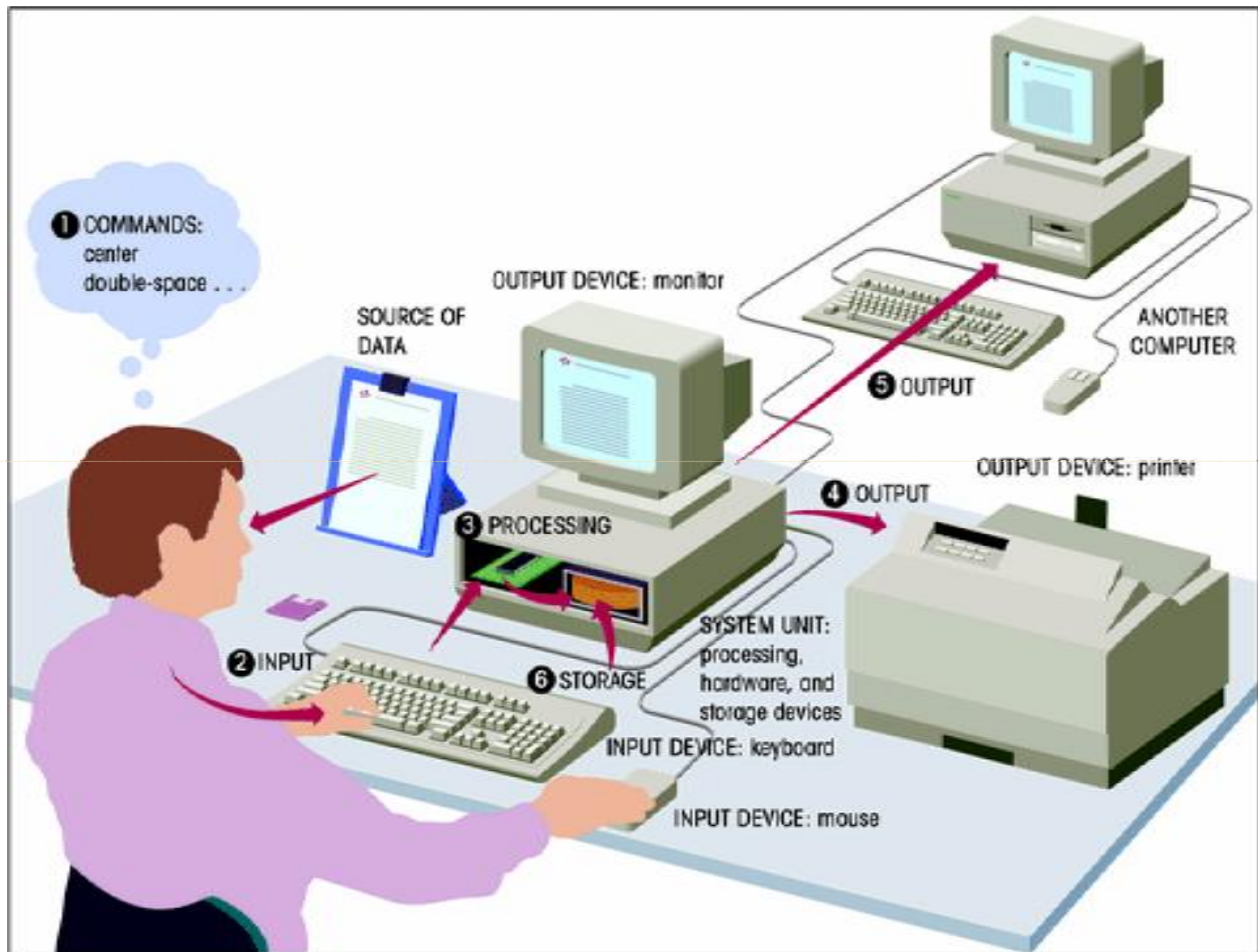




Computer Hardware

Definition

- A computer is a device that accepts information (in the form of digitalized data) and manipulates it for some result based on a program or sequence of instructions on how the data is to be processed.



Basics

- All types of computers consist of two basic parts – **hardware** and **software**.

Hardware is any part of your computer that has a **physical structure**, such as the computer monitor or keyboard. If you can touch it, it is hardware.

- **Software** is any **set of instructions** that tells the hardware what to do. It is what guides the hardware and tells it how to accomplish each task.

Anything you buy for your computer can be classified as either hardware or software.

Hardware

- Functional components
 - input
 - central processing unit
 - secondary storage
 - output



Input Devices, Media and Data Capture Methods

- Keyboard
- Multimedia input devices
 - digital camera, webcam, video capture, scanner, voice data entry
- Optical character recognition (OCR)
- Magnetic ink character recognition (MICR)
- Bar-code readers

Input Devices, Media and Data Capture Methods

(a)

A B C D E F G H I J K L M N O P Q R S T

U V W X Y Z

1 2 3 4 5 6 7 8 9 0 . , ; : &

(b)

a b c d e f g h i j k l m n o p q r s t u v w x y z

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

1 2 3 4 5 6 7 8 9 0 . , ; : & ! ?

- Examples of optical character fonts: (a) OCR-A; (b) OCR-B

Input Devices, Media and Data Capture Methods

- Optical mark readers
- Remote data entry using network technology
- Swipe cards and smart cards
- Touch screen
- Magnetic tapes and disks, optical disks and memory cards
- Selection of appropriate media
 - type, cost, speed, errors

(a)

0 1 2 3 4 5 6 7 8 9 " ' : ;

(b)

A B C D E F G H I J K L M N O P Q R S
T U V W X Y Z
a b c d e f g h i j k l m n o p q r s

Examples of magnetic ink character fonts: (a) E13B; (b) CMC7

Secondary Storage Devices

- Purpose of secondary storage
 - permanent record
 - alternative to costly main memory
 - Security
- Factors affecting choice
 - speed, capacity
 - cost, robustness
- As managers these factors and the needs of the organization should guide us to choose

Secondary Storage Devices

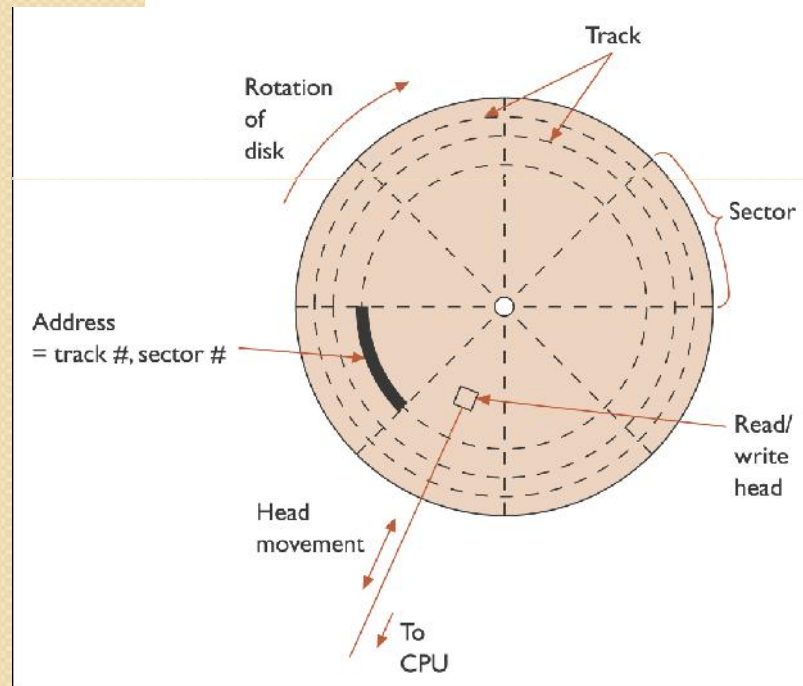
- Optical disks
 - CD-ROM
 - CD-R
 - CD-RW
 - DVD

Secondary Storage Devices

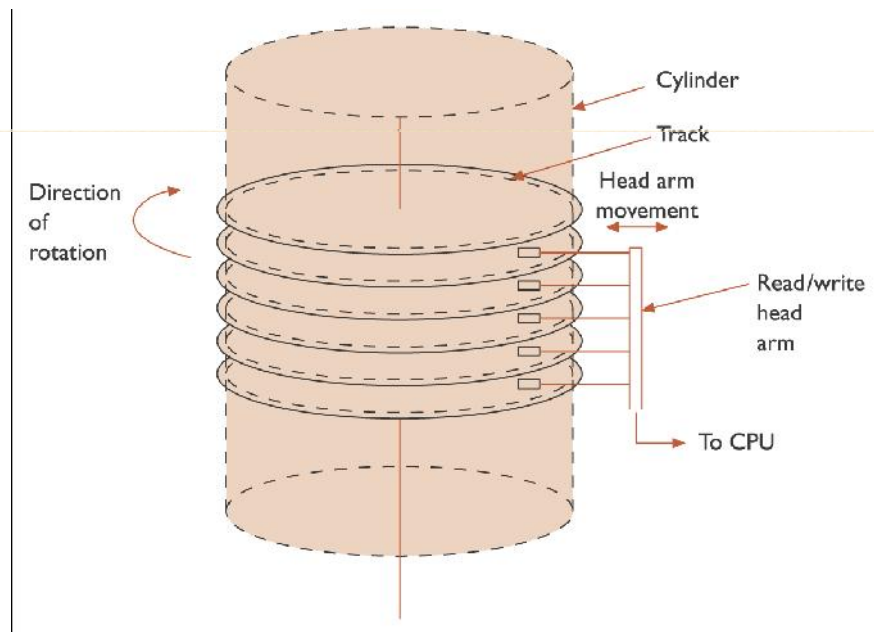
- Magnetic disks
 - floppy disk
 - hard disk
- Magnetic tape

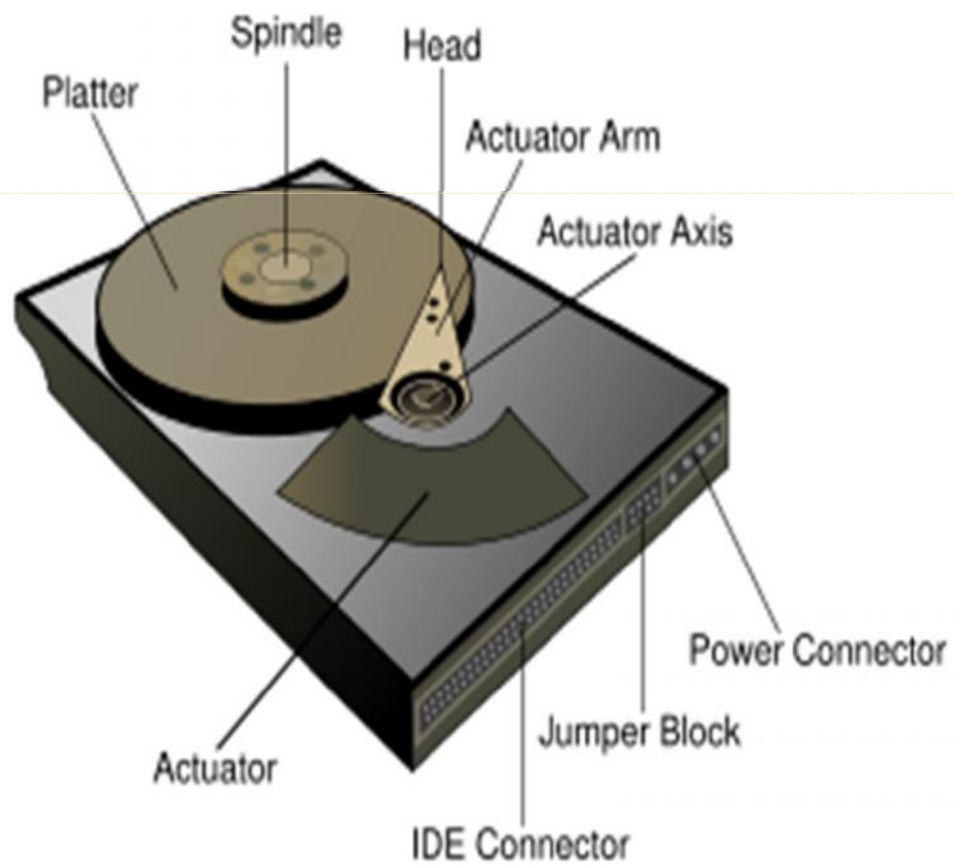
Secondary Storage Devices

- Magnetic disks



- Magnetic tape





Characteristics of secondary storage

- Media or Medium is the actual physical material that holds the data
- Capacity measures how much a particular storage medium can hold
- They are hardware that reads data and programs from storage media. Most also write to storage media
- Access speed or time measures the amount of time required by the storage device to retrieve data and programs

Output Devices

- **Monitor (CRT).**
 - The **monitor** works with a **video card**, located inside the computer case, to display images and text on the screen. The **two main types** are cathode ray tube (CRT) and liquid crystal display (LCD) monitors.
 - Liquid Crystal Display (LCD)
 - Cathode Ray Tube (CRT)
 - The **CRT** monitor is **big**, like a tube television, and takes up a lot of desk space; however, it is the least expensive monitor option. The **LCD** monitor is **thin** and saves energy, but costs more. Over the years you can expect to see fewer CRT monitors as LCD monitors become the standard.
 - Normally measured by the colour it can display and the dots (pixels) used to form the images, this determines the screen resolution

Output Devices

- Printers
 - laser
 - inkjet
 - dot-matrix
- A **printer** is a peripheral device which produces a hard copy (permanent human-readable text and/or graphics) of documents stored in electronic form, usually on physical print media such as paper.

Printers

- Main types are,
 - **Inkjet**
 - This squirts ink at the paper to form high quality images
 - Advantages
 - Relatively cheap to buy and run
 - Produce good quality printing
 - Silent in operation
 - Relatively good color versions are available at reasonable price
 - Disadvantages
 - Staining of ink on low quality paper
 - Blockage (Clogging) of ink nozzles
 - Printing cost per page printed is relatively high

Dot Matrix

- **Dot Matrix**
 - It is described as an impact printer.
 - It is made up of a print head comprising a number of pins which strike the paper through an inked ribbon to form an image on the paper
- **Advantages**
 - They are relatively cheap to buy and to run
 - They can print multi part stationery
 - They can print on continuous or single sheet paper
- **Disadvantages**
 - They are relatively slow with relatively low print quality
 - They are noisy and colour versions are not particularly effective

Lasers

- Laser
 - It uses a technology similar to that used in photocopy machines
 - They use a laser light beam to produce images with excellent letter and graphics quality
 - The term "**laser**" is an acronym for ***Light Amplification by Stimulated Emission of Radiation.***
- Advantages
 - Very high print quality
 - Relatively fast and quiet
 - Print cost per page is relatively low
- Disadvantages
 - High purchase cost
 - Expensive to run
 - Colour versions are very expensive

Output Devices

- Output to magnetic disk/tape or optical disk
- Factors affecting selection:
 - type, cost, speed
 - quality, storage, environmental

Central Processing Unit

- Main memory
 - RAM and ROM
- Arithmetic and logic unit
 - Registers
- Control unit
 - program execution
- Current issues in CPU design
 - **Dual core** processors have two separate cores on the same physical machine. This means they can do two tasks at the same time without interfering one with the other or using up the others memory or processing speed.

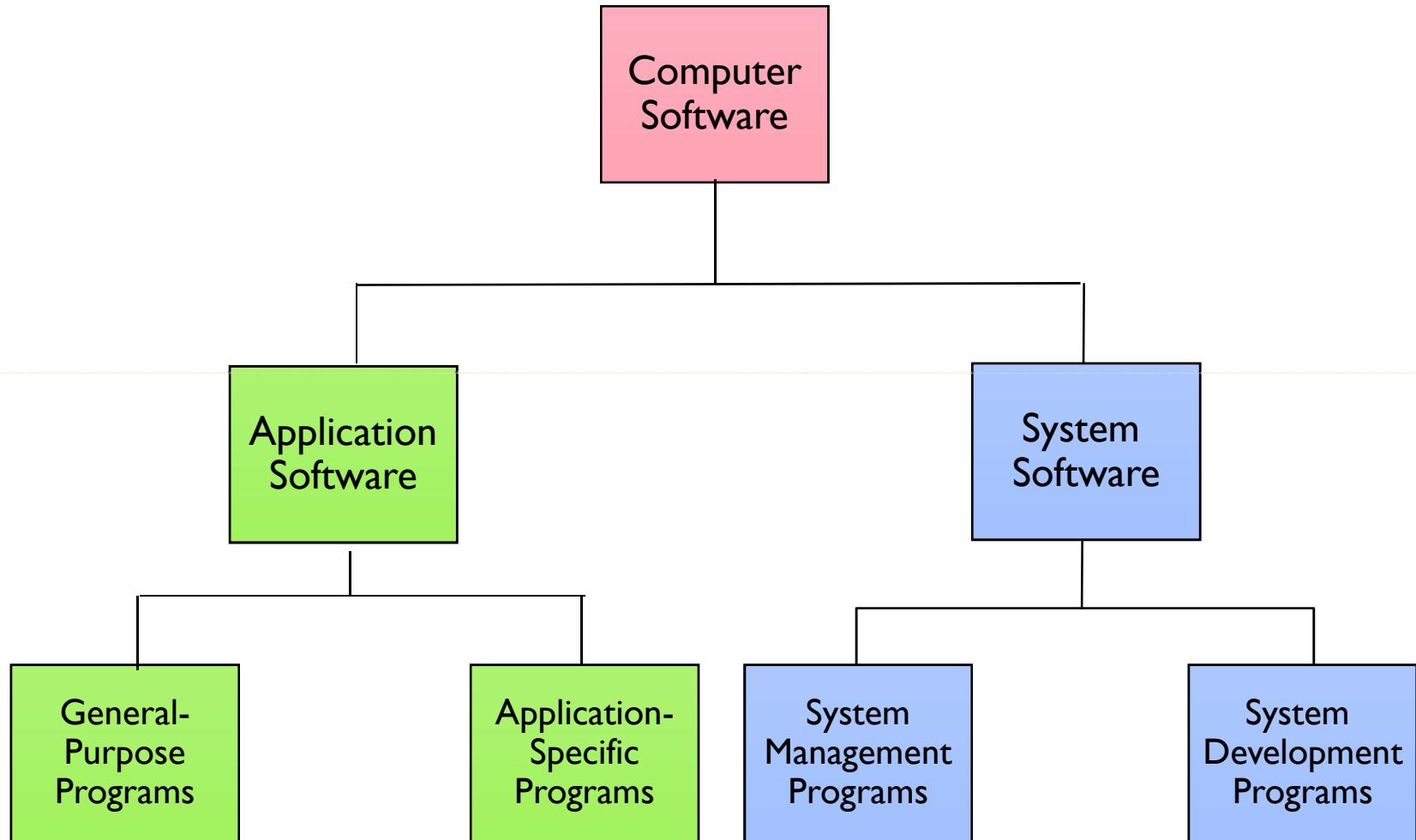


COMPUTER SOFTWARE

Software

- **Software is any set of instructions that performs some task on a computer. The operating system performs many essential tasks for a computer.**
- It is another name for programs.
- SW and programs are normally used interchangeable

Categories of Software



System Software

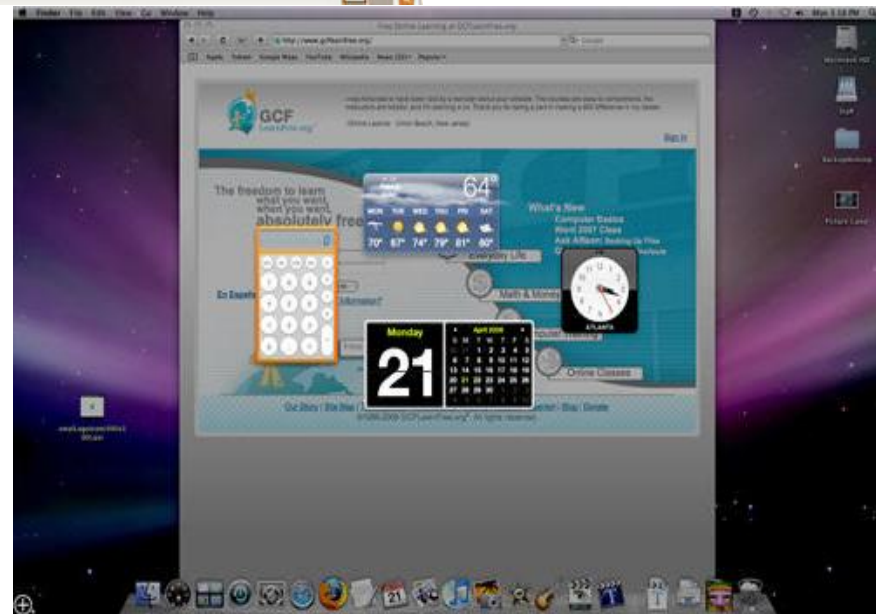
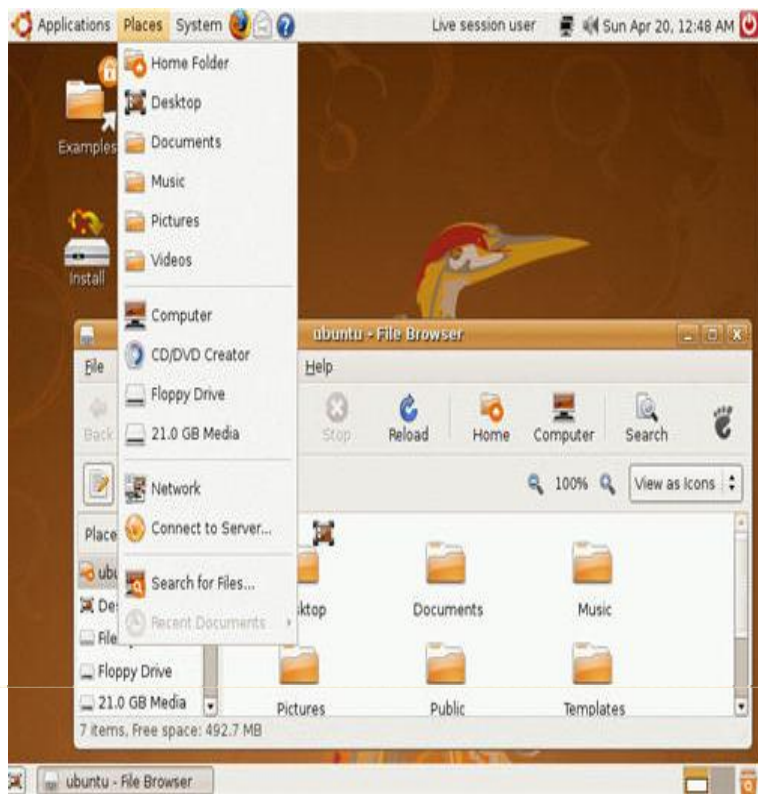
- It enables the application software to interact with the computer hardware
- It is a background software that helps the computer manage its own internal resources.
- It is a collection of programs
 - Namely;
 - Operating system
 - Utilities
 - Devices


Operating System

- An operating system is the most important software that runs on a computer.
 - It controls the memory needed for computer processes,
 - manages disk space,
 - controls peripheral devices,
 - and allows you to communicate with the computer without knowing exactly how a computer works.

Functions

- User interface
 - Users interact with application program's and computer hardware through user interface (GUI). GUI uses graphical elements such as icons and windows
- Resources
 - It coordinates the computers resources including memory, processing, storage and devices (like printers and monitors)
- Running Applications
 - They load and run applications such as word processors and spreadsheets.



- 
- Visit the [Microsoft](#), [Apple](#), and [Linux](#) websites to learn more about each operating system.
 - Search the Internet for articles that **compare** Windows Vista and Mac OS X.

Application Software

- Application software allows end users to accomplish one or more specific tasks.
- Typical applications include industrial automation, business software, educational software, medical software, databases, and computer games.
- Businesses are probably the biggest users of application software, but almost every field of human activity now uses some form of application software

Types

- General-purpose or basic applications
 - They widely used in all careers
 - They are the kinds of programs you have to know to be considered computer competent.
 - Eg. Word processor
- Special purpose applications
 - Programs that are narrowly focused on specific disciplines and occupations
 - Eg. Graphics, multimedia, etc

Benefits and limitations of Software

- ????????

Choosing the computer that's right for you

- Thinking about purchasing a new computer? If so, you've never had as many options as you do now. For most people, you don't need to buy a GH1500 system to have something that will work for you. If you open up the weekly ads you'll see desktops advertised from GH400 and up. Before you run out to buy a new computer, give some serious thought to what you need and pay close attention to what is offered for the specific price. Here are some things to consider:
- **Desktop or laptop** -- Each type has its own advantages and disadvantages. **Desktops** generally start at a lower price and offer more in terms of hard drive capacity and memory options. Also, additions and repairs for desktop computers tend to cost less. The obvious downside is that desktops take up a lot of physical space. **Laptops**, on the other hand, are mobile units that you can carry anywhere and some have all the options available in a desk top.
- **Operating System** - Most PCs come preloaded with the operating system, Microsoft Windows. Macintosh computers, or Macs as they are often called, come preloaded with Mac OS X. While Windows is used by more people, Apple has become known for producing solid, reliable products and has quite a following; however, you can expect to pay more for a basic Mac than a PC with similar features. If you are purchasing more high-end models, you will find that the prices of the Macs and PCs are comparable. Ultimately, it comes down to choosing a model you are comfortable with.

Choosing the computer that's right for you

- Once you have made those big decisions, you need to think about your **processor, hard drive, memory, and CD/DVD options**. Remember that the "top of the line" unit today may not be the "top of the line" next month, next week, or even the next day. Computers change rapidly, so think long term. That doesn't mean you should purchase the highest-end computer available. Strike a balance by thinking about what your **actual** needs are and how you'll use the computer. Do you primarily use word processing programs and surf the Internet? Or do you want to run complex games and videos? You need to consider how you use the computer when you make decisions about the following components:
- **Processor** - The CPU is the brain of the computer and everything that the computer does is managed by the CPU. A lot of the machines advertised now are 3 gigahertz; however, for most people 2 gigahertz will suffice.
- **Hard drive** - The hard drive is the permanent storage that is used to hold programs and documents. Storage is relatively cheap, so buy as much as you may need. If you download a lot of music or do any serious video editing or graphics work, 100 gigabytes (GB) is the minimum you should even consider.
- **Memory** - The programs you use on your computer can quickly use up your memory. Some of the "bargain" computers only give you 256 megabytes (MB) of RAM, but that is not sufficient. You will want at least 1 GB.

Choosing the computer that's right for you

- **CD/DVD options** - Give some serious thought to how you'll use your computer. Do you intend to purchase music or movies from the Internet? If so, you may want to look for a computer that has a DVD burner. If you only need to be able to copy documents onto a disk, then you can simply shop for a CD burner.
- Purchasing a computer can be overwhelming and all the options can make it difficult to compare and price-shop; however, if you create a list using the points discussed above and compare the models from store to store, you will be able to wisely evaluate your options. Try not to get distracted by the extra features that you may not use and remember that this will be a machine that you and your family will use - not the salesman. Look for a computer that will meet your needs and have fun shopping!