

Mrs AVN College Polytechnic
VISAKHAPATNAM
COMPUTER HARDWARE AND NETWORKING LAB MANUAL
DCME IV SEMESTER
(C-09 SCHEME)

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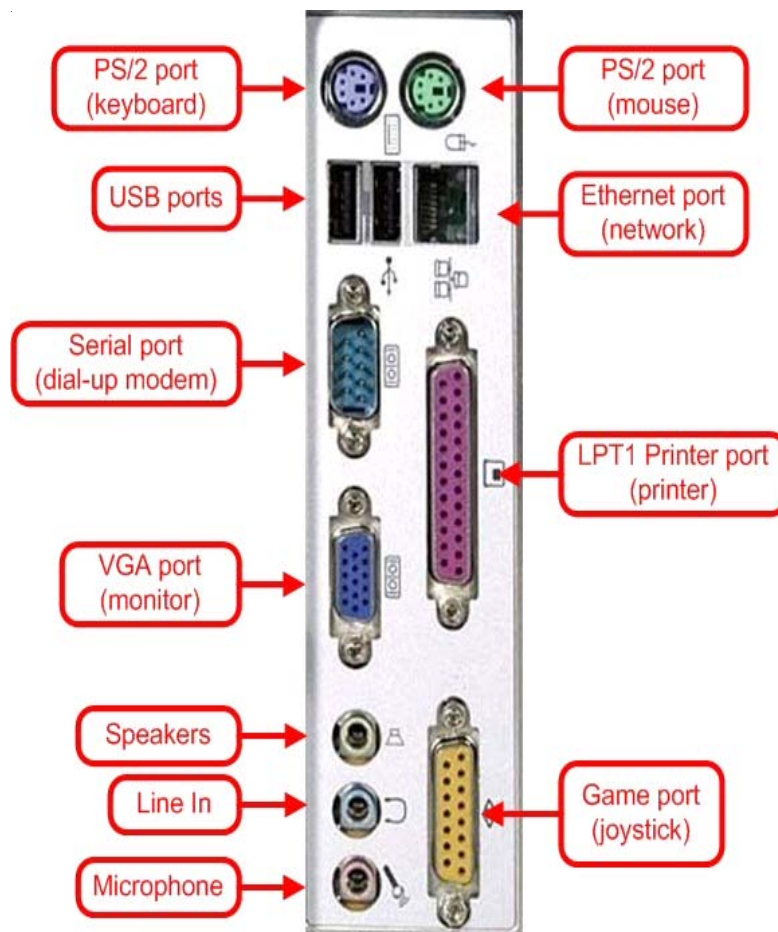
Experiment:1

1

Identifying external ports and interfacing

Objective:

To learn about different ports and how to connect devices to them
This diagram shows different ports available on the back panel of the PC



Parallel port (LPT parallel port):

As shown in the diagram parallel port with 25-pins can be used to connect a parallel port printer. Previously dot matrix, ink jet, bubble jet printers etc were connected to parallel port. Nowadays-parallel port is used to connect Dot-Matrix printers.

Serial port:

As shown in the diagram serial ports with 9-pins protruding outwards can be used to connect modem but it can also be used for connecting mouse, provided serial port mouse is available.

VGA Port:

VGA port which has 15-pins is used to connect a monitor.

PS/2 Port:

Two 6-pin PS/2 ports are there, one is violet to which keyboard is connected and other is Light green to which mouse is connected

USB Port:

Connecting a USB device to a computer is simple — you find the USB connector on the back of your machine and plug the USB connector into it.

USB ports are used to connect to Inkjet printers, Web Cams, Scanners etc.

Ethernet Port:

Ethernet port is used to connect a computer on network through RJ-45 connector

Game Port:

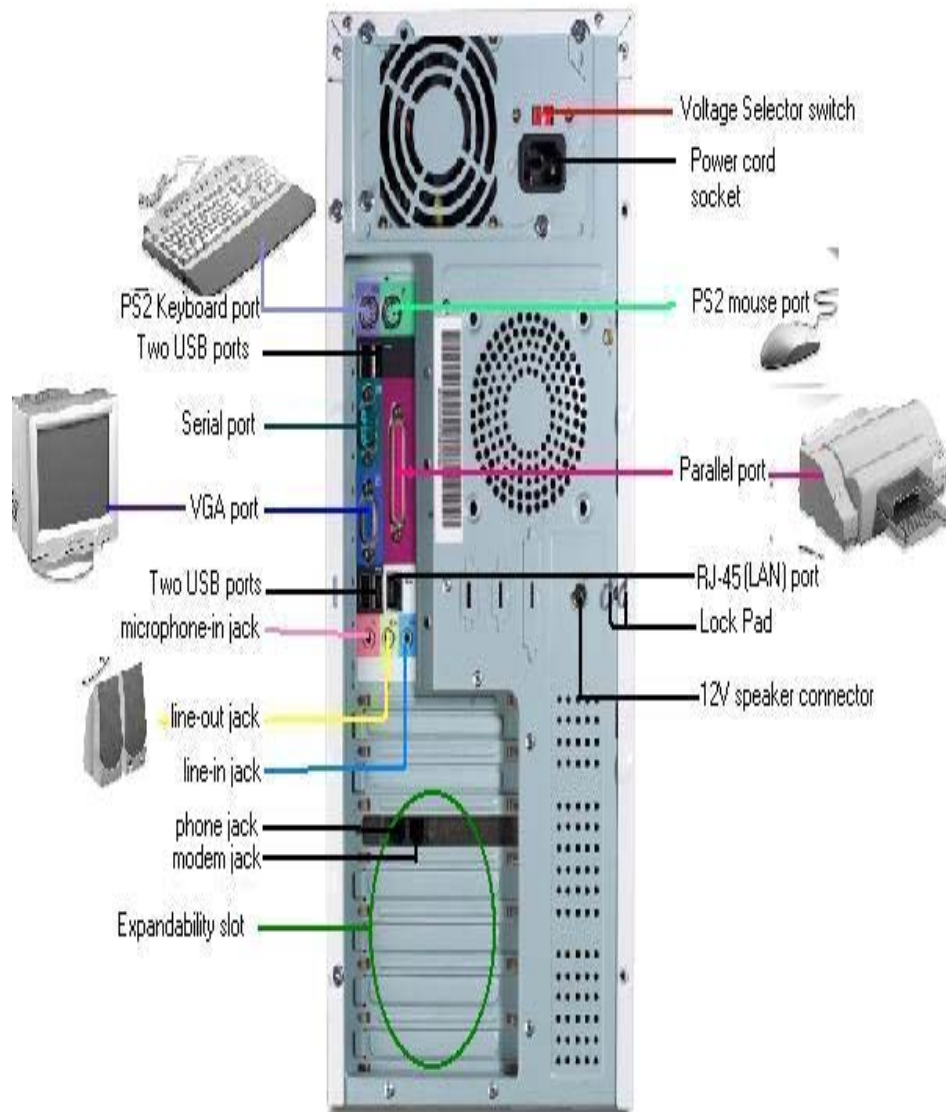
Game Port is used to connect joystick, which is usually used in video games

Three more ports are available for multimedia connections. Green port is used connect speakers, blue port is used to connect headphones and light Orange is used to connect microphone.

Experiment:1

3

Output:



Experiment :2

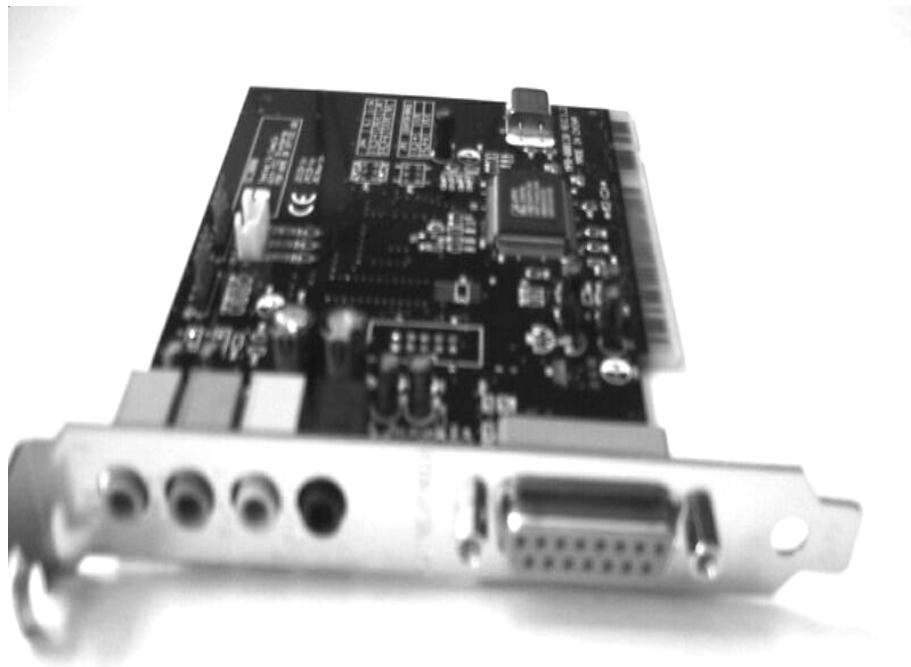
4

Identifying PC cards and interfacing.

Objective : To identify different PC cards and to learn how to install them.

Sound card

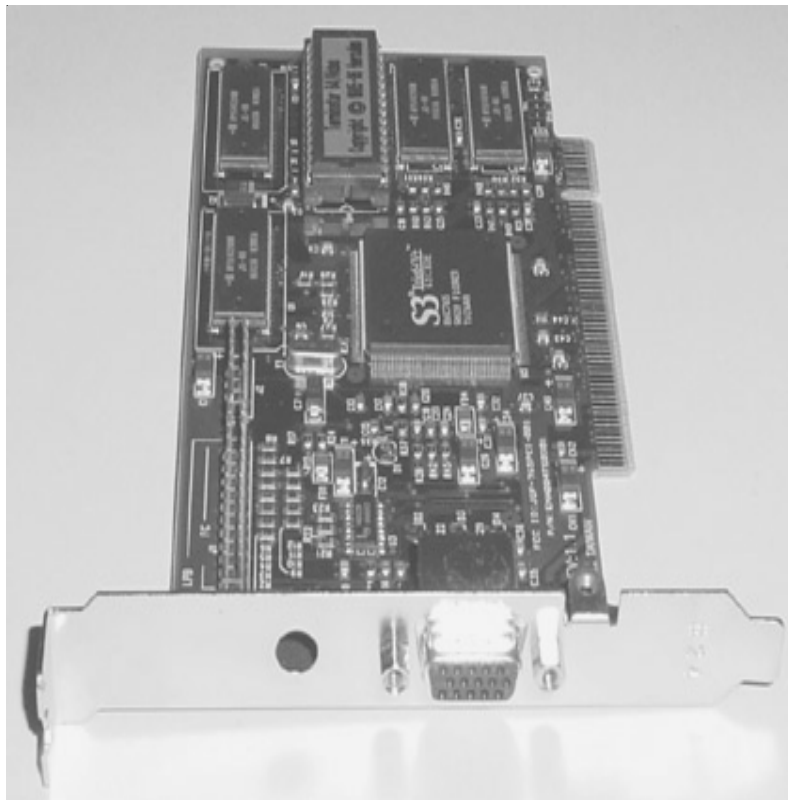
A sound card or audio board, which allows computers to output audio signals through speakers and or headphones.



Sound Card

Video card

The video card is responsible for creating all that you see on your computer monitor



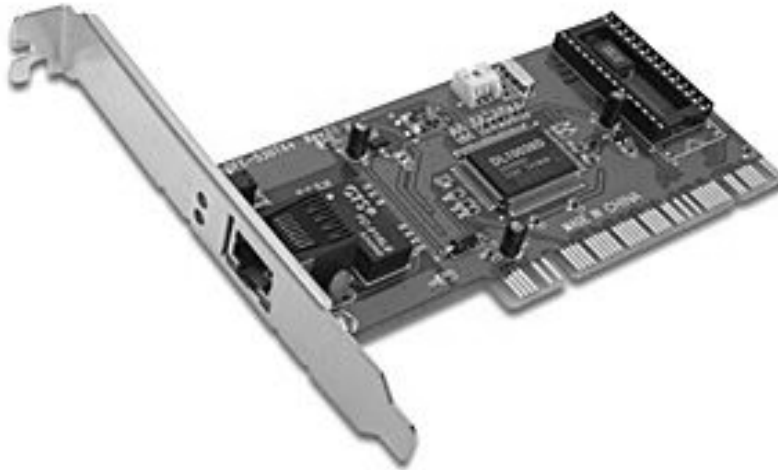
VGA Card

Experiment:2

6

Network card

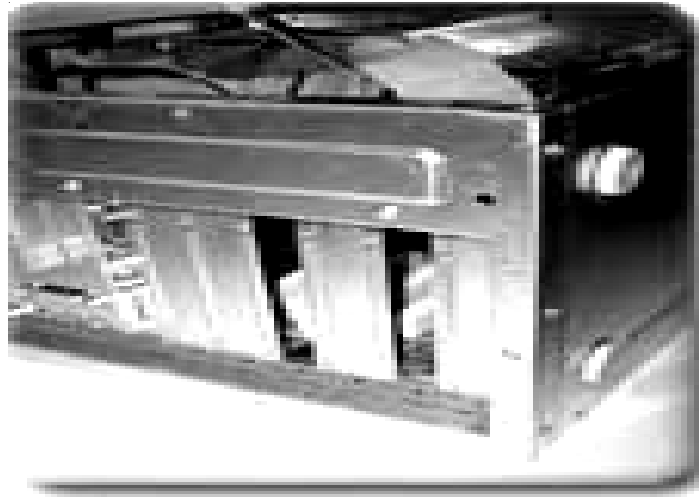
This piece of hardware allows your computer to be connected to a network of other computers (known as a LAN or Local Area Network)

**Network Card****Procedure to install a sound card**

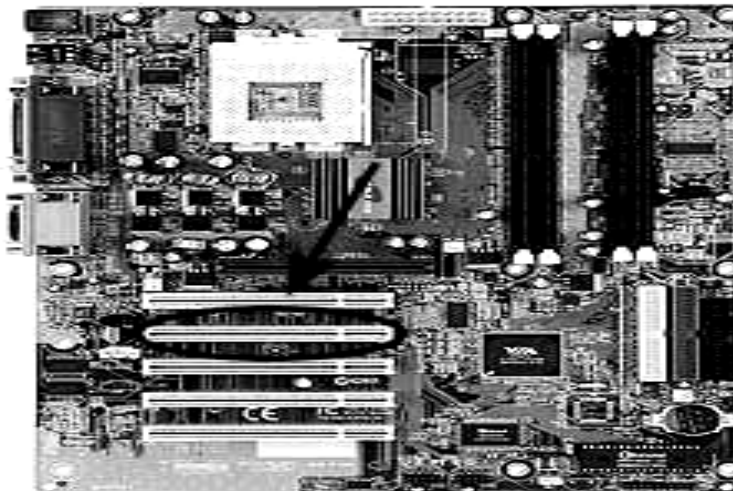
In this example we are going to install a sound card.

NOTE: It is best not to install all your PCI hardware if you are building from scratch. Only install your video card and sound card right now. Once you have your operating system installed, turn off the computer and install the other components. This saves you from possible problems when loading up for the first time.

1. Remove any unnecessary temporary metal plates. Only remove the metal plates from the slots you are going to use. If you do not remove these, you cannot install any PCI components. Most either unscrew or pop out.



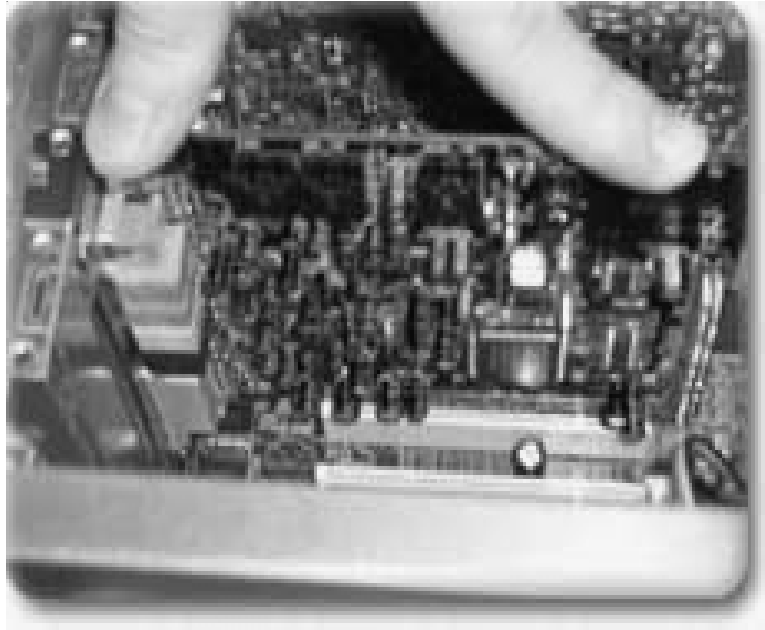
2. Locate PCI Slots on Motherboard. Your PCI Slots should look similar to the ones in the image below



Experiment:2

8

3. Line up component with PCI slot and install. Simply line up the component with the slot and gently press down on both sides until it slides in place



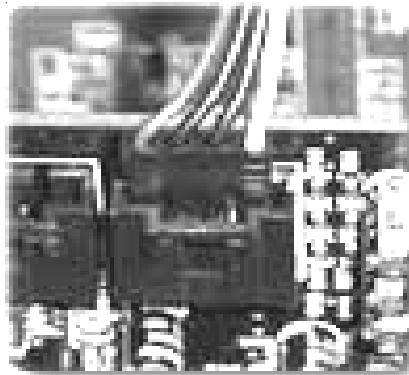
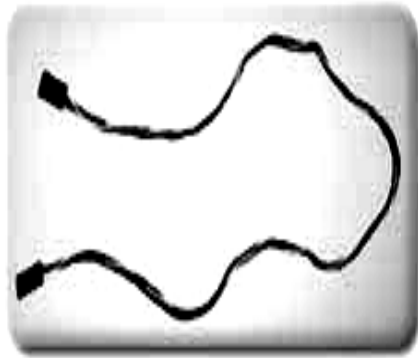
4. Insert screw. There is only one screw needed to secure each PCI component in place.



5. Give it CD Sound. Remember that audio cable from the CD-ROM drive? Now we will connect the other end of it.

If you want to hear audio when play a cd in your CD-ROM, you need to connect the CD-ROM to the Sound Card (or motherboard if your sound card is integrated in) using the audio cable as seen below. Refer to your sound card owners manual for correct placement.

If you did not purchase a sound card and you have one integrated into your motherboard, refer to your motherboard owner's manual for correct placement



6. Repeat for any other components. Every component is different but as long as its PCI compatible, it is installed the same way (except for the audio cable. It is installed only on sound cards and motherboards.)

Experiment:3

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Identifying ports on the cards and interfacing

Objective: **To identify ports on the PC cards**



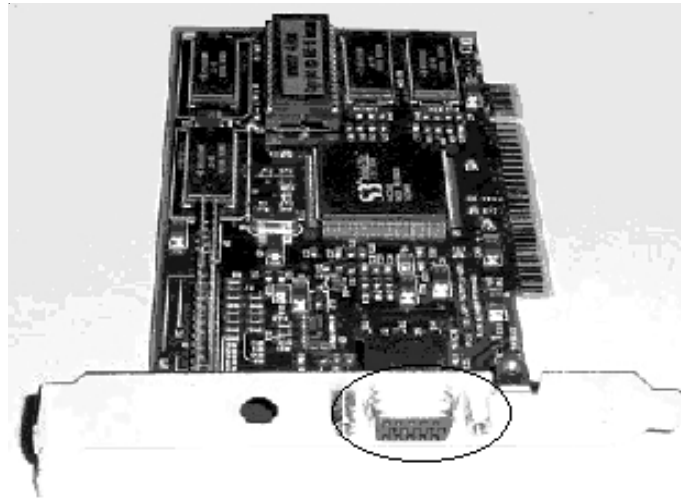
MIDI / Game port is a port which is most commonly used for the game port which will allow you to connect a game paddle and or Joystick to the computer. This port will also allow you to connect a device such as a MIDI keyboard to the computer, additional information on this can be found in the Midi section.

Line In connector allows you to connect a Cassette Tape, CD or record player to the computer.

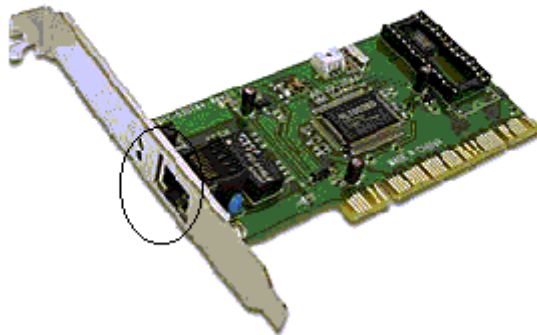
Line Out connector is the location which the speakers or headphones will be connected to get sound out of the sound card.

Volume control is generally no longer found on sound cards. However for cards that do include this as a feature this allows for the volume to be turned up and down on a non-amplified output such as a set of headphones.

Microphone allows you to connect a microphone to the computer and record your own sound files.



Graphic port on VGA Card



NIC Port on Network Card

Experiment:4

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Preventive maintenance of a PC

Objective:

To learn how to maintain a PC so that it gives longer service without any problems.

1) System backups.

Take the backup of data at regular intervals. Use floppy disks for small data and if data is very large perform backup using CD- RW or tape drives.

2) System cleaning.

Floppy disk drives are vulnerable to dust as they contain a large opening in the system case through which air continuously flows. Therefore, they accumulate a large amount dust and chemical buildup within a short time. Where as cleaning a hard disk requires simply blowing the dust and dirt off from the outside the drive.

3) Cleaning motherboards:

First, clean the dust and debris off the board and then clean any connectors on the board. To clean the boards, it is usually best to use a vacuum cleaner. Also blow any dust out of the power supply, especially around the fan intake and exhaust areas. Use a duster can and blast the compressed air into the supply through the fan exhaust port. This will blow the dust out of the supply and clean off the fan blades and grill, which will help with system airflow. To clean the connectors on the board use the cleaning solutions and the lint-free swabs

1) Hard Disk Maintenance:

De-fragmenting files: As you delete and save files to your hard disk they become fragmented(they are stored on non contiguous areas on the disk). Before you defragment your disk use Scandisk to scan your hard disk. To scandisk your hard disk follow the below steps.

Go to programs → Accessories → System tools → Scandisk

To scandisk your hard disk follow the below steps.

Go to programs → Accessories → System tools → Disk Defragmenter

Experiment:5

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Experiment 5

Understanding CMOS

Objective :

To know and understand the features available in the CMOS

To enter into CMOS setup continue pressing Delete(Del) button while system is booting

AMIBIOS setup main menu AMIBIOS HIFLES SETUP UTILITY – version 1.21© 1998 America1 Megatrends, Inc. All rights reserved Standard CMO Setup Advanced CMO Setup Advanced Chipset Setup Power Management SetupPCI/Plug And Play Setup Peripheral SetupCPU Configuration SetupHardware Monitor SetupAuto-Detect Hard Disks Change User Password Change Supervisor Password Auto Configuration With Optional Settings Auto Configuration With Fail Safe Settings Save Settings And Exit Exit Without Saving
Standard CMOS Setup for changing time, date, hard disk type , etc Esc:Exit : Sel F2/F3: Color f10 : Save & Exit

By choosing Advanced CMOS setup from the main menu you reach to this screen below.

AMIBIOS Setup –Advanced CMOS Setup© 1998 America1 Mega trends, Inc. All rights reserved		
Quick Boot	Enabled	Availabel options
1st Boot Device	Floppy	→ Disabled
2 nd Boot Device	Ide 0	Enabled
3 rd Boot Device	CDROM	
Try Other Boot Device	Yes	
Initial Display Mode	BIOS	
Display Mode At Add-On Rom Init	Force BIOS	
Floppy Access Control	Read/Write	Esc:Exit : Sel F2/F3
Hard Disk Access Control	Read/write	
S.M.A.R.T For Hard Disks	Enabled	Color ↑ ↓
Boot Up Nim-Lock	ON	
Floppy Drive Swap	Disabled	Pgup/PgDn:Modify
Floppy Drive Seek	Enabled	F1:Help
Ps/2 Mouse Support	Enabled	
Primary Display	VGA/EGA	
Password Check	Setup	
Boot To Os/2 > 64 Mb	No	
Cpu Serial Number	Disabled	
L1 Cache	Writeback	

Quick boot : Set this option to enabled

1st Boot Device : This option sets the type of device for the first boot drives that the AMIBIOS attempts to boot from.

2nd Boot Device : This option sets the type of device for the second boot drives that the AMIBIOS attempts to boot from.

3rd Boot Device : This option sets the type of device for the third boot drives that the AMIBIOS attempts to boot from

Experiment:6

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Experiment 6

Partitioning and formatting Harddisks.

Objective :

To learn how to partition and format the hard disk.

Hard Disk Partitions

This procedure explains how to setup a **new hard disk**.

Before a new hard disk can be used it needs to be setup. This involves partitioning and formatting the hard disk. Windows 98 or ME boot disk contains the required software to perform this procedure. FDISK.EXE and FORMAT.COM are the files required in your bootable floppy disk.

Start the partition and format procedure by booting your PC using a Windows boot disk. Make sure you set the BIOS so that the boot sequence is set to detect the floppy disk first. If your system has no problems booting you will be presented with a Windows boot disk menu. This gives you the option to start the system with or without CD-ROM support. At this stage you do not need the CD-ROM support, so choose the option to boot without CD-ROM support. You should end up in the MS DOS prompt A: (A drive).

From A: command prompt type **fdisk**. You will be presented with following message:

Your computer has a disk larger than 512 MB. This version of Windows includes improved support for large disks, resulting in more efficient use of disk space on large drives, and allowing disks over 2 GB to be formatted as a single drive.

IMPORTANT: If you enable large disk support and create any new drives on this disk, you will not be able to access the new drive(s) using other operating systems, including some versions of Windows 95 and Windows NT, as well as earlier versions of Windows and MS-DOS. In addition, disk utilities that were not designed explicitly for the FAT32 file system will not be able to work with this disk. If you need to access this disk with other operating systems or older disk utilities, do not enable large drive support.

Do you wish to enable large disk support (Y/N)? **[Y]**

Choose “Y” to enable large disk support.

You will now be presented with the FDISK main menu as shown below.

```
Microsoft Windows 98
Fixed Disk Setup Program
(C) Copyright Microsoft Corp. 1983 - 1998

FDISK Options

Current Fixed disk drive: 1

Choose one of the following:

1. Create DOS partition or Logical DOS Drive
2. Set active partition
3. Delete partition or Logical DOS Drive
4. Display partition information
5. Change current fixed disk drive

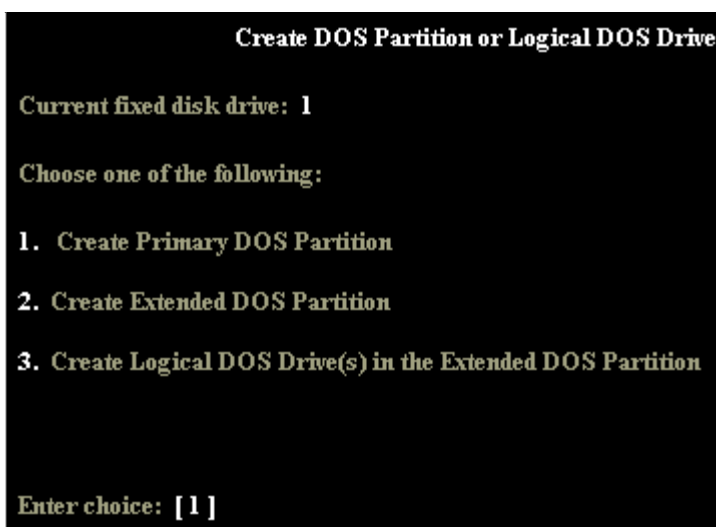
Enter choice: [ 1 ]

Press Esc to exit FDISK
```

Experiment:6

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From the menu, choose option 1 - Create DOS partition or Logical DOS drive. Another menu will present the following options.



Choose option 1 - Create primary DOS Partition. FDISK verifies the integrity of your drive and will ask you if you want to use the maximum available size of your hard disk to create the primary partition and set it active. To keep things simple we will create one large partition. Choose "Y" to use maximum available space. When the partition has been created successfully you will be notified by the system. Your drive is now known as C: (C drive). Press "Esc" to return to the menu. Press "Esc" again to exit FDISK. You need to restart your system for the changes to take effect. Leave boot disk in the drive.

When the system reboots, choose start without CD-ROM from the boot disk menu. While booting from floppy disk you might get error message like "Invalid media type reading drive C" this is OK for this stage as the hard disk is not formatted.

If you want to create extended DOS partitions, specify the size of the partitions in the bytes for primary partition. And remaining space can be utilized to create logical drives in the extended partition. Like D, E, F etc.

You will get a message saying “WARNING, ALL DATA ON NON-REMOVABLE DISK DRIVE C: WILL BE LOST. Proceed with Format (Y/N)?”

Don't worry about the message, as you do not have any data in the new hard disk. Choose “Y”. The format will proceed and would show you a progress indicator. The time it takes to format a hard disk depends on the size and speed of the drive. This could be around 5-30 minutes. Once the format is complete you need to reset your system. You are now ready to install an operating system

Experiment 7

Installing system and application software

Objective:

To learn how to install system and application software.

First let us learn how to install a system software i.e Windows 98

Windows 98 Installation

This is what you will need before installing windows 98.

1. Windows 98 CD.
2. Computer with CD-ROM Access.

Configuring your BIOS for the Install:

To find out how to access the BIOS please refer to your motherboard manual or the manufacturer of your computer. (The system bios can usually be entered on boot, usually by pressing the F1, F2, F8, F10 or DEL key. Make sure you save the settings before exiting. If you are unsure or don't want to enter the BIOS then just test the computer by putting the CD-ROM in the drive and rebooting the computer. This is the recommended way to install windows 98.

Experiment :7

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Starting The Setup:

1. Insert CD and restart PC.
2. Once the Windows 98 Setup Menu comes up choose option 2 (Boot from CD-ROM)
3. Then the Windows 98 Startup Menu will come up. Select Option 1. (Start Windows 98 Setup from CD-ROM)
4. Now your computer will install some drivers so please wait a few moments.
5. Now a blue setup screen will come up. Press enter.
6. Setup then wants to do some system tests. Just press enter.
7. Scandisk will now run, please wait.
8. After ScanDisk completes Windows will copy a few important files for setup.
9. Now the graphical Windows 98 Setup Screen will come up.
10. Click continues and wait for the setup wizard to complete.
11. Now it will ask you in which directory to install Windows to. The default directory is
just fine so click next.
12. Setup will now prepare the directory, please wait.
13. Setup will now check for installed components and disk space, please wait.
14. Setup will now prompt you what type of install. Choose typical if you have a desktop
computer or portable if it is a laptop.
15. Windows will prompt you to install components, just choose continue.
16. If a network card is detected a network information screen will appear. Type in the
required information and click next
17. Select your country settings, United States should be chosen by default.
18. Now finally the main part of Setup is here. Setup will start copying files.
This will take a pretty long time, be patient.

19. Once setup is done copying files Windows will restart automatically.
20. The Windows 98 Startup Menu will appear. Select option 1 (Boot from Hard Disk)
21. The Windows 98 booting screen will appear!
22. Now Windows will prompt you for user information, enter it and click continue.
23. Now the License Agreement. Read and if you agree click on "I accept the Agreement" and click next. If you select "I don't accept the Agreement" then setup will end.
24. Now input your product key computer. Click next to continue.
25. Next click on Finish.
26. Setup will now finalize the hardware and install settings.
27. Setup will now install plug and play devices.
28. Your computer will restart automatically.
29. The Windows 98 Startup Menu will appear. Select option 1 (Boot from Hard Disk)
30. Windows will start booting for the second time.
31. Setup will continue installing hardware.
32. Now setup will prompt you to enter in your time, date, and time zone. Once selected click on apply and then ok.
33. Windows will continue to setup Windows items.
34. The computer will restart automatically once again.
35. The Windows 98 Startup Menu will appear. Select option 1 (Boot from Hard Disk)
36. Windows will boot for the third time.
37. Windows will update system settings.
38. Now finally you have reached the Windows Desktop!
39. You also may need to install your hardware drivers. If everything is working properly then you shouldn't worry about them.

Experiment :7

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Enjoy your new freshly installed Windows

Now let us learn installing application software i.e MS-Office installation

MS OFFICE 2003 INSTALLATION

In order to install Microsoft Office 2003, simply begin by putting the Office CD in the CD or DVD drive. The XP operating system will begin the loading process and the software will ask if you want to install Office. Click Yes as usual. And then assent to the license agreement. You will then be asked for the 25 digit security code which we have made available to you. Type this in **exactly** as it has been given to you (Figure 1).

You will then be asked what type of installation you wish to perform. Please choose “Complete Installation” as indicated in Figure 2. The Complete Installation assures you that you have all the file converters necessary to read these documents After you have chosen the Complete Installation, click next. You will get a review screen which should look like Figure 3. After you click the Install box the software should begin to install from the CD.

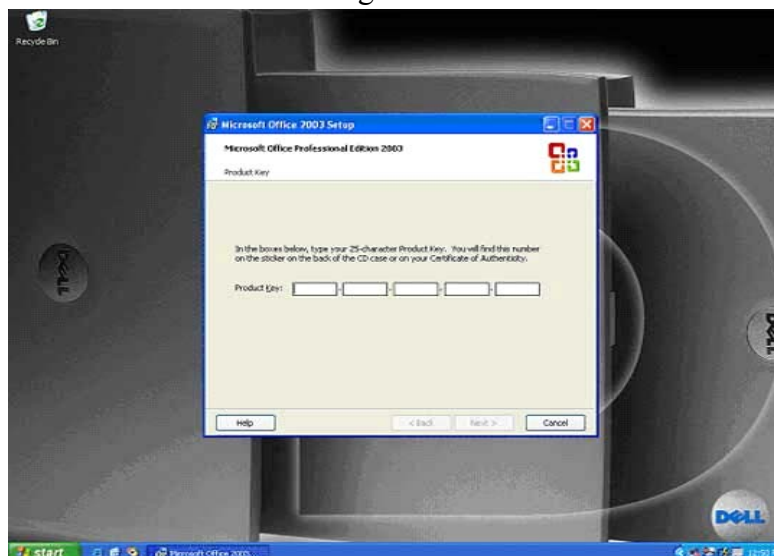


Figure 1 - Enter the MS Office security code

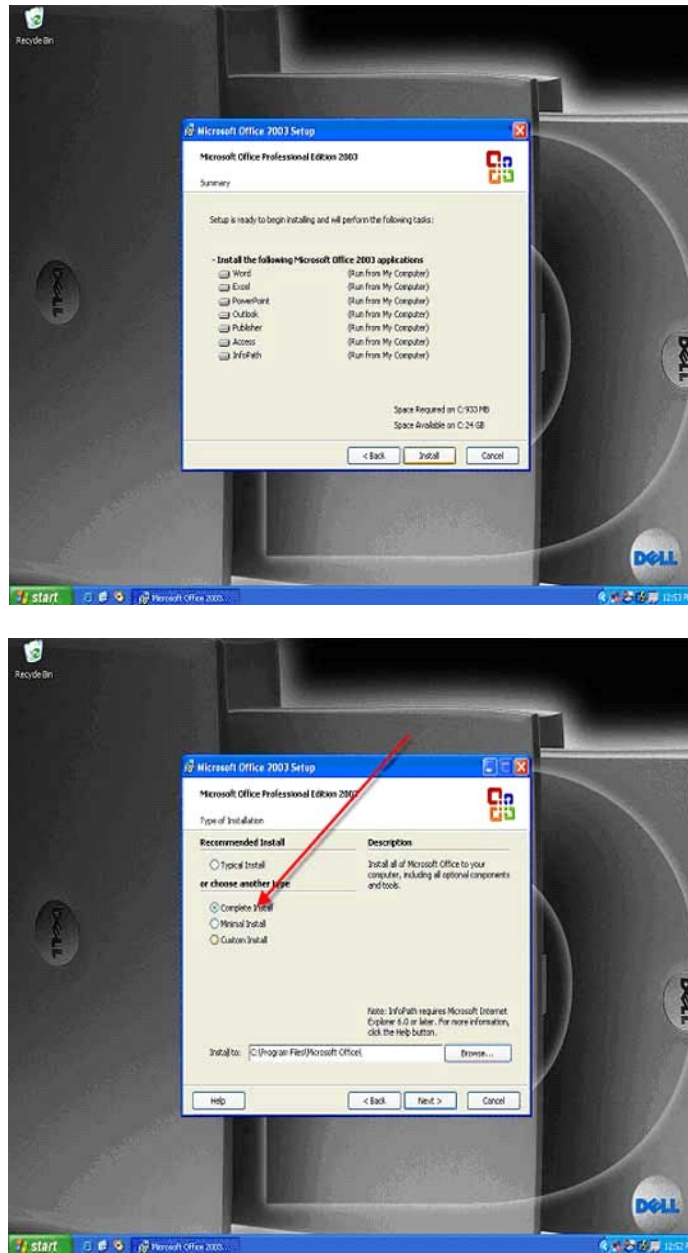


Figure 3 - MS Office software review prior to installation

Experiment :7

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After MS Office installs, you will get a screen which will allow you to Check the web for updates and Delete installation files (Figure 4). You will certainly want to Check the web for updates (so check this box) and you may want to Delete the installation files to save disk space (this is up to you). Click the appropriate boxes and click on the Finish box. You will be directed to the Microsoft Office Update website.

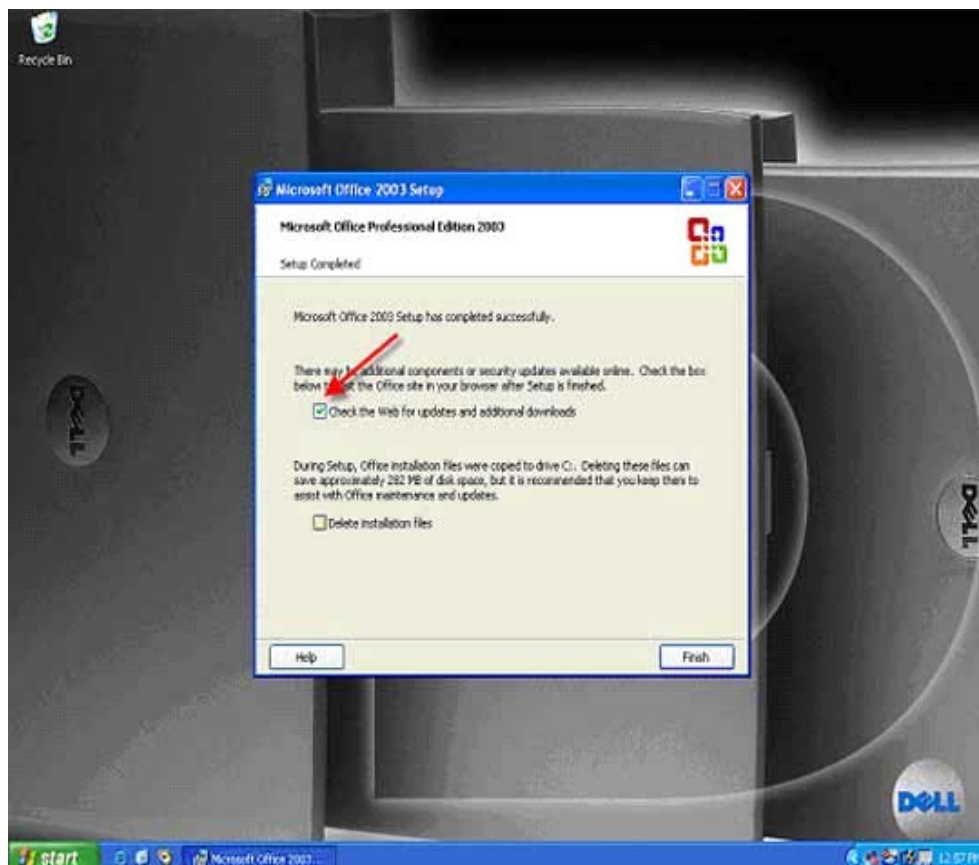


Figure 4 - MS Office installation last step

You certainly want to Check the web for MS Office updates now because you have the CD. Microsoft Office updates often require a CD and the CDs are only available through the Library and Computer Services. So save yourself the hassle and check for updates now.

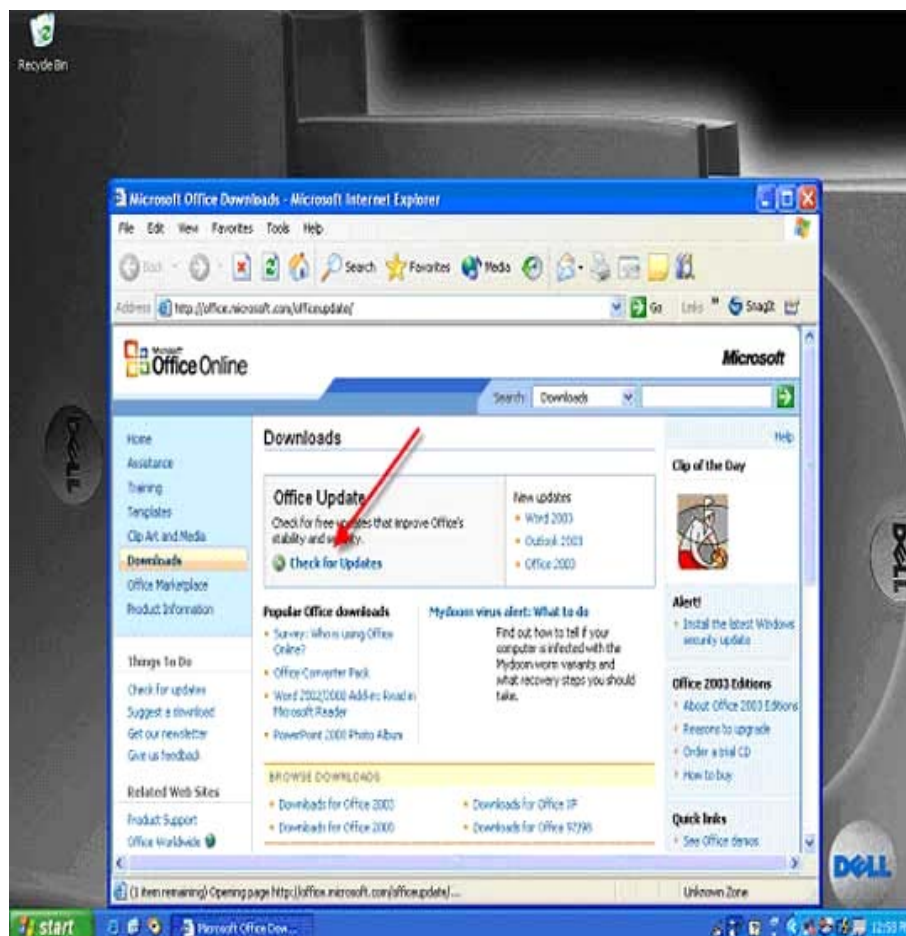


Figure 5 - The MS Office update website

Experiment :7

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The Microsoft Office update website currently looks like Figure 5.

Because you have not previously checked for Office updates, you will be asked to install the Office updated installation engine (Figure 6). Click Yes and install this on your computer (when you go back to the Office Update site, you will not be asked about nor do you need to reinstall this update engine). The update engine is a small piece of software which works with this website and will check Office on your computer to determine what components need updating.

The update list (Figure 7) will depend on exactly what release of Office 2003 you have installed and what updates are available subsequent to that release. Some of these updates need to be installed independently of the others. Often then can be bundled together so you can download a number of updates together and install them together. Click the updates you wish to install (we recommend installing all the security related updates and all the updates that are appropriate for your computer. If you don't have a tablet PC and there are updates specifically for this type of computer, you don't have to install them.) You can't go wrong by installing all the updates for MS Office. After you have checked the boxes of the updates you wish to install, click the Start Installation box. The updates will begin to download and install.

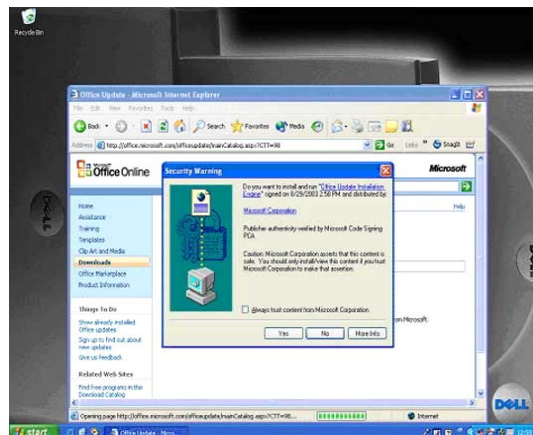


Figure 7 – The Office update installation engine

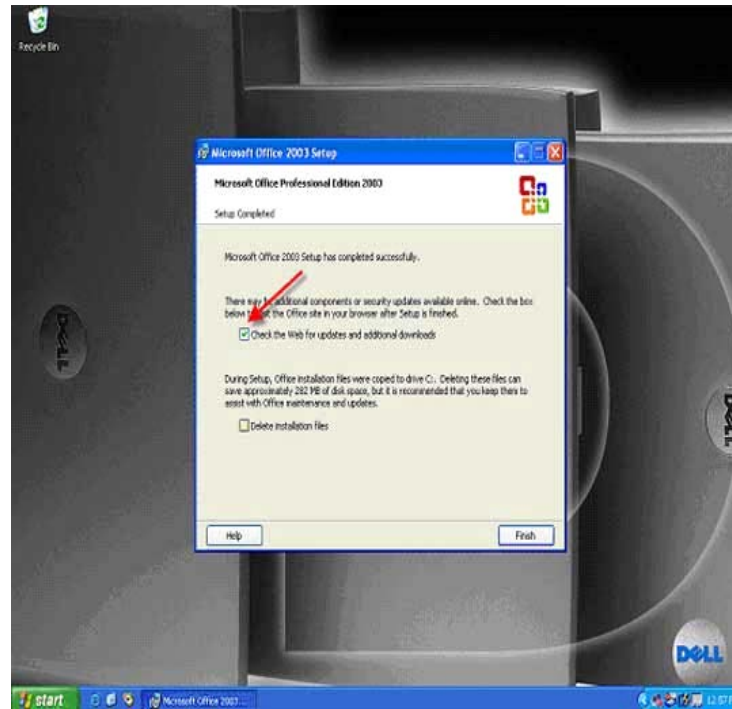


Figure 8 - Choose the updates you wish to install

After you have installed the updates successfully, the MS Office update site will provide you with a screen which tells you which updates have been successfully installed (Figure 8).

Experiment :7

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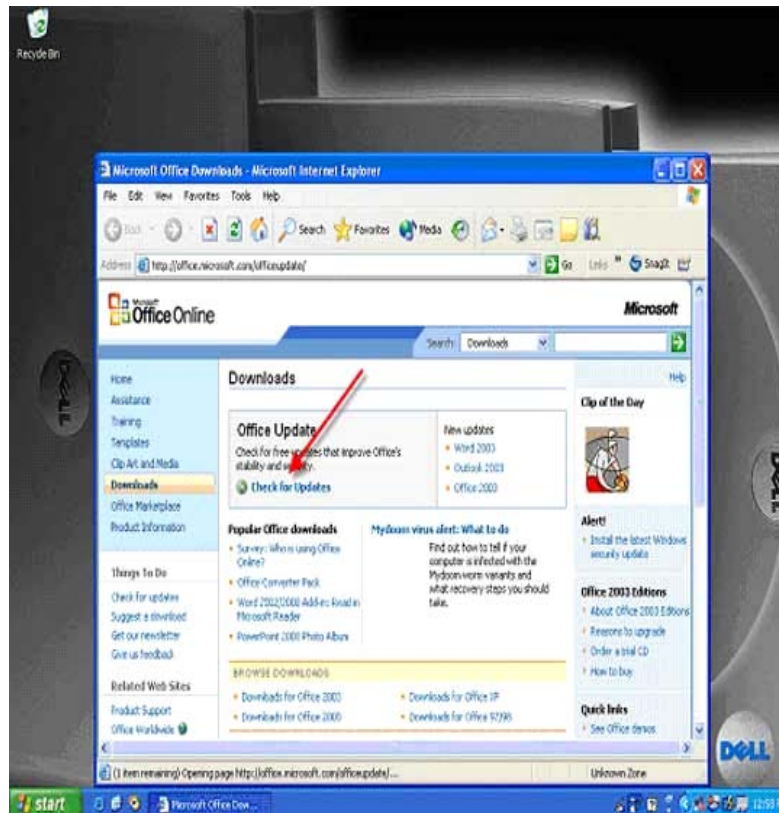


Figure 9 - Successful MS Office update installation

This finishes the process of installing MS Office

Experiment 8

Understanding control panel settings.

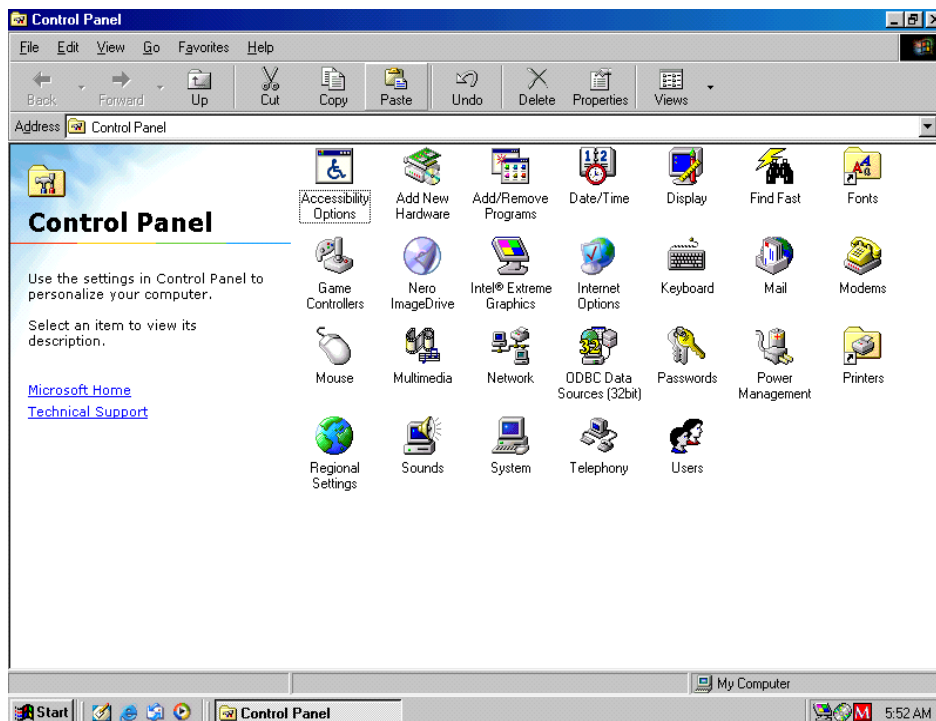
Objective:

To learn about the control panel and options available in it.

To access a control panel go through the following steps below

Go to settings → select control panel

Figure below shows the options available in control panel.



Experiment:8

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Accessibility Options: You find keyboard, sound, display, mouse, and general settings available. Using this you can change the behavior of keyboard, mouse, sound, display and mouse.

Add New Hardware:

With this feature you can add new hardware to your computer.

Add / Remove Software:

With this feature you can add new software and remove existing ones.

Network:

With this feature you can add and remove Network Interface Card settings i.e TCP/IP number, Domain name etc.

Printer:

With this feature you can add new printer software.

System:

This is one of the most important features in the control panel. This contains information about the whole computer. Software, Hardware etc. You can also find if all the hardware devices are fit properly through the Device Manager option.

Experiment 9

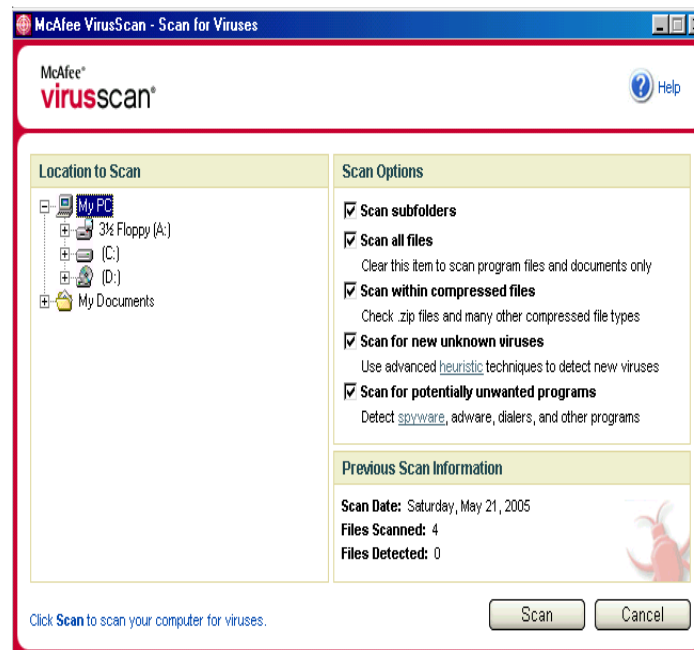
Working with antivirus software

Objective:

To learn how to use antivirus software and remove virus.

Scan for Viruses

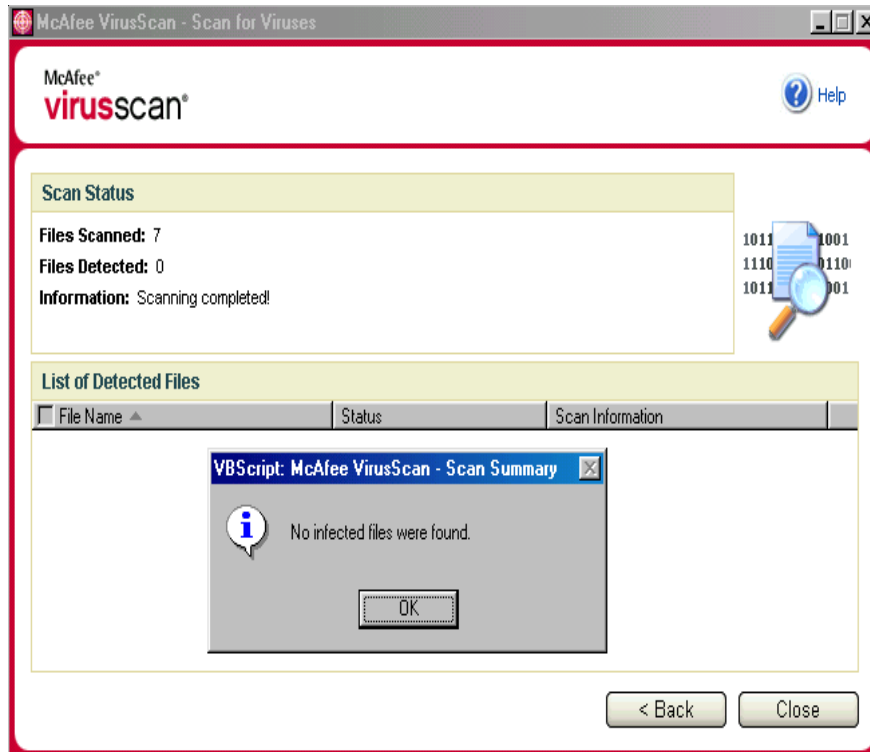
1. Click on *start button* and go to *programs* or click on desktop *icon of McAfee antivirus* or click on the *McAfee antivirus icon on status bar*.
2. Click on the options available for your use. Ex: 1) If you want to scan floppy, click on floppy option. 2) If you want to scan C drive, select and click on it.



Experiment:9

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3.It scans and reports if any infected files are present with several options



4. They are 1) Clean the virus. 2) If it cannot clean it will ask for "Quarantine or delete" the file.
5. This is the time when you have to download the patches form the vendor's site and install. And now again scan the system to clean the virus, which could not get cleaned in the previous attempt.
6. If this is not helpful to clean the virus. It is better to report to the vendor.

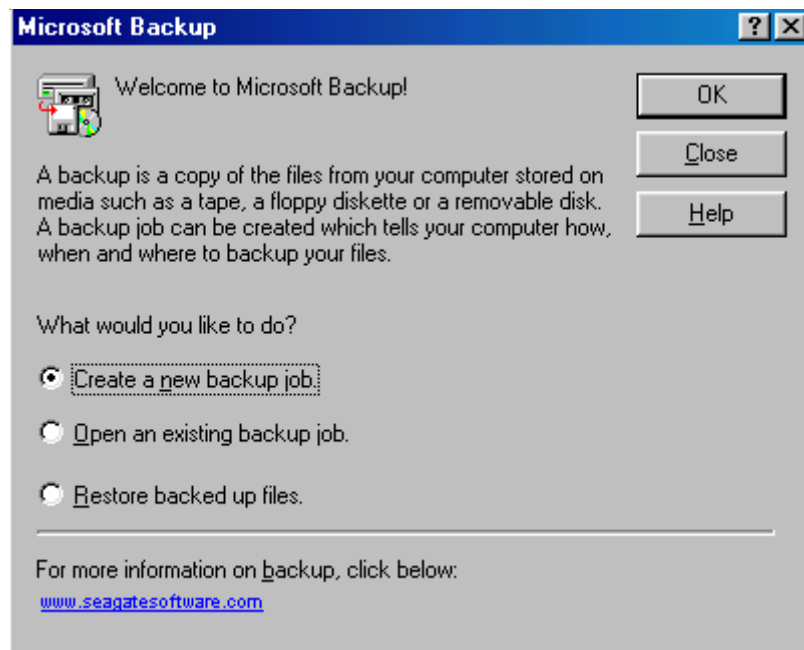
Experiment 10

Working with Backups and Archival utilities

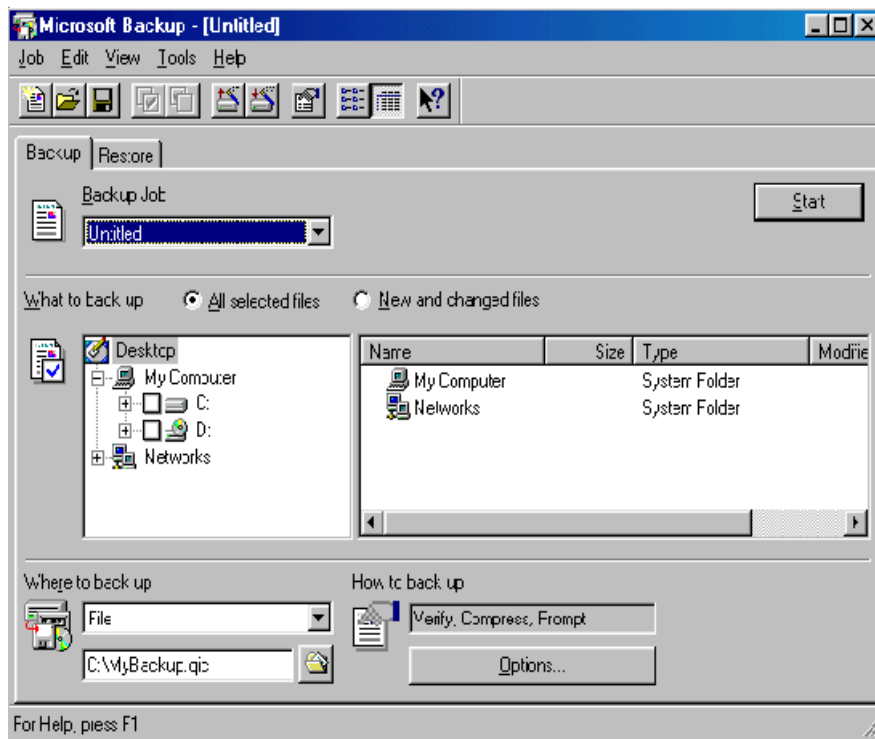
Objective:

To learn how to use Backups.

Go to programs → Accessories → System tools → Backup



Click Close then you get the screen which is shown below



Creating a Backup Job

1. On the **Job** menu, click **New**

The Backup window appears with no files selected and all settings set to default

2. Click All selected files or New and changed files.
3. Select the check boxes associated with the drives, folders, and files you want to back up.

You must make file selections before running your backup job.

4. Choose a backup destination in Where to back up.
5. Click **Options** to set your options.
6. Click a tab to view different option groups. Different options are available in the following tabs:

General tab

Password tab

Type tab

Exclude tab

Report tab

Advanced tab

7. On the **Job** menu, click **Save**.
8. To run this backup job now, click **Start**

Archival utilities

WinZip® is a tool to make working with Zip files and other types of archive files easier

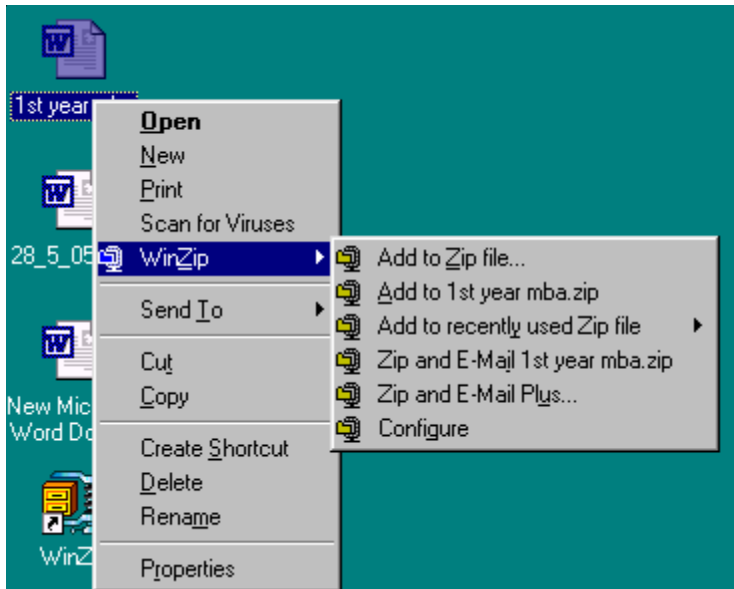
Archives are files that contain other files, and Zip files are the most common archive format. Typically, the files in an archive are compressed. WinZip uses the term “Add” to mean “compress files and add them to an archive”. “Extract” means “decompress files in an archive, creating separate files on a disk”. Some people use the verbs “zip” or “pack” instead of Add, and “unzip” or “unpack” instead of “extract”.

How to Zip a File:

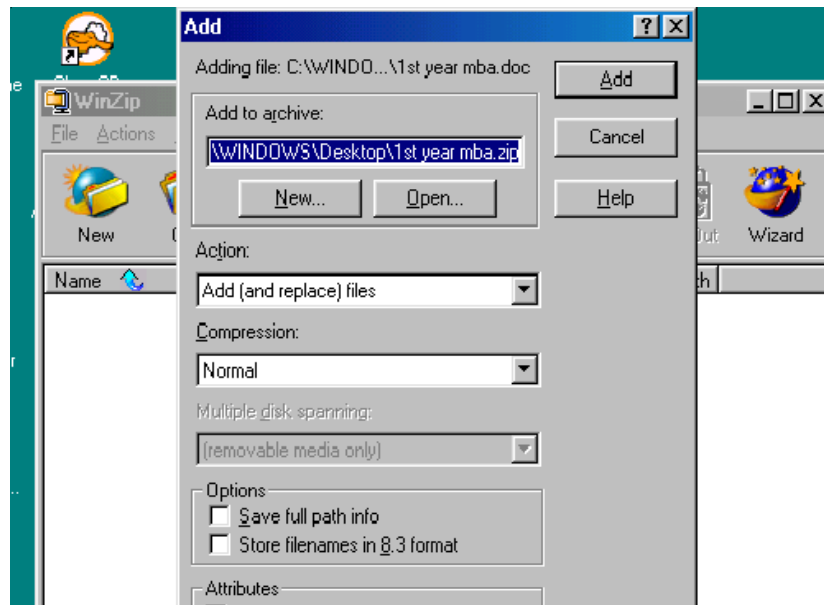
Select any file and right click as shown below and click on add to zip file.

Experiment:10

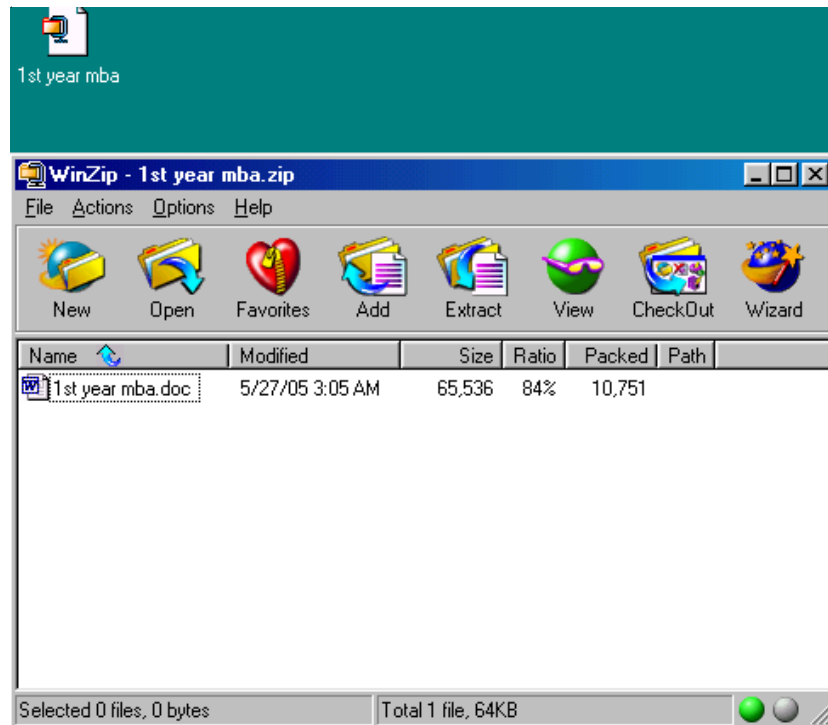
37



2. Click on Add



3. You will get a screen as shown below and icon of the corresponding Zipped file also appears on the desktop.

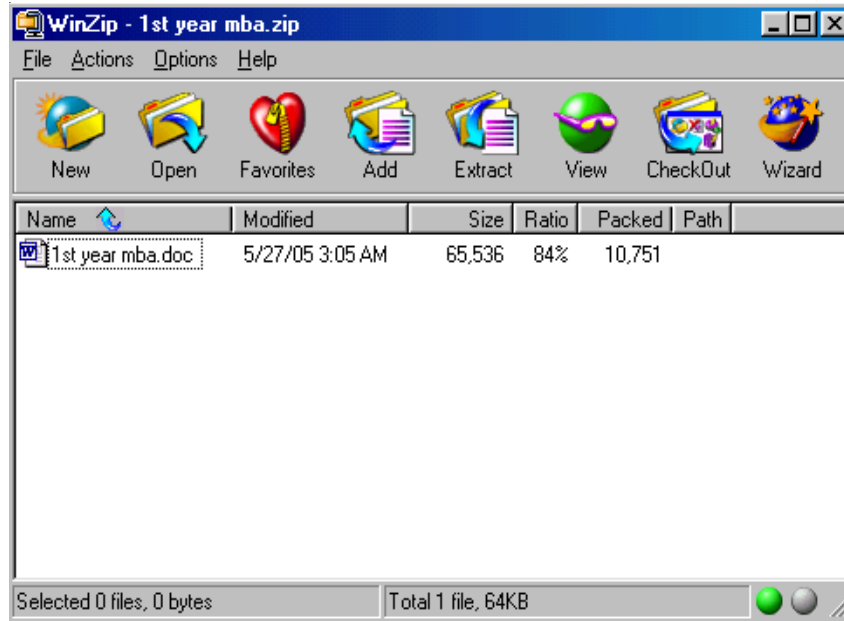


Extracting Zipped File

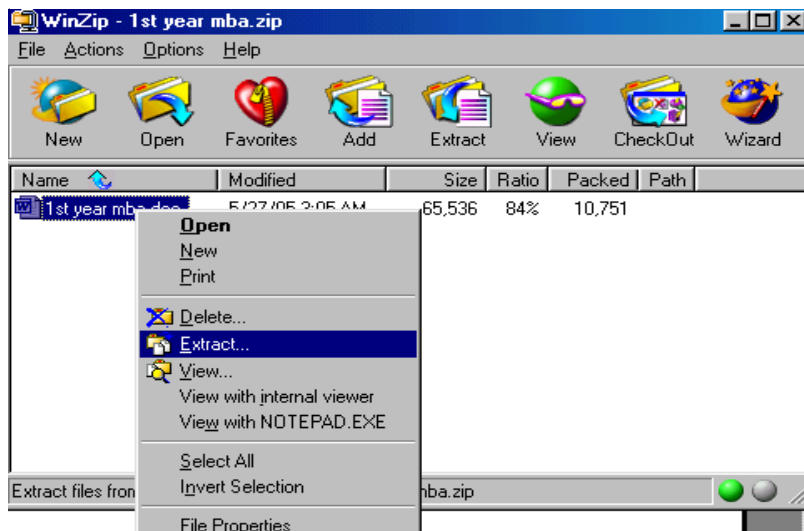
1. Double click on the icon on the file, which you want to extract. You will get the screen shown below.

Experiment:10

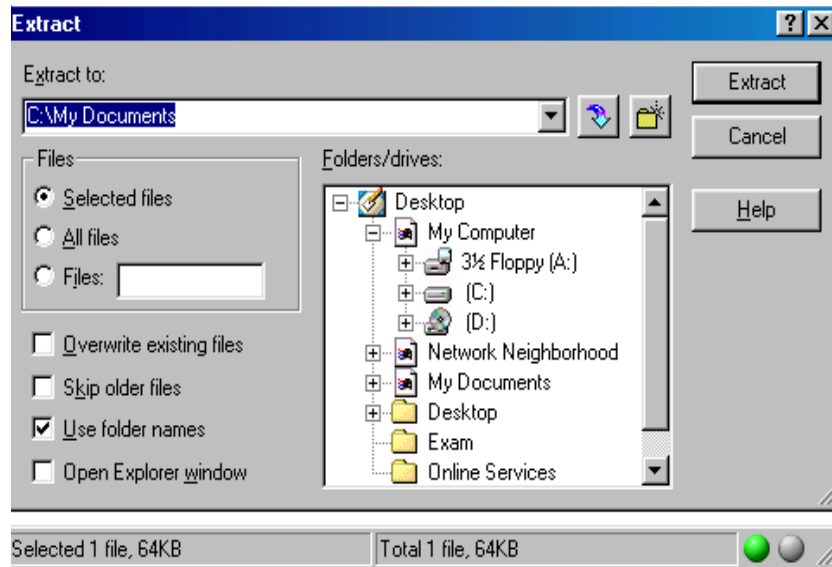
39



2. Select the file and right click on it and select extract as shown below.



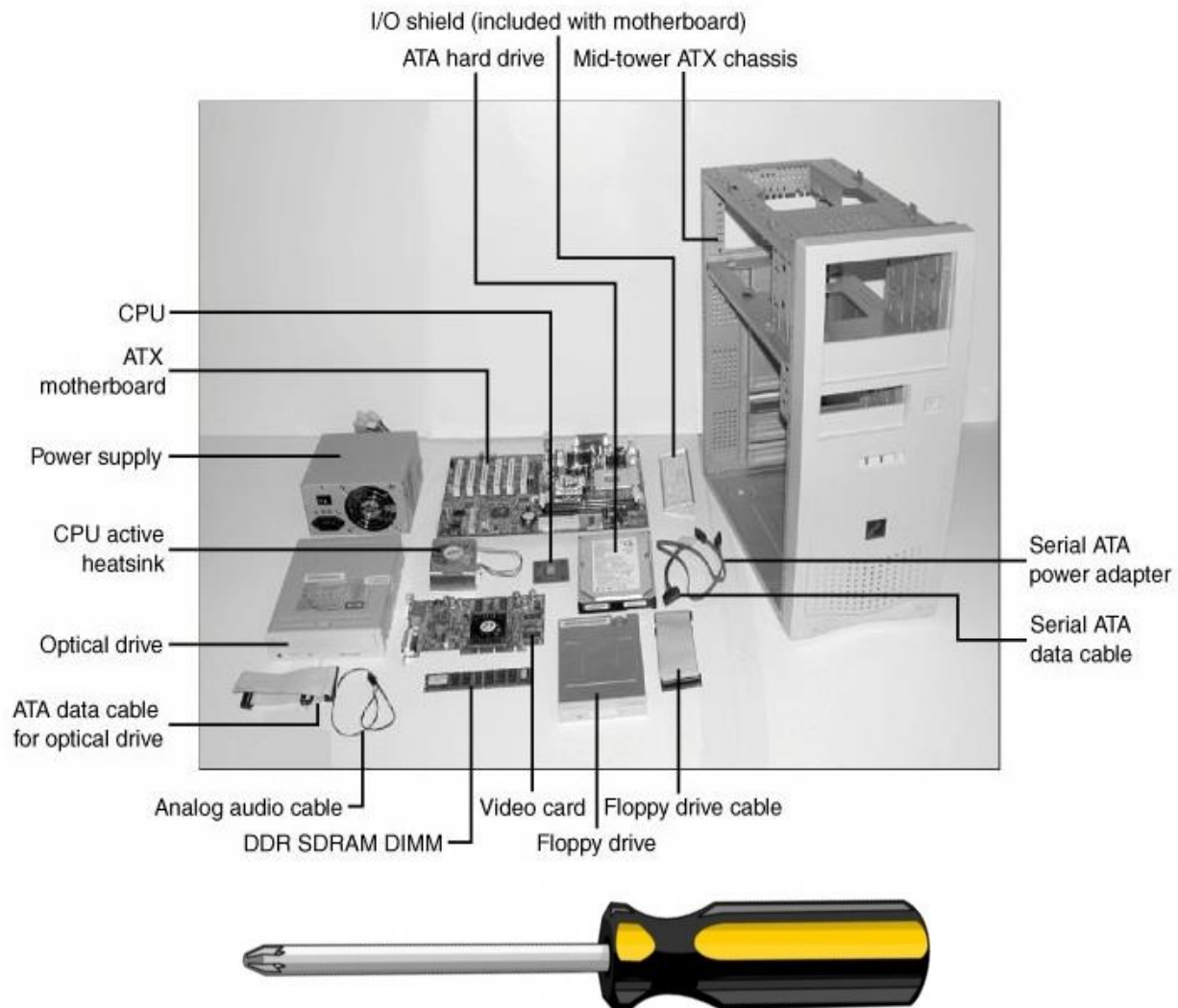
3. Specify the path where you want to save the file and click on extract. This finishes your unzipping process.



Assemble and Disassemble the Desktop PC

Aim of the Experiment

- Assemble and Disassemble the whole Desktop computer
- Identity and use tools
- Troubleshoot connection problems



The components used in building a typical PC are as follows:

- Case and power supply
- Motherboard
- Processor with heat-sink and fan

- Memory
- Floppy drive (optional)
- Hard disk drive
- Optical drive(s) (CD and/or DVD)
- Keyboard and pointing device (mouse)
- Video card and display
- Sound card (optional) and speakers
- Modem (optional) or network interface card (optional)
- Cables
- Hardware (nuts, bolts, screws, and brackets)
- Operating system software

Tools used to Assemble and Disassemble

Phillips/square screw driver³, also known as the **Quadrex** screw

Frearson screw drive.



Figure 3.0 Quadrex bits



Figure 3.1 Tweezers



Figure 3.2 Cable Cutter



Figure 3.3 Claw Tool

The following sections cover the assembly and disassembly procedure:

1. System Case and Power Supply
2. Motherboard, Processor, Heat sink, RAM.
3. Adapter cards
4. Disk Drives
5. External Devices

System Case and Power supply (SMPS)

System Case and Power Supply are available as single unit pre-attached, if not, assemble the power supply as follows.

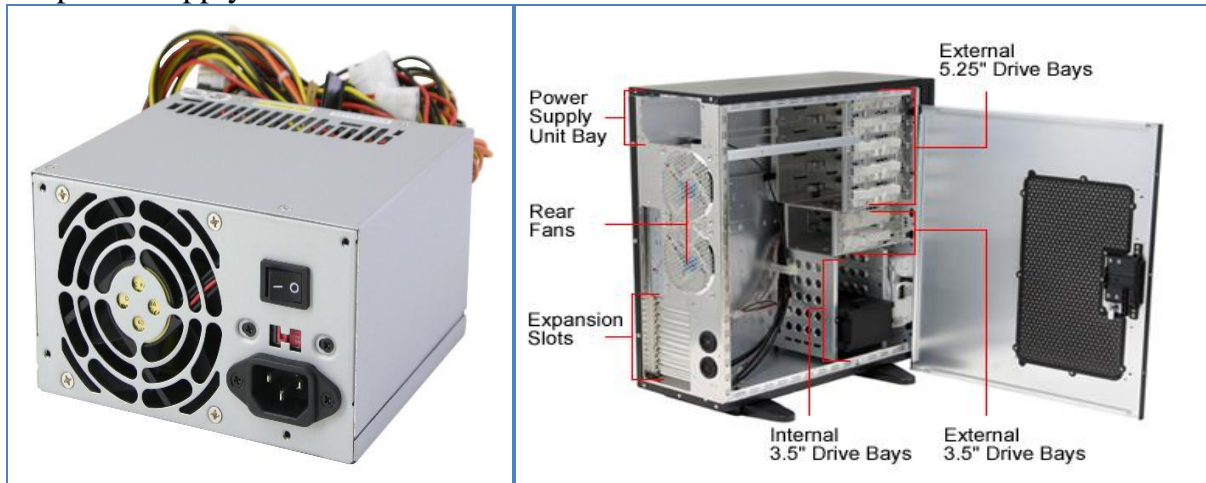


Figure 3.3 SMPS

Figure 3.4 System Case

Note: SMPS should be set to proper Input Voltage Level 220 or 110.

Motherboard

Motherboard should be prepared as follows

Processor: While inserting Processor, in to processor socket. One should follow the marking on the processor and processor socket they should be on same side.



Figure 3.5 Processor and Processor Socket direction for assembling

Heat sink and Processor Fan: heat sink is the metal piece made of Aluminum Alloy which acts as heat exchanger, it disperses the heat in to surrounding air, and heat-sink is used to cool the high power semiconductor devices. On computer motherboard it used on processor, memory control hub and Input Output Control hub. Before placing heating on

any chip heat sink compound is used it is a viscous fluid it is also known as thermal grease⁴ it increases thermal conductivity.



Figure 3.6 Heat sink



Figure 3.7 Thermal grease

Heat sink Fan: a fan is attached on the top of processor heat sink and other heat sink is left without fan or it is not required. This fan will exhort the hot air from heat sink.

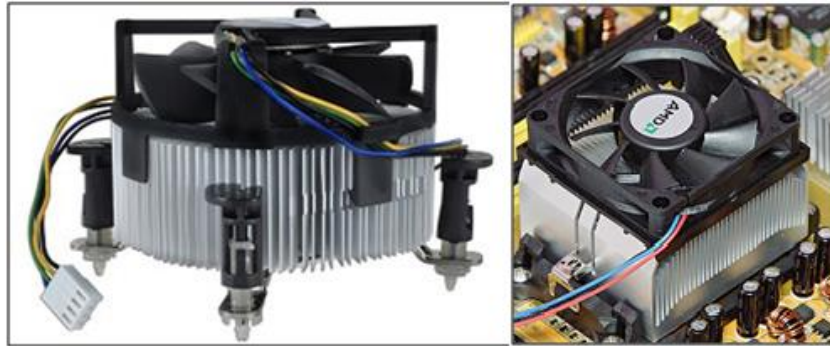


Figure 3.8 Heat sink with fan

Insert RAM in to DIMM Slots

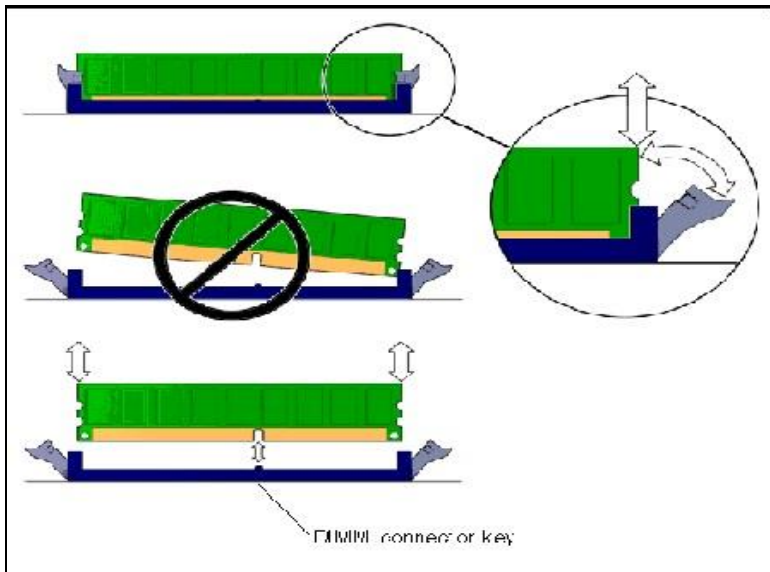


Figure 3.9 RAM Placement

Disk Drives: Disk drives (Hard Disk Drives, CD/DVD Drives) should be mounted in to racks of the system case and alignment should be proper.

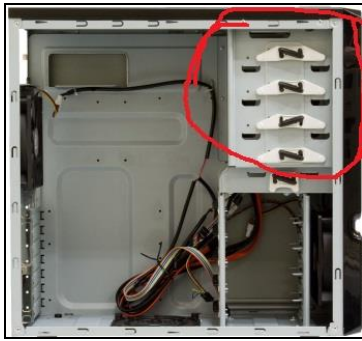


Figure 3.10 Disk Racks in system case

Motherboard should be placed in to the system case here two things should be taken in to account.

1. Position of the screw holes and standoffs
2. Back panel alignment

After motherboard is placed in to system case and screws and standoffs are fixed carefully next step is to connect all the cables.

Connect Power cable to motherboard

Hard Disk Drive CD/DVD power cable and Data cable (SATA/PATA)

Connect Front panel cables for Power Switch, Restart, USB, LEDs, and Audio Jacks. Refer motherboard manual for connections or follow the labels of connectors and motherboard or in few motherboards pin pattern act as guide.

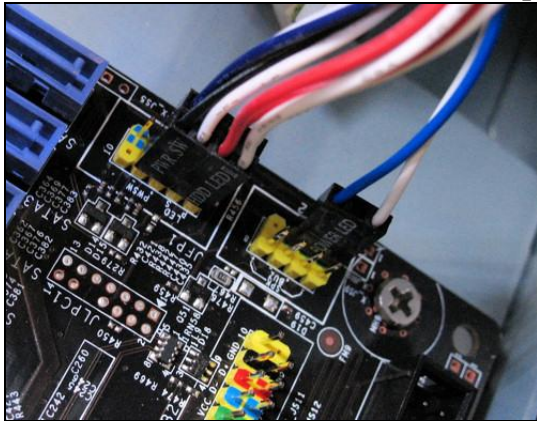


Figure 3.11 Front Panel Connectors

Adapter cards: like Network interface cards, Display cards, Modem cards. Etc are installed in to system on Slots like PCI AGP PCIe and others. To install a adapter card first identify the card and slot required for it. If available place the card in to slot carefully insert with little force and ensure complete connect.

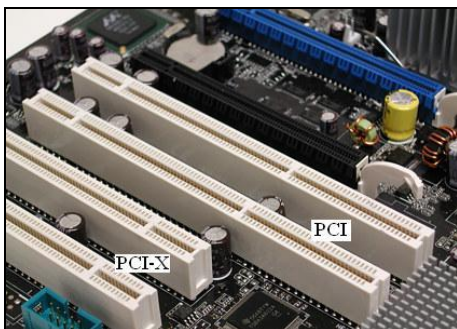
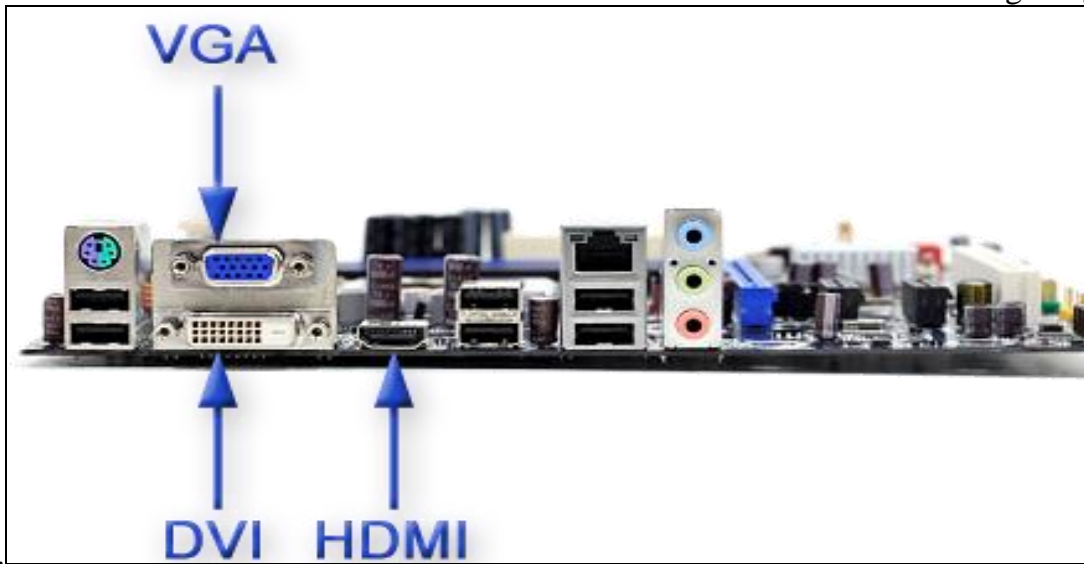


Figure 3.12 Expansion Slots

External Devices: External Device like Monitor Keyboard, mouse, Speakers, Printers etc are connected through back panel and USB devices and audio devices can be connected through front panel⁵ also

Monitor requires power and data through separate connections. Power is given directly or even through SMPS, Data cable is connected to the back –panel of the system (motherboard). There are different types of connectors, but VGA is the standard connector. Other than VGA there are HDMI and DVI as shown in the figure given



below.

Figure 3.13 Monitor Connectors

Keyboard and Mouse are connected to the system in two ways

1. PS/2 (green for Mouse, blue for keyboard)
2. USB

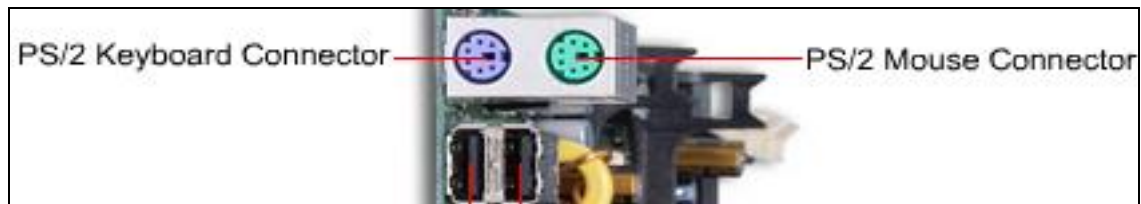


Figure 3.14 PS/2 and USB connector

Audio System and Head Phones are connected through Audio jack and USB also.



Figure 3.15 Audio Jack

Safety Precautions

- ⊗ Turn of power supply and disconnect power cable
- ⊗ Use anti-static electric discharge pads
- ⊗ Handle HDD very carefully
- ⊗ Remove the components and place them on safe area
- ⊗ Installed Processor with due care