Computer Assembly & Configuration

Lab & Homework Assignments

Amy Hissom

Key Terms

1. **<u>Advanced Configuration and Power Interface (ACPI)</u>** - a power management specification developed by Intel, Microsoft, and Toshiba. ACPI, which will be part of the next version of Windows, enables the operating system to control the amount of power given to each device attached to the computer. With ACPI, the operating system can turn off peripheral devices, such as a CD-ROM players, when they're not in use. As another example, ACPI will enable manufacturers to produce computers that automatically power up as soon as you touch the keyboard.

2. **<u>Advanced Power Management (APM)</u>** - an API developed by Intel and Microsoft that allows developers to include power management in BIOSes. APM defines a layer between the hardware and the operating system that effectively shields the programmer from hardware details.

3. **Basic input/output system (BIOS)** - the built-in software that determines what a computer can do without accessing programs from a disk. On PCs, the BIOS contains all the code required to control the keyboard, display screen, disk drives, serial communications, and a number of miscellaneous functions.

4. **Binary Number System** - Pertaining to a number system that has just two unique digits. For most purposes, we use the decimal number system, which has ten unique digits, 0 through 9. All other numbers are then formed by combining these ten digits. Computers are based on the binary numbering system, which consists of just two unique numbers, 0 and 1. All operations that are possible in the decimal system (addition, subtraction, multiplication, division) are equally possible in the binary system.

5. **Bit** – Short for binary digit, the smallest unit of information on a machine. The term was first used in 1946 by John Tukey, a leading statistician and adviser to five presidents. A single bit can hold only one of two values: 0 or 1. More meaningful information is obtained by combining consecutive bits into larger units. For example, a byte is composed of 8 consecutive bits.

6. **Bus** – A collection of wires through which data is transmitted from one part of a computer to another. You can think of a bus as a highway on which data travels within a computer. When used in reference to personal computers, the term bus usually refers to internal bus. This is a bus that connects all the internal computer components to the CPU and main memory. There's also an expansion bus that enables expansion boards to access the CPU and memory.

7. **Byte** – Abbreviation for binary term, a unit of storage capable of holding a single character. On almost all modern computers, a byte is equal to 8 bits. Large amounts of memory are indicated in terms of kilobytes (1,024 bytes), megabytes (1,048,576 bytes), and gigabytes (1,073,741,824 bytes).

8. **Cards** – Adapter boards or interface cards placed into expansion slots to expand the function of a computer, allowing it to communicate with external devices such as monitors or speakers.

9. **Central processing Unit (CPU)** - The CPU is the brains of the computer. Sometimes referred to simply as the processor or central processor, the CPU is where most calculations take place. In terms of computing power, the CPU is the most important element of a computer system.

10. **Chip Set** - A number of integrated circuits designed to perform one or more related functions. For example, one chipset may provide the basic functions of a modem while another provides the CPU functions for a computer. Newer chipsets generally include functions provided by two or more older chipsets. In some cases, older chipsets that required two or more physical chips can be replaced with a chipset on one chip.

11. **Circuit board** – A computer component, such as the main motherboard or an adapter board that has electronic circuits and chips.

12. **Clock Speed** – The speed or frequency expressed in MHz, that controls activity on the motherboard and is generated by a crystal or oscillator located somewhere on the motherboard.

13. **CMOS configuration chip** – A chip on the motherboard that contains a very small amount of memory, or RAM – enough to hold configuration, or setup, information about the computer.   The chip is powered by a battery when the PC is turned off. Also called CMOS setup chip or CMOS RAM chip.

14. **CMOS RAM chip** –   (Same as the CMOS configuration chip) A chip on the motherboard that contains a very small amount of memory, or RAM – enough to hold configuration, or setup, information about the computer.   The chip is powered by a battery when the PC is turned off.

15. **CMOS setup** – **(1)** the CMOS configuration chip. **(2)** The program in system BIOS that can change the values in the CMOS RAM.

16. **CMOS setup chip** – (Same as the CMOS configuration chip) A chip on the motherboard that contains a very small amount of memory, or RAM – enough to hold configuration, or setup, information about the computer.   The chip is powered by a battery when the PC is turned off.

17. **Complementary metal-oxide semiconductor (CMOS)** –   the technology used to manufacture microchips. CMOS chips require less electricity, hold data longer after the electricity is turned off, are slower, and produce less heat than earlier technologies. The configuration, or setup, chip is a CMOS chip.

18. **Data bus** –   The lines on the system bus that the CPU uses to send and receive data.

19. **Data path size** – The number of lines on a bus that can hold data, for example, 8, 16, 32, and 64 lines, which can accommodate 8, 16, 32, and 64bits at a time.

20. **Dual inline memory module (DIMM)** – a miniature circuit board used in newer computers to hold memory. DIMMs can hold up to 2 GB of RAM on a single module.

21. **Dual inline package (DIP) switch** – a switch on the circuit board or other device that can be set on or off to hold configuration or setup information.

22. **Expansion card** –   a circuit board inserted into a slot on the motherboard to enhance the capability of the computer.

23. **Expansion slot** – a narrow slot on the motherboard where an expansion card can be inserted. Expansion slots connect to a bus on the motherboard.

24. **Firmware** – Software that is permanently stored in a chip. The BIOS on a motherboard is an example of firmware.

25. **Flash ROM** – ROM that can be reprogrammed or changed without replacing chips.

26. **Front side bus (FSB)** – (Same as system bus.) The bus between the CPU and memory on the motherboard. The bus frequency in documentation is called the system speed, such as 400MHz. Also called the memory bus, front-side bus, local bus, or host bus.

27. **Gigahertz (GHz)** – One thousand MHz or one billion cycles per second.

28. **Hard copy** – Output from a printer to paper.

29. **Hard drive** – The main secondary storage device of a PC, a small case that contains magnetic coated platters that rotate at high speed.

30. **Hardware** – the physical components that constitute the computer system, such as the monitor, the keyboard, the motherboard, and the printer.

31. **Hertz (Hz)** – Unit of measurement for frequency, calculated in terms of vibrations, or cycles per second. For example, for 16-bit stereo sound, a frequency of 44,000 Hz is used.

32. **Host bus** – (Same as memory bus, system bus, or FSB) The bus between the CPU and memory on the motherboard. The bus frequency in documentation is called the system speed, such as 400MHz. Also called the memory bus, front-side bus, local bus, or host bus.

33. **Jumper** – Two wires that stick up side by side on the motherboard and are used to hold configuration information. The jumper is considered closed if a cover is over the wires, and open if the cover is missing.

34. **Keyboard** –   a common input device through which data and instructions may be typed into computer memory.

35. **Main board** – (Same as the motherboard.) the main board in the computer, also called the system board. The CPU, ROM chips, SIMMs, DIMMs, RIMMs, and interface cards are plugged into the motherboard.

36. **Megahertz (MHz)** – One million Hz, or one million cycles per second.

37. **Memory** – Physical microchips that can hold data and programming, located on the motherboard or expansion cards.

38. **Microprocessor** – (Same as the CPU.) The CPU is the brains of the computer. Sometimes referred to simply as the processor or central processor, the CPU is where most calculations take place. In terms of computing power, the CPU is the most important element of a computer system.

39. **Monitor** – the most commonly used output device for displaying text and graphics on a computer.

40. **Motherboard** – the main board in the computer also called the system board. The CPU, ROM chips, SIMMs, DIMMs, RIMMs, and interface cards are plugged into the motherboard.

41. **Mouse** – A pointing and input device that allows the user to move a cursor around a screen and select programs with the click of a button.

42. **Nonvolatile** – Refers to a kind of RAM that is stable and can hold data as long as electricity is powering the memory.

43. **Parallel port** – a female 25-pin port on a computer that can transmit data in parallel, 8 bits at a time, and is usually used with a printer. The names for parallel ports are LPT1 and LPT2.

44. **Peripheral device** – Devices that communicate with the CPU but are not located directly on the motherboard, such as the monitor, floppy drive, printer, and mouse.

45. **Plug and Play (PnP)** – A standard designed to make the installation of new hardware devices easier by automatically configuring devices to eliminate system resource conflicts (such as IRQ or I/O address conflicts). PnP is supported by Windows 9x/Me, Windows 2000, and Windows XP.

46. **Port** – **(1)** as applied to services running on a computer, a number assigned to a process on a computer so that the process can be found by TCP/IP. Also called a port address or port number. **(2)** Another name for an I/O address. **(3)** a physical connector, usually at the back of a computer, that allows a cable from a peripheral device, such as a printer, mouse , or modem, to be attached.

47. **Processor** – (Same as the CPU) The CPU is the brains of the computer. Sometimes referred to simply as the processor or central processor, the CPU is where most calculations take place. In terms of computing power, the CPU is the most important element of a computer system.

48. **Power supply** – a box inside the computer case that supplies power to the motherboard and other installed devices. Power supplies provide 3.3, 5, and 12 volts DC.

49. **Primary storage** – Temporary storage on the motherboard used by the CPU to process data and instructions. Memory is considered primary storage.

50. **Printer** – a peripheral output device that produces printed output to paper. Different types include dot matrix, ink-jet, and laser printers.

51. **Program** – a set of step-by-step instructions to a computer. Some are burned directly into chips, while others are stored as program files. Programs are written in languages such as BASIC and C++.

52. **Protocol** – a set of rules and standards that two entities use for communication.

53. **Random access memory (RAM)** – Memory modules on the motherboard containing microchips used to temporarily hold data and programs while the CPU processes both. Information in RAM is lost when the PC is turned off.

54. **Read-only memory (ROM)** – Chips that contain programming code and cannot be erased.

55. **RIMM** – a type of memory module developed by Rambus, Inc.

56. **Secondary storage** – Storage that is remote to the CPU and permanently holds data, even when the PC is turned off, such as a hard drive.

57. **Serial port** – A male 9-pin or 25-pin port on a computer system used by slower I/O devices such as a mouse or modem. Data travels serially, on bit at a time, through the port. Serial ports are sometimes configured as COM1, COM2, COM3, or COM4.

58. **Single inline memory module (SIMM)** – A miniature circuit board used in older computers to hold RAM. SIMMs hold 8, 16, 32, or 64 MB on a single module.

59. **Software** – Computer programs, or instructions to perform a specific task. Software may be BIOS, Oss, or application software such as a word-processing or spreadsheet program.

60. **Startup BIOS** – Part of the system BIOS that is responsible for controlling the PC when it is first turned on. Startup BIOS gives control over to the OS once it is loaded.

61. **System BIOS** – BIOS located on the motherboard.

62. **System board** – (Same as the motherboard). the main board in the computer, also called the system board. The CPU, ROM chips, SIMMs, DIMMs, RIMMs, and interface cards are plugged into the motherboard.

63. **System bus** – the bus between the CPU and memory on the motherboard. The bus frequency in documentation is called the system speed, such as 400 MHz. Also called the memory bus, front-side bus, local bus, or host bus.

64. **System clock** – a line on a bus that is dedicated to timing the activities of components connected to it. The system clock provides a continuous pulse that other devices use to time themselves.

65. **Trace** – a wire on a circuit board that connects two components or devices.

66. **Universal serial bus (USB)** – a type of port designed to make installation and configuration of I/O devices easy, providing room for as many as 127 devices daisy-chained together.

67. **Video card** – an interface card installed in the computer to control visual output on a monitor. Also called display adapter.

68. **Volatile** – Refers to a kind of RAM that is temporary, cannot hold data very long, and must be frequently refreshed.

REVIEWING THE BASICS

1. Why is all data stored in a computer in binary form?
For the computer, the binary system is more natural because of its electrical nature (charged versus uncharged). In the binary system, each digit position represents a value of 2. Because computers use the binary number system, powers of 2 play an important role. This is why everything in computers seems to come in 8s (2 to the 3rd power), 64s (2 to the 6th power), 128s (2 to the 7th power), and 256s (2 to the 8th power).

2. What are the four primary functions of hardware?
Input, processing, storage, and output.

3. What three things do electronic hardware devices need in order to function?
A method for the CPU to communicate with the device, software to instruct and control the device, and electricity to power the device.

4. How many bits are in a byte?
8

5. What is the purpose of an expansion slot on a motherboard?
They enable the installation of expansion cards which enhance the capability of the computer.

6. Which component on the motherboard is used primarily for processing?
The CPU.

7. Name three CPU manufacturers.
AMD (Advanced Micro Devices), Intel Corp, and SiS.

8. What technology is most often used today to manufacture microchips?
CMOS

9. What are two other names for the system bus?
Front-side bus, memory bus, host bus, and local bus.

10. What are two other names for the motherboard?
Main board and System board.

11. List three types of ports that are often found coming directly off the motherboard to be used by external devices.
Serial port, USB port, and Parallel port.

12. List three kinds of memory modules.
SIMMs, DIMMs, and RIMMs.

13. What is the difference between volatile and nonvolatile memory?
Volatile refers to a kind of RAM that is temporary, cannot hold data very long, and must be frequently refreshed, while nonvolatile refers to a kind of RAM that is stable and can hold data as long as electricity is powering the memory.

14. What technology provides for up to four devices on a system, including the hard drive as one of those devices?
EIDE (Enhanced Integrated Drive Electronics)

15. What is the size of the data path on most system buses today?
64 bits wide with or without additional lines for error checking.

16. What is the measurement of frequency of a system bus and CPU? Which is faster, the system bus or the CPU? The speed and the CPU is faster.

17. Name four types of buses that are likely to be on a motherboard?
System bus, PCI bus, AGP bus and ISA bus.

18. A power supply receives 120 volts of AC power from a wall outlet and converts it to 3.3, 5, and 12 volts of DC power.

19. ROM BIOS chips that can be upgraded without replacing the chips are called Flash ROM.

20. List three ways that configuration information can be stored on a motherboard.
CMOS setup chip, CMOS RAM chip, and CMOS configuration chip

THINKING CRITICALLY

1. When selecting secondary storage devices for a new desktop PC, which is more important, a CD-ROM drive or a floppy drive? Why? A CD-ROM drive because bland cds hold up to 700 MBs of data while a blank floppy disk only holds only 1.44 MB of data.

2. Based on what you have learned in this chapter, when working on a Word document, why is it important to save your work often? Explain your answer in terms of primary storage and secondary storage. Primary storage is only temporary. If you save your work often it is stored in secondary storage which is permanent.   If something happens to the computer where it shuts down on you because of and electrical surge, etc, your work is lost if you haven't saved it to secondary storage.

3. Most buses are 16, 32, 64, or 128 bits wide. Why do you think these bus widths are multiples of eight? They are based on the binary number system.

4. Why do you think the trend is to store configuration information on a motherboard in CMOS setup rather than by using jumpers or switches? Jumpers and switches have to be mechanically set.

5. Why would it be difficult to install four hard drives, one CD-ROM drive, and one DVD drive in a single system? Because most computers use EIDE technology which can only accommodate four of these devices on one system.

ENHANCED   Name: Amy Hissom

A+ Guide To

Managing and Maintaining Your PC
Fifth Edition

Chapter One – Intro to Hardware

I. Observation of Computer-Exterior

1. Does the system have any identification on it indicating the manufacture, model, and component information? If so, list them.
This particular computer is a Dell OptiPlex GX110 Pentium III

1a. Why might these identification items be useful?
For upgrading memory (RAM), hardware, etc.

2. How many of the following does your system have?
    -Floppy Drive (1)
    -Zip Drive (1)
    -CD Drive (1)
    -DVD Drive (0)
    -Internal Hard Drives (1)

2a. Explain how you achieved the answers for these.
By exploring the labels on the front of the PCU and the internal device manager.

3. Describe the shape of the connection used by your mouse. How many pins does the connection have? Do the same for the keyboard.
Both connections are round and have 6 pins.

4. What is the size of the monitor you are using?
13 inches

5. How many keys are on your keyboard?
108

6. On the back of the PC, list all ports and how many each there is.

Serial – 3	COM – 2	USB – 2
Ethernet – 1	Audio – 3	Electrical – 1
Video – 1		

II. Observation of Computer-Interior

Now we are going to remove the cover from the computer and examine some of the internal components. It is important to UNPLUG the computer first and it is suggested that you wear an anti-static bracelet and connect the clip to the side of the computer case. Now remove the screws and open the case.

With the case removed, identify and describe the components below:

Component	Description (size, location, connections)
Power Supply	115 Volts with 8 connections located on top backside inside the computer.
Floppy Disk Drive	2 connections located inside the computer facing out the front.
Hard Drive(s)	1 hard drive with 2 connections located on the inside front of the computer.
Motherboard	8"x12" located up against the right side inside of the computer with 26 connections.
CPU	Located on the top left corner of the motherboard with 1 connection. It is about 2 ½"x2" in size.
Cooling Fan (not in Power Supply)	Located in the middle of the back side inside the computer.
CD ROM Drive	About 7" long with 2 connections located inside the computer facing out the front.
Network Card	Located inside the computer facing out the back with one connection.
Sound Card	Located inside the computer facing out the back with 8 connections and is about 4"x2" in size.

1. Describe how you knew which component was the sound card and which was the network card.
The sound card has three ports and the network card has only one.

2. Describe how you identified the type of CPU your system has.
I located the label on the motherboard. It is an Intel.

3. Does your system have room for adding new components? If so, how many and what kinds of components could be added?
This system does have room to add additional components. It has one IDEE Cable, Two extra Power Supply connectors, four PCI Slots and one extra Memory Slot. With all of these extra you could add different components. For example, a fire wire, more USB plugs, a modem, and extra hard drive, zip drive or floppy drive, along with more memory (RAM)

Chapter One-SANDRA   Name: Amy Hissom

Use the file to install the SANDRA program. You can
download the program from the following URL for free.
www.sisoftware.co.uk

1. After it is installed, click on the SYSTEM SUMMARY icon. This will display information
about your system similar to Device Manager. Examine this for a moment, and then click
the RED X to close.

2. Now click on the WINDOWS INFORMATION utility. From this, answer the following
questions: When finished, click the RED X to close.

What Operating System is your computer running? Microsoft Windows XP 2002 Pro

What is the default Web Browser? Internet Explorer 6.0

What is the PRODUCT CODE for your computer? 55274-640-1305203-23165

What is the HOST NAME? GIT-R-DONE

What is the path for the temporary folder? C:\WINDOWS\TEMP

3. Now click on the Drives Information utility.

How much free space does your hard drive(s) contain? 17GB 92%

That type of file system does the hard drive use? NTFS

4. Create a REPORT by clicking on the CREATE A REPORT WIZARD.
Click the NEXT button (green arrow)
Select MAKE CHOICES and GENERAGE REPORT
On steps 2, 3, & 4, select CLEAR ALL
In Step 5, leave the selected items and hit NEXT.
Add any comments if desired on the next step.
Save the file as a text file.

View the file and see what is on the report.

Si Software Sandra Lite Information

1. **Name**
2. **Version**
3. **Copyright**
4. **Registered Owner**
5. **Registered Organization**
6. **License Status**
7. **License Extra**
8. **URL**
9. **E-Mail**
10. **Done By**
11. **Host Name**
12. **System ID**
13. **Run ID**
14. **Done On**
15. **Done At**

Price Compare   **Name:** <u>Amy Hissom</u>

Visit DELL.com or HP.Com and find a computer that is for sale. Anyone you choose is fine.

From the computer you find on the web site, fill in the information about the computer.

PC Manufacturer:	HP
Model #:	m7690e series
Processor / MHz:	AMD Athlon(TM) 64 X2 5000+ dual-core - 2.6GHz
RAM:	2GB DDR2-667MHz dual channel SDRAM (2x1024)
Operating System:	Genuine Windows XP Media Center Edition 2005
Hard Drive Capacity:	250GB 7200 rpm SATA Hard Drive
Monitor:	HP 19" LCD Flat Panel Monitor
Sound / Speakers:	HP stereo speakers with subwoofer Sound Blaster Audigy 4, 24-bit ADVANCED HD Audio
Other Drives (floppy/cd/dvd)	LightScribe 16X DVD+/-R/RW SuperMulti drive
Bonus Items (printer/ usb drive, etc.)	15-in-1 memory card reader, 2 USB, 1394, video 802.11 b/g Wireless LAN PCI Card Single NTSC TV tuner with PVR, FM tuner, remote NVIDIA GeForce 7300LE, w/ TurboCache HP Wireless Keyboard, Wireless Optical Mouse
Bundled Software:	Microsoft(R) Works 8.0/Money 2006/MSN Encarta Plus Norton Internet Security 2006 w/AntiSpyware -36 Mo
Total Price of the System:	**$1,513.99**

Now, go to a web site such as www.pricewatch.com or www.tigerdirect.com
Find comparable components for the computer above and fill in the table.

Component	Description	Price
Processor / MHz:	AMD Athlon 64 X2 (AM2) 64 5000+ / 2.60GHz Socket AM2 2000MHz	$599.99
Motherboard	Asus M2N32-SLI Deluxe Wireless Edition NVIDIA Socket AM2 ATX Motherboard / Audio / PCI Express / SLI Ready / Gigabit LAN / Wirelss 802.11b/g / S/PDIF / USB 2.0 & Firewire / Serial ATA / RAID	214.99

RAM:	OCZ Dual Channel XTC 2048MB PC5400 DDR2 667MHz Gamer Memory (2 x 1024MB	164.99
Case and powersupply:	Just-4-PC / 350SF / 350-Watt / ATX / 80mm Fan / Power Supply Ultra Silver MicroFly Aluminum Micro ATX Tower Case with Clear Sides, Front USB, FireWire and Audio Ports	24.99 69.99
Operating System:	Microsoft Windows XP Media Center 2005 OEM Edition with Remote	139.99
Hard Drive Capacity:	250GB	79.99
Monitor:	NEC LCD1935NXM / 19" / 16ms / SXGA 1280 x 1024 / DVI-VGA / LCD Monitor with Speakers	219.99
Sound / Speakers:	HP JBL Platinum PC Multimedia Speaker	
Other Drives (floppy/cd/dvd)	NEC ND3550A / 16x8x16x DVD+RW / 16x6x16x DVD-RW / 8x DVD+R DL / 6x DVD-R DL / 48x32x48x CD-RW / Black / Dual Layer / OEM DVD Burner with Software	34.99
Bonus Items (printer/ usb drive, etc.)	N/A	0
Bundled Software:	N/a	0
Total Price of the System:		**1549.91**

Which is a better deal money wise?
The first choice!

Key Terms

1. Autoexec.bat – Stands for automatically executed batch file, the file that DOS automatically executes when a computer boots up. This is a convenient place to put commands you always want to execute at the beginning of a computing session. For example, you can set system parameters such as the date and time, and install memory-resident programs.

2. Child Directory – (Another name for subdirectory) A directory or folder contained in another directory or folder.

3. Cluster – A group of disk sectors. The operating system assigns a unique number to each cluster and then keeps track of files according to which clusters they use.

4. CMOS Setup – **(1)** the CMOS configuration chip. **(2)** The program in system BIOS that can change the values in the CMOS RAM.

5. Config.sys – The configuration file for DOS systems. Whenever a DOS computer boots up, it reads the CONFIG.SYS file (if it exists) and executes any commands in it. The most common commands are BUFFERS= and FILES=, which enable you to specify the buffer size and the number of files that can be open simultaneously. In addition, you can enter commands that install drivers for devices.

6. Desktop – In graphical user interfaces, a desktop is the metaphor used to portray file systems. Such a desktop consists of pictures, called icons, that show cabinets, files, folders, and various types of documents (that is, letters, reports, pictures). You can arrange the icons on the electronic desktop just as you can arrange real objects on a real desktop -- moving them around, putting one on top of another, reshuffling them, and throwing them away.

7. Device Driver – A program that controls a device. Every device, whether it be a printer, disk drive, or keyboard, must have a driver program. Many drivers, such as the keyboard driver, come with the operating system. For other devices, you may need to load a new driver when you connect the device to your computer. In DOS systems, drivers are files with a.SYS extension. In Windows environments, drivers often have a.DRV extension. A driver acts like a translator between the device and programs that use the device. Each device has its own set of specialized commands that only its driver knows. In contrast, most programs access devices by using generic commands. The driver, therefore, accepts generic commands from a program and then translates them into specialized commands for the device.

8. Direct Memory Access (DMA) Channel – a technique for transferring data from main memory to a device without passing it through the CPU. Computers that have DMA channels can transfer data to and from devices much more quickly than computers without a DMA channel can. This is useful for making quick backups and for real-time applications. Some expansion boards, such as CD-ROM cards, are capable of accessing the computer's DMA channel. When you install the board, you must specify which DMA channel is to be used, which sometimes involves setting a jumper or DIP switch.

9. Directory Table – An OS table that contains file information such as the name, size, time and date of last modification, and cluster number of the file's beginning location.

10. File Allocation Table (FAT) – A table that the operating system uses to locate files on a disk. Due to fragmentation, a file may be divided into many sections that are scattered around the disk. The FAT keeps track of all these pieces. In DOS systems, FATs are stored just after the boot sector. The FAT system for older

versions of Windows 95 is called FAT16, and the one for new versions of Windows 95 and Windows 98 is called FAT32.

11. File Extension – a three-character portion the name of a file that is used to identify the file type. In command lines, the file extension follows the filename and is separated from it by a period. For example, Msd.exe, where exe is the file extension.

12. File System – The system that an operating system or program uses to organize and keep track of files. For example, a hierarchical file system is one that uses directories to organize files into a tree structure.

13. Filename – The first part of the name assigned to a file. In DOS, the filename can be no more than eight characters long and is followed by the file extension. In Windows, a filename can be up to 255 characters.

14. Folder – (Same as a Subdirectory or child directory) A directory or folder contained in another directory or folder.

15. Graphical User Interface (GUI) – A program interface that takes advantage of the computer's graphics capabilities to make the program easier to use. Well-designed graphical user interfaces can free the user from learning complex command languages. On the other hand, many users find that they work more effectively with a command-driven interface, especially if they already know the command language.

16. Hardware Compatibility List (HCL) – The list of all computers and perioheral devices that have been tested and are officially supported by Windows NT/2000/XP

17. Hardware Interrupt – An event caused by a hardware device signaling the CPU that it requires service.

18. I/O Address – Numbers that used by devices and the CPU to manage communication between them. Also called ports or port addresses.

19. Initialization Files – Configuration information files for Windows. System.ini is one of the most important Windows 9x/Me initialization files.

20. Interrupt Request (IRQ) Line – A line on a bus that is assigned to a device and is used to signal the CPU for servicing. These lines are assigned to a reference number (for example, the normal IRQ for a printer is IRQ 7).

21. Logical Drive – A part of a physical disk drive that has been partitioned and allocated as an independent unit, and functions as a separate drive altogether. For example, one physical drive can be partitioned into drives F:, G:, and H:, each representing a separate logical drive but all still part of the one physical drive.

22. Memory Address – A number assigned to each byte in memory. The CPU can use memory addresses to track where information is stored in RAM. Memory addresses are usually displayed as hexadecimal numbers in segment/offset form.

23. Multitasking – Doing more than one thing at a time. A true multitasking system requires two or more CPUs, each processing a different thread at the same time. Compare to cooperative multitasking and preemptive multitasking.

24. New Technology File System (NTFS) – the file system for the new Windows NT/2000/XP operating systems. NTFS cannot be accessed by other operating systems such as DOS. It provides increased reliability and security in comparison to other methods of organizing and accessing files. There are several versions of NTFS that might or might not be compatible.

25. Operating System (OS) – Software that controls a computer. An OS controls how system resources are used and provides a user interface, a way of managing hardware and software, and ways to work with files.

26. Partition – A division of a hard drive that can be used to hold logical drives.

27. Path – (1) a drive and list of directories pointing to a file such as C:\Windows\command. (2) The OS command to provide a list of paths to the system for finding program files to execute.

28. Polling – A process by which the CPU checks the status of connected devices to determine if they are ready to send or receive data.

29. Port Address – (Same as I/O address) Numbers that used by devices and the CPU to manage communication between them.

30. Preemptive Multitasking – A type of pseudo-multitasking whereby the CPU allows an application a specified period of time and then preempts the processing to give time to another application.

31. Protected Mode – an operating mode that supports preemptive multitasking, the OS manages memory and other hardware devices, and programs can us a 32-bit data path. Also called 32-bit mode.

32. Real Mode – A single-tasking operating mode whereby a program has 1024k of memory addresses, has direct access to RAM, and uses a 16-bit data path. Using a memory extender (Himen.sys) a program in real mode can access memory above 1024k. Also called 16-bit mode.

33. Registry – A database that Windows uses to store hardware and software configuration information, user preferences, and setup information.

34. Root Directory – the main directory created when a hard drive or disk is first formatted. In Linux, it's indicated by a forward slash. In DOS and Windows, it's indicated by a backward slash.

35. Sector – On a disk surface one segment of a track, which almost always contains 512 bytes of data.

36. Shadow RAM or Shadowing ROM – ROM programming code copied into RAM to speed up the system operation, because of the faster access speed of RAM.

37. Shell – the portion of an OS that relates to the user and to applications.

38. Startup BIOS – Part of the system BIOS that is responsible for controlling the PC when it is first turned on. Startup BIOS gives control over to the OS once it is loaded.

39. Subdirectory – (Another name for child directory) A directory or folder contained in another directory or folder.

40. System BIOS – BIOS located on the motherboard.

41. System Resource – A channel, line, or address on the motherboard that can be used by the CPU or a device for communication. The four system resources are IRQ, I/O address, DMA channel, and memory address.

42. System.ini – A text configuration file used by Windows 3.x and supported by Windows 9x/Me for backward-compatibility.

43. Terminate-and-stay-resident (TSR) – A program that is loaded into memory and remains dormant until called on, such as a screen saver or a memory-resident antivirus program.

44. Track – One of many concentric circles on the surface of a hard drive or floppy disk.

45. Volume – (Same as Logical Drive) A part of a physical disk drive that has been partitioned and allocated as an independent unit, and functions as a separate drive altogether. For example, one physical drive can be partitioned into drives F:, G:, and H:, each representing a separate logical drive but all still part of the one physical drive.

REVIEWING THE BASICS

1. List four major functions of an OS.
Manages hardware, runs applications, provides an interface for users, and stores, retrieves, and manipulates files.

2. List three well-known Os.
DOS, Windows 9x/Me, Windows NT/2000/XP, UNIX, a version of UNIX called Linux, OS/2, and the Mac OS.

3. Which operating system is only used on Apple Macintosh computers?
Mac OS

4. What is the latest Microsoft operating system for desktop computers?
Windows XP

5. Which operating system often used for server applications is a scaled-down version of Unix?
Linux

6. Which file system is used by floppy disks?
FAT
7. What are two file systems used by hard drives?
FAT & NTFS
8. Real mode operates using a(n) 16 -bit data path, and protected mode uses a(n) 32 -bit data path.

9. Which Microsoft operating system(s) support 16-bit device drivers or 32-bit device drivers?
Windows 95 and Windows 98

10. Real mode allows programs direct access to RAM, but protected mode does not.

11. List three text files that Windows 9x/Me supports for loading device drivers in order to remain backward-compatible with DOS and Windows 3.x.
Config.sys, Autoexec.bat, and System.ini

12. List three types of information that are kept in the Windows registry.
(1) Hardware and software configuration information (2) User preferences (3) Application settings that are used when the OS is first loaded and are accessed as needed by hardware, applications, and users.

13. Device drivers loaded from Config.sys run in 16-bit real mode.

14. Device drivers loaded from autoexec.bat run in 16-bit real mode.

15. List four ways to launch an application from the Windows desktop.
(1) shortcut icons (2) Start Menu (3) Run command (4) windows explorer or My Computer

16. List four system resources that software uses to manage hardware.
(1) I/O addresses (2) IRQs (3) DMA Channels (4) Memory addresses

17. What is the IRQ of the system timer?
0

18. What IRQ does COM2 use?
3

19. Which DMA channel is used to cascade into the lower four DMA channels?
4
20. How is hardware interrupt initiated?
By placing voltage on the designated interrupt request (IRQ) line assigned to it.

21. If memory addresses are used by the CPU to access memory, then what are I/O addresses used for?
Hardware devices that software uses to send a command to a device.

22. What is the I/O address range for the keyboard?
0060-006F

23. Why are DMA channels not as popular as they once were with high-speed devices?
Because their design makes them slower than newer methods.

24. Name a device that uses polling in order to be serviced by the CPU?
Joystick

25. Name one Windows 2000/XP and Windows 9x/Me utility that allows you to see the IRQ assignments made to devices.
Device Manager

THINKING CRITICALLY

1. Name one system resource that a video card most likely will not need.
DMA channel

2. Is a mouse more likely to be controlled by a device driver or by system BIOS?
System BIOS

3. Name one device that is likely to be controlled by system BIOS.
Keyboard

4. If your printer is giving you trouble, what is the best way to obtain an update for the device driver?
Through the printer manufacturer's Web site!

Chapter Two-OS, Hardware, Software   Name: Amy Hissom

Follow the directions then answer the questions below:

Under the Control Panel, double click on the SYSTEM icon. Under the HARDWARE tab, select DEVICE MANAGER.

1. Under the Device manager, list all of the device types shown.

Computer	Disk Drives
Display Adapters	DVD/CD-ROM Drives
Floppy Disk Controllers	Floppy disk Drives
IDE ATA/ATAPI Controllers	Mice and other pointing devices
Keyboards	Monitors
Network Adapters	Ports (COM & LPT)
Processors	Storage Volumes
System Devices	USB Controllers
Sound, video and game controllers	
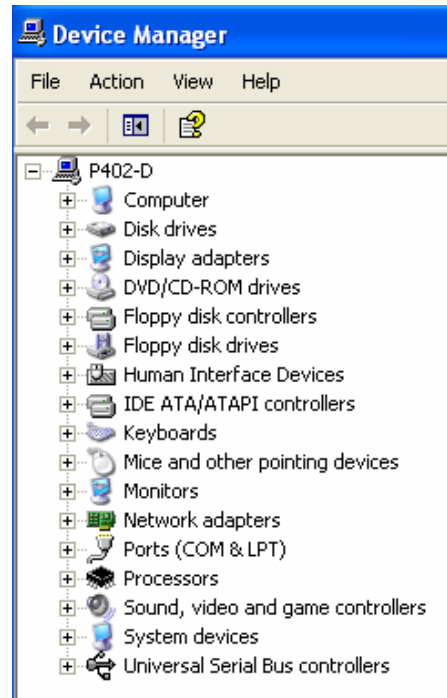
2. Next to the Network Adapter, click on the PLUS (+) Sign. Double click on the device listed under this section. Click the RESOURCE tab.

What IRQ is assigned to the network adapter?
05
What is the I/O range of the network adapter?
EC00-EC7F
What memory addresses are available to the network adapter?
FDFFFC00-FDFFFC7F

3. Next to the Floppy Disk Drive, click on the PLUS (+) Sign. Double click on the device listed under this section. Click the RESOURCE tab.

What IRQ is assigned to the Floppy Disk Drive?
N/A

What is the I/O range of the Floppy Disk Drive?
N/A

What memory addresses are available to the Floppy Disk Drive
N/A

3. Click on the VIEW menu and select SHOW HIDDEN DEVICES. List the additional devices that are shown.
Non-Plug and Play Drivers

Now Next to the NON-PLUG and PLAY DEVICES, click on the PLUS (+) Sign to expand.

How many NON-PLUG and PLAY DEVICES are shown?
25

Explore the properties of the drivers and **note** the differences between the NON-PLUG and PLAY DEVICES and the non-hidden devices.
Non-Plug and Play devices have no resources because they are not being used.

Key Terms

1. Active Partition – the primary partition on the hard drive that boots the OS. Windows NT/2000/XP calls the active partition the system partition.

2. Autoexec.bat – Stands for automatically executed batch file, the file that DOS automatically executes when a computer boots up. This is a convenient place to put commands you always want to execute at the beginning of a computing session. For example, you can set system parameters such as the date and time, and install memory-resident programs.

3. Batch File – A file that contains a sequence, or batch, of commands. Batch files are useful for storing sets of commands that are always executed together because you can simply enter the name of the batch file instead of entering each command individually.

4. Boot Record – The first sector of a floppy disk or logical drive in a partition; it contains information about the disk or logical drive. On a hard drive, if the boot record is in the active partition, then it is used to boot the OS. Also called boot sector.

5. Bootable Disk – For DOS and Windows, a floppy disk that can upload the OS files necessary for computer startup. For DOS or windows 9x/Me, it must contain the files Io.sys, Msdos.sys, and Command.com.

6. Booting – Comes from the phrase "lifting yourself up by your bootstraps" and refers to the computer bringing itself up to an operable state without user intervention. Refers to either a "soft boot" or a "hard boot".

7. Cabinet File – A file with a .cab extension that contains one or more compressed files and is often used to distribute software on a disk. The Extract command is used to extract files from the cabinet file.

8. CD (change directory) command – A command given at the command prompt that changes the default directory, for example CD\Windows.

9. Cold boot – (Same as a hard boot) Restart the computer by turning off the power or by pressing the restart button.

10. Command.com – Along with Msdos.sys and Io.sys, one of the three files that are the core components of the real-mode portion of Windows 9x/Me. Command.com provides a command prompt and interprets commands.

11. DOS box – A command window.

12. Emergency Startup disk (ESD) – (Same as a rescue disk or startup disk) A floppy disk that can be used to start up a computer when the hard drive fails to boot.

13. External Command –Commands that have their own program files.

14. Fragmented File – A file that has been written to different portions of the disk so that it is not in contiguous clusters.

15. Hard Boot – (Same as a cold boot) Restart the computer by turning off the power or by pressing the restart button.

16. Hidden File – A file that is not displayed in a directory list. Whether to hide or display a file is one of the file's attributes kept by the OS.

17. Internal Command – Commands that are embedded in the Command.com file.

18. Io.sys – Along with Msdos.sys and Command.com, one of the three files that are the core components of the real mode portion of Windows 9x/Me. It is the first program file of the OS.

19. Master Boot Record (MBR) – the first sector on a hard drive, which contains the partition table and a program the BIOS uses to boot an OS from the drive.

20. Msdos.sys – In Windows 9x/Me, a text file that contains setting used by Io.sys during booting. In DOS, the Msdos.sys file was a program file that contained part of the DOS core.

21. Ntldr – (NT Loader) In Windows NT/2000/XP, the OS loader used on Intel systems.

22. Partition Table – A table at the beginning of the hard drive that contains information about each partition on the drive. The partition table is contained in the Master Boot Record.

23. Power-on self test (POST) – A self-diagnostic program used to perform a simple test of the CPU, RAM, and various I/O devices. The POST is performed by startup BIOS when the computer is first turned on, and is stored in ROM-BIOS.

24. Program File – A file that contains instructions designed to be executed by the CPU.

25. RAM Drive – An area of memory that is treated as though it were a hard drive, but works much faster than a hard drive. The Windows 9x/Me startup disk uses RAM drive. Compare to virtual memory.

26. Rescue Disk – (Same as an Emergency Startup disk (ESD) or startup disk) A floppy disk that can be used to start up a computer when the hard drive fails to boot.

27. Soft Boot – To restart a PC without turning off the power, for example, in Windows XP, by clicking Start, Turn Off Computer, and Restart. Also called a warm boot.

28. Startup disk – (Same as an Emergency Startup disk (ESD) or rescue disk) A floppy disk that can be used to start up a computer when the hard drive fails to boot.

29. System Disk – Windows terminology for a bootable disk.

30. Warm Boot – To restart a PC without turning off the power, for example, in Windows XP, by clicking Start, Turn Off Computer, and Restart. Also called a soft boot.

31. Wildcard – A * or ? character used in a command line that represents a character or group of characters in a filename or extension.

REVIEWING THE BASICS

1. What is the difference between a hard boot and a soft boot?
A hard boot is turning on the computer from an off position and a soft boot is restarting the computer while it is still on.

2. What three keys can you press to perform a soft boot when using DOS?
Ctrl, Alt, Delete

3. What are the four main parts of the boot process?
(1) Post (2) Loading the OS (3) The OS initializing itself (4) Loading and executing an application

4. What memory address is always assigned to the first instruction in the ROM BIOS startup program?
FFFF0h

5. How does startup BIOS communicate errors during POST if video is not yet available?
Beeps. Short and long beeps indicate an error; the coding for the beeps depends on the BIOS.

6. Name the program that is needed to locate the beginning of the OS on a drive.
Master Boot Record (MBR)

7. List three types of information contained in a hard drive's partition table.
(1) A map to the logical drives on a hard drive (2) How many partitions the drive has and how each partition is divided into one or more logical drives (3) Which partition contains the drive to be used for booting (called the active partition), and where each logical drive begins and ends.

8. Give one example of a file system that can be used on a hard drive.
NTFS

9. What three OS files are necessary to boot to MS-DOS mode? What is the function of each? What additional two files are not required but are used if they are present?
(1) Io.sys (2) Msdos.sys (3) Command.com
Io.sys looks for Msdos,sys, reads it, and uses the settings in it. It then looks on the hard drive for a file named Config.sys. After Config.sys is executed, Io.sys looks for another OS file named Command.com.
Command.com looks for Autoexec.bat, and if found, executes it. Command.com is the program in charge, displaying a command prompt and waiting for a command.
The two additional not required, but will be used if present are (1) Config.sys (2) Autoexec.bat

10. Why is it important not to edit Autoexec.bat with word-processing software such as Microsoft Word or WordPerfect?
Because Word-processing applications place control characters in their document files that prevent the OS from interpreting the file correctly.

11. What is the name of the Windows NT/2000/XP boot loader program?
Ntldr (NT Loader)

12. What is the purpose of the command Device=hymen.sys in the Config.sys file?
It gives real-mode Io.sys access to memory above 1 MB, called extended memory.

13. Give two ways to access a command prompt from Windows 9x/Me.
(1) Click Start, Programs, and MS-DOS Prompt.

(2) Click Start, Run , and enter Command.com in the run dialog box.

14. What are two Windows 2000/XP program files that can provide a command prompt window?
(1) Command.com (2) Cmd.exe

15. How many startup disks are needed to boot Windows 2000 from a floppy disk?
4

16. What are the two wildcard characters that can be used in command lines?
* and ?

17. What is the /S switch used for with the Format command? The /V switch? The /F:size switch?
(1) /S switch – Stores the system files on the disk after formatting. Writes the two hidden files and Command.com to the disk making the disk bootable. Not available under Windows 2000/XP.
(2) /V switch – Allows you to enter a volume label only once when formatting several disks. The same volume label is used for all disks. A volume label appears at the top of the directory list to help you identify the disk.
(3) /F:size switch – Specifies the size of a floppy disk. If the size is not specified, the default for that drive is used.

18. What is the name of the signal directory created when a floppy disk or logical drive is formatted?
Root Directory

19. Name the Windows 98 command that is used to partition a hard drive.
Fdisk

20. The Del or Erase command erases files or groups of files.

21. What command is used to create a subdirectory? To change the current directory? To remove a subdirectory?
Mkdir

22. The Attrib command displays or changes the read-only, archive, system, and hidden charactistics of files.

23. What is a hidden file? Name a Windows 9x/Me file that is hidden.
A file that is not displayed in a directory list.
Io.sys

24. The Recovery Console in Windows 2000 can be used to execute commands when troubleshooting a failed boot.

25. What is the purpose of the Ebd.cab file on the Windows 98 startup disk?
It is a compressed file called a cabinet file, that contains several other compressed files. During startup, the contents of the cabinet file are uncompressed and copied to the RAM drive, because there is not enough space for them on the floppy disk, and the startup disk assumes the hard drive might not be accessible.

26. What icon in the Windows 98 Control Panel is used to create a startup disk?
Add/Remove Programs

27. List the steps to add a shortcut to your Windows desktop to access a command prompt window.
(1) Locate the file (Command.com or Cmd.exe) in Windows Explorer and while holding down the Ctrl key, drag the icon to your desktop.

(2) Click Start, point to Programs (All Programs in Windows XP), Accessories, and Command Prompt. Right click Command Prompt and select Create Shortcut on the shortcut menu.

28. At a command prompt, how must you type long filenames that contain spaces?
Put double quotation marks around the filename. For example; "My long filename.doc"

29. When using a real-mode command prompt, how will DOS display the filename Mydocument.doc?
Mydocum~.doc

30. What is the batch file used by Windows 98 to control loading 16-bit programs?
Autoexec.bat

THINKING CRITICALLY

1. If a PC boots first to the hard drive before checking the floppy disk for an OS, how do you change this boot sequence so that it first looks on the floppy disk for an OS?
By using the computer's CMOS setup.

2. A PC continues to reboot. You try to solve the problem by booting from a Windows 98 startup disk. You boot to the A prompt and look on the hard drive. Explain a possible source of the problem and describe how to fix it.
The problem could be with the file system on the hard drive. If so, you must use tools native to the OS the computer uses to solve the problem.

3. Explain the difference between the Copy command and the Xcopy command.
The copy command allows the user to copy one or more files to an alternate location. Xcopy is a powerful version of the copy command with additional features; has the capability of moving files, directories, and even whole drives from one location to another.

The Copy command copies a single file or group of files. The original files are not altered.

4. Explain the difference between the Chkdsk and the Scandisk commands.
They both check drives for errors and repair them. Scandisk does a more thorough scan for Windows 9x/Me and basically replaces Chkdsk.

5. You need to make 10 duplicates of one floppy disk. Describe how to do this using two different methods. Which method is better and why?

Chapter Three-Boot Sequence   Name: Amy Hissom

You will boot your computer up several times during this lab.

What is the difference between a cold boot and a warm boot? A cold boot is powering your computer back on after it has been shut down completely, while a warm boot is restarting your computer while it is already on without completely shutting it off.

Why is one better to do than another? Explain
There are good reasons for both. A cold boot gives the computer a fresh start, but takes longer to boot up. A warm boot saves time.

Boot your computer and note what messages are on the screen.
Some possible things you are looking for are RAM initialization, CPU speed, devices detected, and other events such as the screen turning colors of any kind.
Record them below:
Click F2 for setup
Bios Version
Operating System and the OS version

Do the following situations and note what occurs:

Insert a BLANK floppy disk into the computer and boot your computer.
Describe the problems / error messages.
The computer would not boot into the Operating System and gave me an error message that told me to remove disks or other media and then to press any key to start.

Unplug the keyboard and boot your computer**.**
Describe the problems / error messages.
The screen showed me the Bios version and then gave me the error message that there was a keyboard failure. Once the computer booted up completely, I opened notepad to test the keyboard by typing. It did not work!

Unplug the mouse and boot your computer.
Describe the problems / error messages.
There were no error messages, and obviously the mouse did not work.

Unplug the monitor and boot your computer.
Describe the problems.
Reconnect it after a minute and see if the system booted.
After booting up the computer with the monitor unplugged, I noticed a information box floating on the monitor screen that said there was no connection and to check the signal cable. I then plugged the monitor back in to see if the computer had indeed booted and it did.

NOW, create one of the problems above, and switch places with another group. ***Don't tell them the problem***, but see if they can diagnose what you did.
What problem did your group encounter?
the mouse was unplugged!

Chapter Three-Startup and Files   Name: Amy Hissom

I. Boot Disk

What is a boot disk???
A diskette from which you can boot your computer. Normally, your computer boots from a hard disk, but if the hard disk is damaged (for example, by a virus), you can boot the computer from a bootable diskette. For this reason, it's a good idea to make sure you always have a bootable diskette on hand.

You can create a boot disk by using a Windows 98 CD. It is recommended to use a Win 98 boot disk because it all fits on one disk and has the drivers that recognize CD drives.

We will be using another method, however.
Visit www.bootdisk.com and download the WINDOWS 98 SE OEM file. Save it to a location that will allow you to take it to another computer (ie save it to your USB drive or a blank floppy disk)

On your computer in the lab, copy the downloaded file.

With a blank floppy in the computer, run the program. It will make your floppy into a boot disk.

Once it is complete, leave it in the floppy drive and re-boot your PC.   **What is displayed on your screen?**
Microsoft Windows 98 Startup Menu

II. Startup

Under START, and RUN, type **MSCONFIG**
Examine each tab at the top of the window.

Under the STARTUP tab, notice how many programs are listed. By checking the box, the next time Windows is started the program selected will be added or removed from the startup routine.

III.   Windows and File names

1.Go under **MY COMPUTER** and under the **TOOLS** menu, select **FOLDER OPTIONS.**

Under the **VIEW** tab, change the setting for **HIDE FILE EXTENSIONS FOR KNOW FILE TYPES.**

Open a Folder that contains file and turn this setting on and off.

What occurs when this setting is changed?
Unhiding shows file extensions and hiding takes the file extensions away.

2. Under START, and RUN, type **CMD** to get a command prompt.

Type **MD** Test to create a new directory called Test.

Check to see if the directory exists by using the **DIR /P** command

Type **CD Test** to change to the Test directory

Type **edit test.txt** and press enter. This will create a file called test.txt and allow you to type things in it. Type **THIS IS A TEST. THIS WAS CREATED WITH EDIT.** To save the file, hit **ALT + F + S**. To close the file hit **ALT + F + X**.

After it is closed type **type test.txt**. This should display your text you typed.

2. Next, close your Command prompt and go under My Computer and find the folder Test and the file Test.txt you created. Double click on Test.txt.   What happens?
   The Test,txt file opens in notepad.
   Next, create a new file in Notepad. Type the following **THIS IS A TEST. THIS WAS CREATED WITH NOTEPAD.** Go under File and save the document as **Longnametest.txt** in the TEST folder.

3. Return to the Command Prompt by going to the Start, Run, and CMD command.

   Go under the TEST folder (CD Test)

   View the contents of the folder (DIR / P)

   What is displayed as the contents of the folder?
   Longnametest.txt
   test.txt

4. Copy the files to a floppy disk (**test.txt & longnametest.txt**). Don't use your startup disk.

   Place a startup disk in your drive A and restart your computer.

   When you get to a command prompt, use the DIR command and record the names of the two files on the floppy disk.
   LONGNA~1.TXT
   TEST.TXT

   How is this different from what occurred above in step 3?
   This showed the shortened 8.3 file name format.

   Now using the DEL command, delete both files from the floppy disk.

   Write the commands used to perform these tasks:
   del test.txt
   del longna~.txt

Command Prompt   Name: <u>Amy Hissom</u>

From a previous lab, you should have a folder called TOOLS. If you don't, create one.

I. By using My Computer or Windows Explorer, select the TOOLS folder. When inside the TOOLS folder, right click your mouse to **Create** a new Text Document.

Name the new text document   **deleteme.txt**. Be sure to place a .txt extension on the end of the filename.

You may type something in this text file, or you may not at this time.

II. To operate in a command line environment, select the Start button, then Run, then type CDM.

This will open a MS-DOS window.

The MS DOS Prompt is probably something similar to this:
C:\

Next, type the following commands and NOTE what occurs:

1. C:\ cd . .
Nothing

2. C:\ **dir**
The list of the directories on drive C came up

3. C:\ **dir \ w**
Made the page wide

4.   C:\ **dir \ p**
Took the directory of drive C back to displaying one page at a time

5. C:\ **dir / os**
Showed the same directory list of drive C

6. C:\ **dir / o-s**
Same as #5

7. C:\ **cd tools**
Took me to the Tools folder located on drive C

8. C:\ tools > **dir**
Shows the directory list of files in the tools folder

9. C:\ tools > **dir \w**
Made the page wide

10. C:\ tools> **edit deleteme.txt**
Opened the deleteme.txt file for editing

11. C:\ tools> **del deleteme.txt**
Deleted the deleteme.txt file

12. C:\ tools>**cd . .**
Took me back to the root directory C

13. **C:\ cls**
Cleared the screen

14. **C:\ dir * . ***
Gave me a list of all directories on the C drive

15. **C:\ dir c* . ***
Listed all files starting with the letter c

16. **C:\ dir a*.???**
Showed all files starting with the letter a
What is the difference between 15 & 16?
#15 looked for all types of files and folders, while #16 only looked for three types.

17. **C:\ md otherstuff**
Made a directory called "otherstuff".

18. **C:\ dir / w**
Made the page wide displaying the directory list of drive C

19. **C: copy autoexec.bat A:**
Copied the autoexec.bat file to the blank disk in the floppy drive

Dos Commands to know

DIR   **CLS**   **CD**   **CD . .**

*   **?**   **del**   **md**

Copy