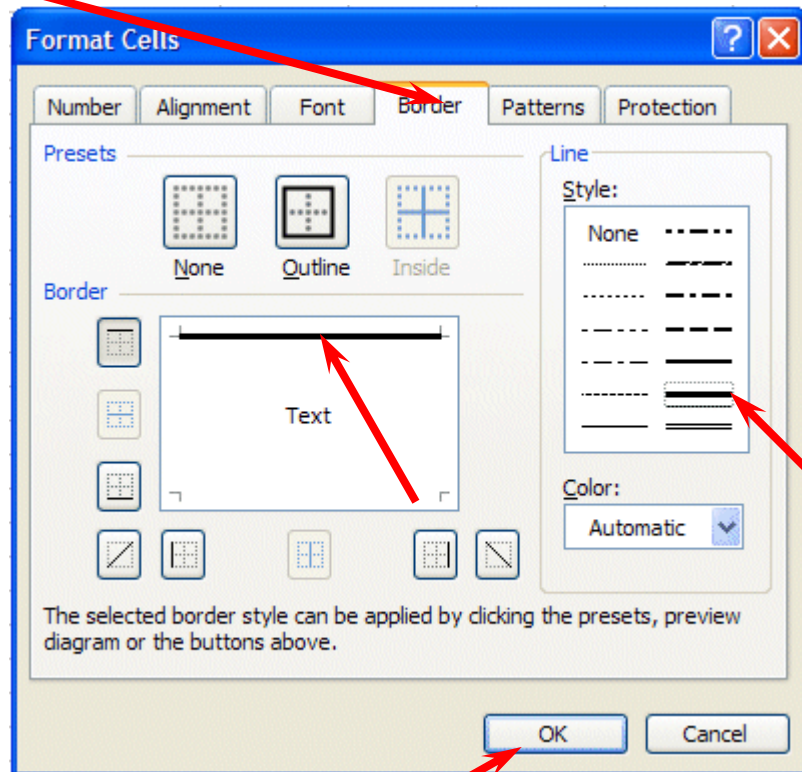
Select **Format Cells**.

When the **Format Cells** menu screen below appears, select **Border**.

Look at the **Line Style** box in the **lower right**.

There are several types of lines that you can choose. Point to the **thick single line** in the **Style Area** (see arrow) and click the **left** mouse button. A **box** will **go around the line**. Look at the area which says **Border**.

Point to the **upper part of the Text box** (see arrow) and click the **left** mouse button. A **thick black line** will appear at the **top** of the **Text** box.



If the **thick line does not show-up at the top** of the **Text box**, **click-again** at the "top line area in the Text box" and the line will "disappear". Then click-on the thick, single line in the Line Style box again and repeat the previous instructions. If, somehow, you make a **mistake**, simply **click "on and off in the Text line boxes."** You will notice that the lines appear and disappear. This is called a "toggle" in computer jargon. So, work at this until you get the line on the top or where you want it. We have just indicated that we want a single thick underline at the top of the cell C7. Point to **OK** and **click** the **left** mouse button.

When you **return** to the **spreadsheet**, **click somewhere other than cell C7**. This is called "**clicking away**." You should now **see a line** at the **top** of cell **C7**. Sometimes the box highlighting a cell hides the lines. If you "messed-up", try again.

Now type in the numbers in the cells indicated.

C11 30

C12 50

C13 150

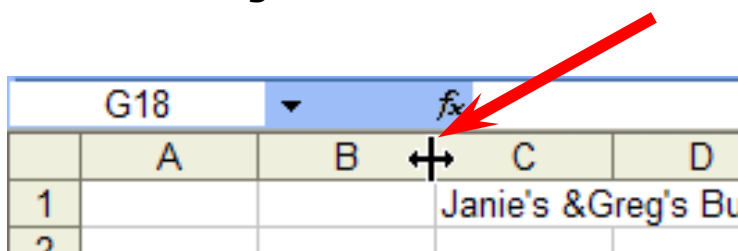
C14 70 (After you type 70, tap the **Enter** key)

Now, **underline** the **top** of cell **C15** like you did cell **C7**.

6.3 Widening Columns

You probably **noticed**, as you typed in the numbers, **some** of the **words** were just **too wide** for the default **cell width** (Investments and Miscellaneous). Let's **widen column B** to take care of this.

Slowly move the **mouse arrow** to the **right edge** of the **B** cell (between the **B** and the **C**). The cursor will turn into an **arrow pointing right and left with a small vertical line in the middle** (see arrow below). **Hold down** the **left mouse button** and **move** (drag) the line to the right.

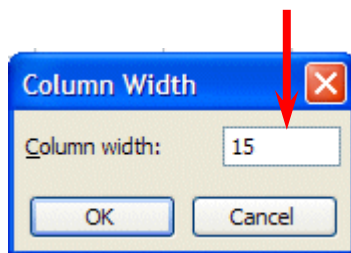
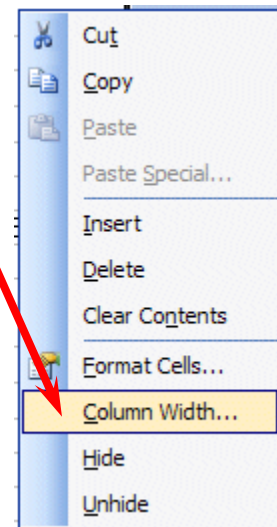


As soon as you **start to move (drag)**, a **dotted vertical line** will **go down the spreadsheet** and it will **move as you hold down the left button and drag the mouse**. **Keep dragging** to the right **until** you are **past the widest word** and a bit more (for some space). Release the button. The column is widened. Notice in the upper left corner of the screen, below File in the menu bar, and above the buttons, that as you hold down and drag that it tells you that current width of the column.

	B
Parents	
Job	
Investments	
Total	
Food	
Beverages	
Parties	
Miscellaneous	
Total	

This is one way to widen a column. Here is **another way**. Point to the **B at the top of column B** (in the **Gray** area) and **click** the **left** mouse button (The **cell** should turn **dark blue** and the **column light blue**.).

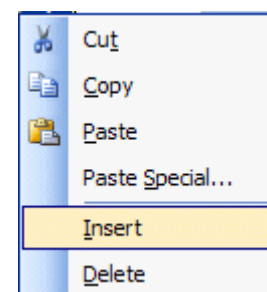
Now, **keeping** the **cursor** somewhere in the **"blue"** area, **click** the **Right Mouse Button**. Notice that a **menu** with **Column Width...** appears. **Click-on** **Column Width...** and **type** in **15** and **click-on** **OK**. This is another way to widen a column.



6.4 Inserting Rows

Oops... a **mistake** (on purpose). We **haven't left enough room** at the top of the spreadsheet **to insert** some budget **months**. So... move the cursor to the **gray 2** along the **left** edge (this is the second row) **so we can insert two new rows**. **Click** the **left** mouse button. You will notice that the whole row goes **light blue** and the **2** turn's **dark blue**. **Make sure** the cursor **arrow** is either **on the 2** or **somewhere in the blue row**.

	A	B	C	D	E	F
1			Janie's & Greg's Budget			
2						
3	Income					
4		Parents	300			



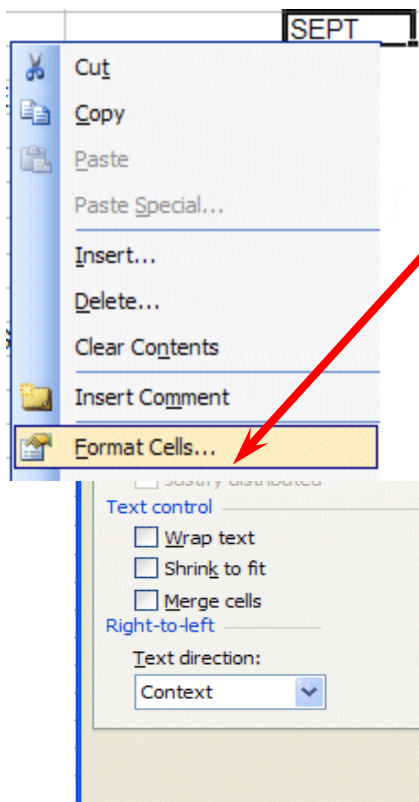
Click the **RIGHT** mouse button. A drop down menu will appear. Point to **Insert**. Click the left **button** on **Insert**. Notice how **one row** was **inserted** and how **everything below moved down**. Do this **again** to **insert another row**. Excel, and all spreadsheets, will remember where they moved your work and automatically adjust for these changes. **Income** should **now** be in cell **A5**.

6.5 Aligning Cells

Now we'll type some more. Go to cell

C3 SEPT (Type-in SEPT and tap the Enter key)

Notice again how **SEPT** is **automatically left aligned**. Logically, since you are using Excel, the English version, the text is left aligned so that all of the text entries will line up nicely in the column cells. We would like to **center SEPT** in cell **C3**. Click on cell **C3** to "mark" the cell. One way to **center SEPT** is to simply **click-on** the **Center button** in the **button bar** at the **top of the screen**. Make sure that you are **ON cell C3**, then **click-on** the **center button** (see image above right). You'll notice that SEPT is now centered in cell C#.



Here is another way to **center SEPT**. Click **RIGHT** on cell **C3**. Then click on **Format Cells**.

When the **Format Cells Menu** appears,

click-on the – **Alignment Tab** and then **click-on -- Horizontal - Center --Vertical - Center --** then click **OK**. Try it.

This is how you can align words for neatness. You can also point to several cells you want aligned and do this. We'll try that next.

Now type the below text in the cells indicated.

D3 OCT

E3 NOV

F3 DEC

G3 MONTHLY TOTALS (tap the **Enter** key and then **correct**
the width of
this column)

Next we'll highlight cells **C3 through G3**. To do this, point to **C3** and click the **Left mouse button**. Then, **holding down** the left mouse button, **drag the mouse to the right through G3** – **when the cells are highlighted** – **take your finger off of the left mouse button**. Then **point** to the **group of cells** and click the **right** mouse button to bring up the **Format Cells** menu. Click on **Alignment** and choose **Center (vertical & horizontal)**. Then point to **OK** and **click** the **left** mouse button. All of the cells will then be as centered.

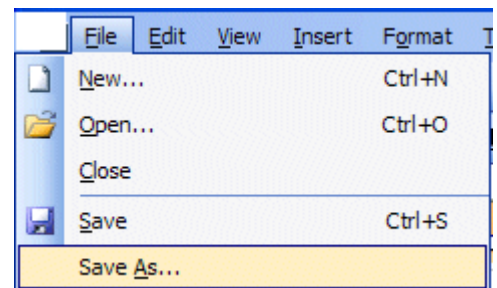
B	C	D	E	F	G	H
	Janie's & Greg's Budget					
	SEPT	OCT	NOV	DEC	MONTHLY TOTALS	

You could **also click** the **Center button** as you did before.

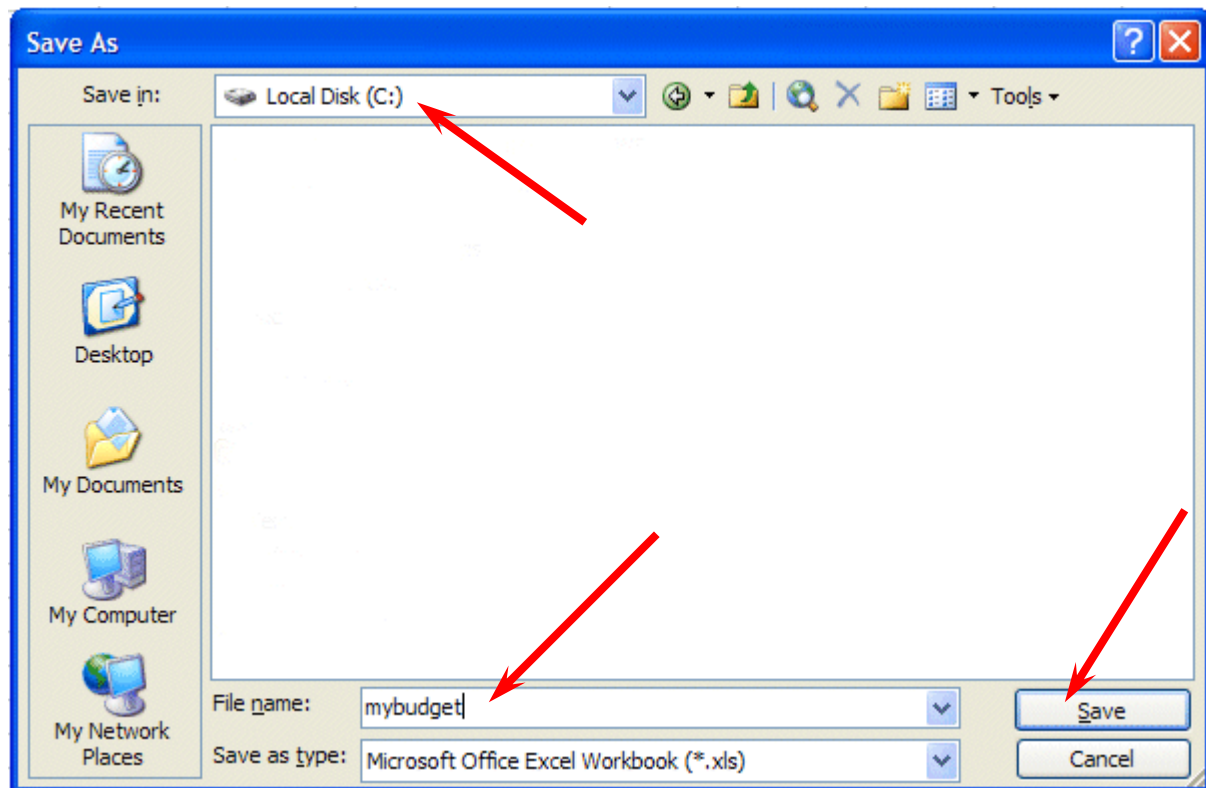
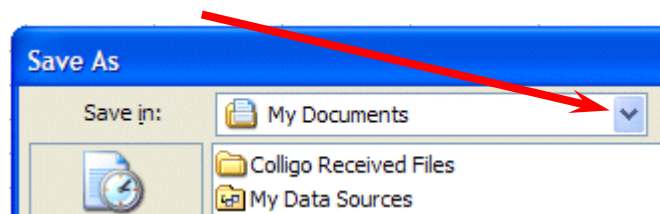
MONTHLY TOTALS will **not fit its space** when you do this. But, **you know what to do**. Move the cursor over the line between cells G and H and drag the line to the right to widen the G cell just like you did a few minutes ago.

6.6 Saving Spreadsheets

We have done quite a bit of work so now is a good time to save our spreadsheet. Point to **File** in the **Menu Bar** at the **top** of the **spreadsheet**. Point to **Save As** and **click-on Save As**. A **Save As menu box** appears (like the one below).



Notice in the **upper left corner** that there is a "box" to the **right** of **Save In:** with a **down pointing arrow** to the **right**. **Click-on** the **arrow**. This will **show** you **all** of the "drives" and "folders" where you may save your work.

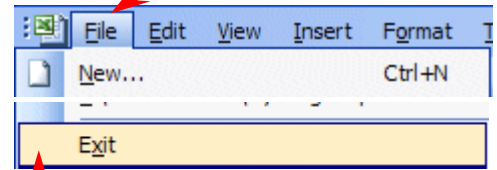


When you see the drop-down list in the Save in: area, choose the drive where you want to save your file. If you are going to use a diskette, **put a formatted 3 1/2 diskette in the A Drive**, then **click-on** the **3 1/2 Floppy (A):** We are going to save our file on the Local Disk (C:) – our hard drive, so we chose that drive in the image above (see **top arrow**).

To the right of **File name:** delete the information (which is in the box) and **type-in MYBUDGET** (see **lower left arrow**). This is the name under which you are saving your file. (In the future you will choose logical names for your spreadsheets as you save them.) Now point to **Save** and **click** the **left** mouse button (see **lower right arrow**).

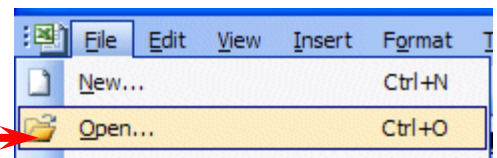
6.7 Exiting Spreadsheets

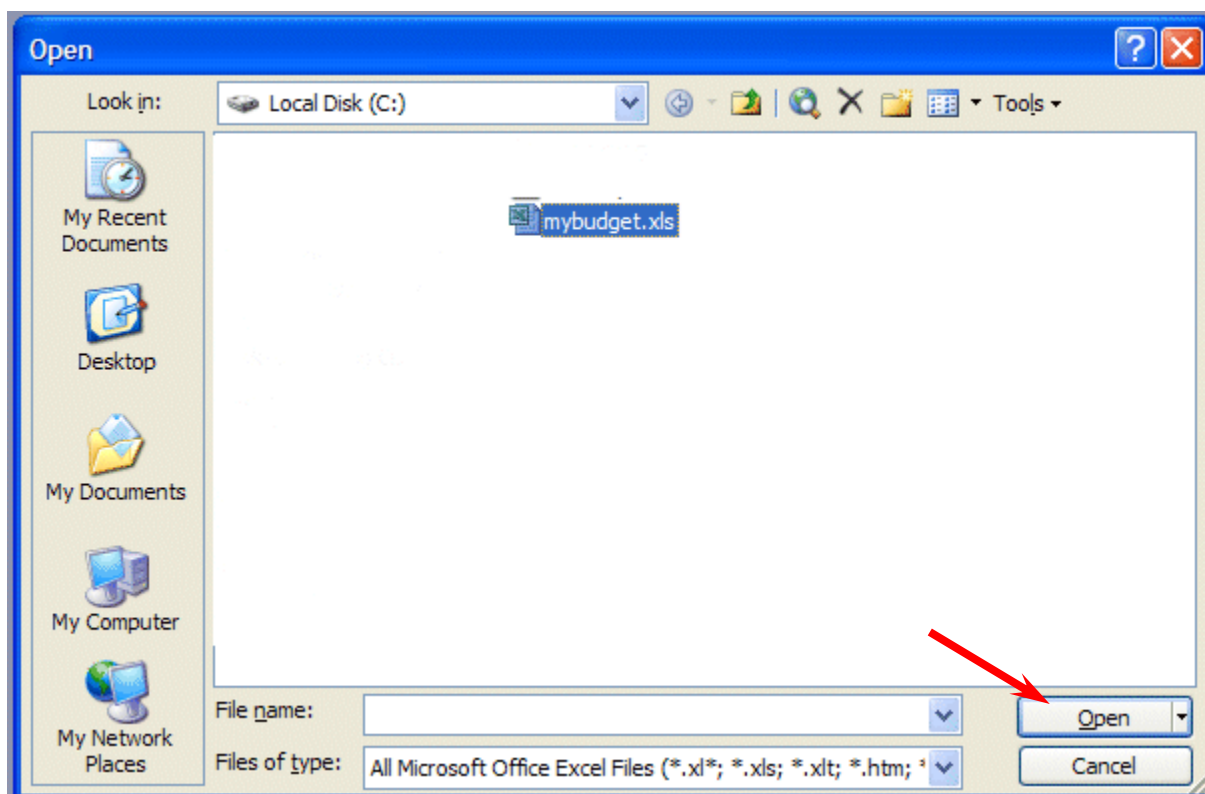
Anytime you need to leave your spreadsheet simply click on **File** in the **menu bar**, then **click-on Exit**. If you **have not saved** your spreadsheet, a reminder box will appear **asking you to do so**.



6.8 Retrieving Spreadsheets

When you need to **return to a spreadsheet**, you first **load Excel**, as you did **originally** (Page 1). When Excel is on the screen, **click-on File** in the menu bar then **click-on Open**. The following **Open** menu screen will appear:





Click on the **down arrow** to the right of the **Look in:** box (Similar to the arrow in the Save in: box – see **top arrow**). Click-on the **3 ½ Floppy (A:)**, or the drive or folder you chose. Files saved on a disk or in a folder will appear in the box below. **Click-on** your file (**MYBUDGET**), and then **click-on Open**. Your file will open. You could also **double-click quickly on the file to open it**.

Also, if you have not done so already, **move your cursor slowly over the "buttons" located below the menu bar**. You will notice a **little box** appears that tells you what these buttons do. These little boxes are called **Text Help** boxes. Many of them will **save** you extra "**clicks**" by using them. **Notice**, that under **File** and **Edit** in the **Menu bar**, there are a **small folder (Open)** and a **diskette (Save)**. Clicking-on them will take you directly to Open and Save.

6.9 Adding Numbers

Next we want to learn how to add numbers. There are several ways to do this. Each method has its advantages and disadvantages.

To do this, begin by **moving** your cursor to cell **C9**, and **clicking**-on cell C9.

Always move to the cell where you want the answer to be located.

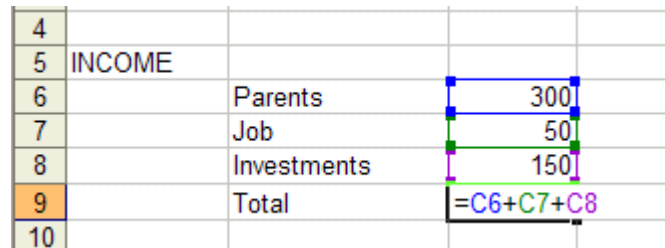
6.10 Working with Simple Formulae in Excel

6.10.1 Using Type in Method.

We want to **add** the three numbers in cells **C6**, **C7** and **C8**. To use this method **type-in** (using the keys on the keyboard) the following in cell **C9**:

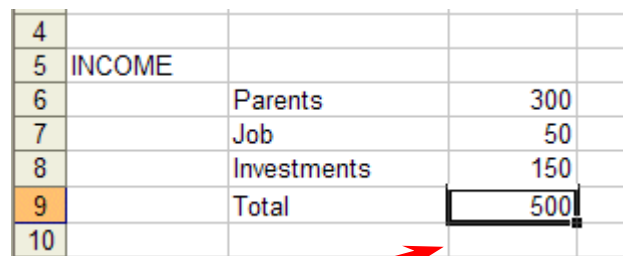
= C6 + C7 + C8

Your spreadsheet should look like the image to the right as you are typing in this equation. Note: you don't have to use capital letters – we only did this because they are easier to "see" in the tutorial.

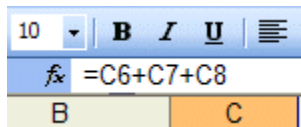


4			
5	INCOME		
6	Parents	300	
7	Job	50	
8	Investments	150	
9	Total	=C6+C7+C8	
10			

Now – **tap** the **Enter** key. Then, **click** on cell **C9** **again**. The **total** of these cells will now **appear** in **C9**.



4			
5	INCOME		
6	Parents	300	
7	Job	50	
8	Investments	150	
9	Total	500	
10			



When you have completed typing your equation, you will **see** this **formula** in the area **below the menu bar**.

Change the number in cell **C6** to **500** (and **tap Enter**). See how the total **AUTOMATICALLY recalculates!!!**

THIS IS THE TRUE POWER OF THE SPEADSHEET!!!

Whenever a number is entered in a cell the entire spreadsheet will automatically recalculate.

Something happened here. Notice how you typed in an (equal sign) **= before the cell location**. If you had simply typed in C6 + C7 + C8, Excel would have thought this entry was a **word (text)** and this entry would have shown as you typed it.

Try this if you want. Any time you “create” an error in Excel, you can simply re-type or edit the formula to correct the error.

The **Type in Method** is really easy if you have a **few numbers and can see their cell locations on the screen**. If you have a lot of cells in the formula, which are on several screens, this is not such a great method. The next method will work a lot better for numbers “all over the place.”

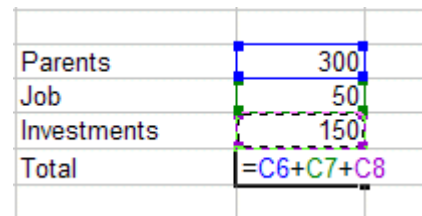
6.10.2 Subtraction, Multiplication, and Division

You can put in a (minus) **- for subtraction**, (asterisk) *** for multiplication**, and (slash) **/ for division**. As you become more capable we'll, build some nifty formulas – using these features.

6.10.2.1 Point Method

Move to cell **C9** again and **click-on it**. We'll now add the numbers a second way. **Tap the Delete key on the keyboard to delete the current formula.**

First, tap the = and then POINT (move) the cursor over cell C6 using the mouse, tap the left mouse button on cell C6 (you will see a marquee box go around the cell). Now **tap a + and move cursor to C7, tap the left mouse button, and tap another + and move the cursor to C8 and tap the left mouse button (notice how as you " + and point " the addition formula is being built in cell C9)**, now **tap Enter**. The **same formula** can be **built** using the **arrow movement keys on the keyboard** (except that you don't have to click-on each cell as the cell is marked - as you move the arrows). **Notice**, as you are **entering the cell addresses**, that as



Parents	300
Job	50
Investments	150
Total	=C6+C7+C8

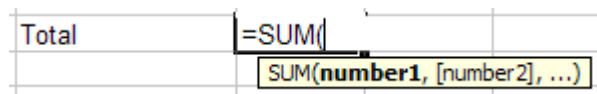
you place another **+** in the **formula**, that the **cursor “returns” to cell C9**. Also **notice**, as you **point** to each **cell** that it is **highlighted** by a “**marquee box**.” This “**tells**” you what **cell** you’ve **pointed to**. Pretty neat!

This **method is good** when you need to move to **numbers that are spread out all over the place**. Some people like it best and use it all the time -- it's your choice.

6.10.2.2 Function Method

Move again to **cell C9**. **Delete** the **formula** by **tapping** the **Delete** key again.

Now **type in** the following:
=SUM(



[This **tells Excel** that we are going to **sum** some **numbers** in a **RANGE** which will follow the =SUM(.]

There are **two ways** to put in this range:

6.10.2.3 Arrow Key and Anchor Method

With the **keyboard arrow keys**, **move the cursor to cell C6**. As you move you will notice that the **cell** where the cursor is located **appears after** the **=SUM(**. When you get to **C6** tap the **. (Period) Key**. This is called an **ANCHOR** and **holds one end** of the **RANGE** in place. You will notice that a **C6:C6** appears in the **formula area under the button bar**. This is a **one cell range**. Now **move, with the arrow keys, to cell C8**. See how cells **C6, C7 and C8** are **highlighted**. This indicates the **Range is C6:C8**. Excel assumes, logically, that these are the numbers you want to add. Now **tap Enter**. The numbers still add, but now the formula reads **=SUM(C6:C8)** instead of **=C6+C7+C8** like it did before.

6.10.2.4 Mouse Method

Move again to **cell C9**. **Delete** the **formula** in **cell C9** by **tapping** the **Delete** key. Type in **=SUM(** as you did before. **Point** to Cell **C6** –

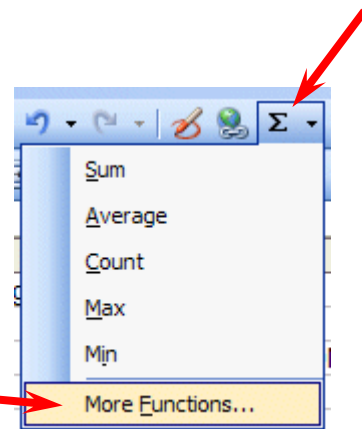
with your **mouse cursor**. **Click and hold down the left mouse button** and **move/drag** the cursor down to cell **C8**. (Cells C6, C7 and C8 should be highlighted.) Now **tap Enter**.

This **=SUM Function** is a **great way** to **add a lot of numbers, or a block/range of numbers**. By simply anchoring, and using page downs, or using the mouse, you can highlight lots and lots of numbers to add quickly. However, since it only sums you can't do subtraction, etc.

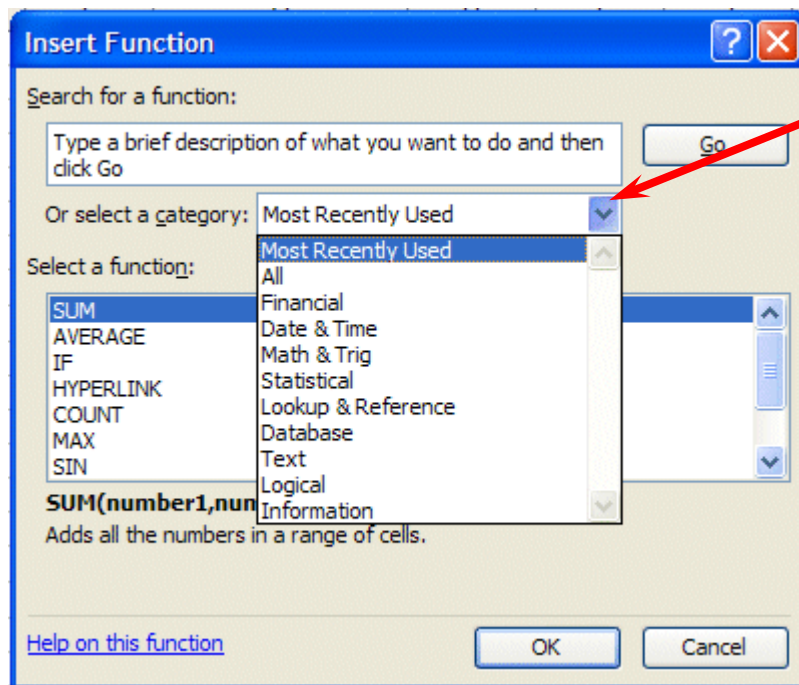
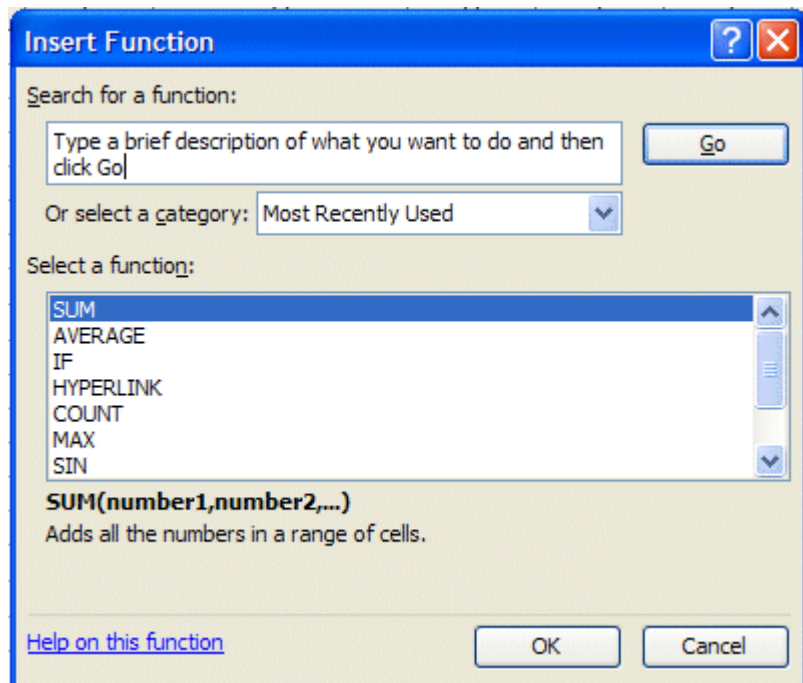
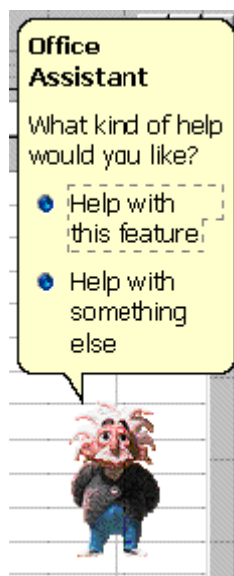
Point to cell **C9** again. **Tap** the **Delete** key to remove the formula currently in cell C9. **This is a really important DELETE**, since what we'll explain below won't work correctly if you do not delete the formula in cell C9.

6.11 Functions

There are a number of **formulas built into Excel**, like **Sum**. These formulas are called **Functions**. **Below the Menu Bar** (see **right**) you will see a "sigma" Σ with a **small down triangle** to the **right** of the sigma (see **arrow** on **diagram** to the **right**). **Click** on the **down triangle**. The drop down menu that you see on the right will appear. Move down to More Functions and **click-on More Functions**.



Two menu screens will now **appear** at the **same time**. An "**Office Assistant**" will appear (see **image** on **left** of **next page**) and you can **ask** it **questions** (the little assistant may be a paper clip or just about anything). The **Insert Function menu screen** will **also appear** (see **image** on **right** of **next page**). The two menu screens work together to assist you when you are using functions.

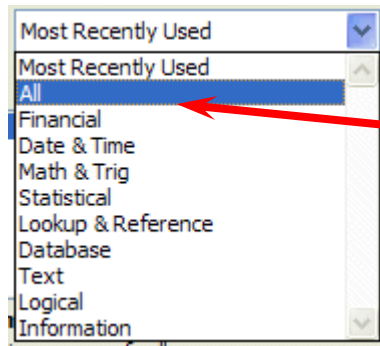


Let's work with the **Insert Function** menu screen. Click-on the **small down arrow** to the **right of Or select a category:** (see **arrow at left**).

In the drop down menu that appears you can see that there are all kinds of formulas (functions) that come with Excel spreadsheet (e.g. statistical, mathematical, financial, etc.). Instead of having to go to math, financial,

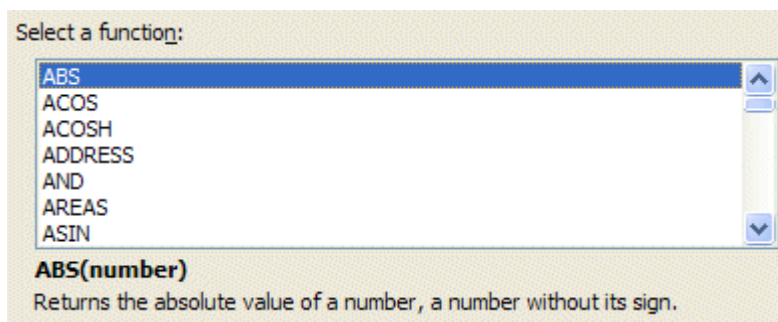
or statistical tables in a book, you can enter data from your spreadsheet into the formulas and receive answers.

This is a really great, timesaving feature. We'll now show you how to use the Help features of Excel 2003 to work with and understand these functions.



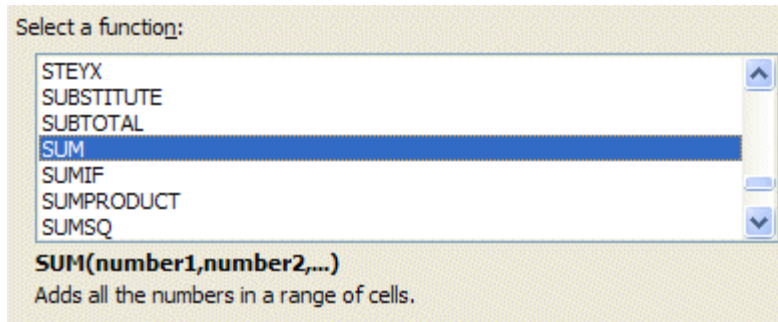
Click-on All in the drop down menu.

The **Select a function menu** will look like the **image below**.



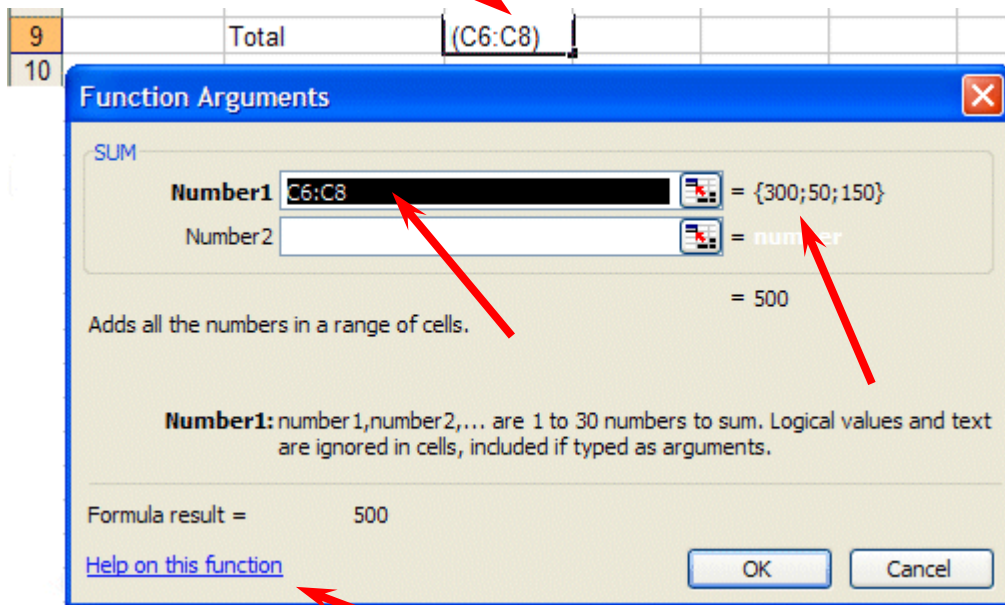
Look at all the functions (formulas)! We'll just go through how to use the addition formula (SUM) in this tutorial. If you need these formulas in the future, you'll know they're here.

Use the elevator bar on the right side of the Select a function menu screen to move down the list until you see SUM. Click-on SUM.



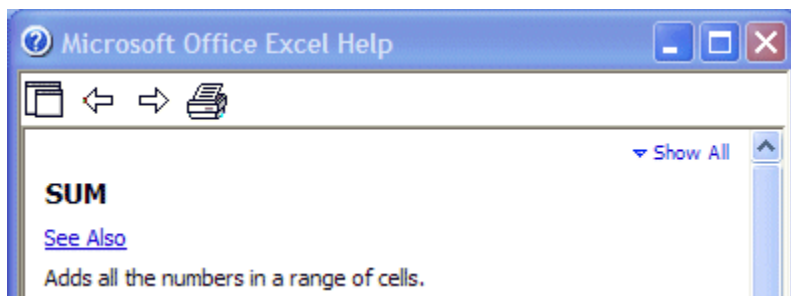
Then **click-on OK**.

Remember, you **clicked**-on Cell **C9** – which was “**empty**” because you deleted the formula in that cell.



When you **click-on OK**, the **Function Arguments** menu screen (**above**) will **appear**. If you **look** at the **top of the screen** in the **SUM area**, you’ll **see** that Excel 2003 has “**guessed**” that you desire to **add** the **numbers above cell C9** – where you clicked in your spreadsheet. Smart Excel! **Notice** that it indicates that **cells C6:C8** will be added (sum cells C6 through C8 – the colon (:) means “through.” It also indicates the numbers in cells C6, C7 and C8 and give you the sum {300;50;150} = 500 (right arrow above).

But it's a little unclear how Excel did this. The Help in Excel Functions is excellent. So, to see how this SUM equation works, we'll go to Help. To do this, **click-on [Help on this function](#)** in the lower left corner of the screen (**see lower left arrow above**).



On the right side of your screen you will **see a Microsoft Office Excel Help window** appear (**similar to the one above**) that will show you **how to use this SUM function** (or any function).

One of the really **neat** things about these Help windows is that there are **examples** for each function. We **moved down** the **SUM help screen** using the **elevator bar** on the **right** of the **help screen**. The **bottom** of the screen **looks like the image** at the **top of the next page**. Spend a few minutes looking at the SUM Help window and notice all of the features.

Example

The example may be easier to understand if you copy it to a blank worksheet.

► How?

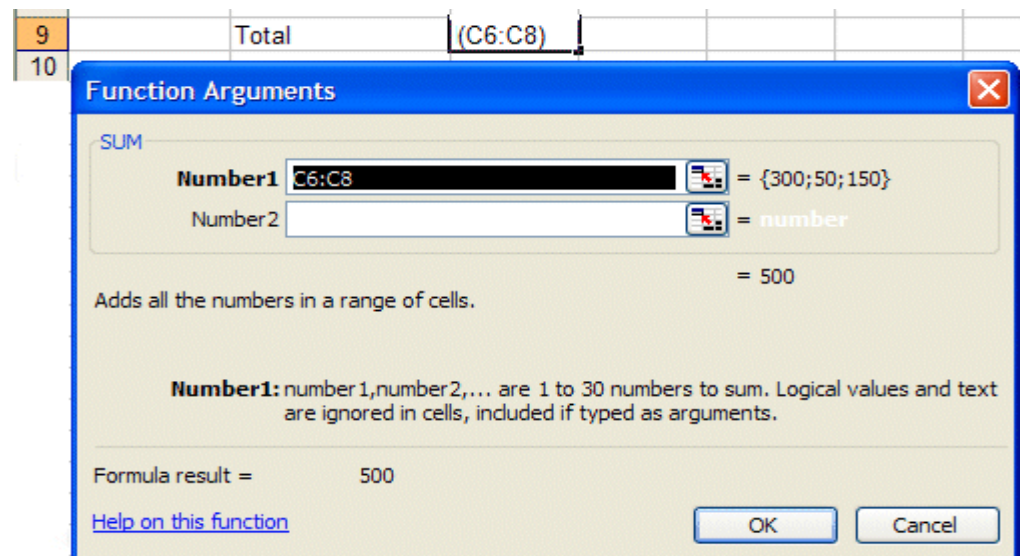
A	
1 Data	
2	-5
3	15
4	30
5	'5
6	TRUE
Formula	Description (Result)
=SUM(3, 2)	Adds 3 and 2 (5)
=SUM("5", 15, TRUE)	Adds 5, 15 and 1, because the text values are translated into numbers, and the logical value TRUE is translated into the number 1 (21)
=SUM(A2:A4)	Adds the first three numbers in the column above (40)
=SUM(A2:A4, 15)	Adds the first three numbers in the column above, and 15 (55)
=SUM(A5:A6, 2)	Adds the values in the last two rows above, and 2. Because nonnumeric values in references are not translated, the values in the column above are ignored (2)

The **bottom** of the **SUM help screen looks like the image** on the **left**. **Notice** that it gives you **examples** from a small spreadsheet that has data in cells A1 through A6. It uses these numbers in the examples at

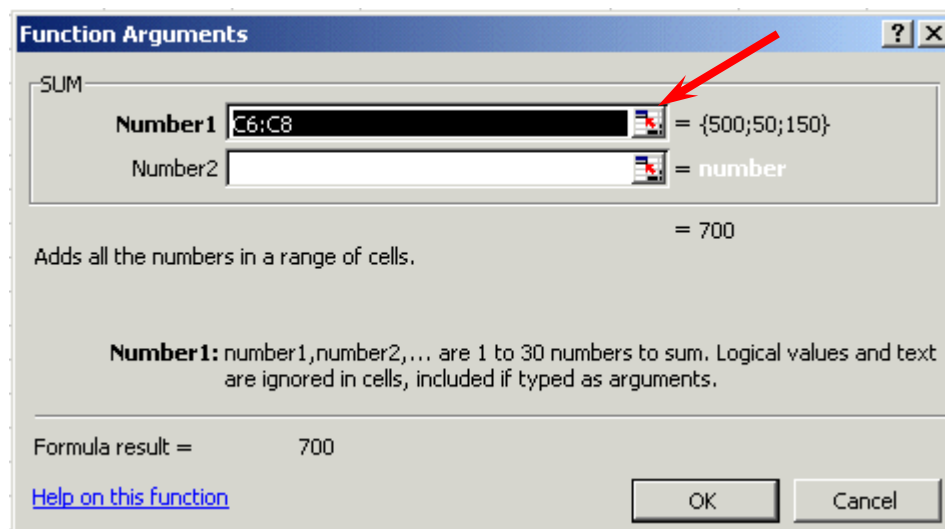
the bottom of the help screen.

When you have reviewed all of the help you care to see, **carefully click-on** the **X** at the **upper right corner** of the **Microsoft Office Excel Help blue bar** to **close** the Microsoft Excel **Help window**. **If you accidentally close the spreadsheet, simply reply yes to Save, and then re-open the spreadsheet as you did on pages 10 & 11.**

The **Function Arguments** menu screen will still be on the screen.

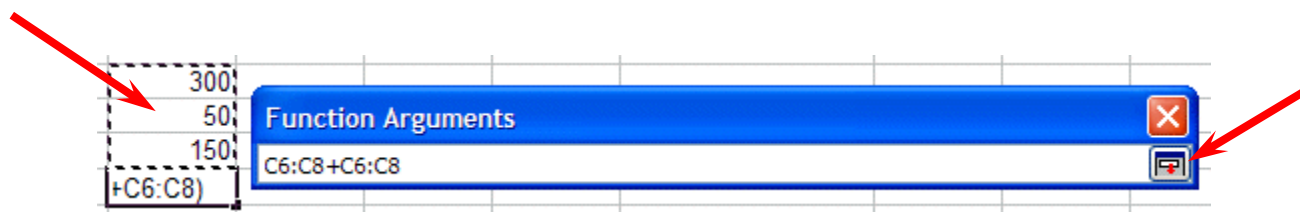


If the **Office Assistant** is **still on the screen** simply point to it and **click** the **RIGHT** mouse button. A pop-up **menu** will appear. **Click-on Hide**. This will put the Assistant away until we need it again



As you can see, in the area to the right of **Number 1**, the "Wizard" has **"guessed"** that you want to add the numbers in the range **C6 to C8**. Now that you are becoming proficient with Excel, we'll try something special. **Carefully, point** to some **"plain part,"** in the **gray area above**. **Click and hold down** the **left** mouse button, and **drag** the above **SUM box "away"** so that you can **see** your **numbers** in **C column cells**. When you have done this, release the mouse button. Now **click-on** the **"small box"** on the **right edge** of the **Number 1 area (see arrow above)**. It has a little **red arrow** in it.

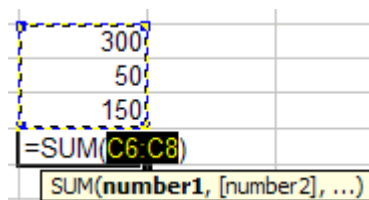
The **below Function Arguments** window will **appear**.



Highlight cells **C6 to C8** in the spreadsheet (**click-on C6, hold down the left mouse button, and drag until the three cells are highlighted**). A **"marquee"** will begin to **flash** around the cells, indicating they are highlighted (**left arrow above**). The **Function Arguments area will appear as above**. Now **click-on** the **small button** on the **right** of the **cell (see right arrow above)**. The **numbers** will **show** in the area to the **right** of **Number 1**. Now, **click-on OK** at the **bottom of the Function Arguments menu screen**. You'll **see** that the **SUM formula [=SUM(C6:C8)]** shows in the **formula area at the top of the screen**. This is a really handy method to highlight a "group" of numbers you want to add.

AutoSum METHOD - Σ

Since we add numbers more than any other operation in spreadsheets, Excel spreadsheet has an additional feature - **Auto Sum**. Move to cell **C9** again and tap the **delete** key to **erase** your last formula. Now **look** at the **upper area** of the **screen**, just below the menu bar, for a Σ (summation) symbol **button**. **Point to it and click with the left mouse button. WOW !! Automatic addition!!** **Notice** that the **cells**, you'd logically desire to add, have a **marquee** around them and



that the **SUM** function is displayed in cell **C9**. You'll need to **confirm** that this is the **correct** formula. So, **tap** the **Enter key** and the SUM function will now be set in cell **C9**. Any time you want to add using this method just click-on the cell where you desire the total to be and click-on the **Σ**.

This would be a good time to save your work. Periodically save and replace your work in case you loose power to your computer

Now move to cell C17 and add the total Expenses in cells C13 to C16 - using each of the four methods.

While you are **in** cell **C17**, go ahead and **place a line at the top of cell C17** using the format cells – border **method** that you learned on **Page 5**.

Subtraction

In cell **A19** **type-in Net Income**. Next, **adjust the width of column A** (Page 6).

Click-on cell C19.

In cell **C19** we want to **subtract** (-)the amount in for **Expenses** in cell **C17** from the amount for **Income** in cell **C9**. This can be accomplished by using either the **Type-In** Method or **Point Method**. Go ahead and do this. Don't forget to **tap** the **Enter** key to **confirm** your **formula**.

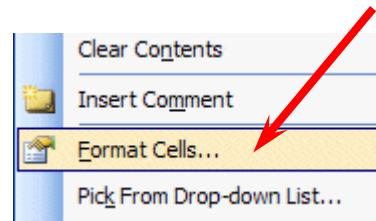
The formula should look like =C9-C17

6.12 More Cell Formatting

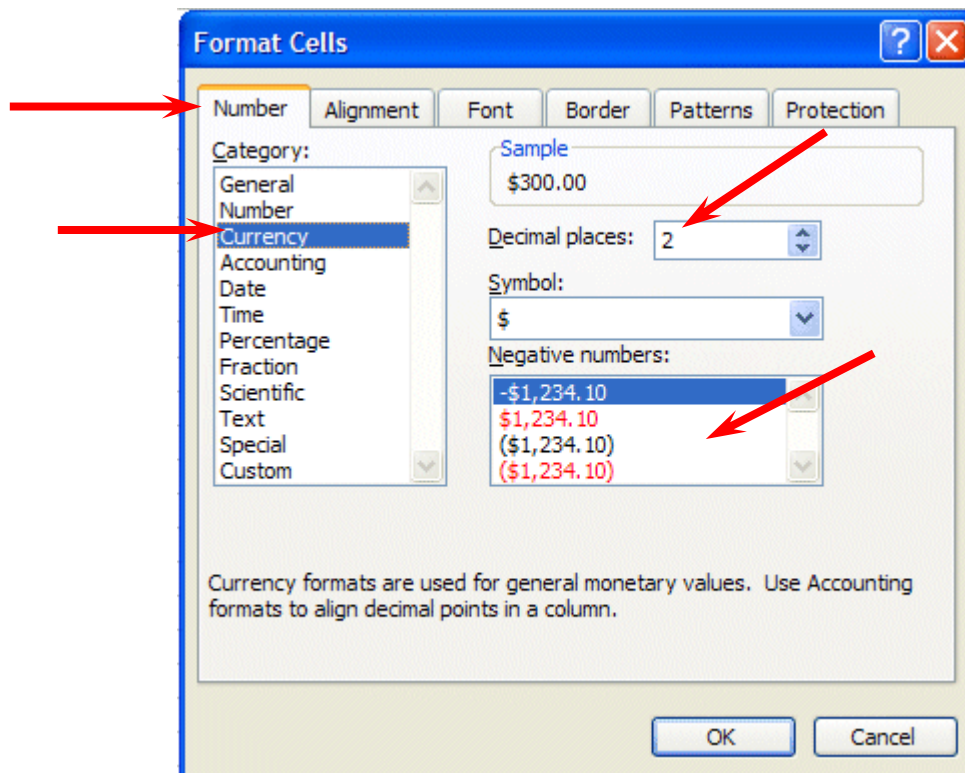
We want our **numbers** to **look better**. To do this we'll include **dollar signs** and **decimal points** in our **numbers**. This is done by **using the mouse**. **Point** to cell **C6**, **hold down the left mouse button** and **drag down slowly to highlight cells C6 through C19**. Your **screen** should **look like** the one at the **top of the next page**.

4			
5	INCOME		
6		Parents	500
7		Job	50
8		Investments	150
9		Total	700
10			
11			
12	EXPENSES		
13		Food	30
14		Beverages	50
15		Parties	150
16		Miscellaneous	70
17		Total	300
18			
19	Net Income		400
20			

Now **point anywhere** in the **highlighted area** and **click the RIGHT mouse button**. A pop-up menu will appear. **Click-on Format Cells** (like you have done before).



Click-on the Number "Tab" at the top of the **Format Cells** menu screen. Point to **Currency** and **click-on Currency**.



Notice **several things**. The **right side** shows the **number of decimal places**. The **2** is the default for cents. **We'll use 2**. Notice above the **Decimal Places** that there is a **sample** of what our **number will look like**. At the lower right it **shows how negative numbers can appear**, depending on **your choice**. When a negative number is calculated, it will appear with your choice. Now **click-on OK**. All the numbers now have \$. If you have large numbers that are **"too wide"** for the current **column width you will see** some **#####** in the **cells** where these numbers are located. If this occurs in your spreadsheet, go ahead and **widen** the columns as you did previously (**Page 6**).

4			
5	INCOME		
6		Parents	\$500.00
7		Job	\$50.00
8		Investments	\$150.00
9		Total	\$700.00
10			
11			
12	EXPENSES		
13		Food	\$30.00
14		Beverages	\$50.00
15		Parties	\$150.00
16		Miscellaneous	\$70.00
17		Total	\$300.00
18			
19	Net Income		\$400.00
20			

Your spreadsheet numbers should now look like the one on the left.

6.13 Division and Percent

Now move to cell **A21** and type in the word **Percent**. We're going to calculate a fun percentage to show you how division works and give you some more practice with numbers.

Now move to cell **C21**. Using either the **Type-In Method** or the **Point Method**, divide (/) the amount for **Income** in cell **C9** by the amount for **Expenses** in cell **C17**.

[The formula should look like =C9/C17]

This will give you a horrid number so why not put a **percent symbol** with it. Now we'll **repeat** what we did **above to format our \$\$\$\$**.

Point to cell **C21** and click the **RIGHT** mouse button. **Point** to **Format Cells**, then **click** the **Number tab**, then **click-on Percentage**. **Select zero (0) Decimal Places**. **Click OK**. Ta Da !!! a %.

6.14 Copying

	A	B	C
1			Janie's & Gr
2			
3			SEPT
4			
5	INCOME		
6		Parents	\$500.00
7		Job	\$50.00
8		Investments	\$150.00
9		Total	\$700.00
10			
11			
12	EXPENSES		
13		Food	\$30.00
14		Beverages	\$50.00
15		Parties	\$150.00
16		Miscellaneous	\$70.00
17		Total	\$300.00
18			
19	Net Income		\$400.00
20			
21	Percent		233%

We could repeat what we did to this point and fill in the Income and Expenses for each of the remaining columns. There is a **simpler way** to do this. **Assuming** our income and expense **amounts** are about the **same**, throughout the months, we want to **copy** the **amounts** in **Column C** to **Columns D, E and F**. This will **require two "steps"**.

Move your cursor to cell **C6**. First, we'll **highlight what we want to copy**; next we'll tell the **spreadsheet where we want to place what we've copied**. So, point to **C6**, hold down the **left mouse button** and drag down the column until cells **C6 through C21** are

high-lighted. Your **highlighted area** should **look like** the one on the **left**.

Now, point to **Edit** in the **Menu bar**. **Click** the **left** button. Point to **Copy** in the menu that appears. **Click** the **left** button. The menu disappears.

\$300.00
\$50.00
\$150.00
\$500.00
\$30.00
\$50.00
\$150.00
\$70.00
\$300.00
\$200.00
167%

You will **notice** that once again, when you **highlight** an area, a **marquee** of running lights moves **around** the **copy area**. So, you'll know you highlighted the correct area (**image on right**).

Now we'll tell the program **where to copy** the information. Point to cell **D6**, **click and hold down the left mouse button and drag down and to the right to cell F21** (This will **highlight three columns** -- OCT, NOV, DEC -- to copy to.). When you have finished your highlighting, your screen should **look like** the one at the **top of the next page**.

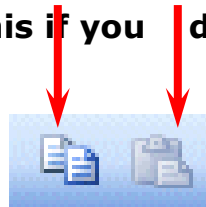
	A	B	C	D	E	F	
1			Janie's & Greg's Budget				
2							
3			SEPT	OCT	NOV	DEC	M
4							
5	INCOME						
6		Parents	\$500.00				
7		Job	\$50.00				
8		Investments	\$150.00				
9		Total	\$700.00				
10							
11							
12	EXPENSES						
13		Food	\$30.00				
14		Beverages	\$50.00				
15		Parties	\$150.00				
16		Miscellaneous	\$70.00				
17		Total	\$300.00				
18							
19	Net Income		\$400.00				
20							
21	Percent		233%				
22							

Now point to **Edit** in the **Menu Bar** again and **click** the **left** button. Point to **Paste**. Click **left** button. **Wow !' All those numbers and dollar signs and formulas - EVERYTHING - was copied in a flash!! That sure saved us a lot of time.**

INCOME					
	Parents	\$500.00	\$500.00	\$500.00	\$500.00
	Job	\$50.00	\$50.00	\$50.00	\$50.00
	Investments	\$150.00	\$150.00	\$150.00	\$150.00
	Total	\$700.00	\$700.00	\$700.00	\$700.00
EXPENSES					
	Food	\$30.00	\$30.00	\$30.00	\$30.00
	Beverages	\$50.00	\$50.00	\$50.00	\$50.00
	Parties	\$150.00	\$150.00	\$150.00	\$150.00
	Miscellaneous	\$70.00	\$70.00	\$70.00	\$70.00
	Total	\$300.00	\$300.00	\$300.00	\$300.00
Net Income		\$400.00	\$400.00	\$400.00	\$400.00
Percent		233%	233%	233%	233%

Click on a **cell away from the area** where the **numbers are located**. This will **"turn-off"** the **highlight**. Tap the **Esc** key and the **marquee** will also **disappear**.

Note: You can also utilize the **copy** and **paste** buttons in the button bar to do this if you desire.



Change a **few numbers** in **each** of the **months** in **both** the **income** and **expense** areas to see **how the spreadsheet works**. (This will make the graphs we'll create more realistic when we create them later in the tutorial.)

This would be a great time to Save again.

Now for something to do on your own

F	G
DEC	MONTHLY TOTALS
\$300.00	\$1,200.00
\$50.00	
\$150.00	
\$500.00	
\$30.00	
\$50.00	
\$150.00	
\$70.00	
\$300.00	
\$200.00	

Entering formulas in the Monthly Totals Column

Move to cell **G6** under the title **Monthly Totals**. Choose one of the formulas you learned earlier to add each of the amounts in **Parents** for the **four months**. Use any of the four methods you desire. Your spreadsheet should look like the one to right, just before you copy the formulas.

MONTHLY TOTALS
\$1,200.00
\$200.00
\$600.00
\$2,000.00
\$0.00
\$0.00
\$0.00
\$120.00
\$200.00
\$600.00
\$280.00
\$1,200.00
\$0.00
\$800.00

After you have completed your formula **copy** it to cells **G7 through G19**. You will see some "stuff (zeroes)" in cells **G10, 11, 12, and 18**. This is because there was "nothing there" to **add**. So, go in and **clean-up** these cells by **deleting** the zeros in these cells.

MONTHLY TOTALS
\$1,500.00
\$200.00
\$750.00
\$2,450.00
\$380.00
\$200.00
\$655.00
\$310.00
\$1,545.00
\$905.00
159%

Next, go to cells **G9** and **G17** and **underline** like you did before (**Page 5**).

Copying Percentage Formula

Notice that **we didn't copy** the **percentage** formula when we started this last copying effort. If we had copied a **SUM** formula, it would have added the four percentages. We don't want the sum of the percentages. We **want** a **percentage** of just the Monthly Totals. So, we need to copy this percentage separately. Now, **copy** the **percentage** formula in cell **F21** to cell **G21**. Now put a **\$** in cells **G6 through G19** if you need to, and a **%** in **G21**. Your **spreadsheet column G** should **look something like** the image on the **right**

This would be a great time to save again.

Absoluting (and multiplication)

There are times, when we are working with a spreadsheet, that we **do not want** a cell to **"roll" to the next column** when we **use** the **copy** feature of the spreadsheet – like it did in our last copying exercise. To **stop** the **cells** from **"rolling"** we utilize something called **absoluting**. The following is an illustration of absoluting.

Go to cell **A23** and type-in **Number**. Go to cell **A25** and type-in **Result**.

Go to cell **C23** and type in a **2** – and **tap** the **Enter** key.

We'll now **create a formula** to multiply our **number** times **Net Income**. You may use either the **Type-in** or **Point** method. Go to cell **C25**, and type-in a formula to **multiply cell C23 times cell C19**.

The formula should look like: **=C23*C19**

The result in **C25** should be **two times the net income in cell C19**.

Now **copy** the formula in cell **C25** to cells **D25, E25, F25 and G25**. Your row 25 should look similar to the one below.

25	Result		\$460.00	\$0.00	\$0.00	\$0.00	\$0.00
----	--------	--	----------	--------	--------	--------	--------

Uh Oh!!! Where did all of those "0's" come from?

Point to each of the cells **D25, E25, F25 and G25**. Notice, as you **click on each cell and look at the screen**, how **C23** (the cell with the 2) **"rolled" and became D23, E23, F23 and G23 (which are blank** - this caused the **"0's"**). A **blank times** a number is a "0." **We want the 2 to be in each formula and not to "roll"**.

To do this we utilize something called **Absoluting** or **Anchoring**.

Go back to cell C25. Now we'll **enter the formula again**, but a little differently (to anchor the 2).

Type-in a =C23 (or you could type = and point to C23). **NOW, tap the F4 key**. Notice, in the **Edit bar** at the **top of the screen**, that the **=C23 changes to: \$C\$23**. (This tells you that cell **C23**

is **absoluted** or **anchored**. The **"\$'s"** indicate the **absoluting**.) Now **finish the formula** by typing in or pointing ***C17** as before. Tap **Enter**.

The formula should look like: **=C\$23*C19**

Now **copy** the **formula** in cell **C25** to cells **D25, E25, F25 and G25** again. Your row 25 should look similar to the image below.

25	Result		\$460.00	\$630.00	\$560.00	\$160.00	\$1,810.00
----	--------	--	----------	----------	----------	----------	------------

The numbers should now be **correct**. Point to cells **D25, E25, F25 and G25** (like you did before). You will notice the **"\$'s"** have **copied** the **=C\$23** to **each cell (absoluting)** and the Net Income figures have rolled as they should. Absoluting is something you should know and understand.

Pause and reflect -- Look at all you have accomplished. If you want go in and change some more numbers or change the income and expense titles to something you feel is more fun or appropriate, please do so.

This would be a great time to Save again.

The next important lesson is to learn how to **print**. This done with a few easy steps.

6.15 Printing

First, **move** to **cell A1**.

All of the Windows **spreadsheets** try to figure out what you want to print. Sometimes they're **right**, sometimes they're **wrong**. So.....

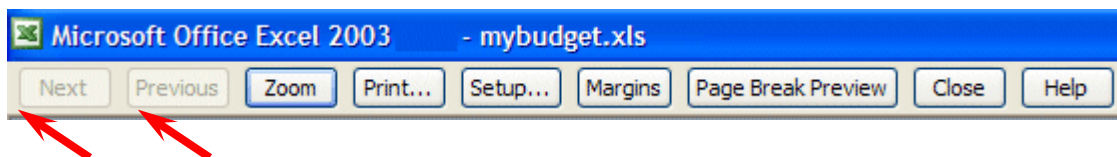
The most important thing with printing is to tell the printer what to print.

Unlike a word processor, you **may need** to **highlight** what you want to print. For the moment, we'll assume that Excel 2003 will "guess" correctly, and that you have not "clicked" somewhere that will cause a problem. If you do have problem, which we'll know in a second, we'll show you how to take care of the problem a bit later.

It's usually a good idea to **see** what our **printout will look like – before you print it**. First, we'll use a **Print Preview** to "**see**" what our spreadsheet looks like. To do this we'll **click-on** the **Print Preview Button** in the **Button Bar**. **Point** to the **Print Preview** button and **click on it**.



A **picture**, of what our **printout will look like**, **appears** on the **next page**.



At the **top** of the **Print Preview screen** you will **see** the **button bar above**. We'll use a number of the buttons on this bar to assist us with our printing.

Notice that the **Next** and **Previous** buttons at the **left end of the bar** are **not highlighted** with text – they are just gray. This **means** that the buttons are **not "active."** This **indicates** that we are **OK** with our spreadsheet – it is **all on one page**. If we saw that the Next button was active, this would mean that there are other pages to our spreadsheet. If you'll **look** at the **lower left corner** of the **Print Preview screen** you'll **see: Preview: Page 1 of 1**. This **confirms** that our spreadsheet is **on one page**. **If you do not see this "combination," we'll show you how to take care of it later.**

If you do see this combination, click-on the **Print** button. **Click-on OK** in the **Print menu screen** that appears. **Label this printout as: Default Spreadsheet Printout.**

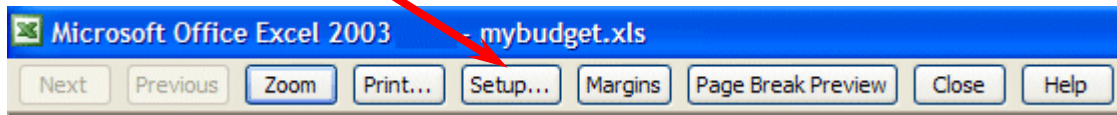
Janie's & Greg's Budget					
	SEPT	OCT	NOV	DEC	MONTHLY TOTALS
INCOME					
Parents	\$400.00	\$300.00	\$300.00	\$500.00	\$1,500.00
Job	\$50.00	\$50.00	\$50.00	\$50.00	\$200.00
Investments	\$150.00	\$150.00	\$300.00	\$150.00	\$750.00
Total	\$600.00	\$500.00	\$650.00	\$700.00	\$2,450.00
EXPENSES					
Food	\$50.00	\$30.00	\$100.00	\$200.00	\$380.00
Beverages	\$50.00	\$50.00	\$50.00	\$50.00	\$200.00
Parties	\$200.00	\$5.00	\$150.00	\$300.00	\$655.00
Miscellaneous	\$70.00	\$100.00	\$70.00	\$70.00	\$310.00
Total	\$370.00	\$185.00	\$370.00	\$620.00	\$1,545.00
Net Income	\$230.00	\$315.00	\$280.00	\$80.00	\$905.00
Percent	16.2%	270%	176%	11.3%	159%
Number	2				
Result	\$460.00	\$630.00	\$560.00	\$160.00	\$1,810.00

Next, notice that an “**image**” of **your spreadsheet** appears below the **button bar (above)**.

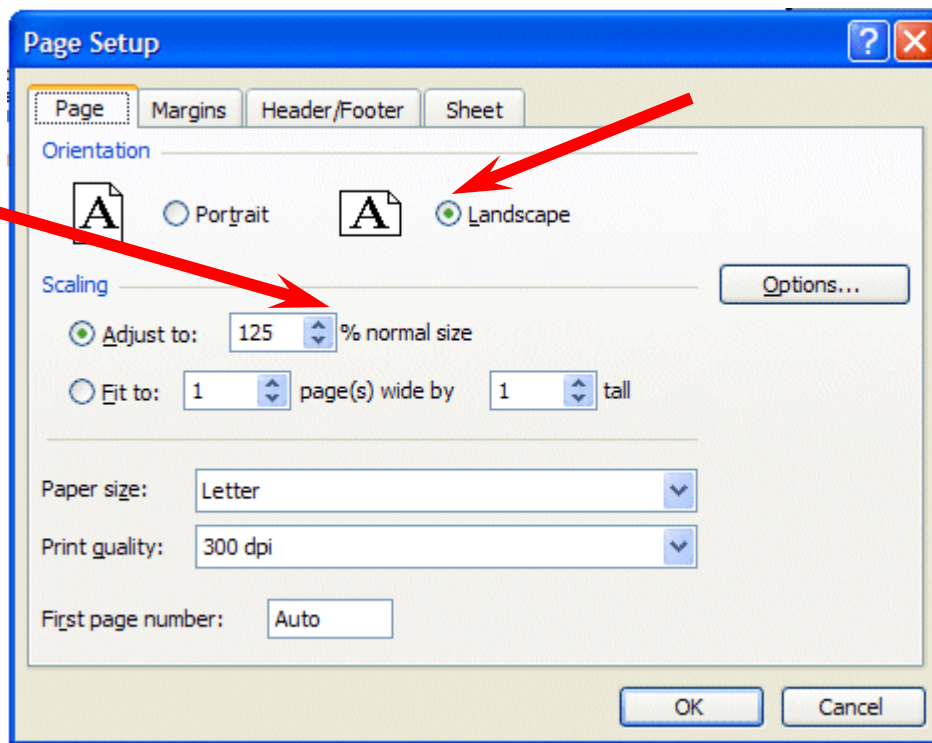
If you **move your cursor over the spreadsheet**, you’ll **notice** that the **cursor changes** from an **arrow** to a **tiny magnifying glass**. If you **click the left mouse button**, your **magnifying glass will “zoom-in” on the exact spot where the magnifying glass is located**. If you **click-again**, it will **zoom-out**. Try this a couple of time. It is a really handy feature.



Now **click-on Setup** in the **top button bar**.



The **Page Setup** menu screen at the **top** of the **next page** will **appear**.



Notice that the **Page Setup** menu screen **indicates** that you are in **Portrait** view. Now we'll **enhance** the spreadsheet to make it a bit more presentable. In the **Orientation** area **click-in** the **small circle** in front of **Landscape** (see arrow above). The spreadsheet will now print on the page as indicated. Next, in the **Scaling** area, **click-in** the **box to the left of % normal size**. Using either the "up/down" arrows, or **by typing** in the information, change the size to **125**. Then click-on **OK**.

Your spreadsheet will now be larger and fill the paper more appropriately. **Click-on Print** and when this spreadsheet comes out of the printer label it: **landscape – enlarged to 125 %**.

Go ahead and **adjust** the “size” of your spreadsheet so that it becomes **too large** to fit on a single page. Set the **Scaling** to **200** and **click-on OK**. When you return to the Preview screen, the **Next** and **Previous** buttons at the top will now be **active**, and you’ll see **1 of 3 or 4 pages** in the **lower left corner** of the screen. Go ahead and click-on the Next and Previous buttons to get a “feel” of the “size” of your spreadsheet. If you click-on Print (please don’t do it), you’ll get these 3 or 4 pages. If you made a mistake when you created the spreadsheet, you might see that you have 58 pages in your spreadsheet!

Now, **click-in** the **small circle** to the **left** of **Fit 1 page(s) wide by 1 tall** in the **Scaling** area and make sure that **1 page** is set. Excel 2003 will now **return** your spreadsheet to **one** page. Try other things here. Work with the **Margins, Header/ Footer, and Sheet** tabs at the top of the Page Setup menu screen. Any time you desire to print, go ahead and do so. This will give you a feel for how the spreadsheets will print. When you are finished, simply click-on **Close** and you will return to your spreadsheet.

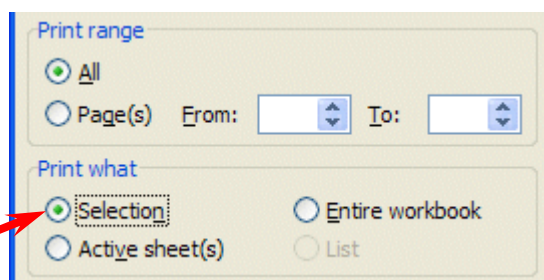
Many folks ask how to **center a spreadsheet on the page**. This feature is located in **Margins** at the bottom of the Margins screen. Simply click-on Margins at the top of the Preview screen or on the Margins tab when you are in the Page Setup screen.

Many folks also ask about how to place **gridlines** and **show the row and column headings** (A, B, C and 1, 2, 3) in their spreadsheet printouts. This feature is located on the Sheet tab in the Setup screen menu.

Cure for the problem

If you have too many spreadsheet pages

Simply **click-on cell A1** and **highlight** your spreadsheet down **through cell G25**. This time however, **after you’ve highlighted A1 through G25**, **click-on File** in the **Menu Bar** and then **click-on Print**. In the **lower left corner** of the **Print menu screen** you will **see** an **area** that **looks like the image on the**



right. Click-in the small circle to the left of Selection. This indicates to Excel that you only want to print the area you've highlighted. **Click OK.** Only the section that you've highlighted will print. **You can still modify your spreadsheet if you desire.** Once you've clicked by Selection, you may click-on the Preview button in the Print menu screen and you will see a preview of your highlighted area. Follow the instructions above to modify as you desire.

Now we'll call it a day and close Excel 2003 for Windows. First, let's **save** our work one more time. If you **forget**, Excel will **remind** you **to do it**. What a nice program!!

Point to the **Edit** menu and click the left button. Point to **Exit**. **Click the left** button. That's it for now.

When you return, we'll retrieve our work and do some really neat graphics. To open your spreadsheet again, follow the instructions on Pages 10 and 11.

6.16 Graphics

This will be a lot of **fun**. We are now going to turn your spreadsheet numbers into graphics -- bar charts, pie charts, etc. This will greatly assist you when you display and explain your work.

Before we do this there are a couple of **essential steps**. First we have to **tell** an Excel 2003 "Wizard" **what we want to chart** and then **were** we want the chart to go.

First: in cell **B9 type-in Income** (to **replace** the word **Total**). Next, **type-in Expenses** in cell **B17** for the same reason.

VERY IMPORTANT.....

Something new.... **Hold down the left mouse button** and **highlight cells B3 to F3**. Next **HOLD DOWN** the **Ctrl** key at the **bottom of the keyboard**, and **while you are holding it down**, **highlight cells B9 through F9**. You will now **see two "ranges" highlighted**. **Hold down the Ctrl again**, and **highlight cells B17 through F17**. These three ranges will make up your chart. The x-axis will be made up of B4 - F4. And, the two sets of bars

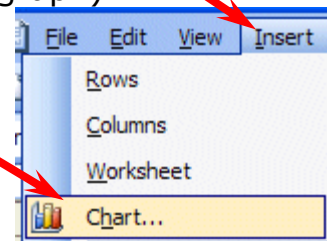
(series) will make-up Income and Expense. When you complete the above instructions, your screen should look like the one below.

	A	B	C	D	E	F
1			Janie's & Greg's Budget			
2						
3			SEPT	OCT	NOV	DEC
4						
5	INCOME					
6		Parents	\$400.00	\$300.00	\$300.00	\$500.00
7		Job	\$50.00	\$50.00	\$50.00	\$50.00
8		Investments	\$150.00	\$150.00	\$300.00	\$150.00
9		Income	\$600.00	\$500.00	\$650.00	\$700.00
10						
11						
12	EXPENSES					
13		Food	\$50.00	\$30.00	\$100.00	\$200.00
14		Beverages	\$50.00	\$50.00	\$50.00	\$50.00
15		Parties	\$200.00	\$5.00	\$150.00	\$300.00
16		Miscellaneous	\$70.00	\$100.00	\$70.00	\$70.00
17		Expenses	\$370.00	\$185.00	\$370.00	\$620.00
18						

If your spreadsheet **does not look exactly** like the one above, please **try again**. This is a bit tricky and it often takes even experienced spreadsheet folks a couple of "tries" to get the highlighting just right.

We'll use the **easiest method** for our first chart (graph).

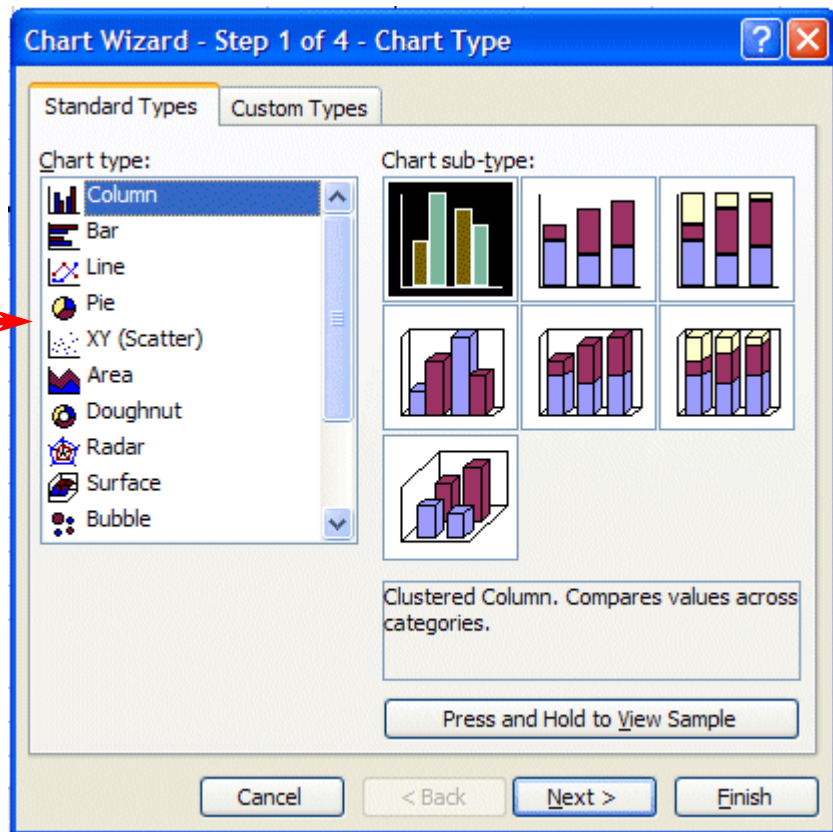
In the **Menu Bar** click-on to **Insert**, then click on **Chart**. The **Chart Wizard – Step 1 of 4 Chart Type** menu screen will appear (like the one at the **top of the next page**).



The **Chart Wizard** shows the various types of charts in **Chart type:** (on the **left** side of the menu screen).

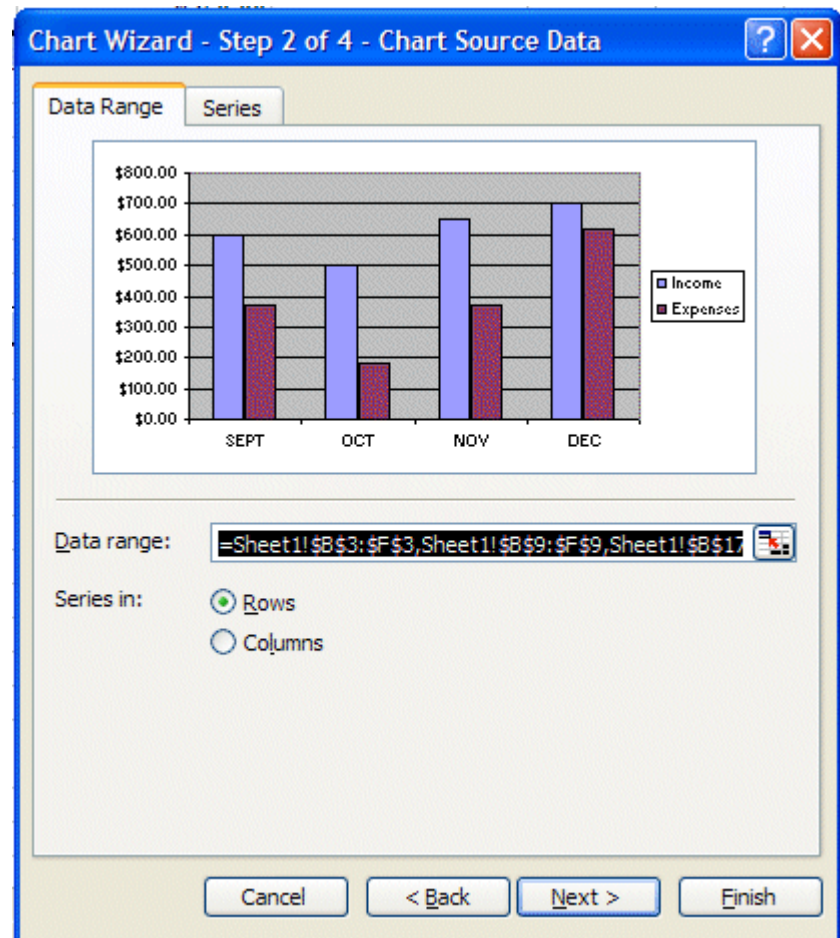
Examples of the selected chart type show on the **right** under **Chart sub-type**. We'll stay with **Column** and the chart selected for now.

Click Next.

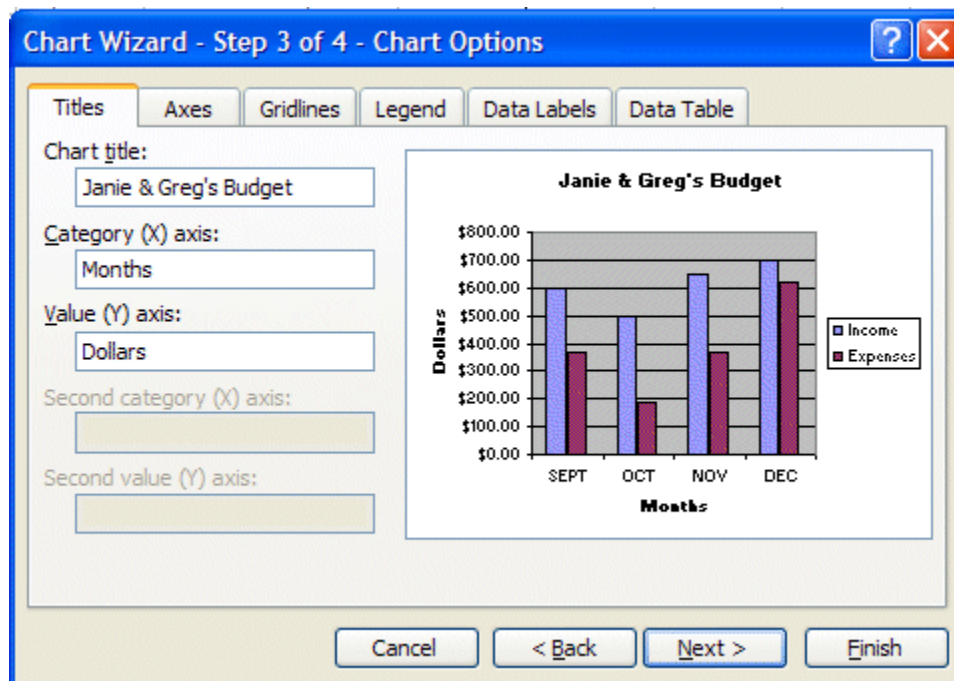


The **Step 2** portion of the menu appears (as **shown** on the **right**).

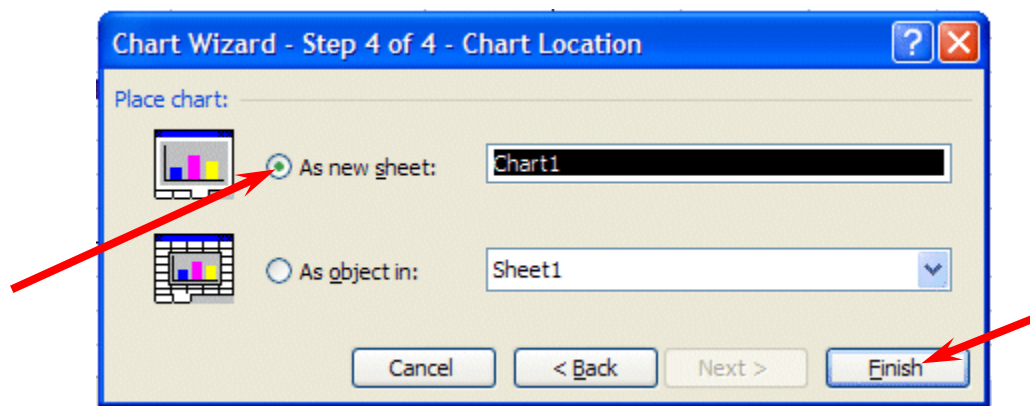
The **Wizard** (on the **last page**) shows you **what your chart will look like**. The "ranges" you **selected** originally are



shown in the **Data range:** area. **If you did not highlight as indicated, your chart won't "look right."** Your chart should look like the **example above**. If you **click-on** the **Series** tab at the **top** of the **Wizard** screen, you'll see a new Wizard screen that shows you where the Income and Expenses series came from. **Click-back** on the **Data range** tab at the top. Now **click-in** the **little circle** in front of **Columns**. The Wizard will **indicate** that the chart has been "**rotated**" **90 degrees** and thus the axis has changed. This is often called a "**pivot**." **Click-back** in the **small circle** in front of **Rows**. Click **Next** again.



The Chart Wizard Step 3 of 4 menu will appear: **Titles** (similar to the image above). **Click-in** the **blank area** under **Chart Title**. A flashing cursor will appear. **Type-in your name with an apostrophe (') s and the word Budget (ex. Janie's Budget)**. Now, **click-in** the **area** under **Category (X) axis:** and type in **Months**. Next, **click-in** the **area** under **Value (Y) axis:** and type in **Dollars**. You probably noticed that as you entered these titles, the chart in the area on the right of the Wizard changed to give you an "instant" preview of your final chart. You will also notice that there are several **tabs** at the **top** of the Wizard. **Click-on each** of the **tabs** and **see** what "they do". Notice how some change axis and put in grid lines. The **legend** is the **small box** on the **right**, which **indicates** what the **colors** of the "**bars**" represent (Income and Expenses). **Click Next** one last time. The **Step 4 page** of the Wizard will now **appear** (image at the **top** of the **next page**)



This is the final Wizard page. You'll notice that it asks you **where** you want to **put** your **chart**. Since this is your first chart, it is best if you select **As a new sheet:** (see **arrow above**). This will put your chart on a **new tab** called **Chart 1**. Now click-on **Finish**, You'll see that you chart has a tab of its own at the bottom of the screen, and "fills" an entire screen.

WOW!!!! There's your chart. Again, notice that Excel created a **new tab** at the bottom of the spreadsheet that says **Chart 1**. **Any time the numbers change on Sheet 1, the bars in Chart 1 will reflect the change automatically!** Click on the **Sheet 1** and **Chart 1** tabs to get the feel of going back and forth between the data and the chart. After you make your changes, **click** on the **Chart 1** tab and you'll see how the chart has changed.

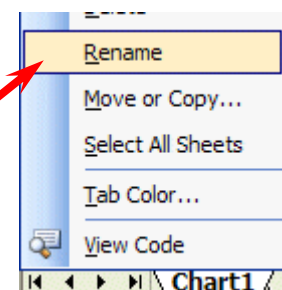
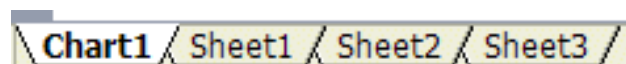
Now it would be a good time to Save again.

In **Excel 2003**, when you save your **spreadsheet**, you also save your **graph**. Your graph is saved wherever you are working in the graph.

6.17 Changing (Renaming) Excel 2003 Tabs

If you would like to have logical names for your Excel 2003 spreadsheet tabs – rather than Sheet 1 and Chart 1, we'll now show you how to do this.

At the **bottom** of your **spreadsheet** you will see you **tabs** (like the **image** on the **right**). To change the name of one of the tabs, **place your**



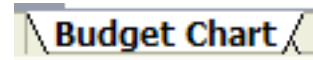
cursor over a tab and **click** the **RIGHT** mouse button.
We'll change the name of Chart 1 first.

When you click the Right mouse button the drop down menu screen to the right will appear. **Choose Rename.**

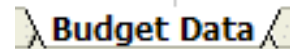
When you choose Rename, the **Chart 1 tab** will **"turn black"** – like the **image** on the **right**. **As soon as you see this, type in the name you want for your chart.** We **typed** in **Budget Chart**.



As soon as we began typing, the tab name changed. When we finished, our chart tab looked like the one on the right.



Go ahead and name your Sheet 1 tab something more logical than Sheet 1. We named our Sheet 1 tab Budget Data.

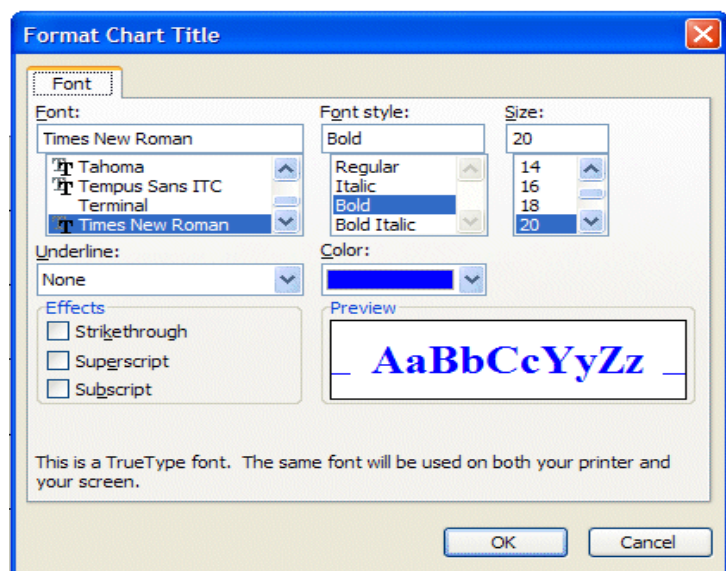


Note: We are about to do some things which could **mess-up** your graph. **If you do get "messed-up" in the graph - don't save again.** Simply **Close** the worksheet and **DON'T SAVE.** **Open** the worksheet again and you will be in a nice neat graph where you can experiment some more.

Let's really get **"Snazzzyyy"**.

Click on the Budget Chart (or whatever you named it) tab.

Click-once on your title at the top. A "box" with **little squares** on the corners will appear. These are "sizing grabbers". When you move the cursor over them you will notice that the cursor changes to small, directional arrows. If you click, hold down the left mouse button, and drag when you see these arrows, you will notice that the Title Box gets larger or smaller as you drag. Next, **click-on the name of your budget** until you get a **flashing cursor** somewhere in the title. With the **arrow movement keys**, or **mouse**, **move** to the **end of the title**, to the right of the "t" in Budget, and tap **Enter**. Type in **Fall 2003**. Now **click** at the beginning of your name, hold down the left mouse button, and drag to **highlight the first line of the budget title with your name in it**. Keeping the cursor on the dark area, **click** the **right mouse button**.



Click-on **Format Chart Title**.

A **Format Chart Title** menu screen, like the one on the right, should appear.

Instructions on how to change the font appear at the top of the next page.

Change the **Font** to **Times New Roman** (by moving up and down with the arrows) or any font that you like. As you change things you will see the results in **Preview** on the lower right. Change the **size to 20**. Change the **color** if you want. **Click OK**. Your title should look something like the one below.

Janie & Greg's Budget
Fall 2003

Click-on the **upper right hand corner of your gray graph area**. You will see **little squares** now appear at the four corners and sides of the graph area. Point to the **upper right corner square** and move the cursor until you see an **arrow with two heads** \leftrightarrow . Hold down the left mouse button and **drag down and to the left** then let go. Your graph will get **smaller**. Now point somewhere in an **open gray area** of the graph (not on one of the bars) and **click** again. **Hold down the left mouse button** and **drag** the graph area so it looks more "appropriate". **Click-on** the **Legend** on the **right** (box with Income and Expenses). When you see the corner "grabbers," make the Legend box a bit larger. Then **click right** in the **Legend area**. **Click Format Legend**. **Click the Font tab**. Make the **font bold** and **size 14**. **Click OK**.

If you **desire** to **change the colors of the Income and E2003ense bars** in the graph, simply **move the mouse over one of the bars** and **click the right** mouse button. **Notice** all the **bars** with the same color now have a **little square in the middle of each bar**. The right click "**marked**" the bars. **Click Format Data Series**. **Choose a color you like** and then **click OK**.

Now let's look at your graph and then print it. Go to **File - Print Preview**. If you like what you see go ahead and **print** the graph. If not, close Preview and make some more graph changes.

Whenever your **graph is visible**, you can **point to any area** of the graph, and **click the right mouse button** on the area, and **edit** that particular area. You can also **click-right** in the **chart** itself. In the menu that appears, **click-on chart type** and then **select a different type of chart**.

You can really go "wild" at this point. If you make a mistake, simply click the undo button at the top of the menu screen and try again.



Note: No matter what type of printer you have, graphs take awhile to print. Be patient.

7 Ms Power Point

7.1 Introduction into Microsoft PowerPoint

Microsoft PowerPoint is a powerful tool to create professional looking presentations and slide shows. PowerPoint allows you to construct presentations from scratch or by using the easy to use wizard.

This tutorial will help you get started with Microsoft PowerPoint and may solve some of your problems, but it is a very good idea to use the Help Files that come with Microsoft PowerPoint, or go to Microsoft's web site located at

7.2 Starting Microsoft PowerPoint

Two Ways

1. Double click on the Microsoft PowerPoint icon on the desktop.

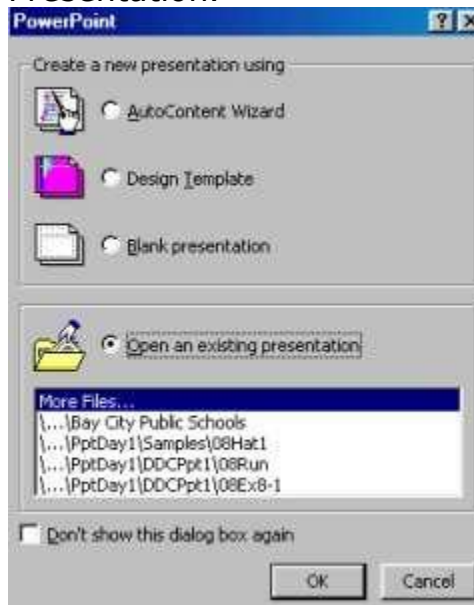


2. Click on Start --> Programs --> Microsoft PowerPoint



7.3 Creating & Opening a Presentation

After you open up Microsoft PowerPoint, a screen pops up asking if you would like to create a New Presentation or Open An Existing Presentation.



7.4 AutoContent Wizard

- Creates a new presentation by prompting you for information about content, purpose, style, handouts, and output. The new presentation contains sample text that you can replace with your own information. Simply follow the directions and prompts that are given by Microsoft PowerPoint.

• **Design Template**

- Creates a new presentation based on one of the PowerPoint design templates supplied by Microsoft. Use what is already supplied by Microsoft PowerPoint and change the information to your own.

• **Blank Presentation**

- Creates a new, blank presentation using the default settings for text and colors. Go to next step: [Creating A Blank Presentation](#)

7.5 Opening an Existing Presentation

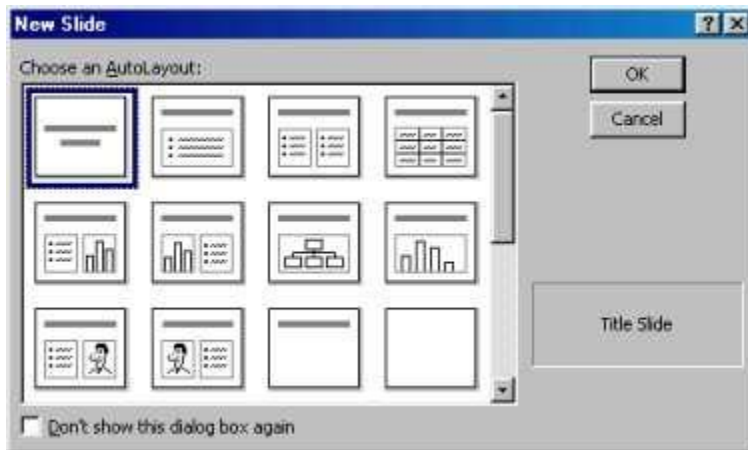
1. Select **Open An Existing Presentation** from the picture above

2. Click on your presentation in the white box below step 1
 - If you do not see your presentation in the white box, select **More Files** and hit OK.
 - Locate you existing Presentation and hit the **Open** button

7.6 Create a Blank Presentation

After you select Blank Presentation a window pops up asking you to select the layout of

the first slide.



7.6.1 Pre-Designed Slide Layouts (Left to Right)






- Title Slide
- Bulleted List
- Two Column Text
- Table
- Text & Chart
- Chart & Text
- Organizational Chart
- Chart
- Text & Clip Art
- Clip Art & Text
- Title Only
- Blank Slide

NOTE: *If you already know what you want in your next slide, it is a very good idea to choose one of the pre-designed layouts from above. However if you do not, then you can still insert what you want in throughout your Presentation anytime you desire. Just choose Blank Slide and insert items as you see fit.*

7.6.2 Different Views That PowerPoint Demonstrates

There are different views within Microsoft PowerPoint that allow you to look at your presentation from different perspectives.



Normal View	Outline View	Slide View	Slide Sorter View	Slide Show View
				
Switches to normal view, where you can work on one slide at a time or organize the structure of all the slides in your presentation	Switches to outline view, where you can work with the structure of your file in outline form. Work in outline view when you need to organize the structure of your file.	Switches to slide view, where you can work on one slide at a time	Displays miniature versions of all slides in a presentation, complete with text and graphics. In slide sorter view, you can reorder slides, add transitions, and animation effects. You can also set the timings for electronic slide shows.	Runs your slide show in a full screen, beginning with the current slide if you are in slide view or the selected slide if you are in slide sorter view. If you simply want to view your show from the first slide: 1. Click Slide Show at the top of the screen 2. Select View Show

7.7 Slide Manipulation

7.7.1 Inserting A New Slide

1. Click **Insert** at top of screen
2. Select New Slide

7.7.2 Formatting A Slide Background

- o You can format your slide to make it look however you would like, whether it be a background color, picture, or a design template built into Microsoft PowerPoint. The next step will show you how to apply a Design Template, but the other items mentioned above can be accomplished the same way.

1. Click **Format** at the top of the screen
2. Select Apply Design Template



3. Select Design you wish to apply
4. Click Apply Button

7.7.3 Inserting Clipart & Pictures

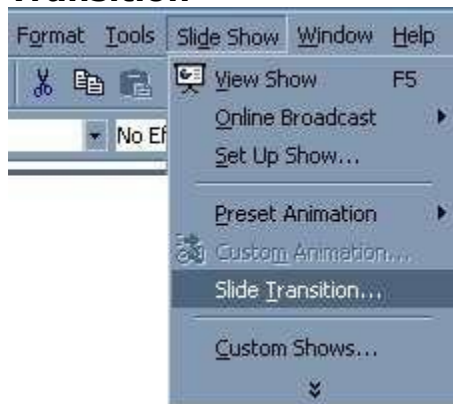
4. Display the slide you want to add a picture to.
5. Click **Insert** at the top of the screen
6. Select **Picture**
7. Select **Clip Art**
8. Click the category you want
9. Click the picture you want
10. Click Insert Clip on the shortcut menu

11. When you are finished using the Clip Gallery, click the Close button on the Clip Gallery title bar
12. **Steps 1-4 are very similar when inserting other Pictures, Objects, Movies, Sounds, and Charts**

7.7.4 Adding Transitions to a Slide Show

You can add customized transitions to your slide show that will make it come alive and become appealing to your audience. Follow these steps when adding Slide Transitions.

1. In **slide or slide sorter view**, select the slide or slides you want to add a transition to.
2. On the **Slide Show** menu at the top of the screen, click **Slide Transition**



3. In the Effect box, click the transition you want, and then select any other options you want
4. To apply the transition to the selected slide, click Apply.
5. To apply the transition to all the slides, click Apply to All.
6. Repeat the process for each slide you want to add a transition to.
7. To view the transitions, on the Slide Show menu, click Animation Preview.

Viewing the Slide Show

You can view your slide show by any of the following ways:

1. Click Slide Show at the lower left of the PowerPoint window.
2. On the Slide Show menu, click View Show.
3. On the View menu, click Slide Show.
4. Press F5 on the keyboard

7.8 Navigating While In Your Slide Show

- **Forward Navigation**

- Simply click on the left Mouse Button or hit the Enter Button on your keyboard

- **Reverse Navigation**

- Hit the Backspace on the keyboard

- **Exiting the show**

- Hit the Esc Button on the keyboard

7.9 Pack up a presentation for use on another computer

1. Open the Presentation you want to pack
2. On the **File** menu, click **Pack and Go**
3. Follow the instructions in the Pack and Go Wizard.

7.10 Unpack a presentation to run on another computer

1. Insert the disk or connect to the network location you packed the presentation to
2. In My Computer, go to the location of the packed presentation, and then double-click **Pngsetup**
3. Enter the destination you want to copy the presentation to

7.11 Printing

Select File | Print from the menu bar to print the presentation.

7.11.1 **Print Range**

Select all to print all the slides in the presentation.

7.11.2 **Current Slide**

This option prints only the current slide.

7.11.3 **Slides**

This option prints only selected number of slides. For example enter slide numbers in the slides field to print only certain slides say from 1 – 5 out of 10 slides.

7.11.4 **Copies**

Enter the number of copies of each slide specified in print range and check the collate box if necessary.

7.11.5 **Print What Options**

- Slide - Prints a full –page slide on each page.
- Hand Outs - Prints as many slides as you designation on each page.
- Notes Page - Prints one slide with that slides notes on each page.
- Outlines View - Prints the outline of the presentation.
- Choose Pure black and white if you are printing with a black and white printer.
- You can choose to frame your slides. click OK to print.

7.12 Bulleted Lists on Design Templates

Bulleted lists allow you to clearly display the main points of your presentation on slides. The text boxes on design templates already include bulleted lists. Click the place holder on the slide to begin adding text and press the ENTER key to return to the next line and add a new bulleted item to go to the next line with out adding another bullet, hold down the SHIFT key while pressing ENTER.

7.12.1 **Bulleted List from a Text Box**

If you are not creating a bulleted list from an existing placeholder on a design template, or if you would like to add an additional bulleted list, follow these steps to create a new list.

1. In slide view, create a text box by selecting Insert | Text box from the menu bar.
2. “Draw” the text box on the slide by holding down the left mouse button while you move the mouse until the box is the size you want it.
3. Choose Format | Bullets and Numbering from the menu bar.
4. Change the size of the bullet by changing the percentage in relation to the text.
5. Choose a color for the bullet from the color menu. Click more colors for a larger selection.
6. Select one of the seven bullet types shown and click OK.

OR

- Click the picture button to view the picture bullet window select one of the bullets and click OK.
- Click the character button to select any character from the fonts on the computer. Select a symbol font such as wingdings or webdings from the bullets from drop down menu for the best selection of icons. Click on the characters in the grid to see them longer click OK when you have chosen the bullet you want to use.
- Click OK on the bullets and numbering window and use the same methods described in the “Bulleted lists on design templates” to enter text into the bulleted lists.

7.12.2 **Numbered Lists**

1. Create a text box.
2. With the text box selected, choose Format | Bullets and numbering from the menu bar.
3. Click the numbered tab at the top of the bullets and numbering window.
4. Change the size of the numbers by changing the percentage in relation to the text.
5. Choose a color for the numbers from the color menu. Click more colors for larger selection.
6. Change the start value if the numbers should not begin with 1.
7. Select one of the seven list types shown and click OK.

7.12.3 **Adding Notes**

From normal view, notes can be added to the slide. These notes will not be seen on your presentation, but they can be seen printed out on paper along with the slide, the notes refer to by selecting print what: Notes pages on the print menu. These are normally speaker’s notes and can be used for reference as one gives the presentation.

7.12.4 **Adding Video**

To add video to your presentation select Insert | Movies and Sounds | Movie from file or insert an animation from Microsoft’s gallery, choose Insert | Movies and Sounds | Movie from Gallery. Select the video file and click OK.

7.12.5 **Action Buttons**

Use the action toolbar to add functioning buttons to slides in a presentation.

1. Select Slide Show | Action buttons from the menu bar. Click the bar a cross the top of the button menu and drag it off the menu so it becomes a floating tool bar.
2. Click one of the button faces and draw the button on the slide using the mouse. The action settings menu will then appear.
3. Set the actions under other the mouse click or mouse over tabs. Actions specified for mouse click will execute when the button is clicked on the slide while actions for mouse over will occur when the mouse pointer hovers over the button.
4. Select an action for the button by choosing a hyper link to destination.
5. If you want a sound to be played when the buttons is clicked, check the play sound box and choose a sound from the drop-down menu.
6. Click OK.

7.12.6 **Presentation Design Tips**

1. Use contrasting colors for the text and the background so the text will be easy to read.
2. Use font size large enough to be seen from the back of the room where the presentation will be held. A font size of 24 – point or larger is recommended.
3. Use short phrases and sentences to convey your message.
4. Use simple slide transitions too many different transitions will distract your audience from the subject of the presentation.
5. Avoid clicking the slides with too much text or graphics your audience should hear what you have to say and note be distracted by a busy screen.
6. Keep text simple and easy to read by not using many different text affects such as bold, italics, underlined, larger font size for emphasis within a sentence, or a different font all on the same slide.

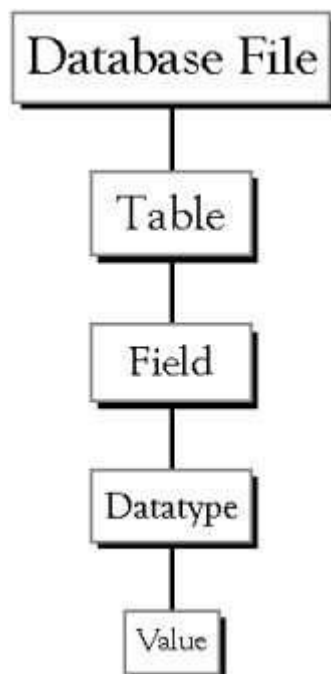
8 MS Access

8.1 Introduction into Microsoft Access Starting Up Microsoft Access

Microsoft Access Description

Microsoft Access is a powerful program to create and manage your databases. It has many built in features to assist you in constructing and viewing your information. Access is much more involved and is a more genuine database application than other programs such as Microsoft Works.

This tutorial will help you get started with Microsoft Access and may solve some of your problems, but it is a very good idea to use the Help Files that come with Microsoft Access. First of all you need to understand how Microsoft Access breaks down a database. Some keywords involved in this process are: *Database File, Table, Record, Field, Data-type*. Here is the Hierarchy that Microsoft Access uses in breaking down a database.



Database File: This is your main file that encompasses the entire database and that is saved to your hard-drive or floppy disk.

Example) StudentDatabase.mdb

Table: A table is a collection of data about a specific topic. There can be multiple tables in a database.
Example #1) Students
Example #2) Teachers

Field: Fields are the different categories within a Table. Tables usually contain multiple fields.
Example #1) Student LastName
Example #2) Student FirstName

Datatypes: Datatypes are the properties of each field. A field only has 1 datatype.
FieldName) Student LastName
Datatype) Text

This tutorial will help you get started with Microsoft Access and may solve some of your problems, but it is a very good idea to use the Help Files that come with Microsoft Access (or any program you use for that matter).

8.2 Starting Microsoft Access

• Two Ways

1. Double click on the Microsoft Access icon on the desktop.



2. Click on Start --> Programs --> Microsoft Access



8.2.1 Creating New, and Opening Existing Databases



The above picture gives you the option to:

- Create a New Database from scratch
- Use the wizard to create a New Database
- Open an existing database
 - The white box gives you the most recent databases you have used. If you do not see the one you had created, choose the More Files option and hit OK. Otherwise choose the database you had previously used and click OK.

8.2.2 Create a database using the Database Wizard

1. When Microsoft Access first starts up, a dialog box is automatically displayed with options to create a new database or open an existing one. If this dialog box is displayed, click **Access Database Wizards, pages, and projects** and then click **OK**.

If you have already opened a database or closed the dialog box that displays when Microsoft Access starts up, click **New Database** on the toolbar.

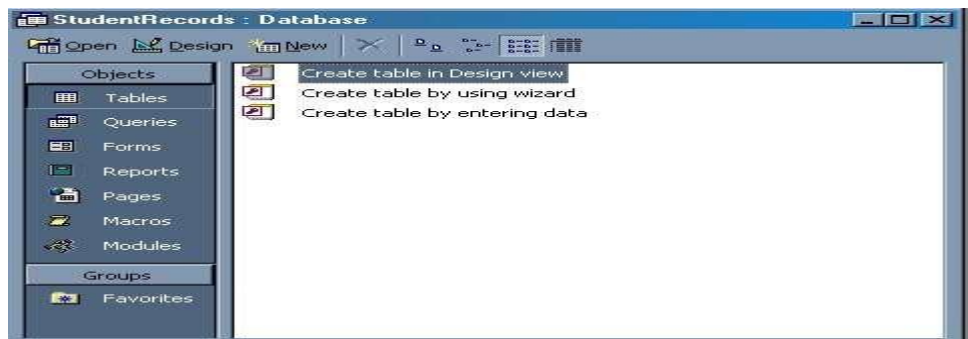
2. On the **Databases** tab, double-click the icon for the kind of database you want to create.
3. Specify a name and location for the database.
4. Click **Create** to start defining your new database

8.2.3 Create a database without using the Database Wizard

1. When Microsoft Access first starts up, a dialog box is automatically displayed with options to create a new database or open an existing one. If this dialog box is displayed, click **Blank Access Database**, and then click **OK**.

If you have already opened a database or closed the dialog box that displays when Microsoft Access starts up, click **New Database** on the toolbar, and then double-click the **Blank Database** icon on the **General** tab.

2. Specify a name and location for the database and click **Create**. (Below is the screen that shows up following this step)



8.3 Tables

A table is a collection of data about a specific topic, such as students or contacts. Using a separate table for each topic means that you store that data only once, which makes your database more efficient, and reduces data-entry errors.

Tables organize data into columns (called **fields**) and rows (called **records**).

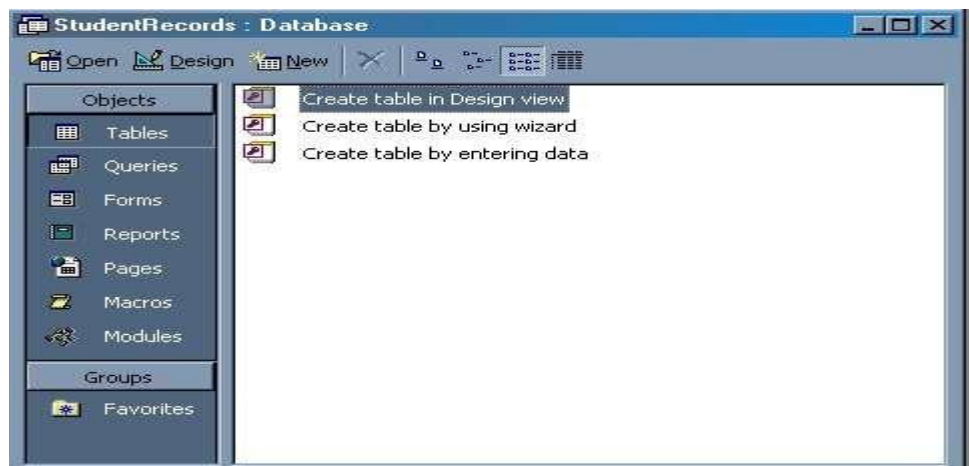
Each field in the *Student Records* table contains the same type of information for every student, such as student's Social Security Number (Soc Sec #). This is an example of a **COLUMN**

Student Records Table					
Soc Sec #	First Name	Last Name	BirthDate	Address	City
123456789	Todd	Jones	1/1/78	312 Wenona Rd	Bay City
315465866	Alan	Craig	2/8/80	123 N Union	Bay City
968585471	Stacy	Evans	3/8/81	RR 5 Box 880	Auburn
848131523	John	Anderson	4/5/80	83 Washington Dr.	Midland

Each record in a *Student Records* table contains all of the information about one student, such as their First Name, Last Name, Birthday, Address, and City, etc... This is an example of a **ROW**.

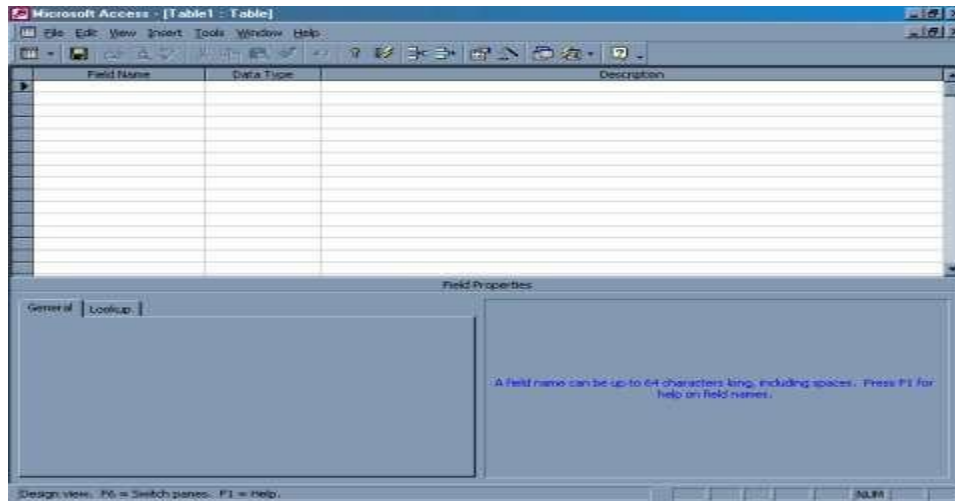
8.3.1 Create a Table from scratch in Design view

1. If you haven't already done so, switch to the Database Window. You can press F11 to switch to the Database window from any other window.



Double-Click on **"Create table in Design view"**.

(DESIGN VIEW)



Define each of the fields in your table.

Under the Field Name column, enter the categories of your table.

Under Data Type column, enter the type you want for you categories.

The attribute of a variable or field that determines what kind of data it can hold. For example, in a Microsoft Access database, the Text and Memo field data types allow the field to store either text or numbers, but the Number data type will allow the field to store numbers only. Number data type fields store numerical data that will be used in mathematical calculations. Use the Currency data type to display or calculate currency values. Other data types are Date/Time, Yes/No, Auto Number, and OLE object (Picture).

- Under the Description column, enter the text that describes what you field is. (This field is optional).
- For our tutorial enter the following items:

Field Name	Data Type	Description
Soc Sec #	Text	Social Security Number. Uniquely identifies a student
First Name	Text	Student's First Name
Last Name	Text	Student's Last Name
BirthDate	Date/Time	Student's Birthdate
Address	Text	Students Address
City	Text	City student resides in
State	Text	State student resides in
Zip	Text	Zip Code student resides in
Phone	Text	Student's home phone number

8.3.2 Primary Key

- One or more fields (columns) whose value or values uniquely identify each record in a table. A primary key does not allow Null

values and must always have a unique value. A primary key is used to relate a table to foreign keys in other tables.

- **NOTE:** You do not have to define a primary key, but it's usually a good idea. If you don't define a primary key, Microsoft Access asks you if you would like to create one when you save the table.

- For our tutorial, make the **Soc Sec #** field the primary key, meaning that every student has a social security number and no 2 are the same.



- To do this, simply select the Soc Sec # field and select the primary key button



- After you do this, Save the table

8.3.3 Switching Views

- To switch views from the datasheet (spreadsheet view) and the design view, simply click the button in the top-left hand corner of the Access program.

Datasheet View	Design View
 Displays the view, which allows you to enter raw data into your database table.	 Displays the view, which allows you to enter fields, data-types, and descriptions into your database table.

8.3.4 Entering Data

- Click on the Datasheet View and simply start "chugging" away by entering the data into each field. **NOTE:** Before starting a new record, the **Soc Sec #** field must have something in it, because it is the Primary Key. If you did not set a Primary Key then it is OK.



8.3.5 Manipulating Data

- **Adding a new row**

- Simply drop down to a new line and enter the information

- **Updating a record**

- Simply select the record and field you want to update, and change its data with what you want

- **Deleting a record**

- Simply select the entire row and hit the Delete Key on the keyboard

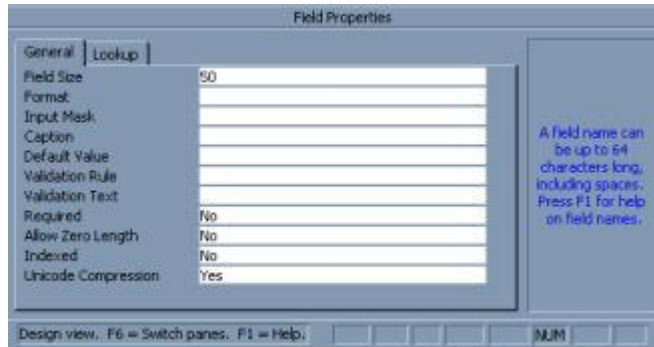
8.3.6 Advanced Table Features w/Microsoft Access

- **Assigning a field a specific set of characters**

- Example) Making a Social Security Number only allows 9 characters.

1. Switch to Design View
2. Select the field you want to alter

At the bottom select the General Tab



3. Select **Field Size**
4. Enter the number of characters you want this field to have
- **Formatting a field to look a specific way (HINT: You do not need to assign a field a specific set of characters if you do this)**

- Example) Formatting Phone Number w/ Area Code (xxx) XXX-XXXX

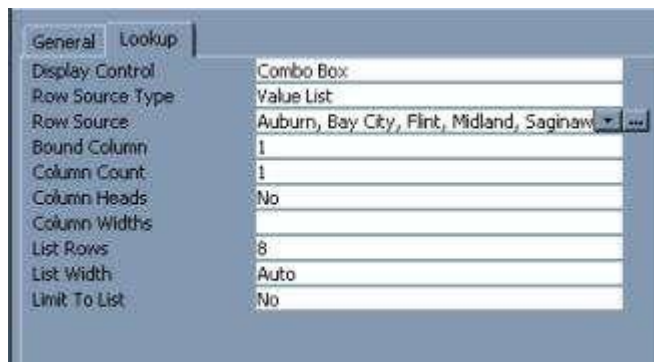
1. Switch to Design View
2. Select the field you want to format
3. At the bottom select the General Tab
4. Select **Input Mask Box** and click on the ... button at the right.
5. Select Phone Number option



6. Click on Next
7. Leave *!(999) 000-0000 the way it is.* This is a default.
8. Click Next

9. Select which option you want it to look like
 10. Click Next
 11. Click Finish
- **Selecting a value from a dropdown box with a set of values that you assign to it. This saves you from typing it in each time**
 - Example) Choosing a city that is either Auburn, Bay City, Flint, Midland, or Saginaw
 - i. Switch to Design View
 - ii. Select the field you want to alter (City)
 - iii. At the bottom select the Lookup Tab
 - iv. In the **Display Control** box, select **Combo Box**
 - v. Under **Row Source Type**, select **Value List**
 - vi. Under **Row Source**, enter the values how you want them displayed, separated by a comma. (*Auburn, Bay City, Flint, Midland, Saginaw*)

NOTE: This will not alphabetize them for you, so you will have to do that yourself. It should look something like this:



Select in the datasheet view and you should see the change when you go to the city field.

1.

Address	City
	<div style="border: 1px solid black; padding: 2px;"> <div style="background-color: #e0e0e0; padding: 2px;">▼</div> <div style="padding: 2px;"> Auburn Bay City Flint Midland Saginaw </div> </div>

8.3.7 Relationships

After you've set up multiple tables in your Microsoft Access database, you need a way of telling Access how to bring that information back together again. The first step in this process is to define relationships between your tables. After you've done that, you can create queries, forms, and reports to display information from several tables at once.

A relationship works by matching data in key fields - usually a field with the same name in both tables. In most cases, these matching fields are the primary key from one table, which provides a unique identifier for each record, and a foreign key in the other table. For example, teachers can be associated with the students they're responsible for by creating a relationship between the teacher's table and the student's table using the TeacherID fields.

Having met the criteria above, follow these steps for creating relationships between tables.

1. In the database window view, at the top, click on Tools --- > Relationships
2. Select the Tables you want to link together, by clicking on them and selecting the Add Button
3. Drag the primary key of the Parent table (Teacher in this case), and drop it into the same field in the Child table (Student in this case.)



4. Select **Enforce Referential Integrity**



- When the Cascade Update Related Fields check box is set, changing a primary key value in the primary table automatically updates the matching value in all related records.
 - When the Cascade Delete Related Records check box is set, deleting a record in the primary table deletes any related records in the related table
5. Click Create and Save the Relationship

8.4 Forms

A form is nothing more than a graphical representation of a table. You can add, update, and delete records in your table by using a form. **NOTE:** Although a form can be named different from a table, they both still manipulate the same information and the same exact data. Hence, if you change a record in a form, it will be changed in the table also.

A form is very good to use when you have numerous fields in a table. This way you can see all the fields in one screen, whereas if you were in the table view (datasheet) you would have to keep scrolling to get the field you desire.

8.4.1 Create a Form using the Wizard

It is a very good idea to create a form using the wizard, unless you are an advanced user and know what you are doing. Microsoft Access does a very good job of creating a form using the wizard. The following steps are needed to create a basic form:

1. Switch to the Database Window. You can do this by pressing F11 on the keyboard.
2. Click on the **Forms** button under **Objects** on the left side of screen
3. Double click on **Create Form Using Wizard**
4. On the next screen select the fields you want to view on your form. Most of the time you would select all of them.
5. Click Next
6. Select the layout you wish
7. Click Next
8. Select the style you desire...**HINT**: if you plan on printing your form, I suggest you use a light background to save on printer toner and ink
9. Click Next
10. Give your form a name, and select **Open the Form and enter information**
11. Select **Finish**
12. You should see your form. To adjust the design of your form, simply hit the design button (same as with the tables), and adjust your form accordingly

8.5 Reports

A report is an effective way to present your data in a printed format. Because you have control over the size and appearance of everything on a report, you can display the information the way you want to see it.

8.5.1 Create a Report using the Wizard

As with the Form, it is a very good idea to create a report using the wizard, unless you are an advanced user. Microsoft Access does a very good job using the wizard to create reports.

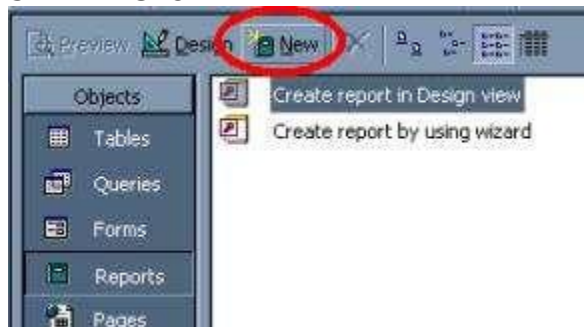
1. Switch to the Database Window. You can do this by pressing F11 on the keyboard.
2. Click on the **Reports** button under **Objects** on the left side of screen
3. Double click on **Create Report Using Wizard**
4. On the next screen select the fields you want to view on your form. Most of the time you would select all of them.
5. Click Next
6. Select if you would like to group your files. Keep repeating this step for as many groupings as you would like.

7. Click Next
8. Select the layout and the paper orientation you desire
9. Click Next
10. Select the style you desire...**HINT**: if you plan on printing your report, I suggest you use a light background to save on printer toner and ink
11. Click Next
12. Give your report a name, and select **Preview the Report**
13. Select **Finish**
14. You should see your report. To adjust the design of your report, simply hit the design button (same as with the tables), and adjust your report accordingly

8.6 Creating Mail Merge Labels using a Wizard

Microsoft Access lets you create Mailing Labels for your database that you have. To do this do the following:

1. Switch to the Database Window. You can do this by pressing F11 on the keyboard.
2. Click on the **Reports** button under **Objects** on the left side of screen
3. Click on **New**



4. Select **Label Wizard** and the table you would like to get your information from.



5. Click OK

6. Select the layout of your labels
7. Click Next
8. Select the font size and color you want on each label
9. Click Next
10. Select how you want your label to look
11. Click Next
12. Select how you want your labels sorted
13. Give your label report a name and preview it