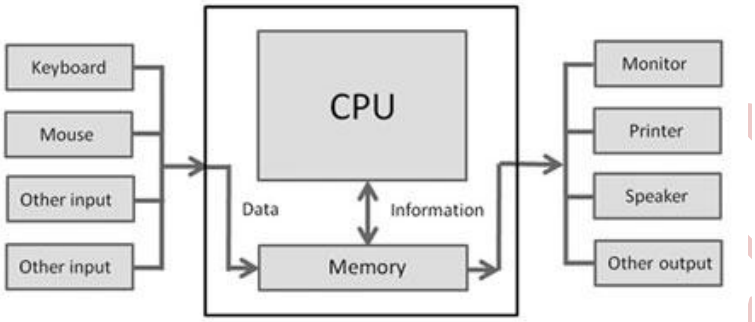
Unit One

Subject: One

1- What is a computer?

A computer is an electronic device that has the ability to store, retrieve, and process data and perform mathematical and logical operations, and display the results of these operations using programs and applications.



2-Computer Classification: By Size and Power

3- Elements of a Computer System:

A computer system is a set of 4 elements.

(i) Hardware

(ii) Software

(iii) Humanware

(iv) Data & Information

1.Hardware	Hardware represents the physical and tangible components of a computer i.e. the components that can be seen and touched. Examples of Hardware are following: • **Input devices** -- keyboard, mouse. • **Output devices** -- printer, monitor. • **Storage Units/Devices** -- Hard disk, CD, DVD. • **System Unit**
2.Software	Software or programs – consist of the step by step instructions that tell the computer how to perform a task.
3.Humanware	Refers to the *staff* who: 1. Maintain hardware. 2. Develop software. 3. Operate and use. 4. Design.
4.Data and Information	• Data: Consists of individual facts or bits. • *Data types*: (Numbers – Words – Sounds – Images). • Information: Is the processed data.

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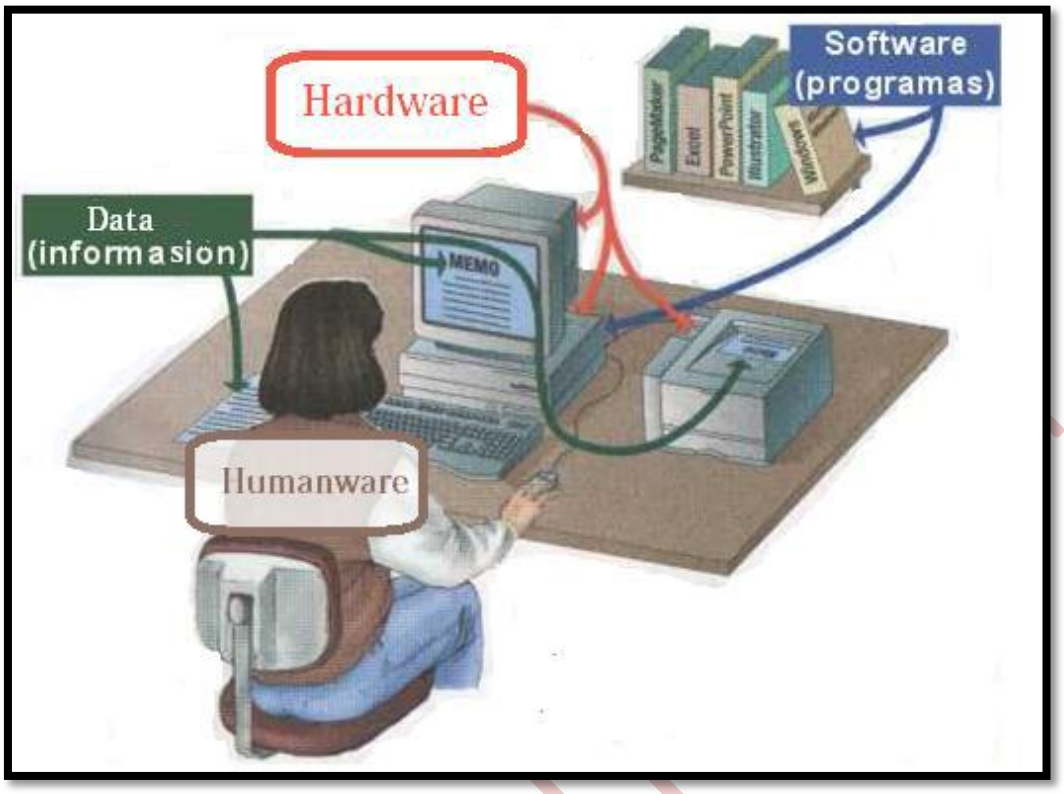
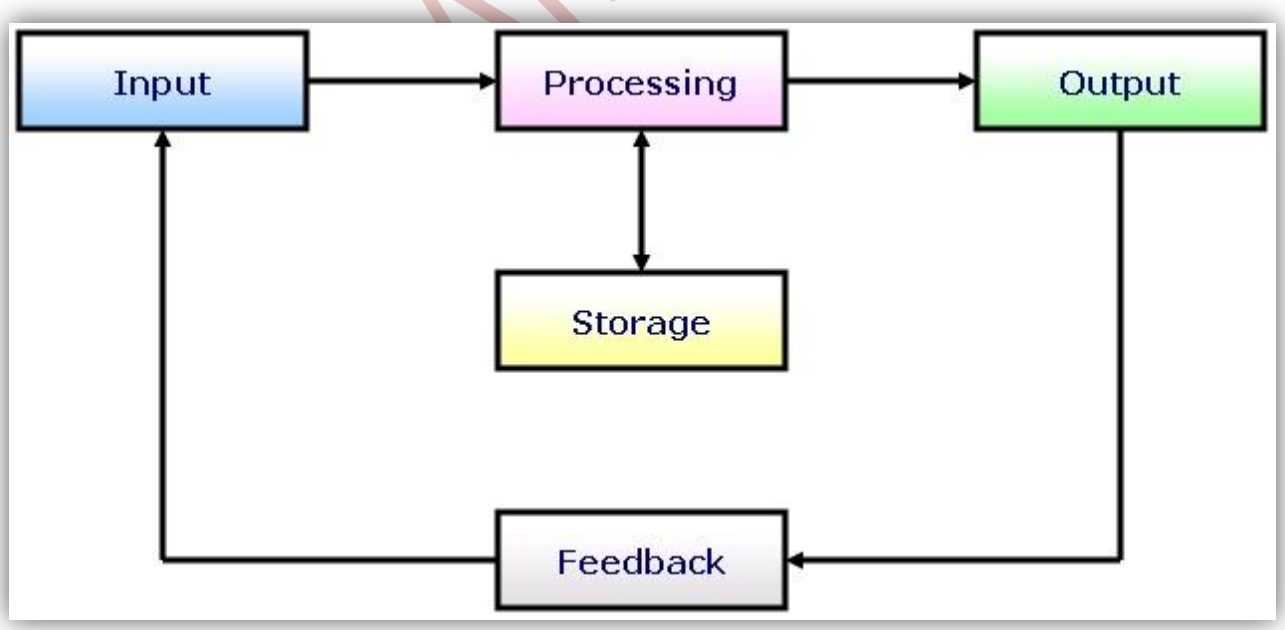

Hardware
Software
(programas)
Data
(informasion)
MEMO
Humanware


Input
Processing
Output
Storage
Feedback

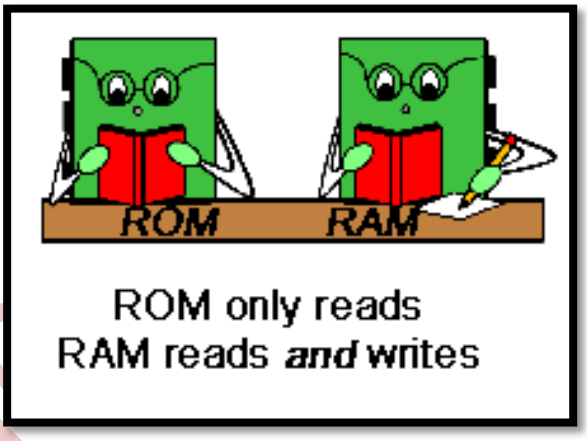
(i) Hardware

1- System Unit

What does System Unit mean?

A system unit is the part of a computer that houses the primary devices that perform operations and produce results for complex calculations. It includes:

- Main Memory
- Central Processing Unit (CPU)
- Motherboard



2- Memory

- RAM: RAM stands for Random Access Memory. This memory holds the information you are working with while the computer is turned on. Once you turn the computer off all the information that was in RAM will be gone.

- ROM: ROM stands for Read Only Memory. This memory holds information that you can only read, but not erase. Information in ROM is built in and is always there even when the computer is turned off.

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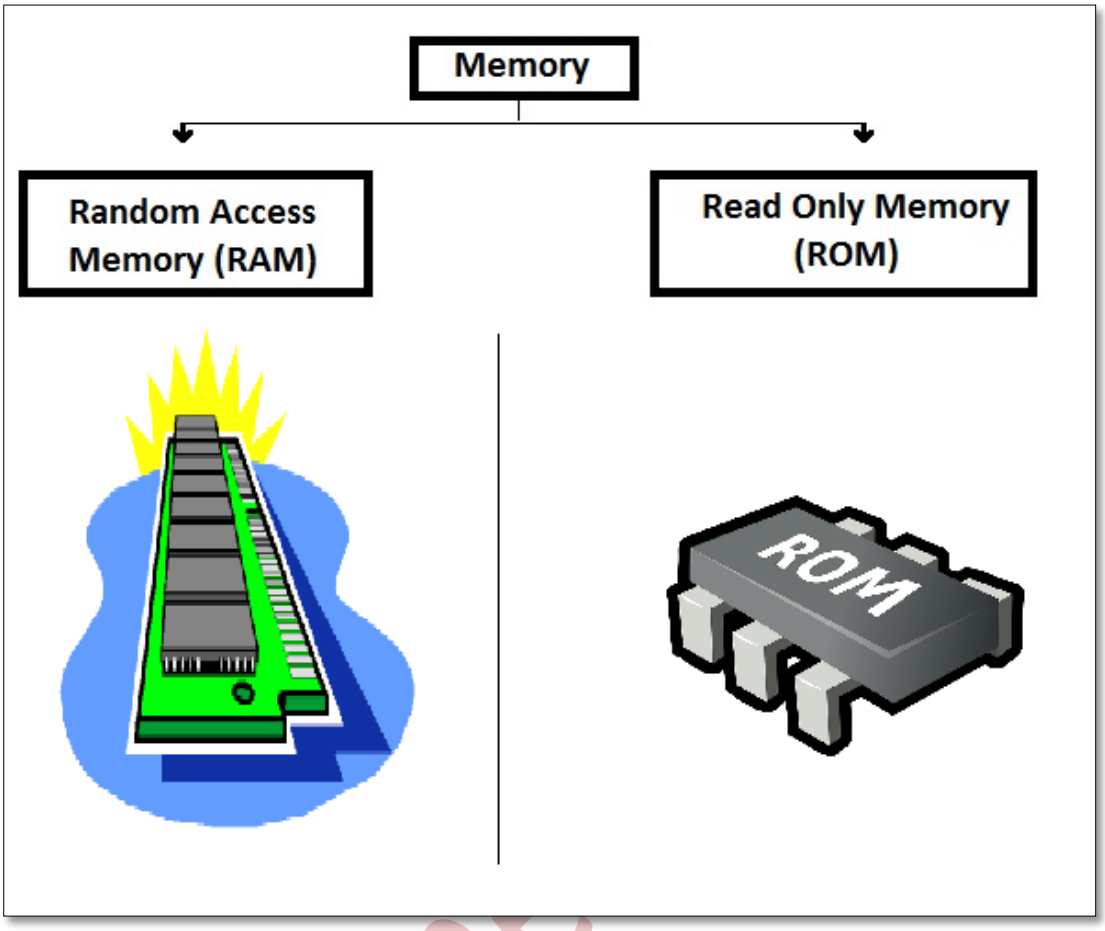

3- Central Processing Unit (Processor)

-It is the brain of computer.

-Processor *contains*:

(A) Arithmetic and Logic Unit (ALU):

Responsible for processing data and convert it to information. All data are stored as numbers. It's responsible for performing the arithmetic and logic process to convert it into information.

(B) Control Unit

Note: Processor, RAM and ROM are located in motherboard.

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Units of Measurement
(Storage Units) Processor Speed

1- Measurement units of storage units

Bit

It is the smallest unit of capacity

Bit could be 0 or 1

0 if there is no electric path

1 if there is passing electric path

Byte

-8 bits make 1 Byte

- Every letter, number or symbol needs a byte to be saved on the computer's memory.

KiloByte

1 KB = 1024

1 MG = 1024 KB

GigaByte

1 GB = 1024 MB

TeraByte

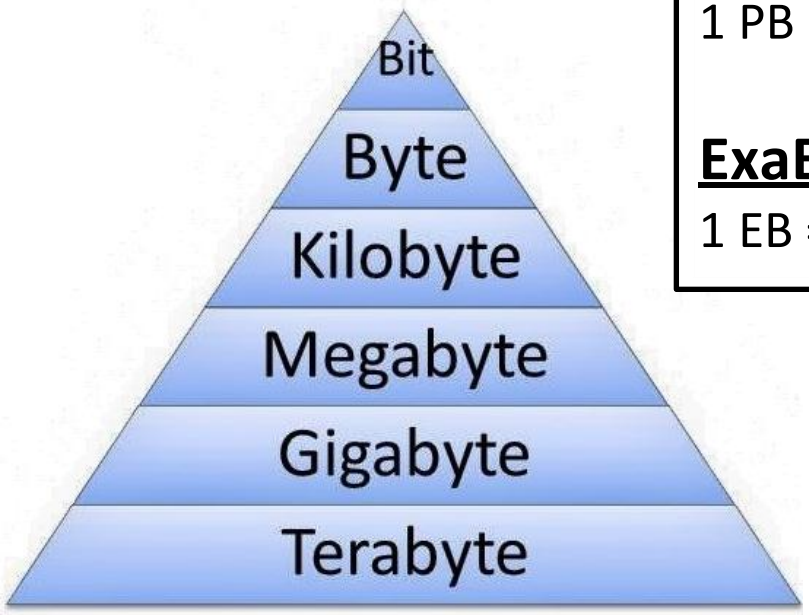
1 TB = 1024 GB

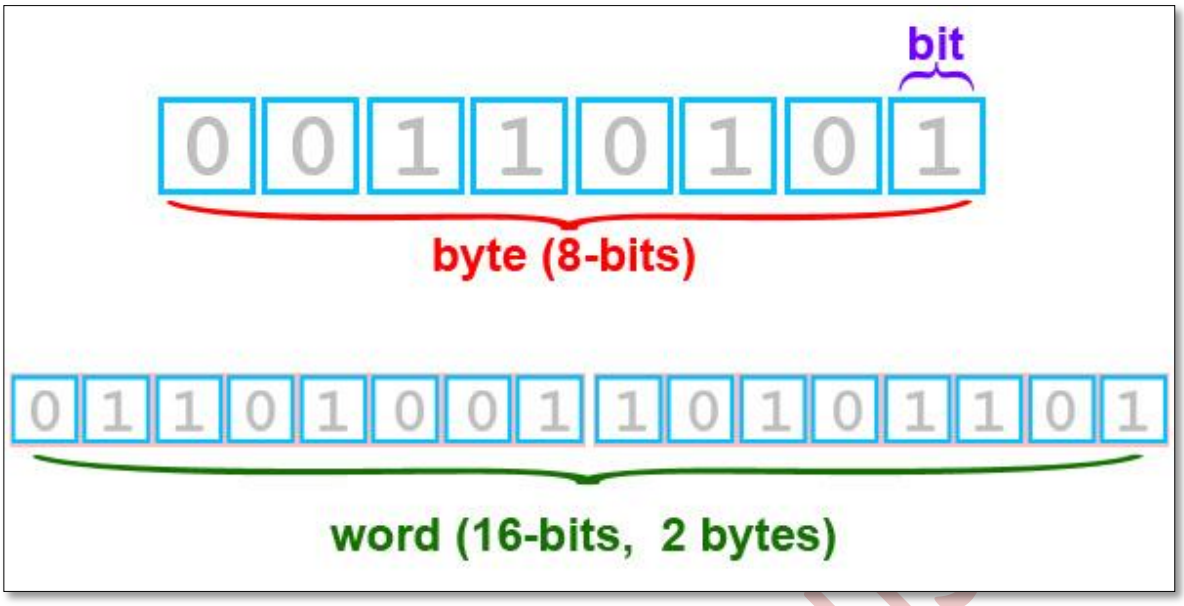
PetaByte

1 PB = 1024 TB

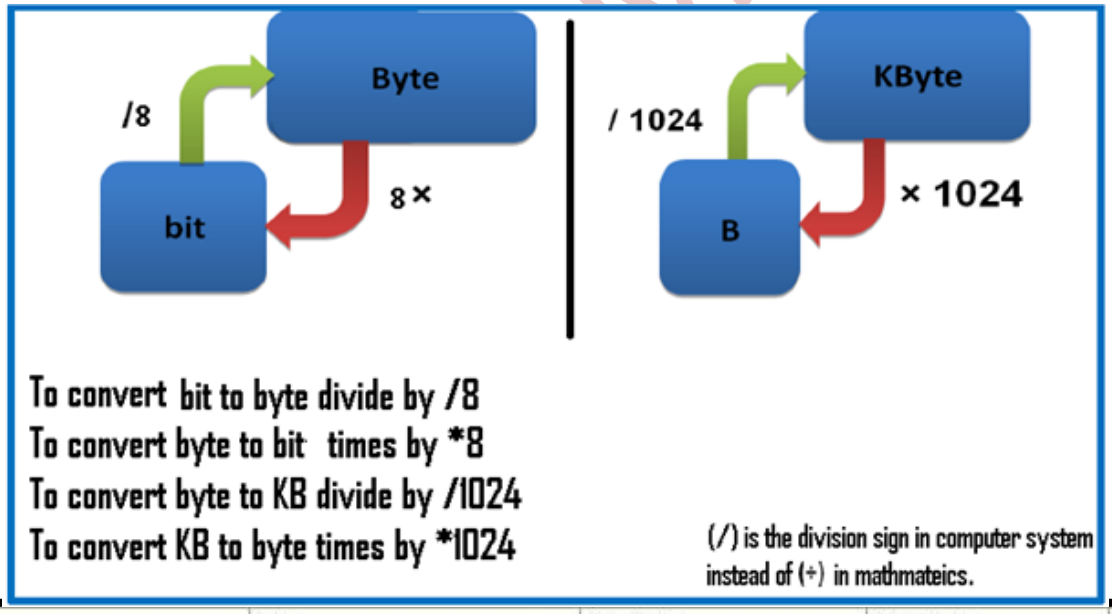
ExaByte

1 EB = 1024 PB





Convert units of measurement

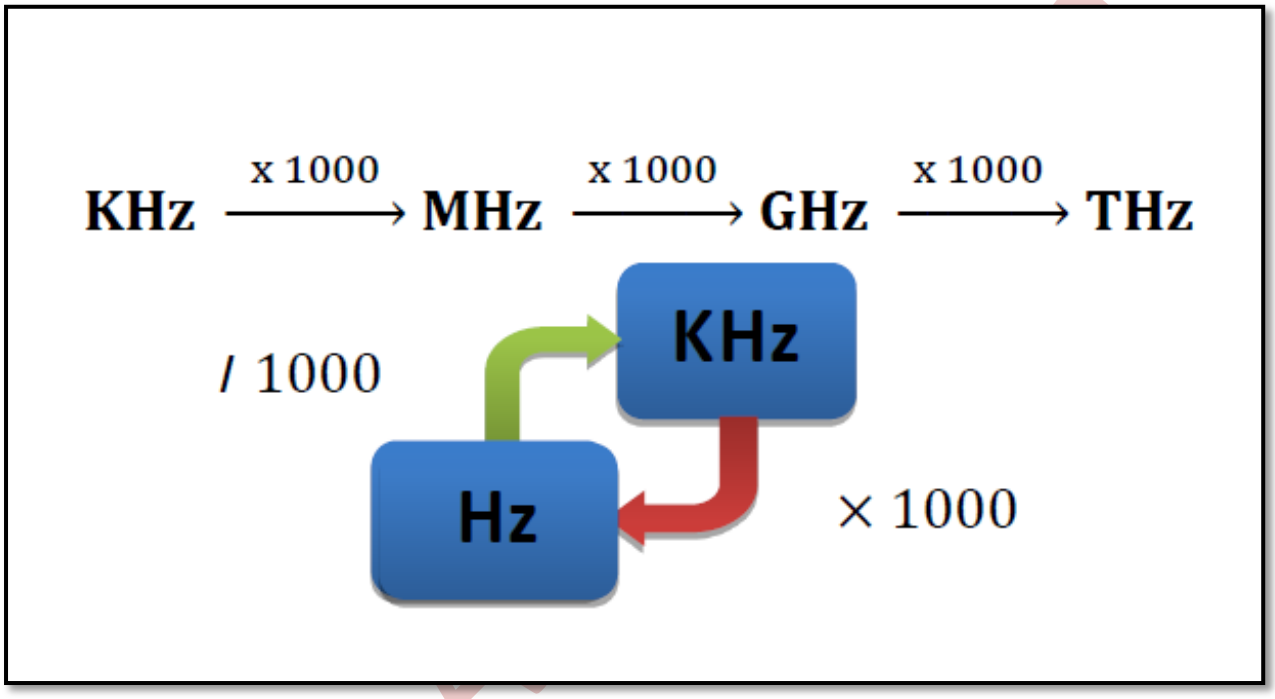


	bit	byte	Kilobyte	Megabyte	Gigabyte
bit	1	8	8,192	8,388,608	8,589,934,592
byte	8	1	1,024	1,048,576	1,073,741,824
Kilobyte	8,192	1,024	1	1,024	1,048,576
Megabyte	8,388,608	1,048,576	1,024	1	1,024
Gigabyte	8,589,934,592	1,073,741,824	1,048,576	1,024	1
Terabyte	8,796,093,022,208	1,099,511,627,776	1,073,741,824	1,048,576	1,024
Petabyte	9,007,199,254,740,990	1,125,899,906,842,620	1,099,511,627,776	1,073,741,824	1,048,576
Exabyte	9,223,372,036,854,780,000	1,152,921,504,606,850,000	1,125,899,906,842,620	1,099,511,627,776	1,073,741,824
Zettabyte	9,444,732,965,739,290,000,000	1,180,591,620,717,410,000,000	1,152,921,504,606,850,000	1,125,899,906,842,620	1,099,511,627,776

2- Measurement unit of processor speed:

Measurement of the processor speed which is rated in hertz **(Hz)**

Example: Core I7 (3.2) GHz is faster than Core I7 (2.66) GHz



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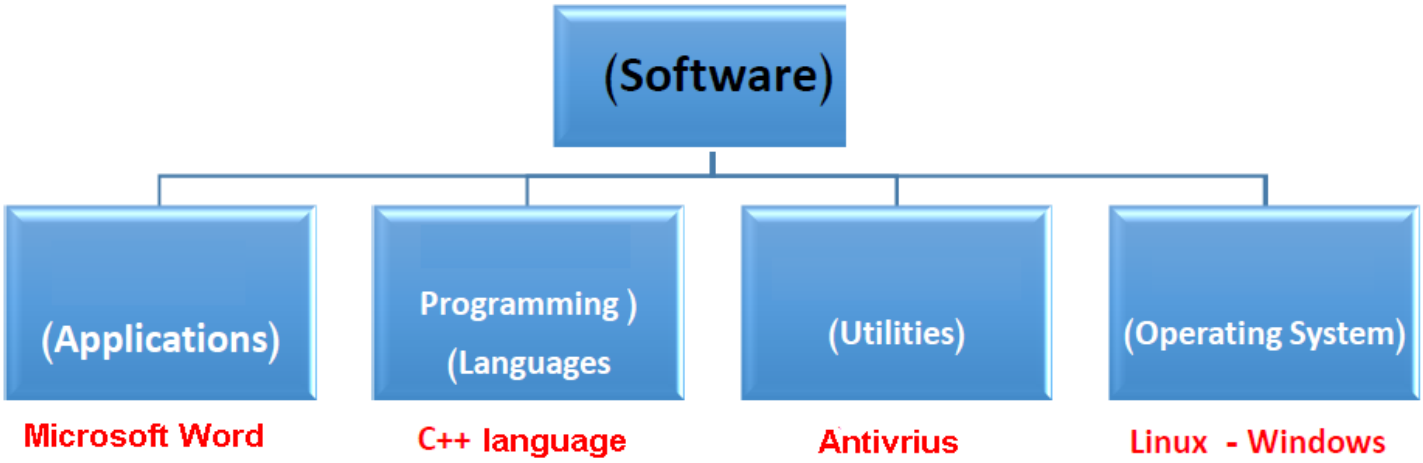
(ii) Software



1- Open source software:

Open source software (OSS) is distributed under a licensing agreement which allows computer code to be shared, viewed and modified by other users and organizations. Open source software is available for the general public to use and modify from its original design free of charge

Example: GIMP, Open Shot (Video Editor), Libre Office, Linux (Fedora – Ubuntu)

2- Closed source software

Closed source software can be defined software distributed under a licensing agreement to authorized users with private modification

Example: Microsoft Office, Photoshop, Windows, Mac OS (Apple Co.)

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Open Software	Proprietary
▪ Linux, Ubuntu, OpenOffice.org	▪ Windows Vista, Microsoft Word
▪ Purchased **with** its source code	▪ Purchased **without** its source code
▪ Users **can modify** the software	▪ Users **cannot modify** the software
▪ Can get open software **for free** of charge	▪ **Must pay** to get the proprietary software
▪ Can install software **freely** into any computer	▪ Must have a **license** from vendor before install into computer
▪ No one is responsible to the software	▪ Full support from vendor if anything happened to the software

Not all free software is open source, software categorized by copy rights as:

Types of software license:

1-Freeware:

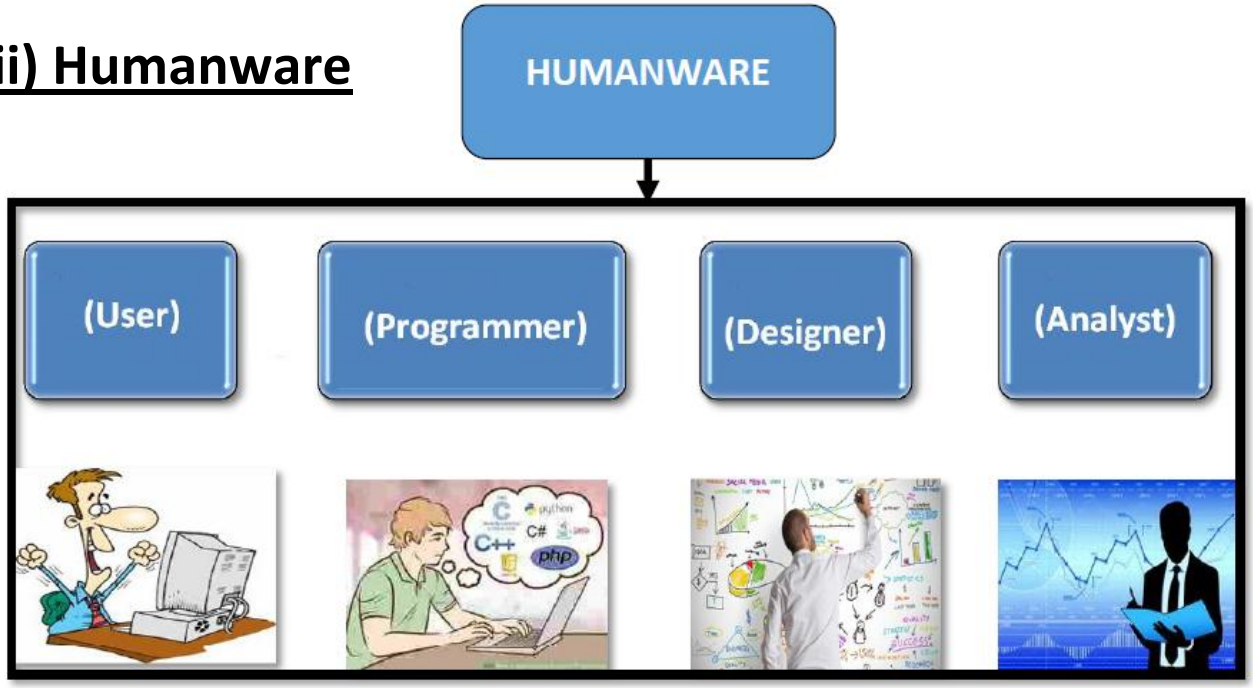
Is absolutely free software for a user for personal use.

2- Shareware:

is software that offers users a limited amount of time to use the software before charging for continued usage. This limited amount of time is often known as a “trial period” or “trial run,” the length of this time varies depending on the software.

3- **All rights reserved (Serial Number)**

(iii) Humanware



1- Users: a person who uses computers for work or entertainment or communication or business.

2- Designer: Graphic designers & Web designers who develop the overall layout of magazines, newspapers, and advertisements.

3- Programmer: the write programs according to the specifications that determined by computer software engineers and system analysts. Using different programming languages such as Java, C++.

4- Analyst: Using computers and related systems to design new IT solutions, modify, enhance or adapt existing systems and integrate new features or improvements, all with the aim of improving business efficiency and productivity.

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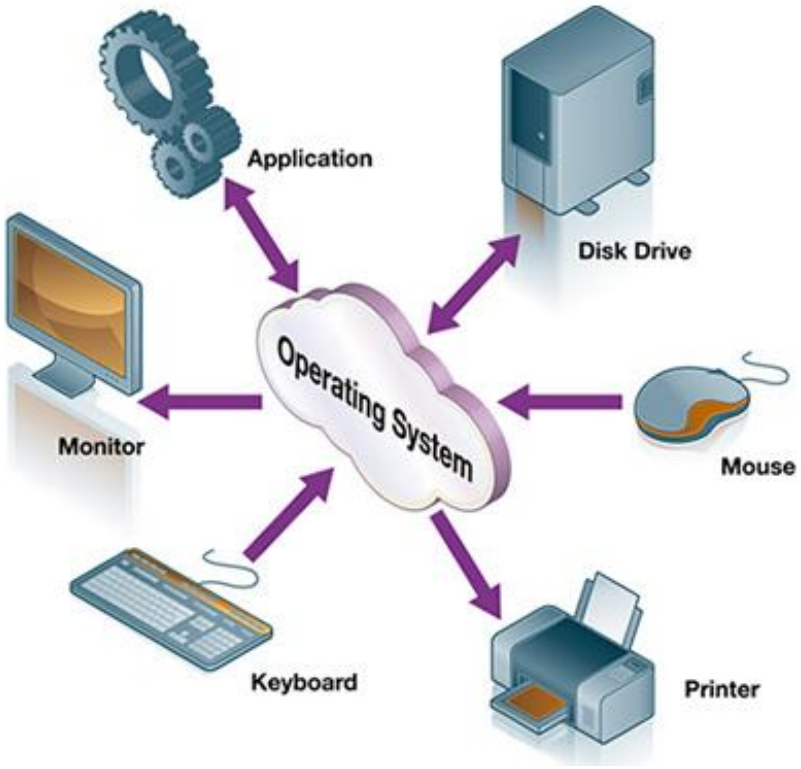
Unit One

Subject: Two

Operating Systems

An operating system or OS is a software program that enables the computer hardware to communicate and operate with the computer software. Without a computer operating system, a computer and software programs would be useless.



Operating System is responsible for:

1- Operating hardware

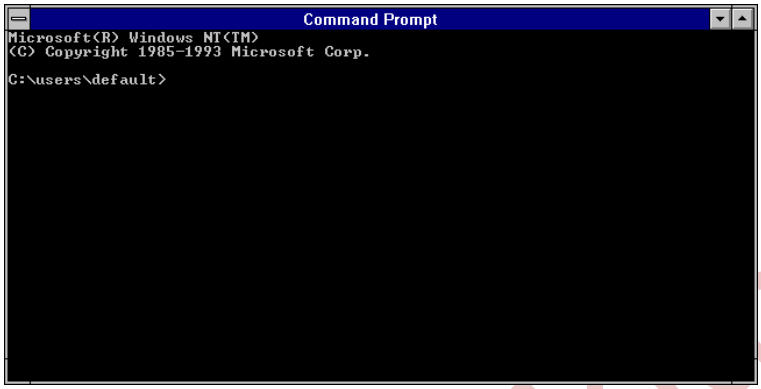
2- Software application

3- User can give orders to the operating system by command prompt or the Interface (GUI).

(A) Command prompt (cmd.ex) or Terminal:

-Command Prompt interacts with the user through a command-line interface.

-Command Prompt is used to execute entered commands.



(B) Interface (GUI) Graphical User Interface:

is a type of user interface that allows users to interact with electronic devices through graphical icons and visual tools using input unit (mouse), what makes it more interested to use.

Examples:

Windows 8 GUI

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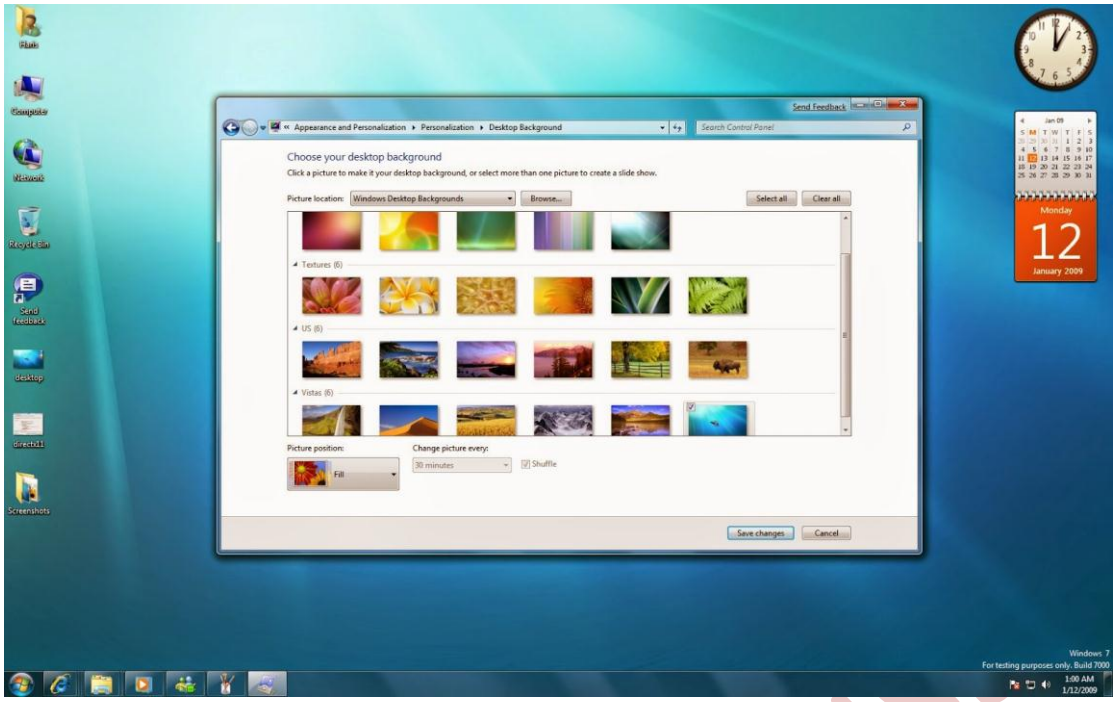


Windows 7 GUI

Linux (Fedora) GUI

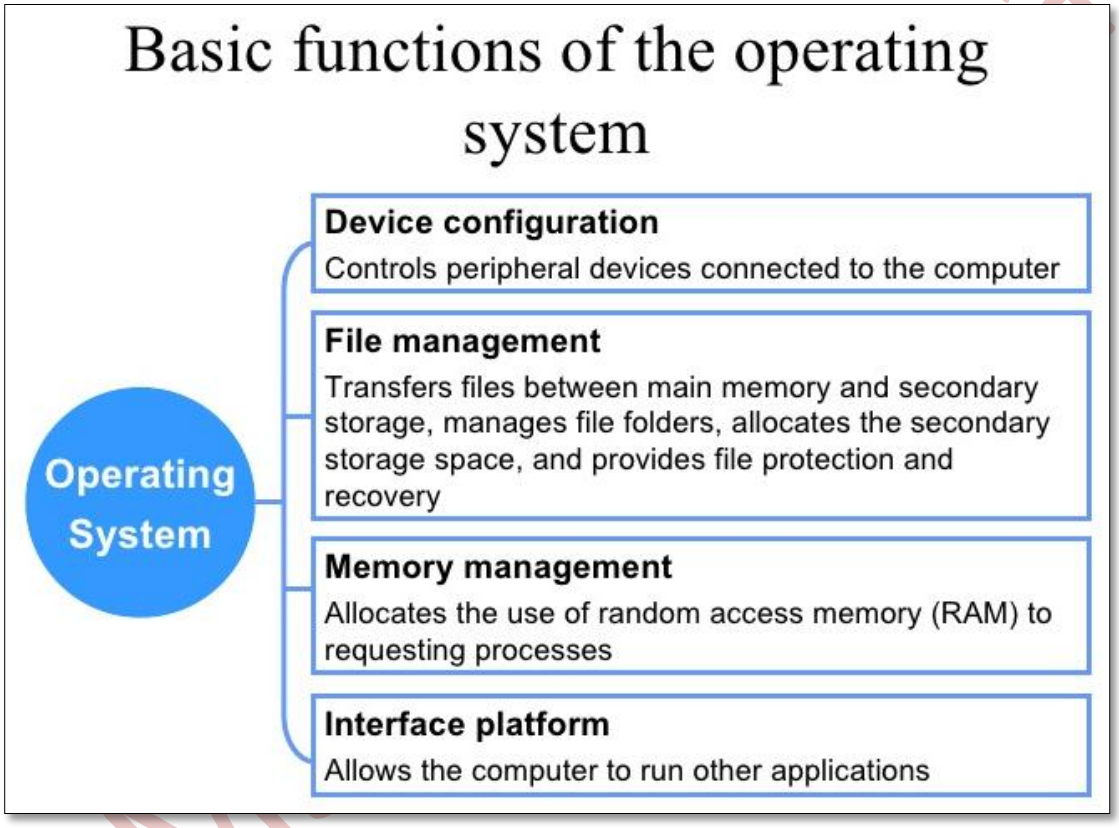
Functions of Operating System:

1- Controls the backing store and peripherals such as scanners and printers

2-maintains security and access rights of users

3-Deals with errors

4- Coordination between other software and users



Mobile Operating System:

operating system that is specifically designed to run on mobile devices such as mobile phones, smartphones, PDAs, tablet.

Examples of mobile device operating systems include Apple iOS, Google Android (Open Source) and Windows.

GUI advantages:

1- Allows for easy memorization of tasks (you remember where you are supposed to point-and-click), instead of having to remember commands to type into a terminal that you may or may not remember easily.

2- Display programs in organized menus

3- Opening more than one program in the same time

4- Using many languages

Opening screen of an operating system:

When opening a computer, checkup is applied for main units

Such as: RAM, Keyboard, Monitor and Hard Disk. This process made by an option called: Power On Self-Test (POST)

Power On Self-Test (POST):

The first thing that the BIOS does when it boots the PC is to perform what is called the *Power-On Self-Test*, or *POST* for short. The POST is a built-in diagnostic program that checks your hardware to ensure that everything is present and functioning properly. The POST runs very quickly, and you will normally not even notice that it is happening--unless it finds a problem.

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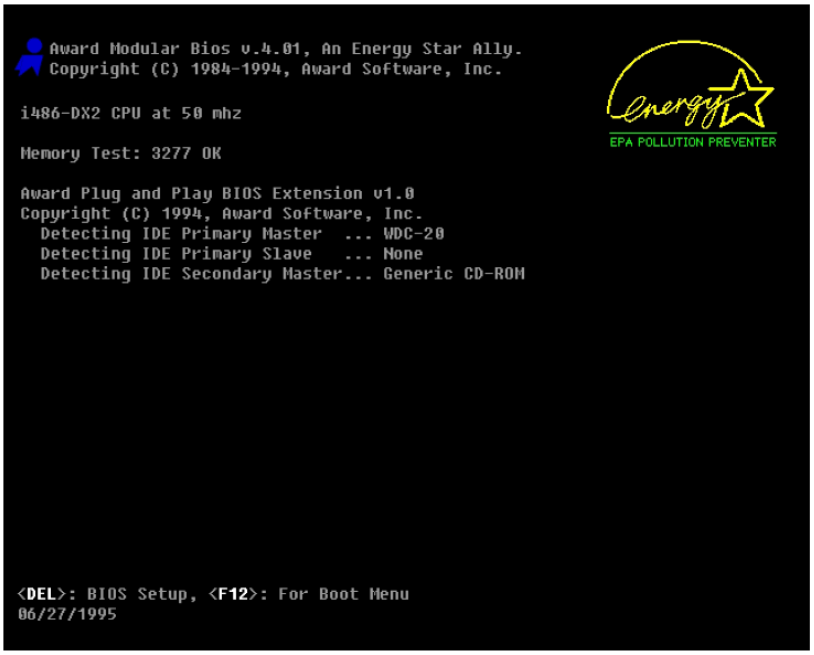

Common components among different types of operating systems (OSs):

1-Background

2-Icons

3-Bars

-Computer can contains more than 1 operating system; chose the required one when turning on a computer.

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Unit One
Subject: Three
Dealing with Files and Folders

One of operating system's function is dealing with folders and files. Each operating system use "File System" that helps in control, store, retrieve, organize and manage files.

1-Files:

Collection of related information that is recorded on secondary storage such as optical disks. A file is a sequence of bits, bytes, lines or records whose meaning is defined by the files creator and user.

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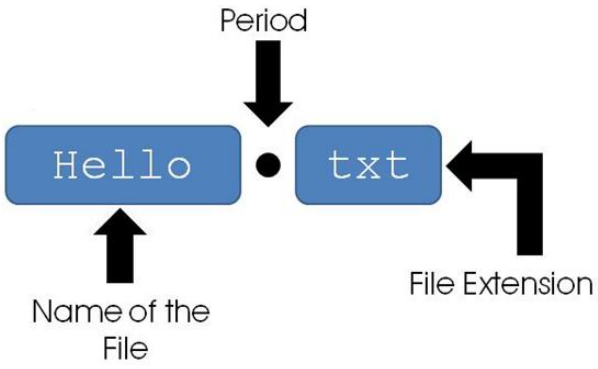
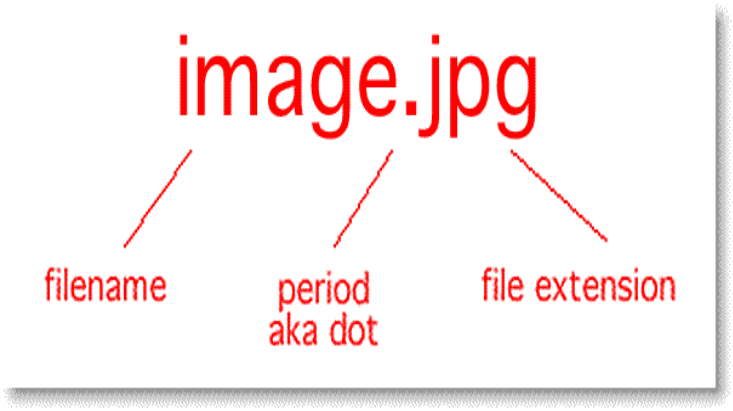
A file contains:

1- File Name

2- Extension (defines type of the file).

Change the file icon display.





.3gp	.mp4	.doc	.swf	.jpg	.dat	.bmp
.accdb	.mpg	.exe	.sys	.js	.rtf	.html
.asp	.mpp	.fla	.tmp	.mov	.jpeg	.xml
.avi	.pdf	.flv	.txt	.mp3	.zip	.wdb
.bat	.png	.gif	.wav	.wmv	.wma	
.bin	.ppt	.htm	.wba	.xls	.rar	

Creating and saving a file:

1- Open any word processing program

2- Type a text paragraph

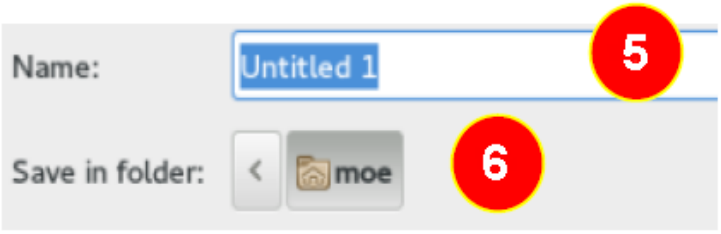
3- "File Menu"

4- "Save As"

5- Type a name for the file

6- Choose a location to be saved in

7- Click "Save"



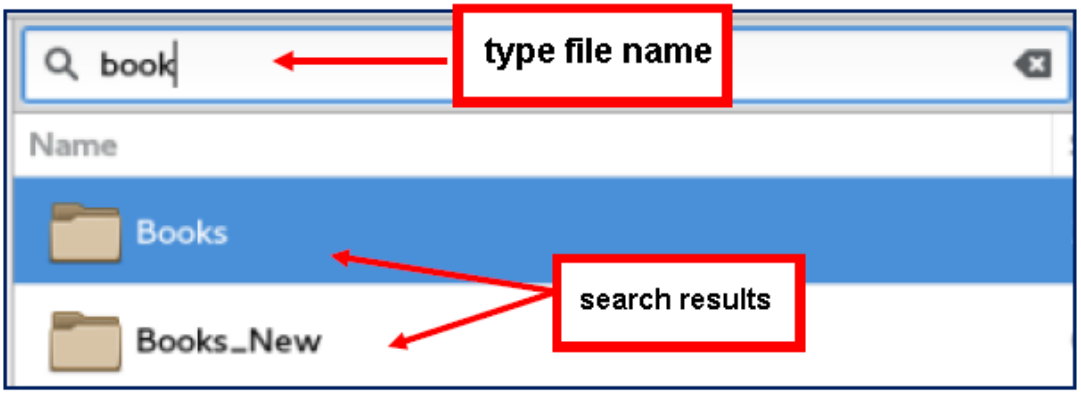
Save

Searching for a file in the computer:

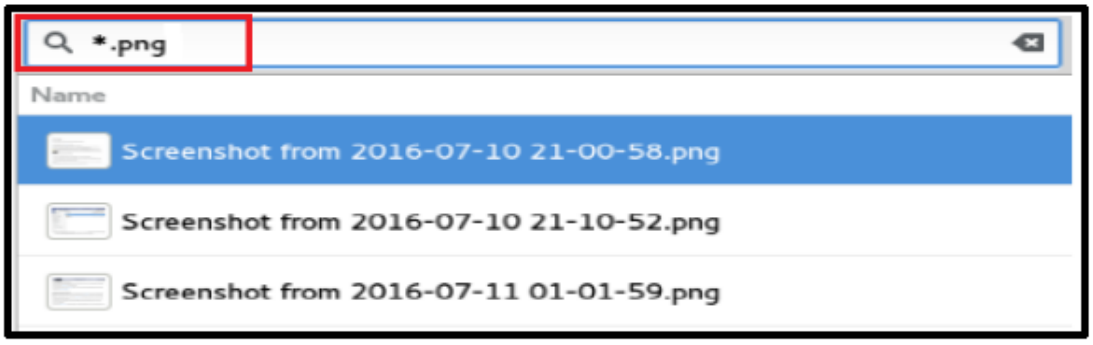
You can search by name of the file or extension

-To display search bar press on CTRL+F

1- Searching by name:



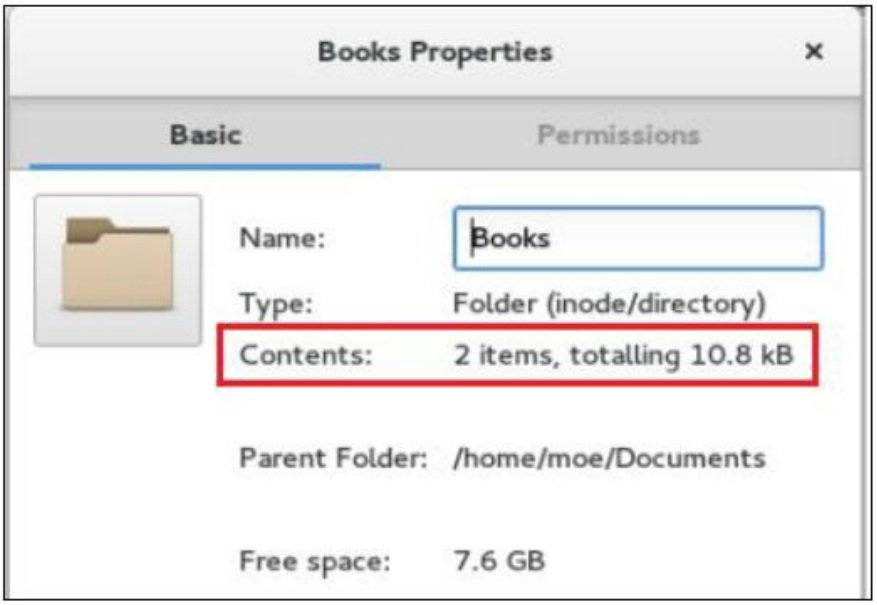
2-Search by extensions:



Dealing with folders in Fedora:

A **folder** is a virtual location where programs, files, and other folders can be located to help users store and organize their files.

Creating folder in Fedora:



1- Right Click

2- Shortcut menu will appear

3- Click "New Folder"

4- Type the desired name

5- Click "Created"

Note:

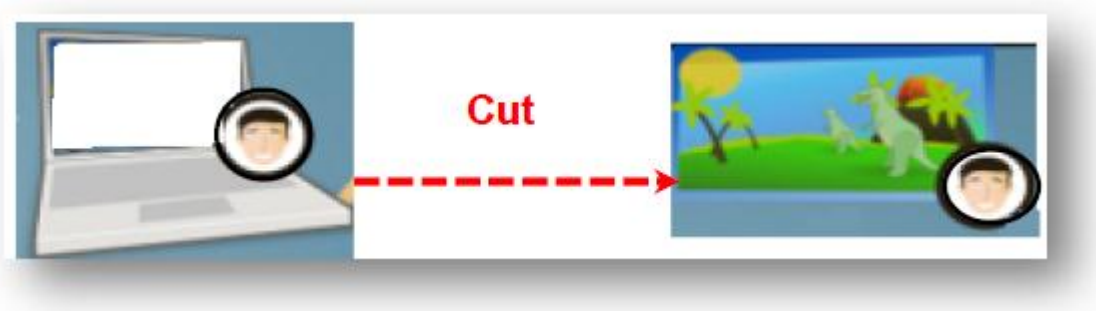
- Folder can contains other folders and files

- You can know the size and number of elements inside it

Copying and cutting a folder:

1- **Cut:**

The "Cut" function removes the currently selected text and places it on the clipboard. The clipboard on a computer functions as temporary storage for the last item you've cut or copied. After you cut text, you won't see it on your screen, but you can place it anywhere in the document using the "Paste" function.



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2- Copy:

The computer copies the selected text into the clipboard. The text also remains in its original location. By pasting copied text, you duplicate it, making it faster to reuse the same word or sentence over and over.

To copy a folder:

1- Right click on the folder that you want to duplicate

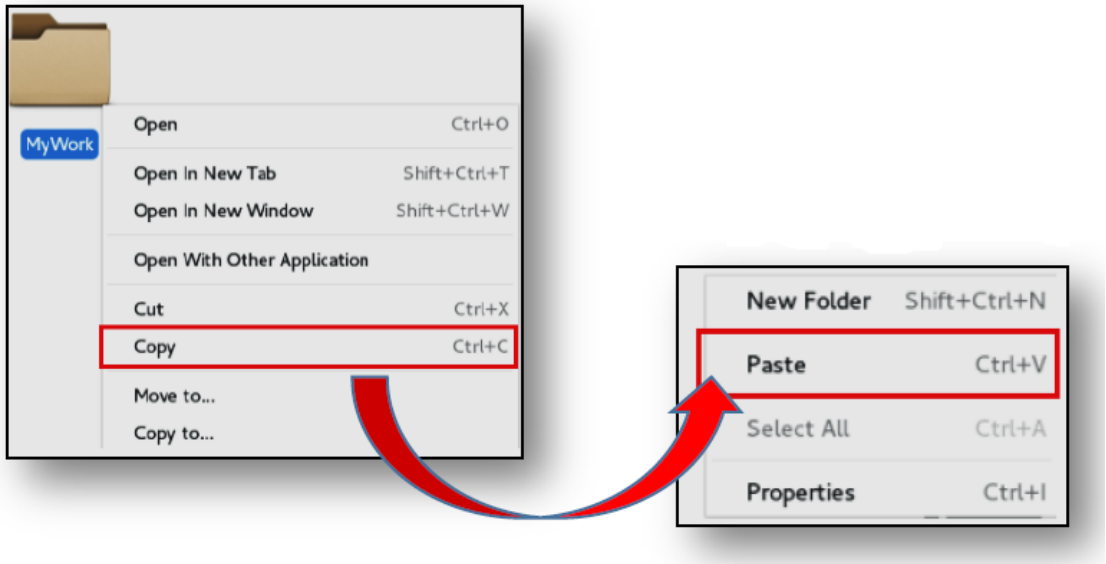
2- Shortcut menu will appear

3- Choose "Copy"

4-To paste it, Right click on the desired location.

Shortcut menu will appear

5-Click "Paste"



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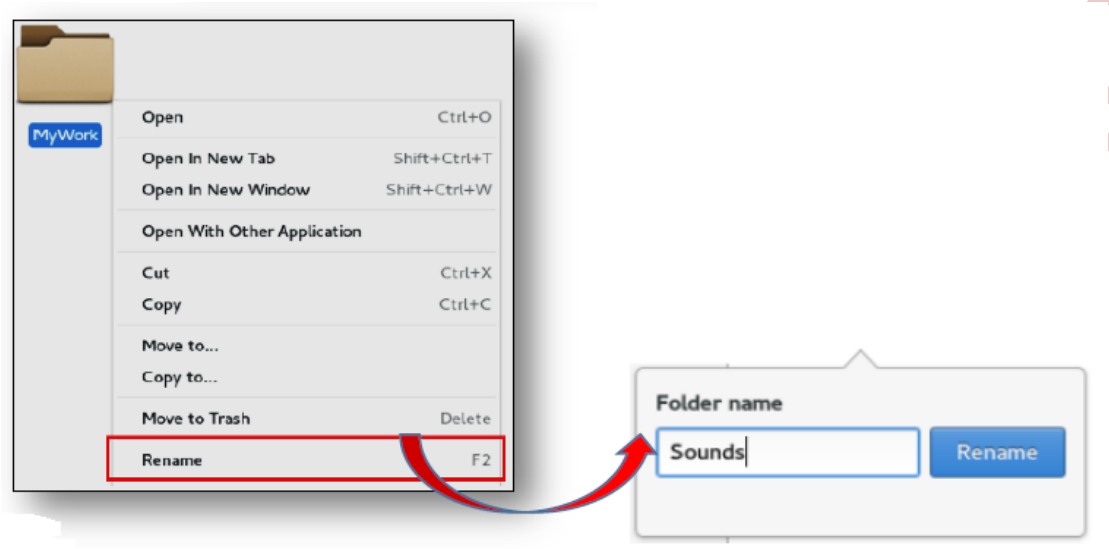
To rename a folder:

1- Right Click on the folder

2- Choose "Rename"

3- Type the new name

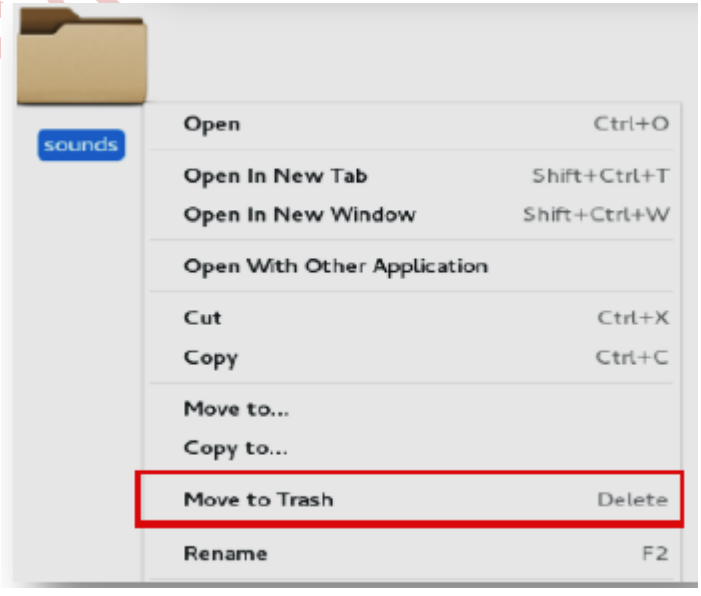
4- Click "Rename"



To delete a folder:

1- Right click on the folder

2- Click on "Move to Trash"



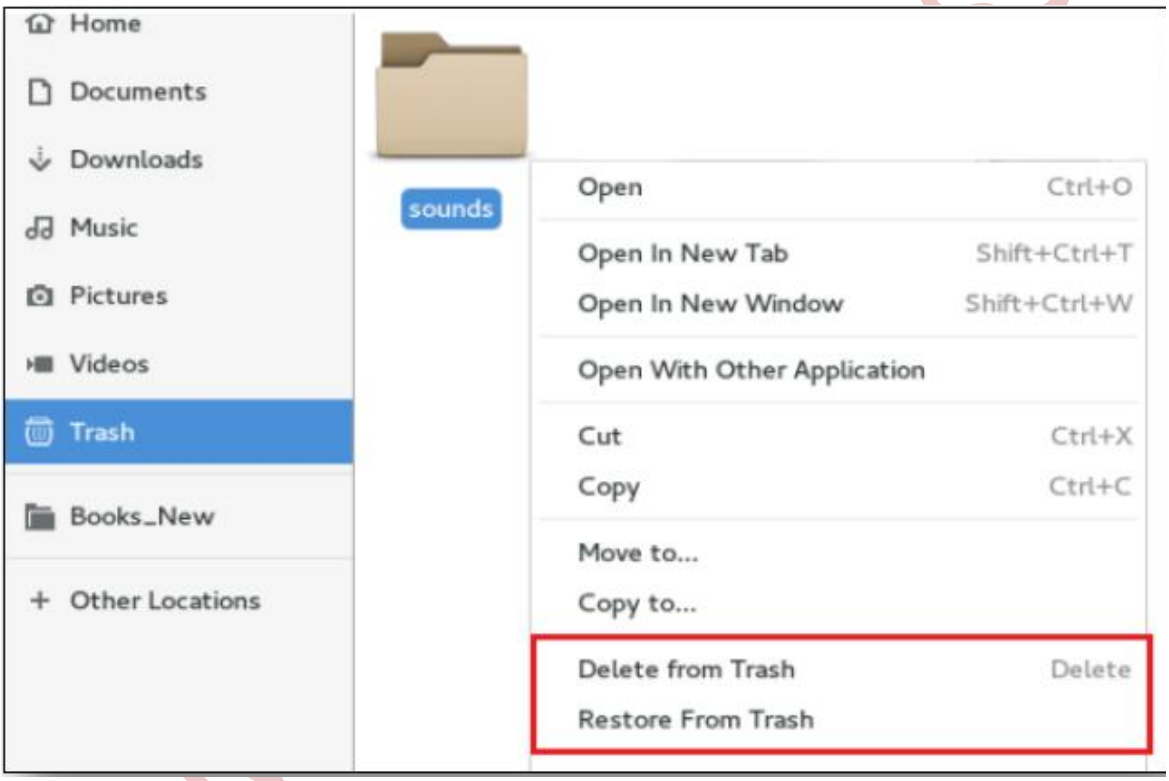
To restore deleted files and folders:

1- Go to "Trash"

2- Right click on the folder or file

3- Click on "Remove from Trash" if you want delete this folder permanently

4- Click "Restore from Trash" to restore the folder



Unit One

Subject Four

Networks

A **network** is a collection of computers connected to one another allowing for data to be shared and used. A great example of a network is the Internet, connecting millions of people all over the world together.

Benefits of Network:

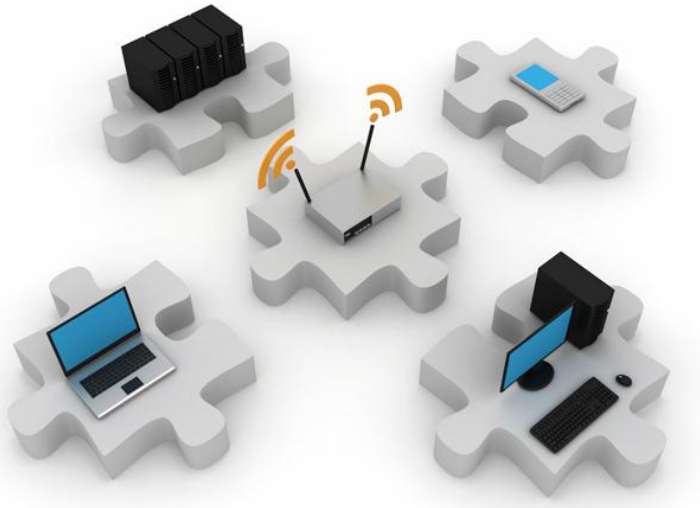
1- File Sharing:

2- Security:

3- Hardware sharing

4- Communication:

5- Workgroup Computing: Workgroup software like Microsoft BackOffice enables many users to contribute to a document concurrently. This allows for interactive teamwork.



Types of Networks:

- Local Area Network (LAN)
- Wide Area Network (WAN)

1- Local Area Network (LAN):

is a computer network covering a small geographic area, like a home, office, school, or group of buildings.

Examples of LAN from practical life:-

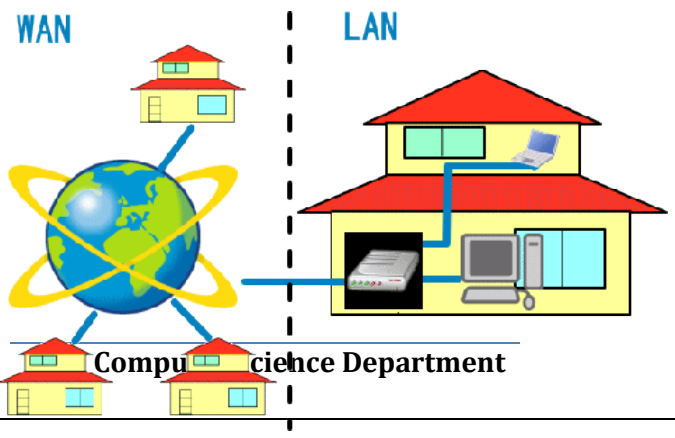
1-Banking networks

2-Network in Railway stations around the country

3-Education network inside computer labs in schools

The benefits of LAN:

- Sharing in data and information.
- Sharing in some devices like printer and scan
- Educational purposes so the teacher can know what the student do on the computer from the teacher device.



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2- Wide Area Network (WAN):

- A **wide area network**, or **WAN**, occupies a very large area, such as an entire country or the entire world. A **WAN** can contain multiple smaller networks, such as **LANs**. The Internet is the best-known example of a public **WAN.**

The benefits of WAN:-

- Get the latest information in all fields
- E- MAIL
- Chat and talks
- Search
- E- COMMERCE
- Access to free software
- Advertising

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File sharing

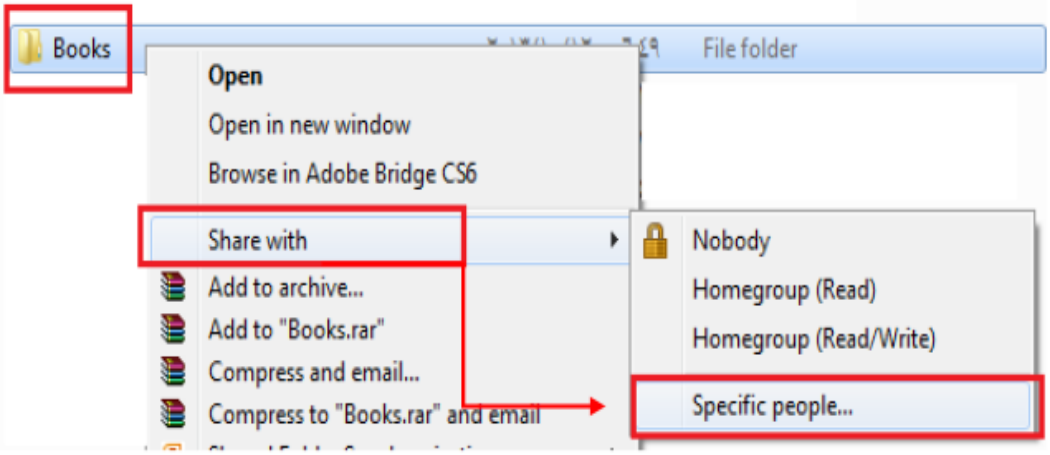
Sharing is the accessing or sharing of files by one or more users. File sharing is performed on computer networks as an easy and quick way to transmit data. For example, a user may share an instruction document on his computer that is connected to a corporate network allowing all other employees to access and read that document.

File sharing in Windows:

1- Right click on the folder you want to share

2- Share with

3- Specific people



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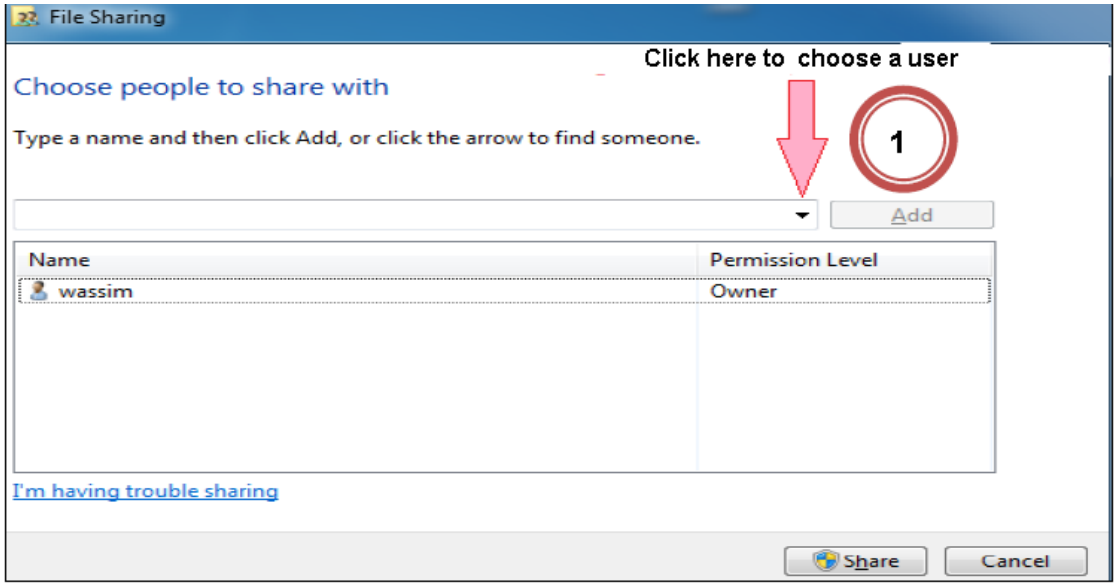
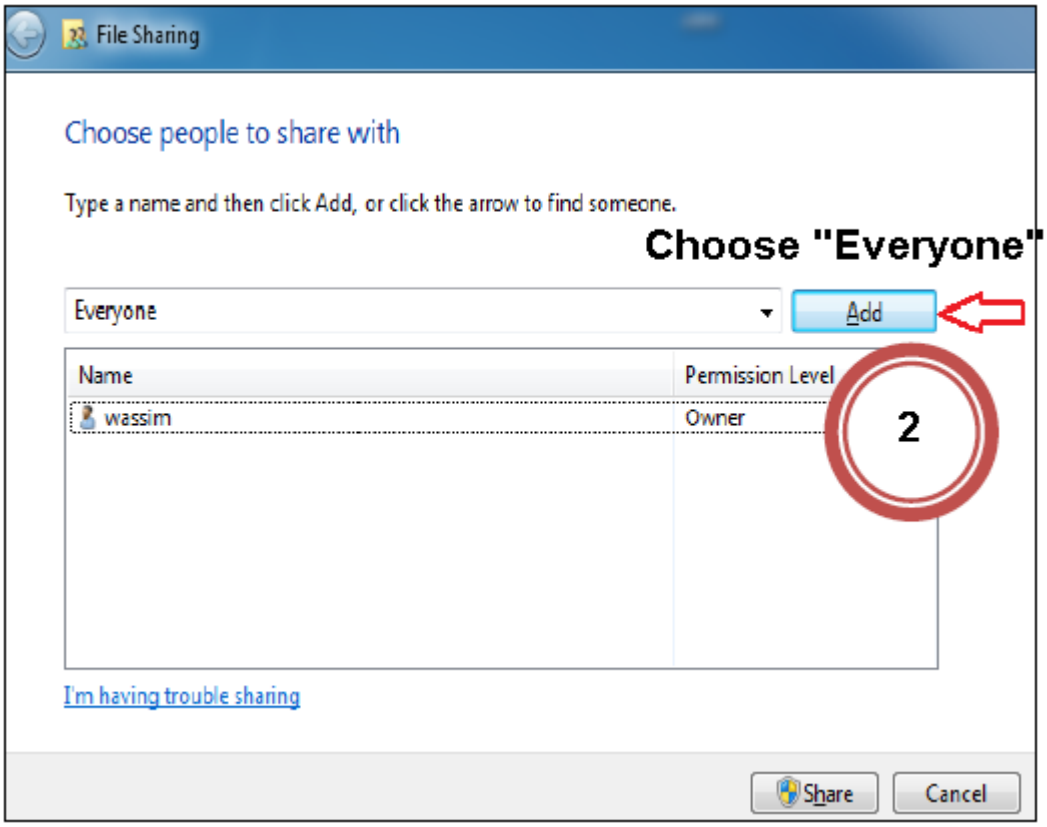
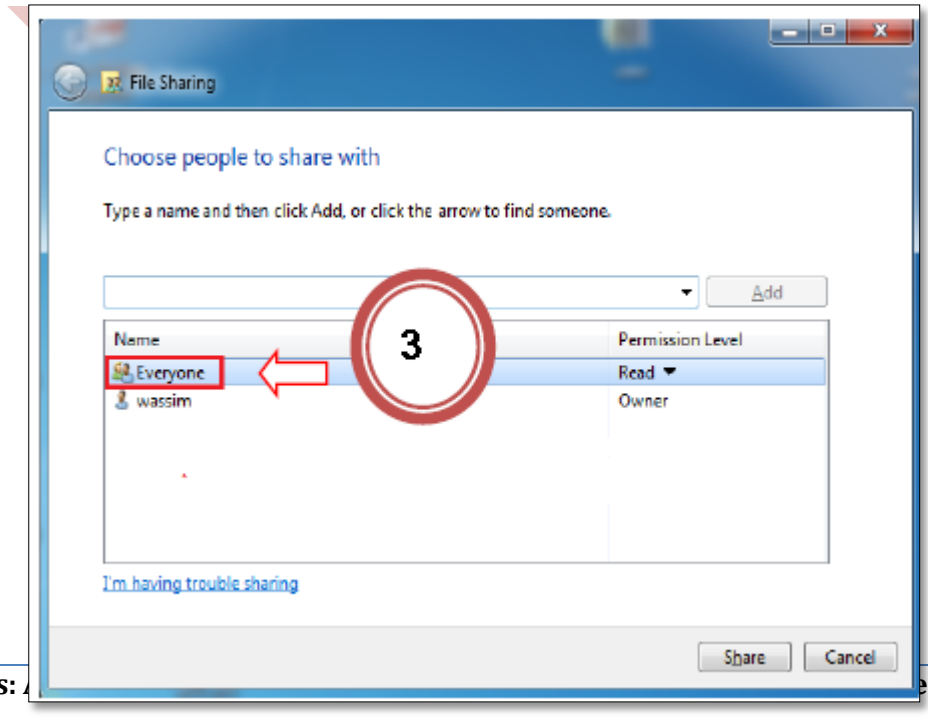
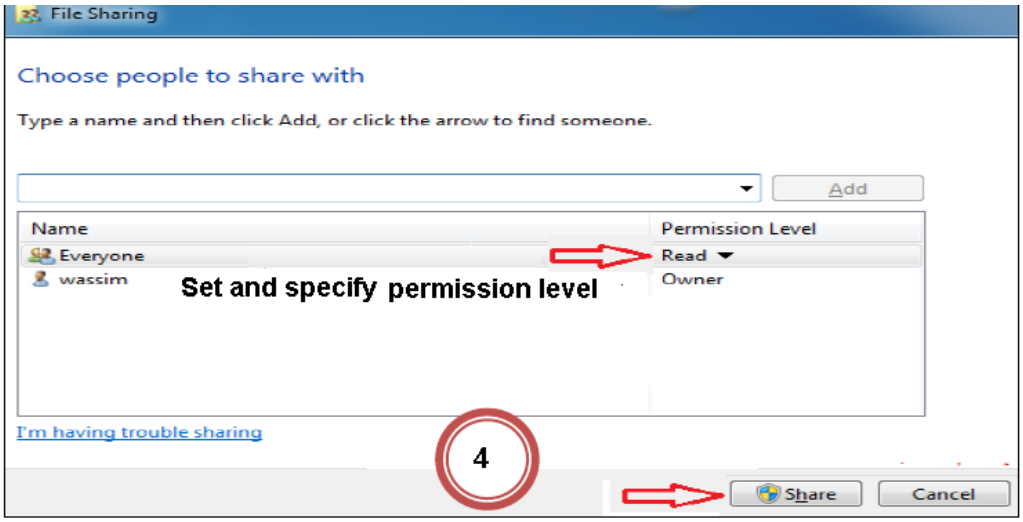

File Sharing
Click here to choose a user
Choose people to share with
Type a name and then click Add, or click the arrow to find someone.
1
Add
Name
Permission Level
wassim
Owner
I'm having trouble sharing
Share
Cancel


File Sharing
Choose people to share with
Type a name and then click Add, or click the arrow to find someone.
Choose "Everyone"
Everyone
Add
Name
Permission Level
wassim
Owner
2
I'm having trouble sharing
Share
Cancel


File Sharing
Choose people to share with
Type a name and then click Add, or click the arrow to find someone.
Add
Name
Permission Level
Everyone
Read
wassim
Owner
3
I'm having trouble sharing
Share
Cancel



1- Choose the user you want to share with, Example; Everyone.

2- Click "Add" to be from the allowed users

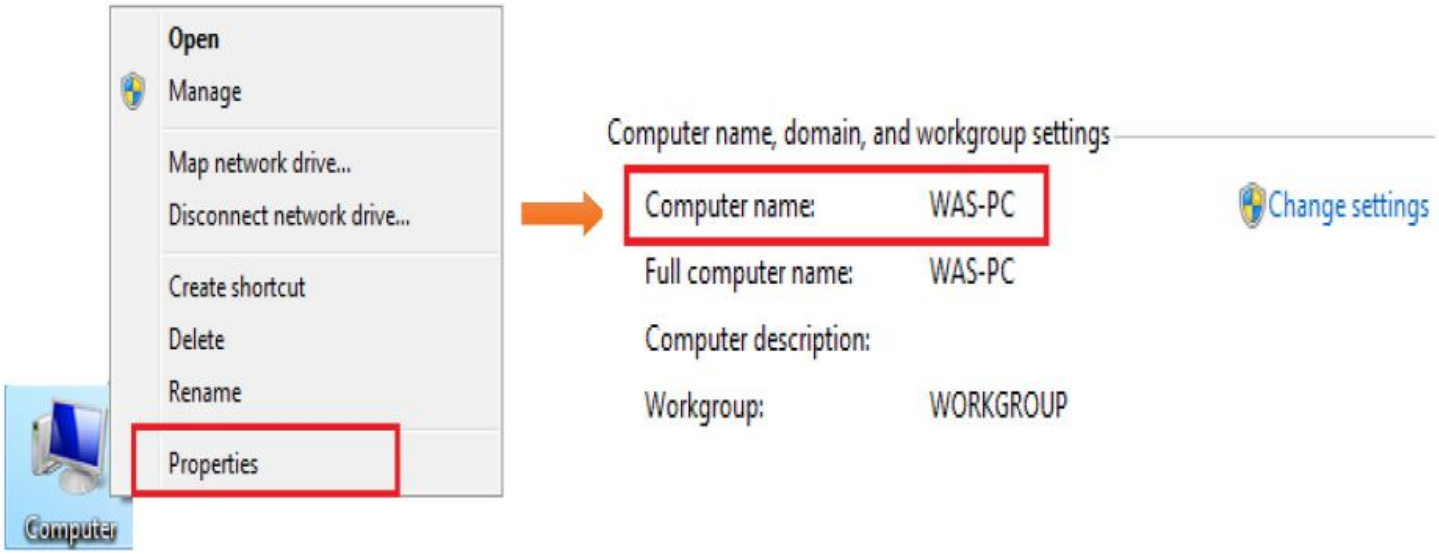
3- Determine permission levels which "Reads" mean reading only and "Read/Write" mean reading, editing and deleting.

4- Click on "Share" button

To know the name of your computer:

1- Right click on "Computer" icon

2- Properties

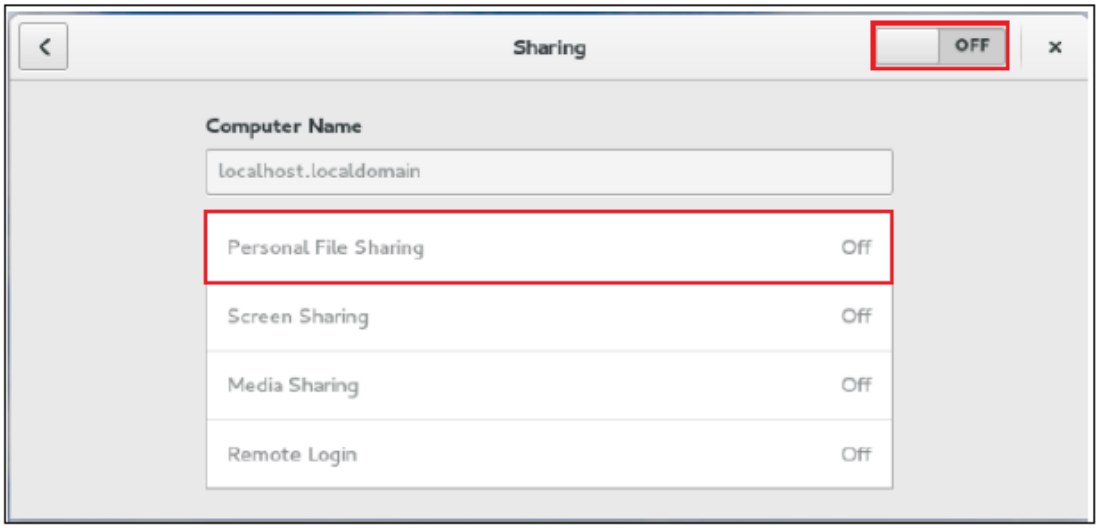


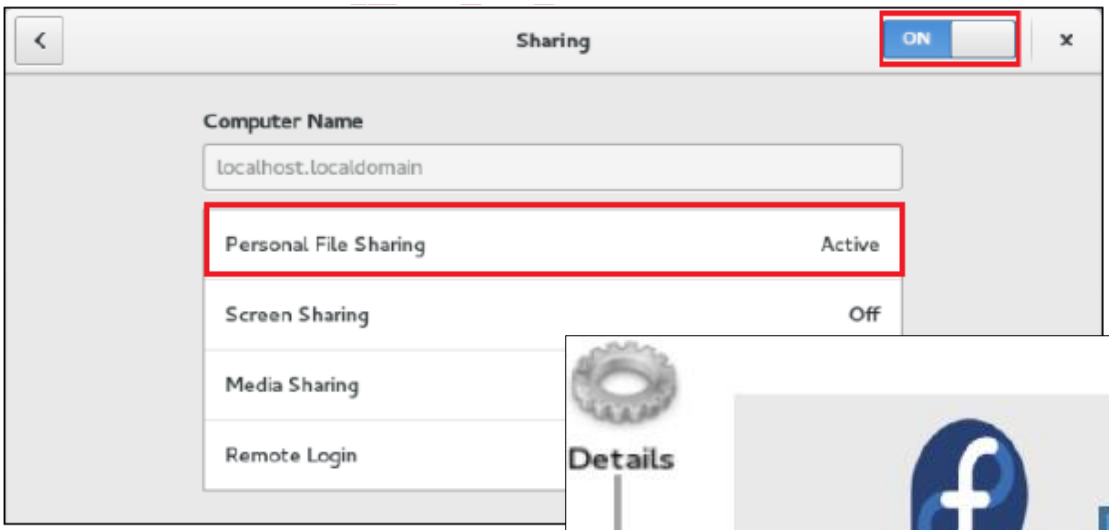
Amel Moussa

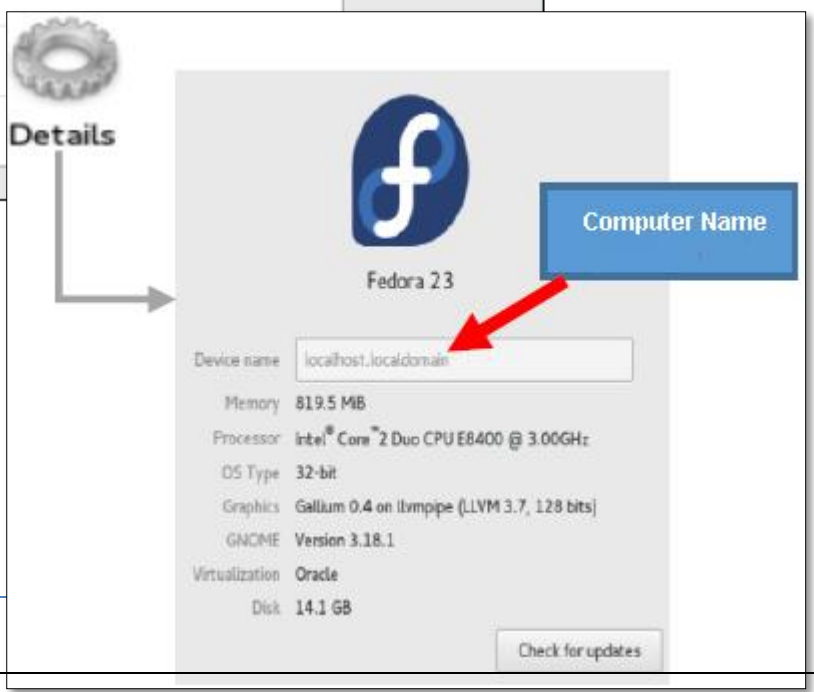
File sharing in Fedora:

1-Click "Activities"

2-Type "sharing" in the search bar







Unit Two

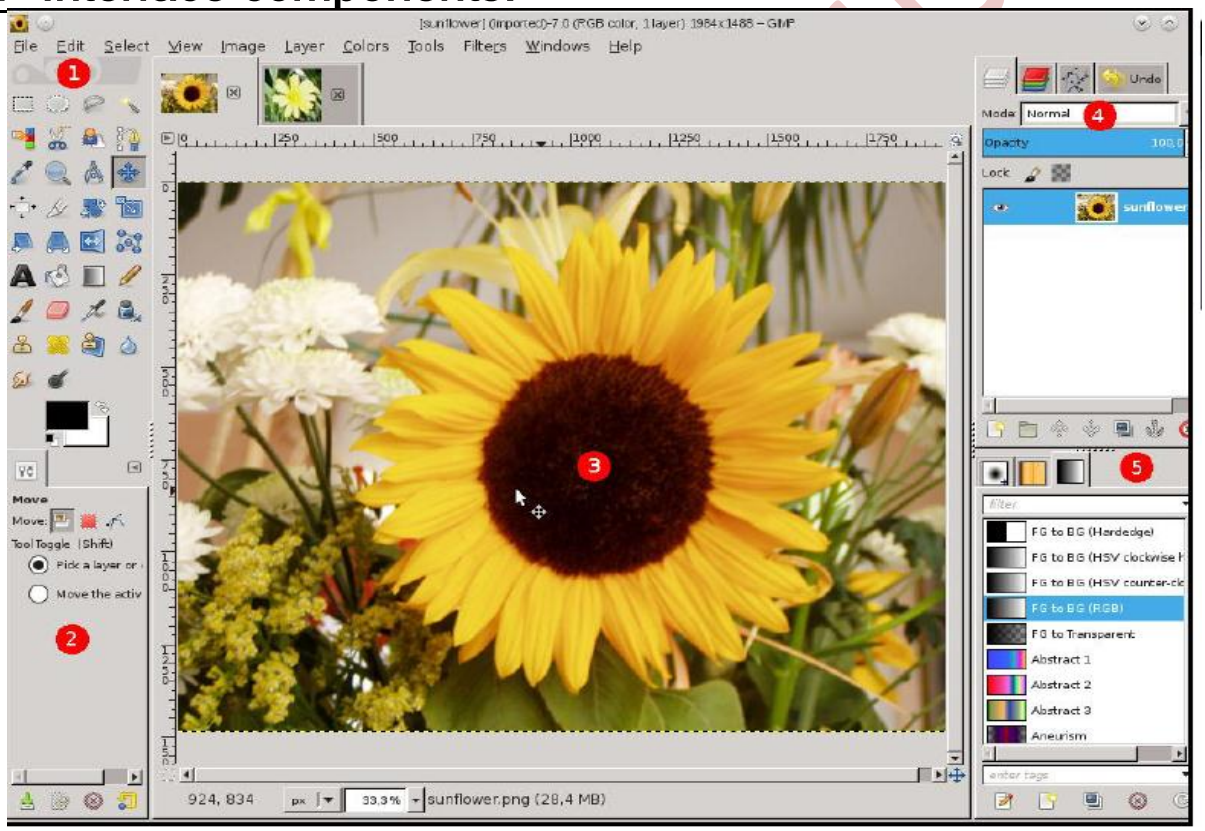
Subject One

Creating and editing images

GIMP is a very popular graphic program, and though not as popular as Photoshop, there are a good many designers who use it as their first choice.

GIMP is open source while Photoshop is closed source.

GIMP Interface components:



1- The main Toolbox

2- Tool options dock

3- Image windows

4- The layers, Channels, Paths, Undo history dock

5- Brushes/Patterns/Gradients dock

Removing Image Backgrounds

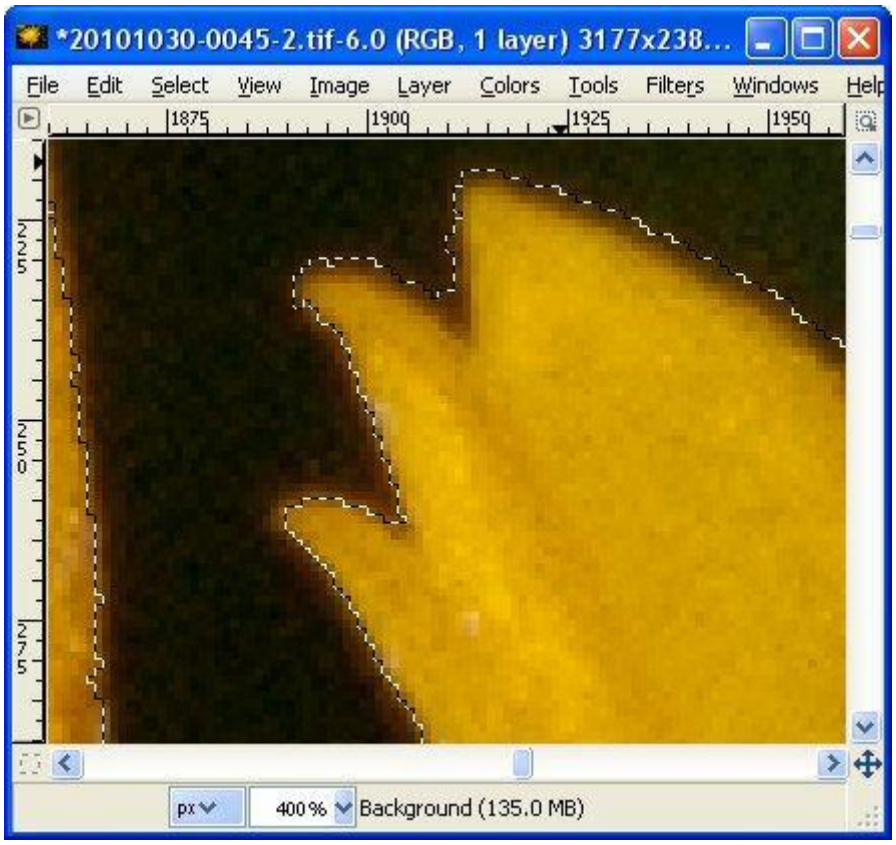
Step 1 - Select the Image Background

Using the **Fuzzy Select Tool** select the part of the image that you wish to remove. The aim is to end up with an image which resembles the one below. You should have the "marching ants" around the area of the image that you wish to keep.

Fuzzy Select Tool

1. Select a large even colored area in the background to start with.
2. Add to the background by clicking on other parts of the background. Be sure to change the Fuzzy Select Mode to "**Add to the Current Selection**" this can be done from the tool options or by holding down the **Shift** key.
3. Once you have selected the bulk of the image background you may you will need to zoom in to finish it off properly. I find that zooming to 400% works well.
4. You will most likely need to adjust the threshold as you go to make the selection more or less sensitive.
5. You may find that you have selected some areas that shouldn't be. This is easily fixed by changing the Fuzzy Select Mode to "**Subtract from the Current Selection**". This can be done from the tool options or by holding down the **Ctrl** key.

Image Zoomed to 400%

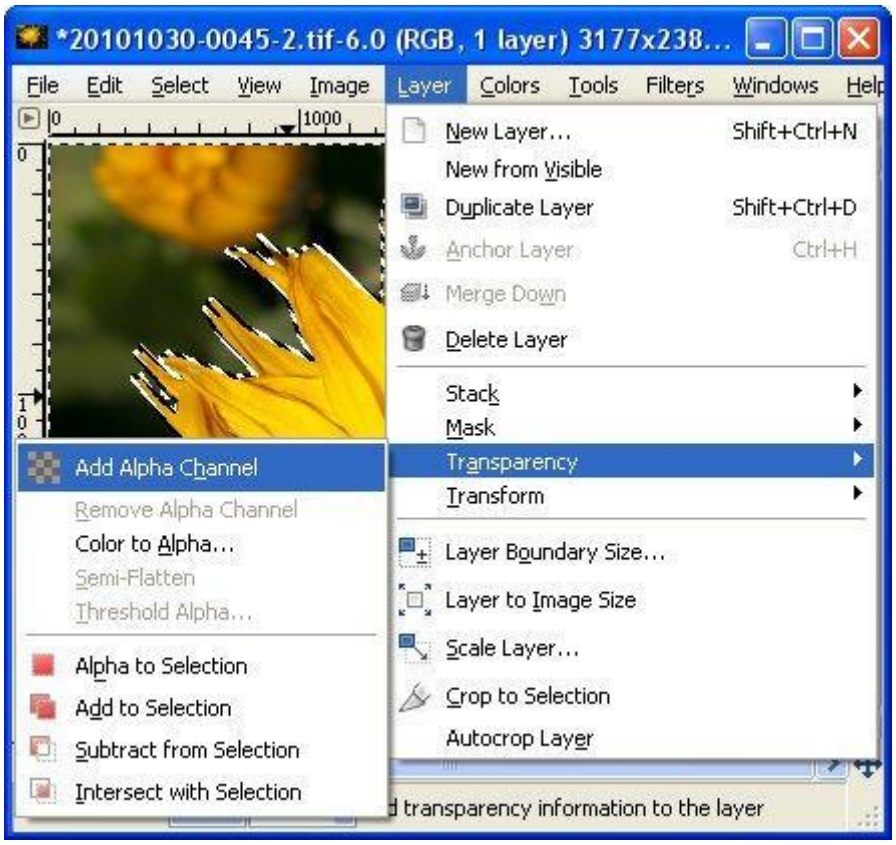


This is what you are trying to achieve around the entire outline of the portion of the image that you wish to keep.

Step 2 - Add Transparency to the Image

Add transparency to the image by using **Layer > Transparency >Add Alpha Channel**. This makes it easy to add another background layer or paste your selection into another image.

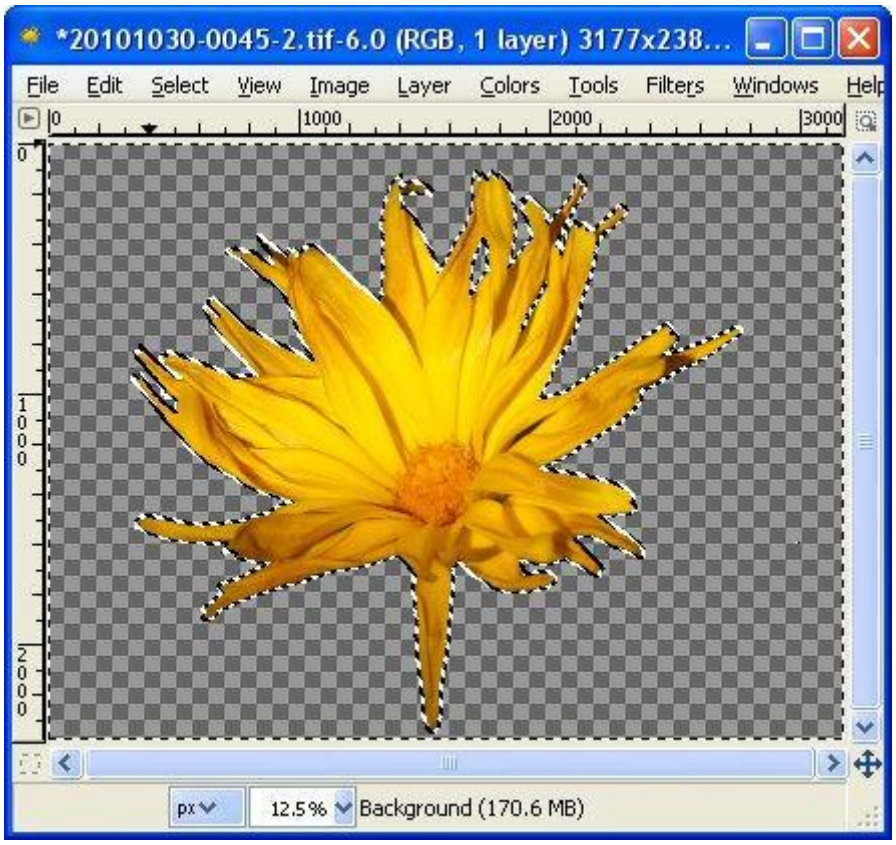
Add Alpha Channel



Step 3 - Delete the Background

Press the **Delete** key to remove the selected background. You should be left with your selection on a checked or transparent background.

Background Deleted



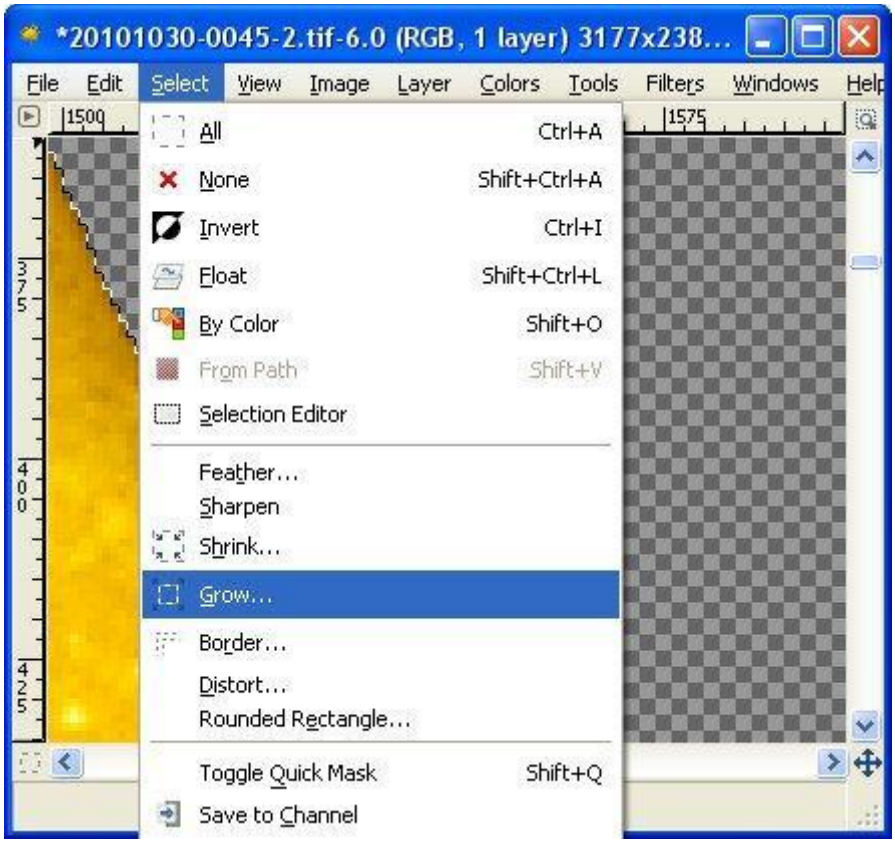
If you were to save the image at this point you would have an image without the background but with jagged edges.

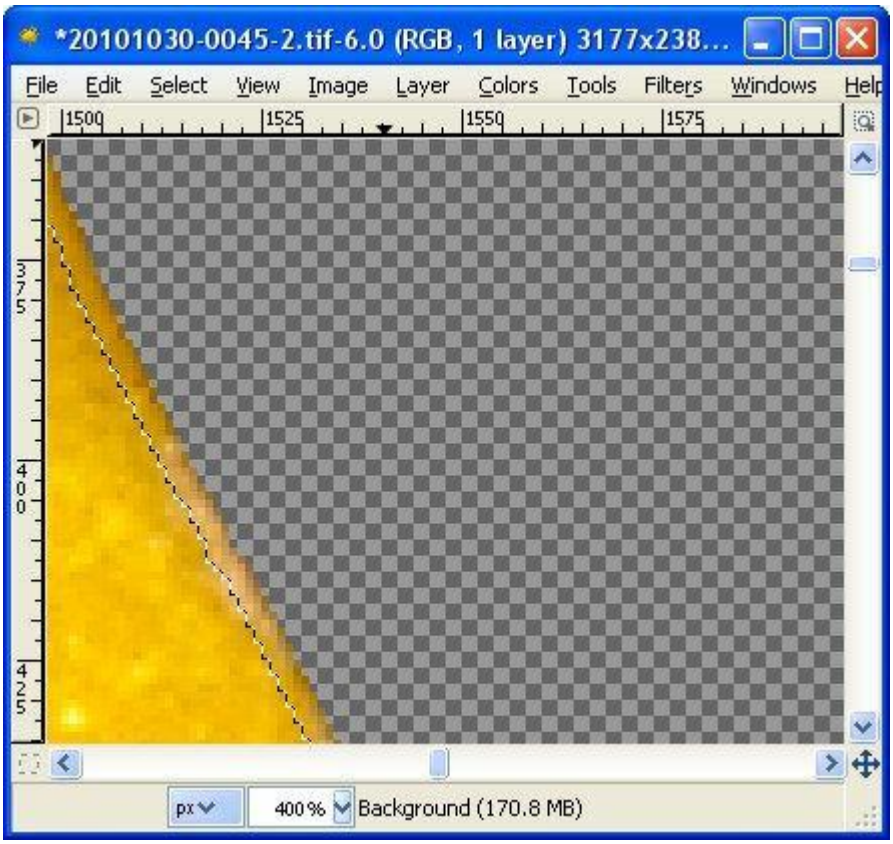
Background Removed and Jagged Edges

Step 4 - Smooth the Edges

Grow the Selection

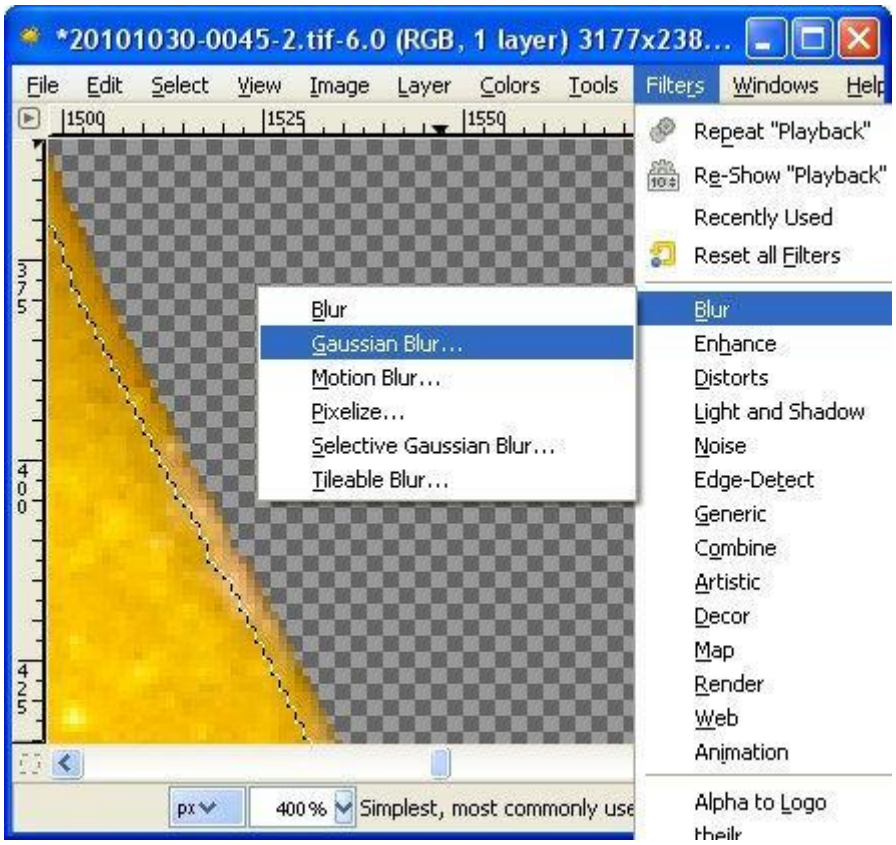
Grow the selection by 2-3 pixels



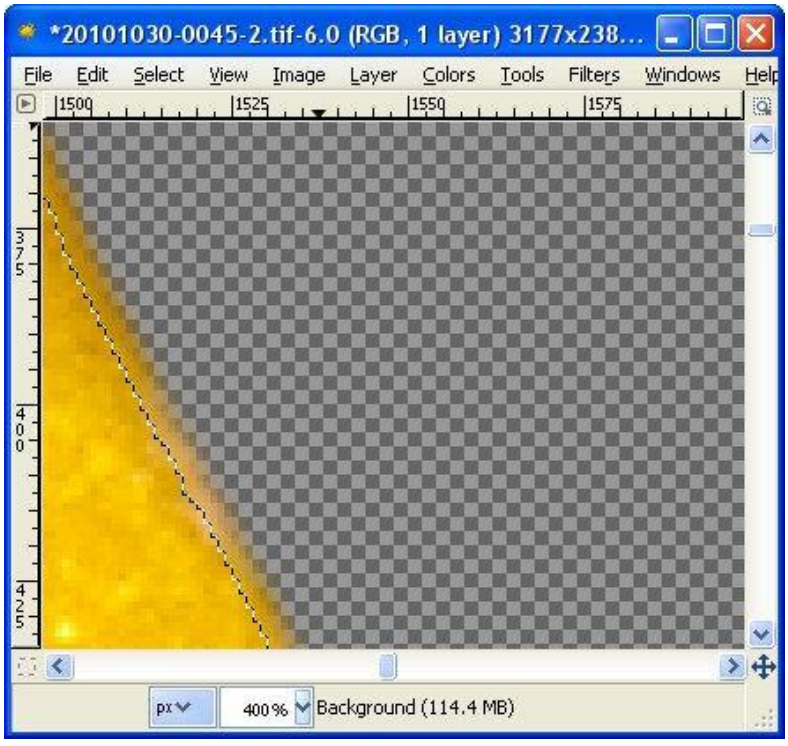


Apply a Gaussian Blur to your Selection

This is done from **Filters > Blur > Gaussian Blur**



Ant aliased Edges after Applying Gaussian Blur



Step 5 - Save the Image

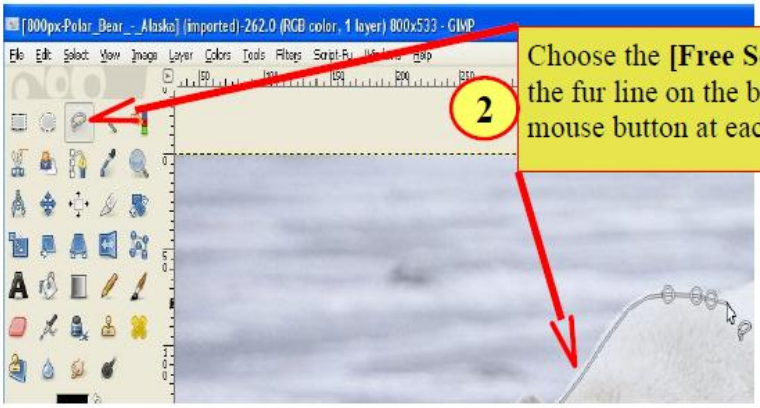
If you are saving the image as a JPG (which you probably would be for display on a website) you will need to select **Export** when prompted as JPG files don't support transparency. The transparent part of the image will be filled with white.

Final Image - Background Removed and Smooth Edges

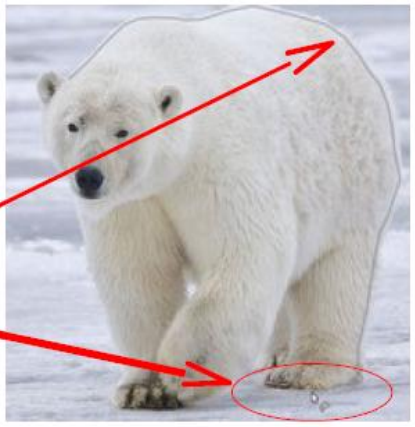
Passing Bear Project

In this tutorial we will take an Arctic Circle Polar Bear from a photograph and place him on a pedestrian crossing in the western suburbs of Sydney.
The trick is cutting the bear from the white Arctic background. This is the main feature of the exercise.

1) Click **[File]** on the menu bar of gimp (then **[Open]**) and load the bear photo. 1
2) Right click the image in the layers channel and add an **Alpha Channel.**

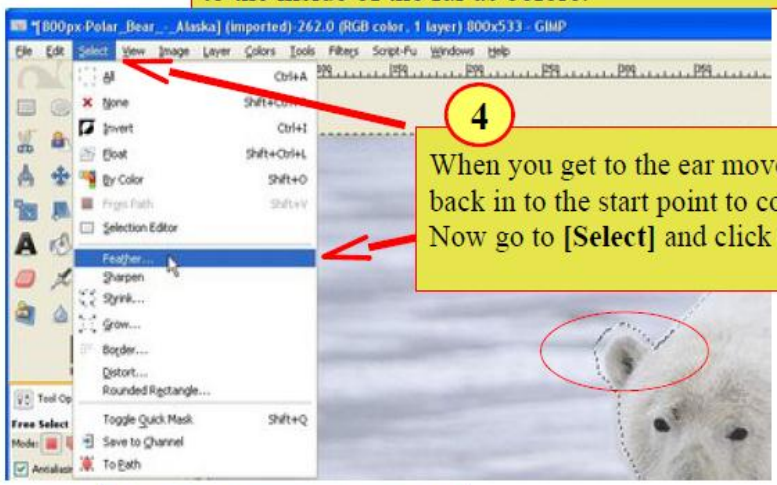


2 Choose the **[Free Select]** tool and make a selection just inside the fur line on the bear move around the bear clicking the mouse button at each turn.

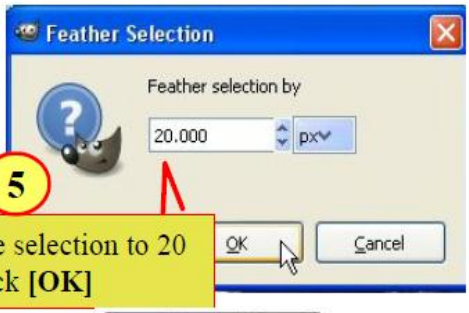


3 Note the selection inside the fur line.

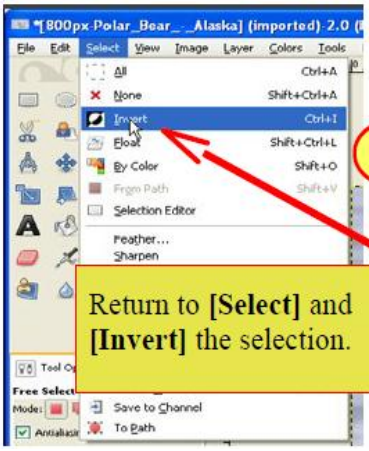
When you get to the feet move out side the fur line and select slightly out from the feet. Then move back to the inside of the fur as before.



4 When you get to the ear move out and away with your selection then back in to the start point to complete the selection.
Now go to **[Select]** and click on **[Feather]**.

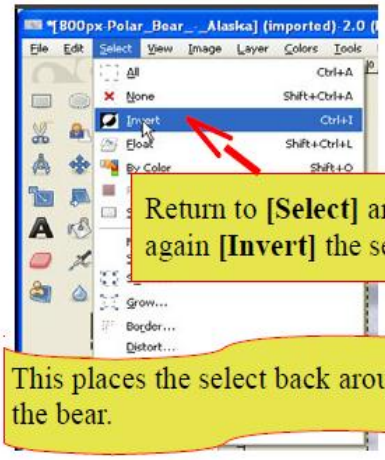


5 Feather the selection to 20 Px and click **[OK]**



6 Return to **[Select]** and **[Invert]** the selection.

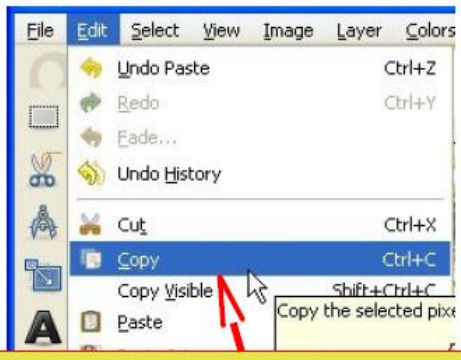
Now press the **[Delete]** key on the keyboard. 7



8

Return to **[Select]** and once again **[Invert]** the selection'

This places the select back around the bear.



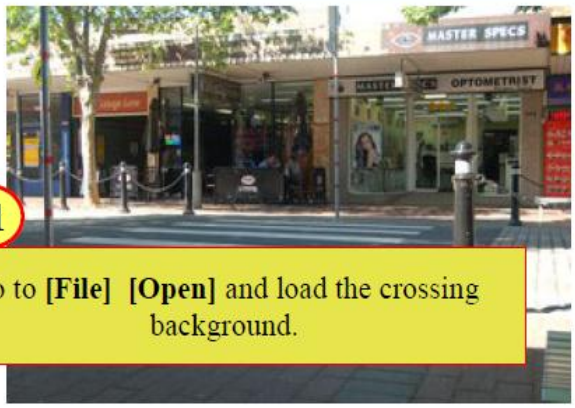
9

Go to **[Edit]** and **[Copy]** the selection to the clipboard.

10

Now close the image of the bear by clicking the **[X]** close button.

Don't Save.



11

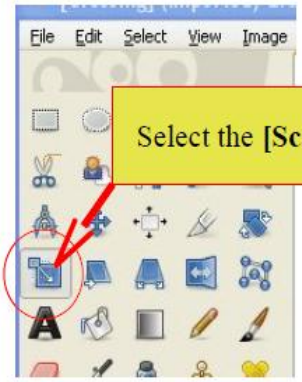
Go to **[File]** **[Open]** and load the crossing background.

12

Go to **[Edit]** and click **[Paste as]** and click **[New Layer]**

Click the **[Move]** tool and move the bear on to the crossing.

13

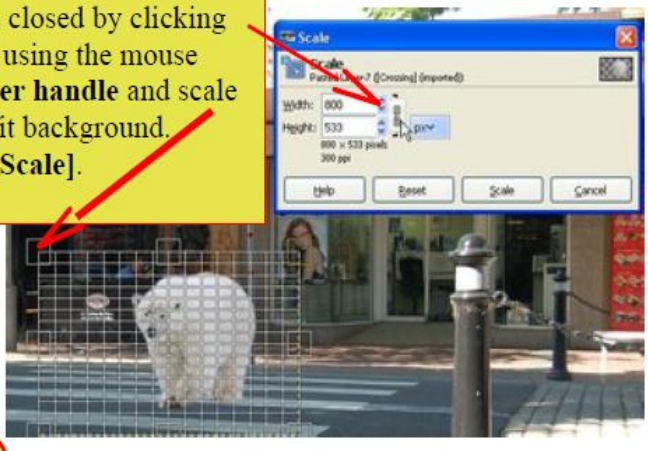


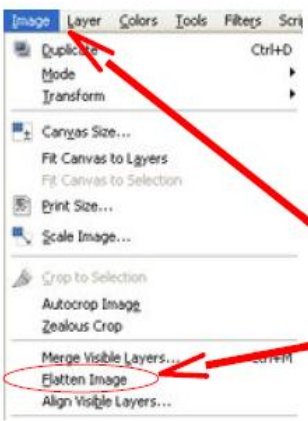
14

Select the **[Scale]** tool

15

Click the bear make sure the chain link is closed by clicking the link and using the mouse click a **corner handle** and scale the bear to fit background. Then click **[Scale]**.





16

Finally go to **[Image]** and click **[Flatten Image]**

Ms. Amel Moussa