Computer Maintenance & Repair I
Hands-on Projects

PROJECT 1-4: Examining Your Computer What type of CPU does your computer have, and how much memory is installed? To answer these questions, using Windows XP, click Start, right- click My Computer, and select Properties on the shortcut menu. The System Properties dialog box opens. Click the General tab. (Using Windows 2000 or Windows 98, right- click the My Computer icon on your desktop and select Properties on the shortcut menu.) The CPU information is listed in this dialog box. Print a screen shot of this dialog box. One quick and easy way to get a hard copy of a screen is to use Paint. Follow these directions to print the screen:

1. Press the PrintScrn (print screen) key. This puts the screen capture on your Windows Clipboard.
2. Open Paint. Click Start, All Programs, Accessories, Paint.
3. Click Edit, Paste to put the contents of the Clipboard into Paint. If necessary, click Yes to the dialog box that pops up to confirm the paste.
4. To submit your assignment via. Email, click File, Print to PDF and follow directions to save the file as a PDF. Email as an attachment to your instructor. Be sure to include "Project 1-4" in the subject field.

REAL PROBLEM 1-1: Reading a Technical Ad for a Computer System Computer ads can sometimes be difficult to read, especially those targeting tech- savvy computer buyers. Figure 1- 38 shows an advertisement published by GIM Computer Corp (www. gimcomputers. com), a computer parts store that assembles systems from parts and sells them as a single unit price with a one- year warranty on all parts. Answer the following questions about this ad:

1. What is the system bus called? What two system bus frequencies are offered?
2. In the ad, what do you think P4 means?
3. What are the four choices of frequencies for the processor?
4. What is the brand of the processor?
5. How much RAM is on the motherboard? What is the cost of doubling that amount of RAM?
6. What type of expansion slot is used for the video card?
7. What terms describe the hard drive in the system?
8. List the terms in the ad that you do not understand (many are not covered in this chapter) and save this list. You will need it in future chapters.
9. Submit your answers via. Email when completed.

GIM 13. Intel SK775 P4 Business System

SK775 330 Celeron 2.66G 533FSB retail box w/fan-$399.99/414.12

SK 775 340 Celeron 2.93G 533FSB retail box w/fan-$428.99/437.58

P4-530-3.0G (1M /800FSB, Hyper Threading, retail box w/fan)-$499.99/ 520.2

P4-540-3.2G (1M/800FSB, Hyper Threading, retail box w/fan)-$545.99/ 556.92

all above cpu chips are retail boxed, 3 years Intel warranty.

ASUS P5DG1-VM Intel 915P, SK775, 4 SATA, 8 USB 2.0, ATX MB

512MB DDR400 PC3200 (+ $50 to add 1 more 512MB for Dual DDR400)

80GB SATA ATA150 8M buffer 7200RPM ATA100 UIDE HDD (+ $38 to upgrade to 160GB)

Integrated Intel Graphics Media Accelerator 900 w/16x PCI Express port// 1.44 FDD

52x32x52x16x IDE CDRW & DVD Combo w/Nero (+ $20 to upgrade to 16x DVDRW)

3D Sound 6 Channel // 10-100 Network

Super Mid-tower case w/2 fans & 2 USB front (retail @ $50)

*** Add $10 to upgrade to P5GD1-VM-S w/gigabit lan & 1394; or + $12 Ug to ASUS P5GD1 Raid, PCI-X MB, also +$ 59 for ATI Radeon x300se 128MB 16X PCI-X video. *** Add $85.99 for Windows XP Home; 0r + $138.99 for Windows XP Pro. w/CD & Manual.

Figure 1-38 GIM Computer sells preassembled systems to tech-savvy customers

PROJECT 2-1: Using the Windows 2000/ XP System Information Utility Using Windows 2000/ XP, do the following to run the System Information utility and gather information about your system:
1. Click Start, click Run, and then type Msinfo32.exe in the Run dialog box. Click OK.
2. Browse through the different levels of information in this window and answer the following questions:
    a. What OS and OS version are you using?
    b. What is your CPU speed?
    c. What is your BIOS manufacturer and version?
    d. How much RAM is installed on your video card? Explain how you got this information.
    e. What is the name of the driver file that manages your parallel port? Your serial port?
    f. How is IRQ 10 used on your system? IRQ 4?
    g. Which DMA channels are used on your system and how are they used?

PROJECT 2-3: Using Device Manager Using Device Manager under Windows 2000/ XP or Windows 9x/ Me, answer the following questions about your computer. To access Device Manager using Windows 2000/ XP, open the System Properties dialog box, click the Hardware tab, and then click Device Manager. For Windows 9x/ Me, right- click the My Computer icon on the desktop, select Properties on the shortcut menu, and click the Device Manager tab.
1. Does your computer have a network card installed? If so, what is the name of the card?
2. Name three settings that you can change under Device Manager.
3. What are all the hardware devices that Device Manager recognizes as present?

PROJECT 2-4: Using Shortcuts Create a shortcut on your desktop to Notepad (Notepad. exe), a text editor. Using a second method for creating shortcuts, add a shortcut to the Windows command prompt (Cmd. exe or Command. com). First, locate the two program files on your hard drive by clicking Start, Search (or Find for Windows 9x/ Me), and using the Search or Find dialog box. Then create the shortcuts. List the steps you took to create each shortcut.

REAL PROBLEM 3-1: Taking Apart a Computer and Putting It Back Together A PC technician needs to be comfortable with taking apart a computer and putting it back together. To learn the most from this project, do it using more than one system. Be sure to use a ground bracelet as you work, and follow the other safety precautions in the chapter. You'll also need a Phillips- head screwdriver, flat- head screwdriver, paper, and pen. Be sure to check with your Instructor before doing the following:
1. Following the instructions in the chapter, begin to take apart the PC. When you get the case cover removed, identify the following major components. (Drawings in this and pre-vious chapters should help.)
    ➢ Expansion cards   ➢ CD drive
    ➢ Floppy disk drive   ➢ Hard drive
2. Remove the expansion cards and drives. As you work, don't force anything. If you find yourself needing to force something, ask your instructor for help.
3. Have your Instructor check your disassembled computer before beginning to reassemble. Reverse the preceding disassembling activities. Install the drives and cards in the case. Connect all internal cables and cords.
4. Before you replace the case cover, ask your instructor to check your work again.
5. Replace the case cover and plug in the keyboard, monitor, and mouse.
6. Turn on the power and check that the PC is working properly. If the PC does not work, don't panic! Just turn off the power and go back and check each cable connection and each expansion card. You probably have not solidly seated a card in the slot. After you have double- checked, try again.
7. Power on the computer and get a final check from your Instructor.

PROJECT 4-8: Exploring Computer System Form Factors You will need to open your computer case to answer these questions about your computer system:
1. What type of case do you have?
2. What are the dimensions of your motherboard in inches?
3. What form factor does your motherboard use?
4. What is the power rating of your power supply?

REAL PROBLEM 4-1: Replacing a Power Supply Suppose you turn on a system and everything is dead— no lights, nothing on the monitor screen, and no spinning fan or hard drive. You verify the power to the system works, all power connections and power cords are securely connected, and all pertinent switches are turned on. You can assume the power supply has gone bad. It's time to replace it. Simulate this activity by exchanging power supplies with your Instructor. Power on the computer and be sure that all the drives and lights are working. Have your Instructor check your work for credit.

PROJECT 5-4: Inserting and Removing a Processor In this project, you remove and install a processor. As you work, be very careful to not bend pins on the processor socket and protect the processor against ESD. Do the following:
1. Verify the computer is working. Turn off the system, unplug it, and open the computer case. Remove the cooler assembly and processor. Be extra careful not to damage the assembly.
2. You are now ready to reinstall the processor and cooler. But first have your instructor check the thermal compound. You might need to install a small amount of compound to account for compound lost when you removed the cooler.
3. Reinstall the processor and cooler. Power up the system and verify all is working. Have your instructor check your work for credit.

REAL PROBLEM 5-1: Troubleshooting a Hung System A user complains to you that her system hangs for no known reason. After asking her a few questions, you identify these symptoms:
1. The system hangs after about 15– 20 minutes of operation.
2. When the system hangs, it doesn't matter what application is open or how many applications are open.
3. When the system hangs, it appears as though power is turned off: no lights, spinning drives, or other evidence of power.

You suspect overheating might be the problem. To test your theory, you decide to do the following:
1. You want to verify that the user has not over-clocked the system. How do you do that?
2. You decide to check for overheating by examining the temperature of the system immediately after the system is powered up and then again immediately after the system hangs. Describe the steps you take to do this.
3. After doing the first two steps and you decide overheating is the cause of the problem, what do you do to fix it?

PROJECT 6-4: Inserting and Removing Motherboards Using your old assigned computer, practice inserting and removing the expansion cards and motherboard. Use the Project 6-5 diagram to re-connect the wires. Have your instructor check your computer at each step of the process.
1. After removal of expansion cards and motherboard.
2. After the motherboard and expansion cards are re-installed and wires are connected.
3. After case is fastened and computer is power on.

PROJECT 6-5: Understanding Hardware Documentation Obtain the manual for the motherboard for your PC. (You will need to download it from the motherboard manufacturer's Web site.) List at least three functions of jumpers on the board as well as the corresponding jumper settings. List the processors that the board supports. What type of RAM does the motherboard support. Print a copy of the page that shows where wires connect to the Motherboard. Be sure it includes the On/Off Power Switch, Power LED, HD LED and Reset wires.

PROJECT 8- 3: Selecting a Replacement Hard Drive Suppose the 370 GB Western Digital hard drive installed as the first serial ATA hard drive in the Windows XP system shown in Figures 8- 49 and 8- 50 has failed. Search the Internet and find a replacement drive of about the same size. Print to a PDF three Web pages showing the sizes, features, and prices of three possible replacements. Which drive would you recommend as the replacement drive and why?

PROJECT 8- 6: Installing a Hard Drive Have your instructor check your computer's hard drives before you begin the lab. Practice installing a hard drive by removing a drive from your computer and installing it as an extra drive in your lab partner's computer. When you boot up the computer with the extra drive, verify that the drives are accessible in Windows Explorer. Have your instructor check your work on both computers.

PROJECT 9- 1: Installing Devices Install the following twelve devices on your computer.

1.	Dual Mice	2.	Dual Keyboards	3.	External Floppy
4.	External Hard Drive	5.	Power Center	6.	APC Battery w/software
7.	LPT Laser Printer	8.	USB InkJet Printer	9.	Digital Camera
10.	Digital Photo Reader	11.	External Speakers	12.	Microphone

PROJECT 9- 3: Comparing Two Computer Ads Find two ads for computer systems containing the same processor. Print your two ads to a PDF. Write a comparison of the two ads. Include in your comparison the different features offered and the weaknesses and strengths of each system.

PROJECT 11-6: Installing Windows This project will erase everything on your hard drive. Check with your instructor before beginning. Do not do it if there is important data on the hard drive.
1. Check the Disk Management utility to see what drives currently exist the computer.
2. Boot from CD then create a 9 Gig partition. Be careful not to delete other partitions.
3. Call the new partition. [your login name]-bootXP.
4. Be sure to use the correct Owner Name, Company Name, Computer Name and Domain. Salem CTE Center is the owner and Salem School District is the company. The computer name will be based on your location in the room and block. For example if you are using the 3rd computer in the back of the room during block 2, then your computer name will be b2-back3-v119. The domain used in room V119 and V112 is CTE and the domain used in other classrooms is salem.
5. Create a second administrator account called admin.
6. Change the admin and administrator passwords to the appropriate one for the classroom.
7. Edit the Startup & Recovery file under advanced system properties so that the startup name "Microsoft Windows XP" reads "Windows XP for [your login name].
8. Download and install PC Wizard using a portable drive on a working computer. This will help detect missing drivers.
9. Download and install the appropriate Ethernet drivers to a portable drive on a working computer.
10. Download and Install the latest Service Pack then perform all the custom Windows updates.
11. Check the device manager for any missing drivers. Install as needed.
12. Check to be sure sound and video are working properly. Update as necessary.
13. Download and install Microsoft Security Essentials for antivirus and spyware protection.
14. For computers in room V119 and V112, you must change the DNS settings from automatic to 172.18.18.5 and 172.18.18.12. For all other classrooms, leave the DNS to automatic.
15. For V119 and V112 classrooms, add the computer to the CTE domain. For all other classrooms the domain is salem.
16. Log in using your domain login and password.
17. Note: Do not use the admin account for any purpose other than to install software and hardware. Surfing as an admin is against school policy and can cause serious Windows file corruption.
18. Have your instructor check your work.

PROJECT 11-6b: Complete Windows Installation: Complete the following after Windows is completely installed in Project 11-6:
1. Perform necessary upgrades to get both versions of LabSims to work on your computer.
2. Install Adobe Reader from the Adobe website.
3. Install Microsoft Office on your computer from the Install folder on the server.
4. Install the classroom printer from the 172.18.18.5 or 172.18.18.12 server. When elsewhere in the building, install the required printers by going to the \\Printers server.
5. Map the Z: to \\172.22.22.73\shsstudents\[your-login-name] in order to make your district drive available to save documents. Be sure to first log in under your personal login and password. Do not set up Z: under admin to prevent other administrators from accessing your documents.

PROJECT 12- 3: Using System Restore: System Restore is a good way to restore your computer back to where it was before a problem such as a virus infecting your computer. Keep in mind that System Restore does not back up data or applications. Create a restore point. Simulate virus issues buy making many changes to your display. Show your Instructor that you can restore the system using System Restore. Are the changes still in effect? Why or why not?

PROJECT 12- 4: Restoring the System using Windows Backup: Understanding the importance of making backups is essential to learning to support Windows. Do the following to examine the power and limitations of backing up the system state data:
1. Back up the Windows XP "SYSTEM STATE" to a folder on your network or hard drive. What is the path to your backup?
2. Back up the "DOCUMENTS AND SETTINGS" folder on C: to the same backup file. Be sure you are logged in as Admin so you have access to all users' documents, not just the Admin's documents.
3. Make several changes to the Windows environment: Using the Display Properties window, change the wallpaper background of the desktop, the screen resolution, and the Windows Theme.
4. Using the Add or Remove Programs applet in Control Panel, remove and add a Windows component. Which component did you remove? Which component did you add?
5. Reboot your system and verify your changes were all implemented.
6. Now restore the "system state" from the backup you made. Which of your changes were undone and which (if any) were left untouched?
7. Delete unneeded documents and folders from your My Documents folder.
8. Restore the "documents and settings" from the backup you made. Are documents and the background back to their original locations?
9. Show the results to your instructor.

PROJECT 12- 10: Finding Windows 2000/ XP Utilities: The following table lists some important Windows utilities covered in this chapter. Fill in the right side of the table with the filename and path of each utility. (Hint: You can use Windows Explorer or Search to locate files.) After locating the files, execute and explore each utility to see how they can help you with your computer.

Utility	Filename and Path
System File Checker	
System Configuration Utility	
Command window	
Windows Backup	
System Information	
Task Manager	

PROJECT 17- 1: Investigating Your PC
Answer the following questions about your connection to the Internet or a network:
1. What is the hardware device used to make this connection (modem or network card)? List the device's name as Windows sees it.
2. If you are connected to a LAN, what is the MAC address of the NIC? Print the screen that shows the address.
3. What is the IP address of your PC?
4. What Windows utilities did you use to answer the first three questions? 5. Print the screen that shows which network protocols are installed on your PC.

PROJECT 17- 4: Sharing and Securing Folders
Working with a partner, using two computers networked together, do the following to practice sharing and securing folders using Windows XP:
1. Create a user account on Computer 1 named User1. Log in to your computer using User1. In the My Documents folder for that account, create a folder named Folder1.
2. On Computer 2, create a user account named User2. Log in to your computer using User2. From computer 2, try to access Folder1 on Computer 1. What is the result?
3. Make the necessary changes on both computers so that User1 can see the Shared folder on Computer 2 and User 2 can see the shared folder on Computer 1.
4. Now change the security settings so that others cannot see or access it on the network.
5. Show the results to your Instructor.

PROJECT 20- 1: Observing Notebook Features
Ask your Instructor for a lab notebook to use for the lab. Examine the notebook, its documentation, and the manufacturer's Web site, and then answer these questions:
1. How do you exchange the battery pack on the notebook?
2. What type of SO- DIMM or SO- RIMM does the notebook use?
3. How much memory is currently installed?
4. What is the capacity of the hard drive?
5. What OS is installed?
6. What processor is installed?
7. What ports are on the notebook?
8. How many PC Card or ExpressCard slots does the notebook have?
9. How much does the notebook weigh?
10. What is the cost of a new battery pack?
11. Can you buy memory from the Web site? How much does it cost to upgrade the note-book's memory to full capacity?

PROJECT 20- 4: Researching PDAs and Smartphones

Select two different PDAs or Smartphone that cost about the same. Using information from the Web site of the manufacturer of each PDA, write the following:

1. Short description of the features of the PDA or Smartphone, including its model number
2. Price
3. Manufacturer
4. Type of battery and battery life
5. Ability for Web and e- mail access
6. Additional devices that can be purchased
7. Operating system
8. Built- in or bundled applications
9. Warranty

REAL PROBLEM 21- 1: Selecting a Color Printer for a Small Business

Mr. Pelletier owns a small computer company and has come to you asking for help with his printing needs. Currently, he has a color inkjet printer that he is using to print flyers, business cards, brochures, and other marketing materials. However, he is not satisfied with the print quality and wants to invest in a printer that produces more professional- looking hard copy. He expects to print no more than 8,000 sheets per month and needs the ability to print envelopes, letter- size and legal- size pages, and business cards. He wants to be able to automatically print on both sides of a legal- size page to produce a three- column brochure. Research printer solutions and do the following:

1. Print Web pages showing three printers to present to Jack that satisfy his needs. Include at least one laser printer and at least one other printer technology other than laser in your selections.
2. Print Web pages showing the routine maintenance requirements of these printers.
3. Print Web pages showing all the consumable products (other than paper) that Jack should expect to have to purchase in the first year of use.
4. Calculate the initial cost of the equipment and the total cost of consumables for one year (other than paper) for each printer solution.
5. Prepare a list of advantages and disadvantages for each solution.
6. Based on your research, which of the three solutions do you recommend? Why?