Working Files

Revision 1.1

Basic Training in Computer Science™
CS 10.0

Written by John Nash

Adult Life Training, Inc.
An Indiana Not For Profit, Community Benefit, Educational Corporation

Affiliated with
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Forward

This book is written to help you, the beginning computer user, build your first computer job skills. This book is designed to be used as a step-by-step guide during your practice time outside of class. In class we use Linux, and you will notice most things work the same, with a very few differences. This text is written specifically to fit the Microsoft-type systems because at this point in time they are still the kind you are most likely to encounter at home or in the library.

We have come a long way from where we started some years ago. We have helped several hundred people and in this revision we have applied that experience to update this text accordingly. This revision is the first to have an instructor's version available.

You can use this book as a beginning for your computer self-help collection. I hope this helps!

John Nash, President
Adult Life Training, Inc.

Disclaimer

By using this manual you indicate that you understand and agree that this manual is not to be construed as professional advice. Seek the appropriate professional practitioner for professional advice.

Acknowledgments

We would like to thank everyone who contributed to this project: our Fort Wayne community that made room for us to serve, Abundant Life Tabernacle that provides the occupancy for our office and lab, AEP and Abundant Life Christian Academy that provides most of the lab computers, and the Indiana Department of Workforce Development that sends us many of our students.

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But over and above all these, we would like to thank God, who as Jesus Christ gave us a reason to live, and through His Spirit living in us today makes this work possible. He has and is still sustaining us when all worldly wisdom says that we should have been defeated, bankrupt, and disappeared homeless two and a half years ago. By His Grace alone we continue even today.

Donations

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Table of Contents

Goals for this module

This module is intended to teach you fundamentals of computer file systems with enough understanding that you can save and open files as part of your job. When you have successfully completed this module, you should be able to:

1. Explain what a file is

2. Explain how to save and open a file, and what saving and opening is for in the work environment

3. Save a file
4. Open a file
5. Browse to a specified file via a file tree, and open it
6. Copy, Cut, Paste, Delete, and Undelete files
7. Move files between folders

Prerequisites

You must successfully complete the Beginner's module before taking this class. You must know how to perform all basic window operations, including: open, move, resize, maximize, un-maximize, minimize, and close. You must be able to place two windows side by side on the screen to copy and move files between them.

Background

What good does it do to work all day and be unable to save your work? The ability to save and re-open existing letters, spreadsheets, and presentations is a fundamental job skill. In this module you learn what a file is, how it is physically saved in the computer, how to re-open an existing file, and some basics of how to copy, modify, and delete files. This simple job skill is one of the areas that gives technically-challenged people the most trouble in the workplace.

What is a File

How to Save Your Work

> *Work is saved as a "file"*
> *Use menu commands File Save or File Save As*
> *Use File Save tool bar button*
> *Change folders with Save In box*
> *Click Save button or just press Enter key.*

Computer work is saved as a file. If you write a letter, it would be of little significance unless you could recall that work at a later time. Why would anyone spend hours working on a project just to throw it away at the end of the day? Since you are likely chomping at the bit for the bottom line anyway, let us just save a file right now. Later we will explain why this works and how to get around in the computer's filing system.

To save a file we use the File / Save command, the File / Save As command, or the File Save icon (3rd from left, second row on the first toolbar). We will have pictures from Sum Microsystems OpenOffice word processor in this manual, but the behavior is almost identical for all general office programs. The function to save your work is always on the File menu.
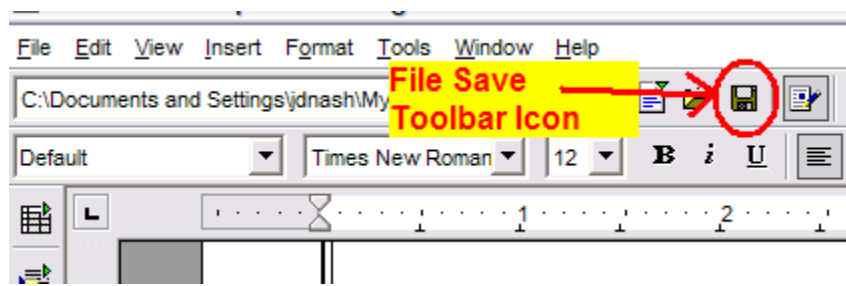
Illustration 1File Save Icon on Tool Bar
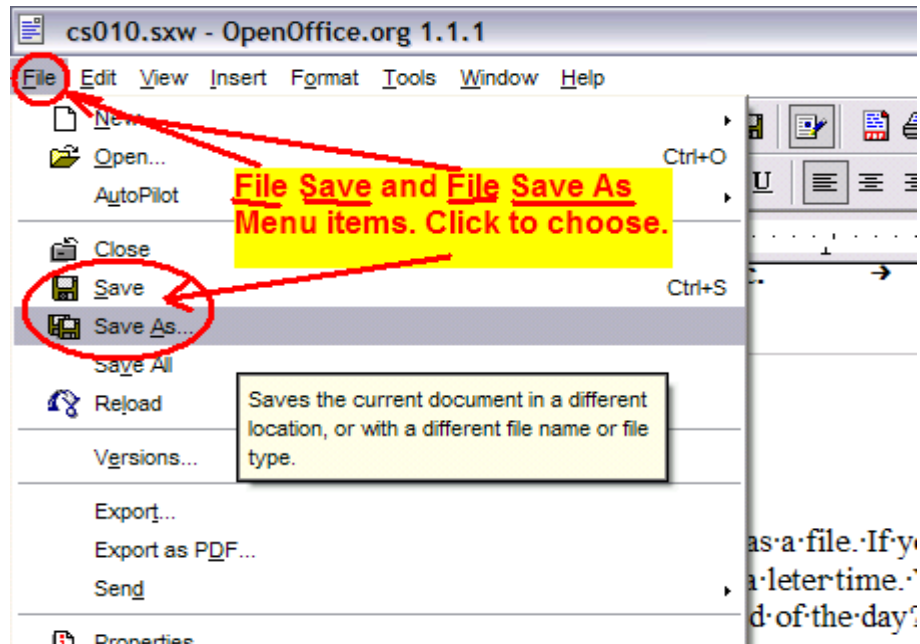
Illustration 2File Save Menu Items

When you click the File Save menu item or the File Save icon on the tool bar, normally the computer simply saves your work with the same name and in the same place as the last time that it saved the file. If this is the first time this particular work is being saved, then the computer will also ask you to name the file and allow you to designate exactly where to save it.
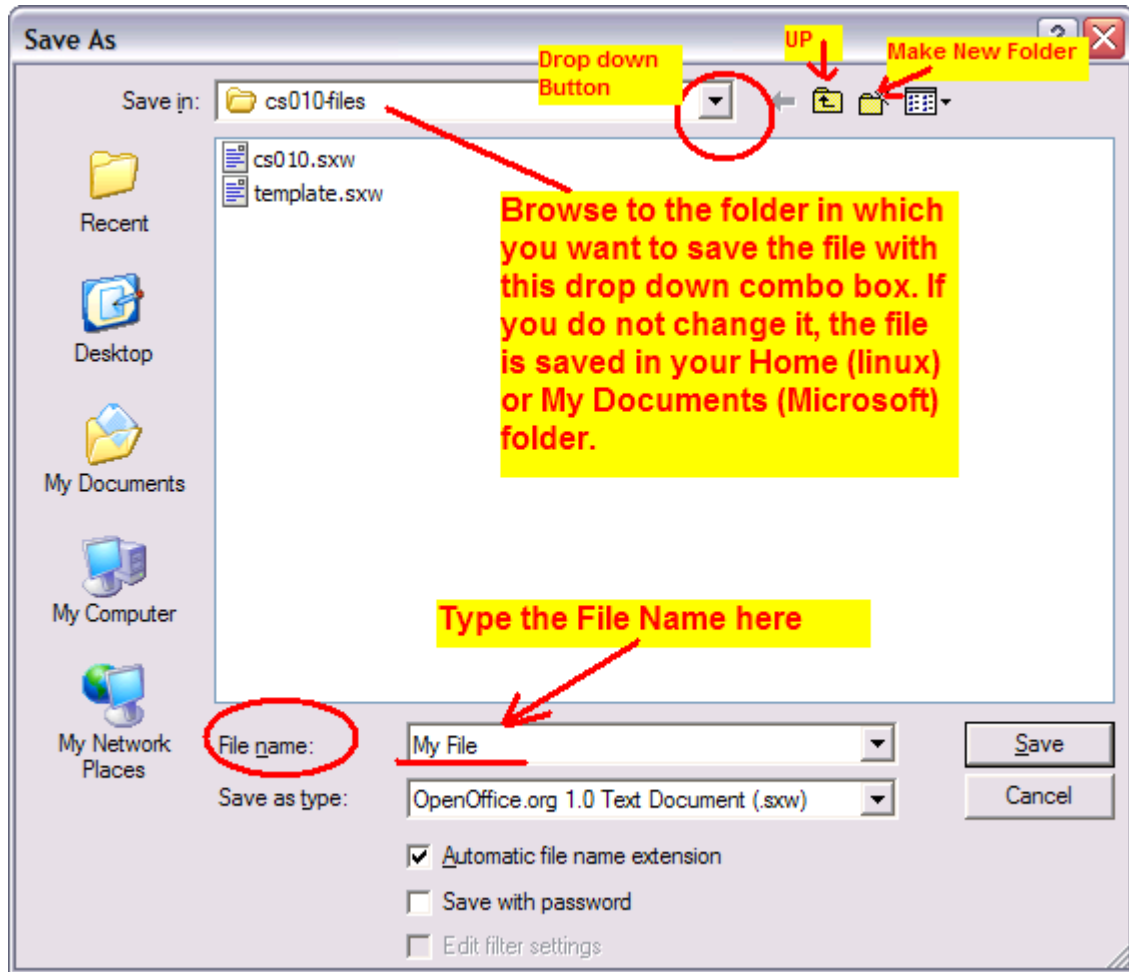
To save the file in a particular folder, use the "Save <u>in</u>:" drop down combo box at the top of the File Save As screen to browse to the desired location, then type the name for the file in the "File <u>n</u>ame" box, and finally click the "<u>S</u>ave" button or simply press the enter key on your keyboard.

Physically speaking

Picture of Hard Disk.

Recording technology: 8-track tape to hard disk

Heads, Tracks, Sectors

File Allocation Tables

A file is like music to your computer's ears

Now that you have saved a file, the pressure should be off. Let us discuss what it actually means to "save a file." I have found that many people have great difficulty picturing what a "file" really is. I have also found that generally, if they can put their hands on a file, then they understand much more quickly.

A file is just a recording on a hard disk. A hard disk is a hard, flat, round disk covered with magnetic recording material. How it works is very similar to how a cassette tape or an eight-track tape works.

Like a tape, but different

If you remember eight track tapes, you could see the tracks on the back of the tape. They were little lines where the tape heads had rubbed the tape. When the tape moved past the heads then the heads picked up the audio signal from the tape. You had eight tracks on each tape, so the tape could hold more music.

A hard disk works like an eight-track tape, but it has many more than eight tracks. A typical hard disk has about 2000 tracks. Instead of a straight tape being pulled past the heads, the hard disk is a round disk that spins past the heads. So, the hard disk is like an eight track tape in that it is magnetic and has tracks, and it is like a record player in that it is a disk that moves in circles.

Heads
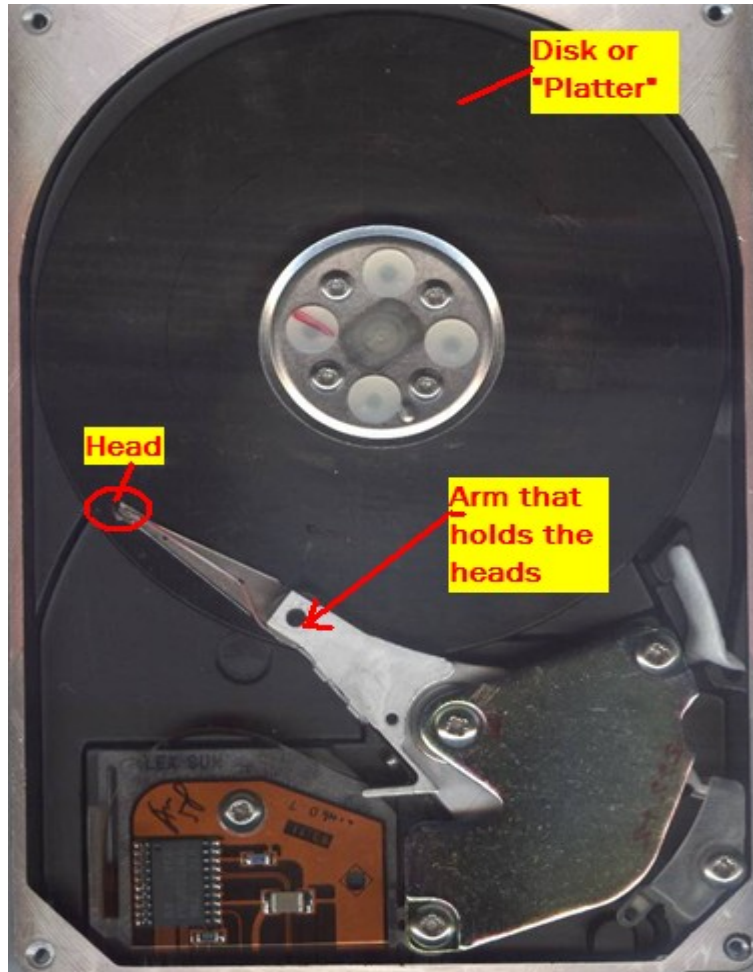
Illustration 4Close up of an actual hard disk showing the disk and heads.

When you were in class, your instructor should have passed around a hard disk for everyone to look at. It shows the internal working of the disk, you can spin the disk, and move the arm that holds the heads. The head is at the very end of the arm and it is quite small – a tiny loop of wire . This loop of wire hovers a microscopic distance above the surface of the disk as the disk spins.

Tracks

If you hold the head still and spin the disk, you should notice that the head would trace out a circle on the disk. This circle is called a track – it is the track that shows where the head has been. If your disk has more than one platter, or round, flat, hard, disk, then you will see that there are several arms, all holding a tiny head at the very end, and all the arms move as one piece. This means that all the heads move together.

Sectors

If you want to find a particular song on an eight-track tape, you must fast forward the tape until you find the song. If you go too then far you must rewind, and you must stop every once in a while and listen to see how close you are. This of course, assumes that you know approximately

where on the tape the song is recorded. If we read files off of a hard disk in this way it would take forever!

A hard disk is divided into pie shaped "sectors" to make it easier to find a file once it has been recorded. The recording starts in the first sector (section of the track) which is empty, and the computer keeps track of which head, track, and sector was used to record the file. When the file is needed later, the computer looks in this "File Allocation Table" (FAT) to see where on the disk to find the file, then reads the file from that part of the disk. This is much faster than reading the whole disk until we find the file.
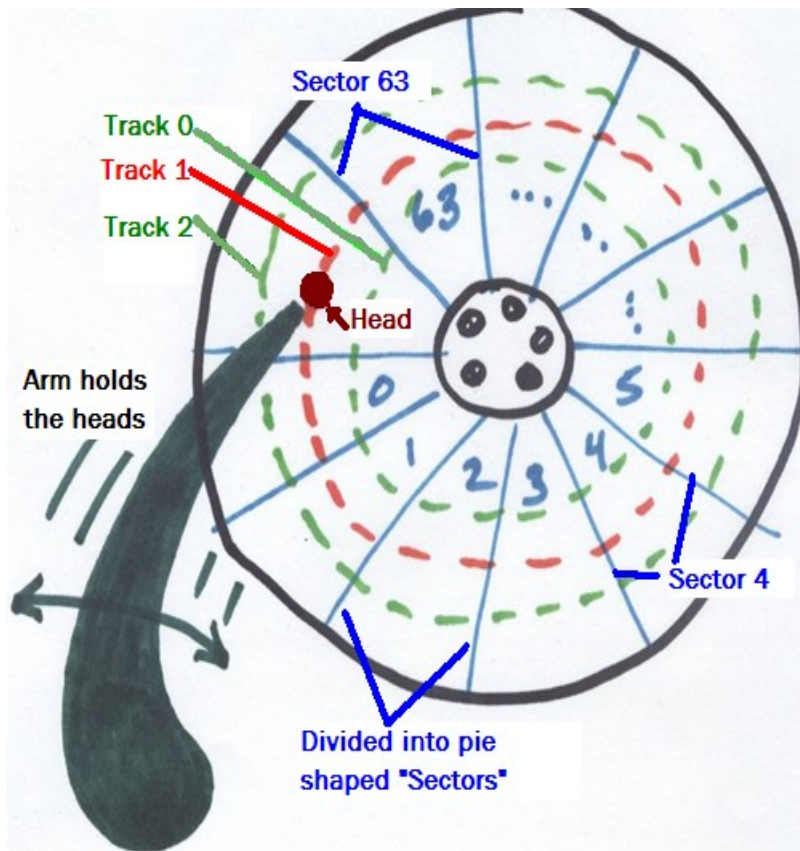
Illustration 5Sketch showing heads, tracks, sectors.

Cylinders

Now if the disk starts recording onto one track, say on the top platter, eventually it will use all the space in that track. The logical thought then may be to move to the next track and record until that track is full, and continue like that until the whole platter is full and then start on first track on the next platter. While this makes sense, it is much slower than the method actually used.

Modern disks spin somewhere around 7,000 revolutions per minute. This means that an entire track can be read in about eight and a half thousandths of a second (8.5 milliseconds). Because the arm that holds the heads is relatively heavy, it takes considerably longer than this to move the heads one track and get ready to write again. Electronics, on the other hand moves at, well, almost light speed.

It is far faster when one track is full to switch electronically to the same track on the next platter than it is to move the heads over one track. This means that the best way to record on a hard disk is to fill up the same track number on each platter before taking time to move the heads over one. We write to track 1 on platter 1, then to track 1 on platter 2, then to track 1 on platter 3, and so on until all the track 1's are full. Then we take time to move to track 2 and fill track 2 on each platter. All the track 1's together are called "cylinder 1." All the track 2's together are called "cylinder 2."
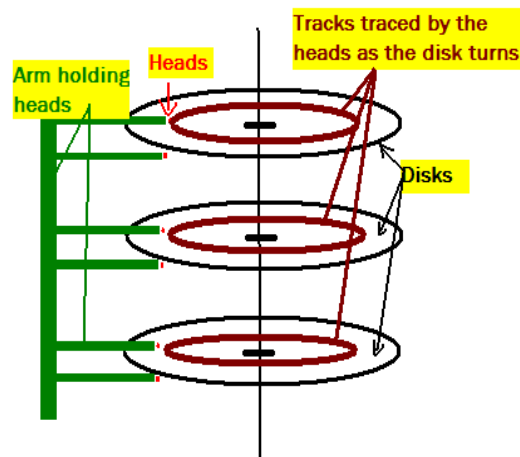
Illustration 7Sketch showing three platters, tracks form a cylinder.

The electronics of the disk handles all the details of actually recording onto the surface of the platter, and it works much like recording music on an audio tape. However, if you play the actual sound that is recorded, it is anything but musical. If you have ever listened on a telephone line that is shared with a fax machine when it is working then you have an idea of what the sound is like.

Hopefully now you have a grasp for the practical side of your computer files system: the files are just audio recorded onto a hard disk. To read the file the computer moves to the place where the file is recorded and "plays" it.

Logically speaking

The Paradigm

We human beings tend to learn new things in relation to what we already know. Our problem solving method is usually to first ask if we have ever solved a similar problem before, and how. Typically when we need to understand a new way of doing things, as when using a new technology, we first ask ourselves how we have viewed similar things in the past.

Computer files systems are one strong example of this behavior. Nothing could be farther from the old way of saving information. Ancient methods included scratches on clay shards (pieces of broken pottery), writing on sheep skins and wood bark, and eventually paprious and then paper. In all these cases, the information was on a different "media" (the clay, wood, or paper) but even in ancient times (3000 BCE) it was organized on shelves in a library. One of the ways that we learn about the most ancient societies is by examining their primitive "documentation" written on clay or clay pottery shards left in ancient libraries.

In our age this same method is still used to store information: book shelves in libraries and file cabinets in modern offices. Up until the small computer replaced the typewriter as a routine fixture in business offices, the file cabinet was the central component in the information storage and retrieval process. This is the same model that we use for information storage and retrieval in most computers, even though we are filing information as an electronic recording on some electronic media instead of scratches or ink on physical (clay or paper) media.

It really shows that the more things change, the more they stay the same!

Into the Breach!

We picture files in the computer as paper documents and folders, and even use a graphical representation of the file cabinet, called a File Tree to show where each item is saved. A file tree is shown in the next illustration.

It begins at the top at at point called the "root" or beginning of the file tree. On a Microsoft system this is a disk drive letter followed by a colon and a backwards slash, such as "C:\". On all other kinds of systems (Unix, Linux, FreeBSD, the Internet, and others) it is simply a forward slash "/". The quote marks are NOT part of what I am showing you here. Why Bill Gates chose the backslash instead of the forward slash I really do not know, but I speculate that he simply had to pick one.

In the illustration that follows, you see a typical tree view for the computer file system. This graphic was captured on a Microsoft system because right now you are most likely to be using Microsoft outside of class, at home or at the library. In class you use Linux, and will see that the file browser looks almost identical to the graphic below. This is the rule rather than the exception – the graphical user interface is about the same no matter which brand of system you are using.
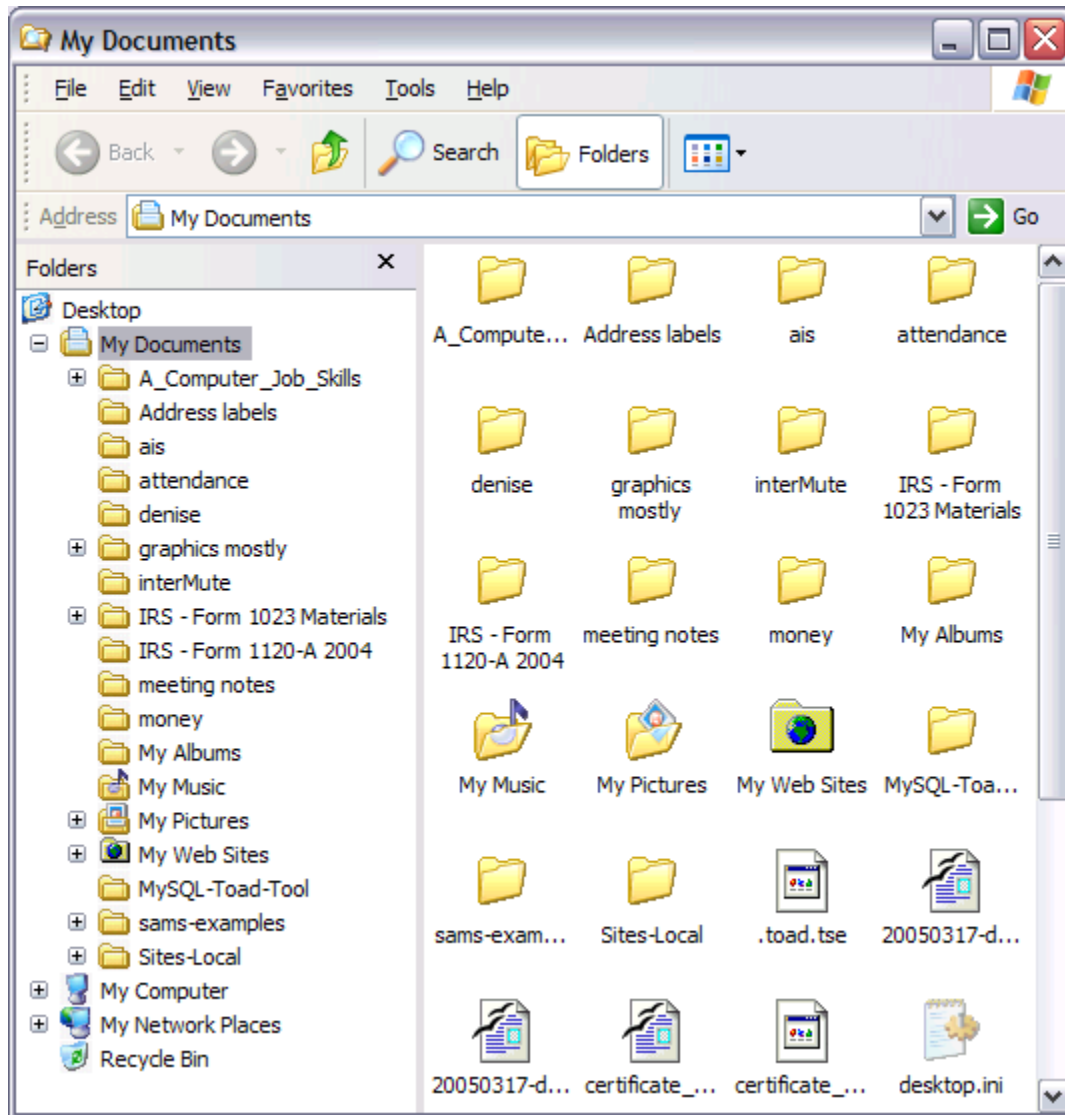
Illustration 8: A File Browser showing the file tree at left and the files at right. Note that the files shown are in the My Documents folder, indicated by the blue background under My Documents in the file tree, and the presence of the folder name My Documents in the Location (Address) box above.

To get this view on Microsoft, click the Y̲iew menu and then select the ICON view.
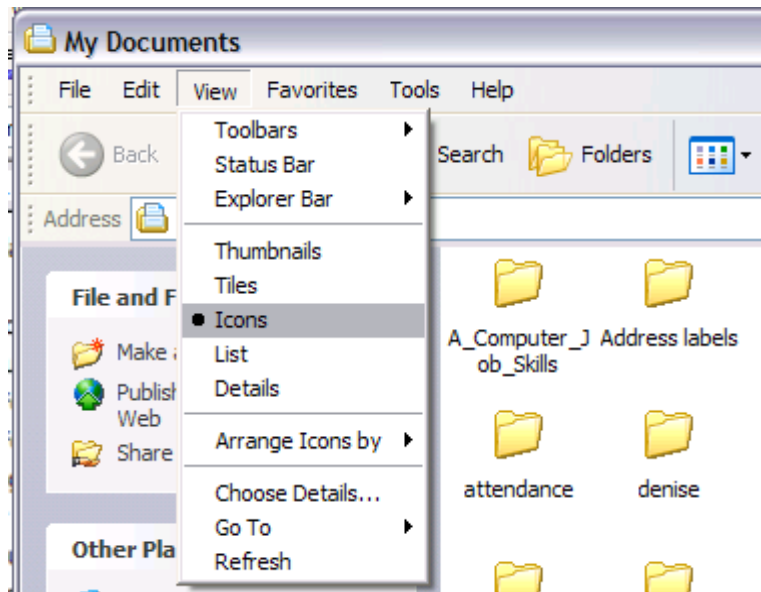
Illustration 9: File Browser with View menu open, showing the Icon view selected.

Click the tool bar button labeled Folders to change the left side of the screen to the tree view.

In Linux, right click on the folder, and choose File Browser from the pop up menu.

Looking at the tree view, we see the computer file system in outline form. When you write a paper or speech you do not simply start typing. First, you *outline* the information that you want to present so that it is orderly and complete. You first list the main ideas. Next you list thoughts related to each main idea under that idea. You indent the minor thoughts under the more significant ones, until you have a complete outline. The indenting helps you to recognize what thought belong to what main ideas.

The outline form is also used to show relationships in the computer file system. In a physical file system you have cabinets, drawers, folders, and documents. In a computer file system you have disk drives and partitions, folders, and documents. We label physical folders with names. We label computer folders with names. We organize physical folders in their drawers. We organize computer folders also.

The photo below shows a physical file system with hanging file folders, holding folders, which hold documents. Note that the hanging file folder marked "People" has three folders in it, marked

Adam, Jackie, and Zach. Those folders also have documents in them. Next we see a graphic of a computer file tree that shows the same relationships.
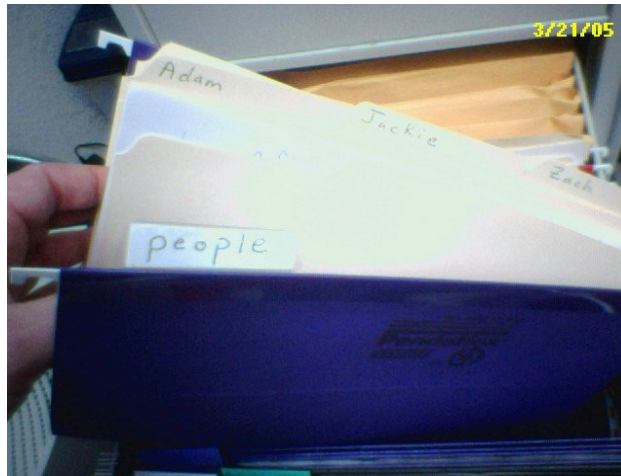

Illustration 10: A physical filing system showing a hanging file named "People" containing folders, labeled Adam, Jackie, and Zach. The folders in the People folder also contain documents and could have additional folders in them.
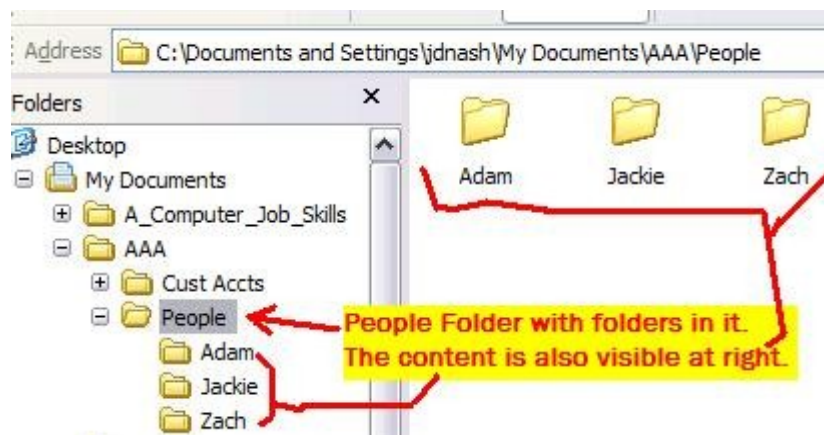
Illustration 11: File tree showing folder named "People" which contains the folders "Adam", "Jackie", and "Zach". Note the Adam, Jackie, and Zach folders are indented under the People folder to show that they are "in" the People folder, rather than next to it in the file drawer.

Now that the main concept has been explained, I would like to explain to you how you move around in a computer file browser. To open a folder, that is to "go down into a folder" you point dead center on the picture of the folder on the RIGHT side of the screen and double click on the folder. To "come back up out of the folder" you click the UP arrow that is above the file tree. Next to this arrow are two more arrows labeled Back and Forward. They work the same way Back and Forward work on an internet browser.

Practice moving in the file tree: click a folder to see its contents. If a single click on the file tree does not work, then use a double click. You must double click a folder in the right hand side of the screen to open it, but sometimes a single click works on a file tree. Click the up arrow to go up (close the folder). Watch where the highlighted area moves on the file tree as you double click a folder to open it and click up to leave it. Note that when yo click UP, the mark on the file tree MOVES up. When you double click the mark on the file tree moves down onto the folder that you just double clicked.

This is essentially all you need to know to move around in the computer file system. The best way to firm up your knowledge is to play with the file browser until you are confortable with it.

Saving and opening files.

Saving and opening files works almost like the file tree – in fact the file tree tends to be a part of the File Save and File Open commands in most programs. Below is a File Save As window from OpenOffice version 2.0 Beta. Type a name in the File name box and then press ENTER or click SAVE. If you want to change the type of file (example, to a Microsoft WORD file instead of the normal file type) then select that in the "Save as Type" box before pressing Save.
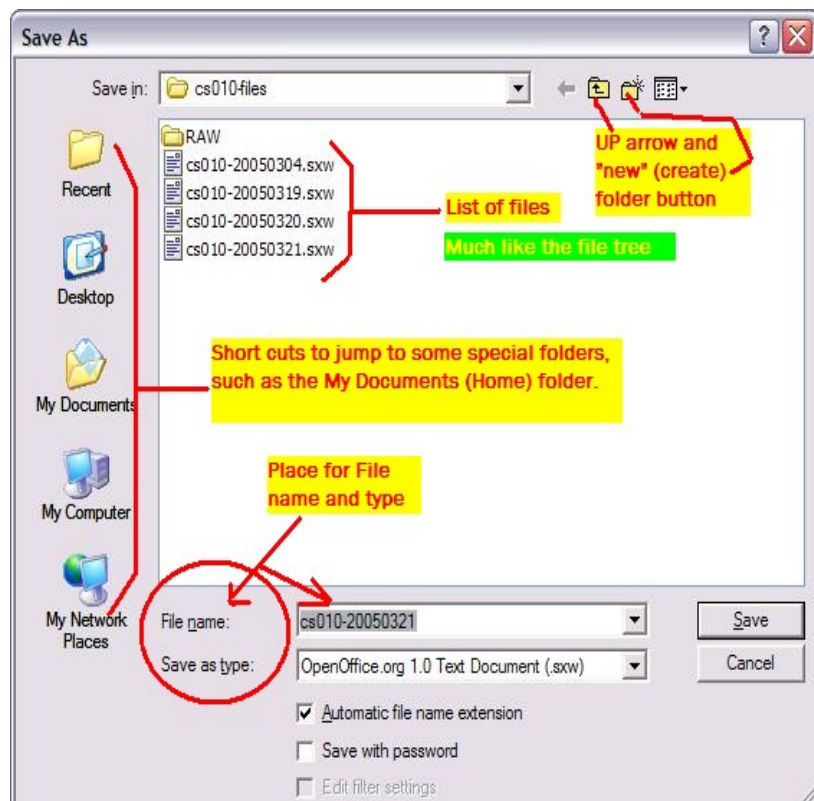
Cut, Copy, Paste, and Moving Files

Your instructor will lead you through the next exercises. Open your My Documents (Microsoft) or Home (Linux) folder by double clicking on it and place it on the right half of your screen. Open your Recycle Bin (Microsoft) or Trash (Linux) by double clicking on it and place it on the left half of your screen. Your screen should resemble the illustration below.
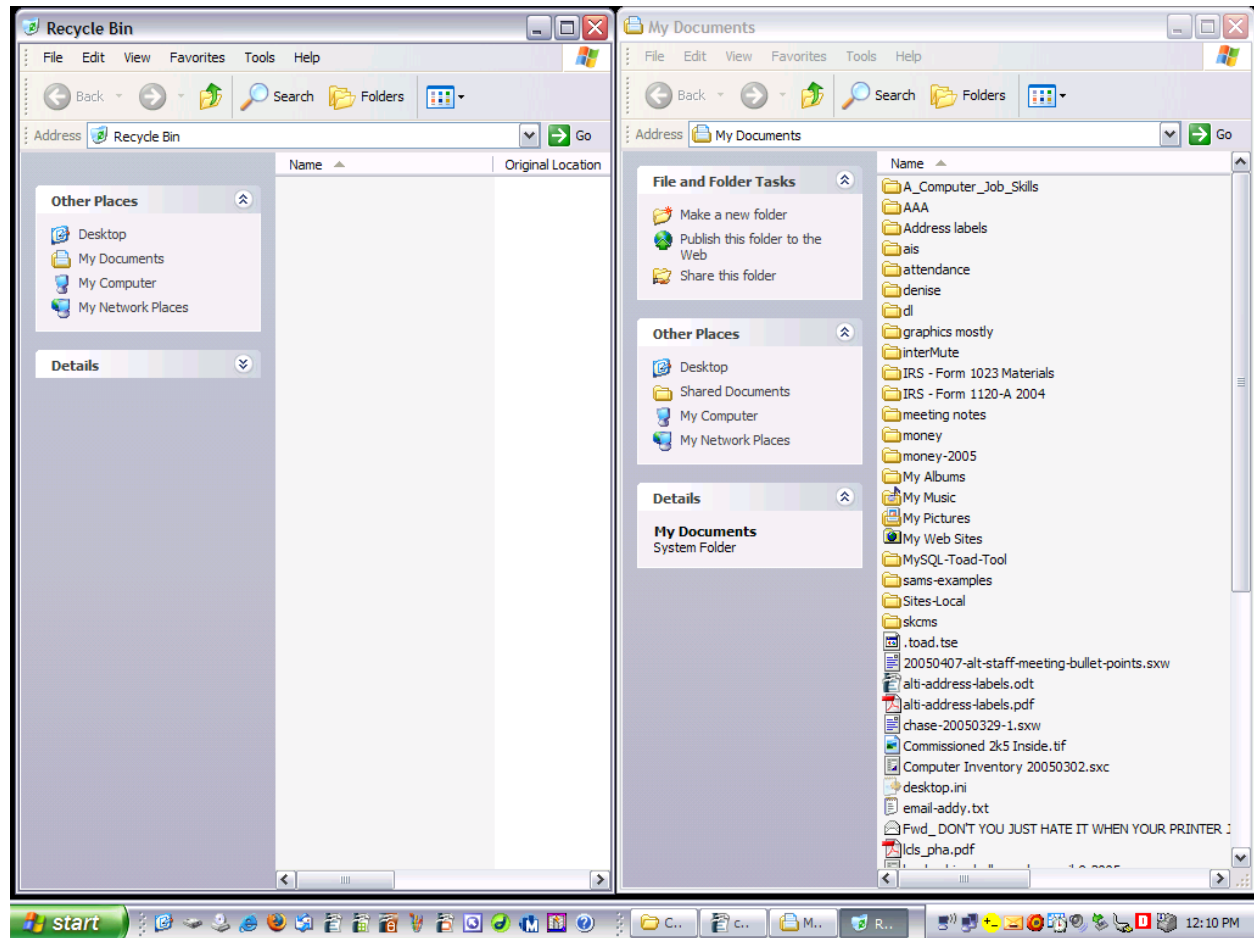
On the right side of this illustration you can see folders (yellow file folders) and files (various shapes NOT like a file folder, such as a white piece of paper.

To delete a file, click on it and press the DELETE key on your keyboard, or right click on it and select Delete (Microsoft) or Move to Trash (Linux) from the pop up menu.

To copy a file, click on it and press Control-C on the keyboard or right click and select Copy from the pop up menu.

To cut a file, click on it and press Control-X on the keyboard or right click and select Cut from the pop up menu.

To paste a file, click in the white space of the window into which you want it to appear and press Control-V on the keyboard or right click the empty white space and select Paste from the pop up menu.

To move a file click and HOLD the mouse button down, then move the mouse to point at a blank white space in the window to which you want to move the file and then release the mouse button. Moving a file is like cutting it from one window and pasting it in the other, but you can do so in one smooth motion. Do not double click the file as that is how you tell the computer to start a program (such as a word processor, to edit the file).

To undelete a file Move (drag) it from the trash can back to the original folder.

Try several of these moves as your instructor leads you in class.

After some practice in these areas, take the test.

Certification Test for CS 010 Files

Review these to test your abilities in these areas in preparation for the certification test. When you feel confident, you may ask the instructor to certify you.

Explain what a file is

1. [   ] Explain what saving and opening files is for in the work environment

2. [   ] Save a file

3. [   ] Open a file

4. [   ] Browse to a specified file via a file tree, and open it

5. [   ] Move files between folders

6. [   ] Copy, Cut, Paste, Delete, and Undelete files

Name : _____

Address: _____

City, State, Zip: _____

Phone: _____

Today's Date: _____

Instructor: _____

Please give this to the instructor so that a certificate may be produced for you.

This is a list of material taught in ALTI classes: some of these are awaiting funding to be transferred into paper documents.

CS 1.0 Working Small Computers
Computer Parts; Output Devices; Input Devices; Mouse, Trackball, or Touch Screen; I/O Devices; Printers, PDAs, and other Peripheral Devices; Notebook, Laptop, and Tablet Computers; To Buy or Build Your Own; Starting the computer; Choices in Operating System.

CS 2.0 Working Computers
Background of the small computer; choices in Operating System; Startup, Use, and Shutdown of the computer; Parts and function of a Window, moving, re-sizing, minimizing, maximizing, un-maximizing, Workspace Switcher; Main Menu, navigation, games, Desktop Background, Screen Saver; Pop-up Menus.

CS 10.0 Files
This is a novice level module required for all students. It discusses computer files, including how they are stored on a computer (physically) and how we think of them (logically). A dismantled hard disk and drawings of the recording schema are used to communicate physical storage (recording) of files. Using the graphical user interface (GUI), files are copied, deleted, undeleted, and moved between folders, on the local computer hard disk and using a Samba ("Windows") network.

CS 6.0 Formatting Text
This is a beginner level module required for all students. It demonstrates how to format text using standard GUI controls. The module is intended to be generic enough to apply to most existing office programs including Sun Microsystem's OpenOffice and Microsoft's Office products.

CS 11.0 Multiple Windows
This is a beginner level module required for all students. It practices multi-tasking on a personal computer. Several windows are opened and the student practices switching between them using the Task Bar, clicking on the screen, and the ALT-TAB keys.

CS 4.0 Working Spreadsheets
Introduction to Spreadsheets. This is a novice level module to help someone who has no experience with spreadsheet programs. The module is intended to be generic enough to apply to most existing spreadsheet programs including Sun Microsystem's OpenOffice and Microsoft's Office products.

CS 3.0 Working Word Processors
Introduction to Word Processing. This is a novice level module to help someone who has no experience with word processing programs. The module is intended to be generic enough to apply to most existing word processing programs including Sun Microsystem's OpenOffice and Microsoft's Office products.

CS 14.0 Working Presentations
Introduction to Presentation software. This is a novice level module to help someone who has no experience with presentation programs, such as Microsoft Power Point. The module is intended to be generic enough to apply to most existing office programs including Sun Microsystem's OpenOffice and Microsoft's Office products.

CS 7.0 Internet (including Internet job searches)
This is a novice level module to help someone who has no experience with Internet browser programs. The module is intended to be generic enough to apply to most existing Internet browser programs including Mozilla Firefox and Microsoft Internet Explorer.

CS 5.0 E-Mail and Web Mail
This is a novice level module to help someone who has no experience with e-mail programs. The module is intended to be generic enough to apply to most existing e-mail programs including Ximian's Evolution,

Thunderbird, and Microsoft's Outlook and Outlook Express. Others may be added as they come into common use in the business environment.

CS 8.0 Instant Messaging
This is a novice level module to help someone who has no experience with Internet Chat programs. The module is intended to be generic enough to apply to most existing Internet Chat programs including Linux GAIM, AOL Messenger, and Microsoft's Messenger.

CS 9.0 Computer Security
This is a General level module to help someone with good working knowledge of the computer and computer programs to understand how viruses and other mal-ware infect a computer and spread, what they do to the victim, and how to affect remediation once an infection is detected.

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