

# Working Computers

Revision 2.0

Basic Training in Computer Science™  
CS 2.0

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**Adult Life Training, Inc.**

An Indiana Not For Profit, Community Benefit, Educational Corporation

Affiliated with

**Abundant Life Church**

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## Foreword

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 both Ubuntu Linux and Microsoft Windows, and you will notice most things work the same, with a very few differences.

We have come a long way from where we started in 2003. We have helped several thousand people in classes just this last year, 2010! In this revision of the Beginner's Manual, Working Computers, we have applied that experience to update this text accordingly with more pictures than ever before, showing both the Linux and Microsoft.

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

John D. Nash, President  
Adult Life Training, Inc.

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## 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 space for our office and lab, A Plus Computers and The Verizon Foundation that provides the lab computers, and Fort Wayne Housing Authority, Volunteers of America, and the Indiana Department of Workforce Development that sends us many of our students.

We also thank Pastor Keller and David Stovall for their continued encouragement and patience, Jordan Nash who most recently edited some of our work and has provided much technical help in the lab, John Nash 3<sup>rd</sup> and Jerrod Nash for their technical help in the lab, Jennifer Nash who has helped with the elementary and middle school material we teach and filled in on the telephones more than once, Jennifer Perkins, Dawn Brock, and Kerri Packer who often have helped with administration, and my patient and loving wife Jolene who has been supportive in so many ways. Starting a business is stressful for a family, but serving our community as an unfunded not for profit, with no salary income for twelve years, creates even more stress. We appreciate your contributions to this important work.

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 years ago. By His Grace alone we continue even today.

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## Goals for this module

This module is intended to help someone who has no experience working with a small computer learn how to start the computer, use a graphic-oriented operating system, and properly turn off the computer when finished. When you have successfully completed this module, you should be able to:

1. Understand choices in operating systems businesses must make today
2. Know the major parts of a computer: monitor, computer, keyboard, mouse
3. Properly start the computer and log on
4. Explain what a Window is and perform all routine window operations
5. Run a program or “Open a window”
6. Personalize the desktop and screen saver
7. Properly shut down the computer

## Prerequisites

This class is intended to teach by instruction and practice how to operate a Graphical User Interface (GUI)<sup>1</sup>, such as Ubuntu Linux, Apple MacIntosh OS/x, or Microsoft™ Windows™.

It is possible to successfully complete this class without prior experience.

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<sup>1</sup> GUI is pronounced “gooey”.

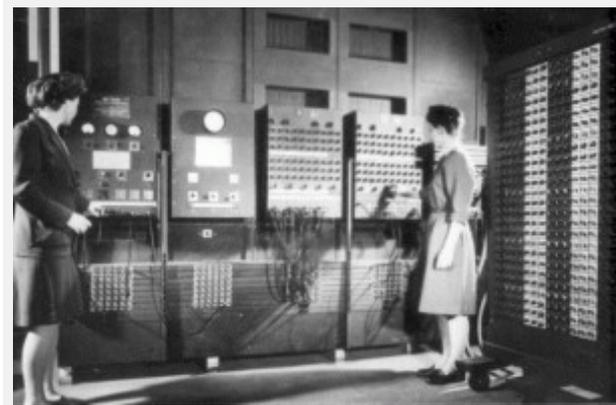
## Background

The discovery and spread of computers has revolutionized our lives much as the discovery and spread of the escapement (clock) movement some 2000 years ago, manufacturing machinery in the 1800s, or assembly line production in the 1900s, revolutionized life in their time. On the one hand, the potential productivity of human kind reached a new beginning with each technology; on the other, the price of this improvement was change.

While large computers, such as [ENIAC](#) and [Univac I](#), were built in the 1940-50s, small computers really were not available to ordinary people until the last two decades of the twentieth century. The story of ENIAC reveals that it was six women who did most of the programming.

Wikipedia says:

The six women who did most of the programming of ENIAC were inducted in 1997 into the Women in Technology International Hall of Fame. [\[13\]](#)[\[14\]](#) As they were called by each other in 1946, they were [Kay McNulty](#), [Betty Jennings](#), [Betty Snyder](#), [Marlyn Wescoff](#), [Fran Bilas](#) and [Ruth Lichterman](#). [\[15\]](#)[\[16\]](#) [Jennifer S. Light's](#) essay, "When Computers Were Women" documents and describes the role of the women of ENIAC as well as outlines the historical omission or downplay of women's roles in computer science history. [\[17\]](#)



Programmers Betty Jean Jennings (left) and Fran Bilas (right) operate the ENIAC's main control panel at the Moore School of Electrical Engineering. (U.S. Army photo from the archives of the ARL Technical Library). This work is in the public domain in the United States because it is a work of the United States Federal Government under the terms of Title 17, Chapter 1, Section 105 of the US Code.

The first small personal computers needed integrated circuits: small bug-like parts that could hold a substantial number of computer circuits in a very small package. When such microcircuits became available, it was then possible to make the Central Processing Unit (CPU), the computer's "brain", on a single chip. The CPU was usually a little less than three-quarters of an inch wide and two inches long. The [Motorola 6800](#), [RCA](#)

[6502](#), [Intel 8080](#), and the [Zilog Z80](#) chips were some of the first widely used CPUs.



Manually designed ZX81 printed circuit board. A later version was made using CAD tools. Public Domain.

When the computer chips came, game computers followed. Eventually, a British computer pioneer, [Sir Clive Sinclair](#), created a small, affordable kit that a computer enthusiast could build himself, the Sinclair [ZX80](#). It was the first popular small computer that could do more than play games; a person could actually write their own programs with it. The ZX80 was a smashing success and a [ZX81](#) quickly followed. Timex

eventually bought the ZX80 series.

By about 1975, several companies began making small computers, with mixed success. I can remember the [Atari 400 and 800](#), the [Commodore 64 and 128](#), the [Pet](#), the [VIC-20](#), the [TRS-80](#), the [Apple II](#), the Intel Prompt 80, the [Southwest Technical Products 6800](#), the [TI 99/4](#), the [Amiga](#), the [Osborne](#) and others. If you are interested you can browse through old computer history at <http://www.old-computers.com>. Our world had already changed forever.

[Dan Bricklin](#) (a student at Harvard Business School) created the [VisiCalc](#) spreadsheet program that revolutionized Wall Street analysis. Dan has a web site with much information he provides on his creation of the world's first "Killer App", VisiCalc, [here](#). The first release shipped in October 1979. Prior to this time Wall Street analysts performed the [analysis for many stocks](#) by hand, mentally adding, subtracting, multiplying, and dividing on black chalk boards that lined their telephone stock brokers' rooms. This was a slow and possibly error-prone process: when a small computer became available that allowed virtually instant updates of these same calculations with perfect accuracy there was no choice: brokers who did not buy the technology would soon go out of business. The VisiCalc spreadsheet only ran on an Apple II, so Wall Street analysts bought Apple computers to run that one program. It is my opinion that this is [why Apple](#)

[Computer still exists](#) today while Atari, Commodore, and most others have faded into obscurity.

Bricklin's achievement is commemorated by a plaque in Harvard Business School's Aldrich Hall, room #108. "In this room, in 1978, Dan Bricklin, MBA '79, conceived of the first spreadsheet program. Visicalc, original "Killer App" of the Information Age, forever changed how people use computers in business."



Dan Bricklin, photographed by Betsy Devine at a blogger brunch in Boston's Chinatown 2/25/2007. This work is licensed under the Creative Commons Attribution-ShareAlike 3.0 License. This licensing tag was added to this file as part of the GFDL licensing update.



IBM 5150 Personal Computer System With IBM 5151 Monochrome Display Keyboard DOS 2.1 Guide To Operations And Basic Manuals. Public Domain.

In November of 1981,

International Business Machines Corporation (IBM) introduced the first IBM Personal Computer (PC). Apple restricted people from making parts or writing programs for the Apple computer to protect its investment, but IBM allowed anyone to make parts or write programs for their PC. Of course, the PC was successful as the most popular computer, but unsuccessful as a for-profit product,

since the entire world began competing with IBM overnight. IBM eventually stopped production of the PC, but it set the world standard for today's small office computers. More information on the history of the IBM PC can be read from the Wikipedia at [http://en.wikipedia.org/wiki/IBM\\_Personal\\_Computer](http://en.wikipedia.org/wiki/IBM_Personal_Computer). Today, IBM is an

industry leader in developing high quality Linux based business systems, from tiny laptop computers to very large main frames.

When IBM was developing the PC, they needed someone to write an operating system (the software program that makes the computer work) for it. Bill Gates was already involved in creating the BASIC ROMs for the IBM PC, and IBM asked him to get an operating system for it as well.

<http://en.wikipedia.org/wiki/MS-DOS> recounts it this way:

*MS-DOS grew from a 1981 request by IBM for an operating system for its IBM PC range of personal computers. Microsoft quickly bought the rights to QDOS (Quick and Dirty Operating System), also known as 86-DOS, from Seattle Computer Products, and began work on modifying it to meet IBM's specification.*

The [http://en.wikipedia.org/wiki/Bill\\_gates](http://en.wikipedia.org/wiki/Bill_gates) gives more details:

*When IBM's representatives mentioned that they needed an operating system, Gates referred them to Digital Research (DRI), makers of the widely used CP/M operating system. IBM's discussions with Digital Research went poorly, and they did not reach a licensing agreement. IBM representative Jack Sams mentioned the licensing difficulties during a subsequent meeting with Gates and told him to get an acceptable operating system. A few weeks later Gates proposed using 86-DOS (QDOS), an operating system similar to CP/M that Tim Paterson of Seattle Computer Products (SCP) had made for hardware similar to the PC. Microsoft made a deal with SCP to become the exclusive licensing agent, and later the full owner, of 86-DOS. After adapting the operating system for the PC, Microsoft delivered it to IBM as*

```

Current date is Tue 1-01-1980
Enter new date:
Current time is 7:40:27.13
Enter new time:

The IBM Personal Computer DOS
Version 1.10 (C)Copyright IBM Corp 1981, 1982

A:\dir>
COMMAND.COM  FORMAT.COM  CHKDSK.COM  SYS.COM  DISCOPY.COM
DISCOMP.COM  COMP.COM  EXEC2BIN.EXE  MODE.COM  EDLIN.COM
DIRBEG.COM  LINK.EXE  BASIC.COM  BASICA.COM  AHT.BAS
SAMPLES.BAS  MORTGAGE.BAS  COLORBAR.BAS  CALENDAR.BAS  MUSIC.BAS
BIMBEY.BAS  CIRCLE.BAS  PIECHART.BAS  SPACE.BAS  BALL.BAS
COMP.BAS
      26 File(s)
A:\dir>dir command.com
COMMAND.COM  4959  5-07-82  12:00p
      1 File(s)
>>

```

A typical command line in PC DOS. This image is ineligible for copyright and therefore is in the public domain, because it consists entirely of information that is common property and contains no original authorship.

*PC-DOS in exchange for a one-time fee of \$50,000. Gates did not offer to transfer the copyright on the operating system, because he believed that other hardware vendors would clone IBM's system. They did, and the sales of MS-DOS made Microsoft a major player in the industry.*

His Microsoft Corporation produced more versions of DOS, and then a GUI shell called Windows. DOS used commands typed on the keyboard to tell the computer what work to do, while Windows used pictures, called Icons, which were clicked with a mouse.

The telephone system relies upon computers. I recall reading a manual from Bell Labs explaining how to use their operating system, which is called UNIX, while I was at Purdue University in the 1970's. This system is designed to let thousands of people use it at the same time, without any of them invading another's privacy, and to run indefinitely (decades) without rebooting. After all, how often do you reboot your telephone? UNIX is a very stable system and it is a very reliable operating system for big computers like those used by the telephone companies. Today Unix, or its relative Linux, are the main computers that run the "insides" of the Internet.



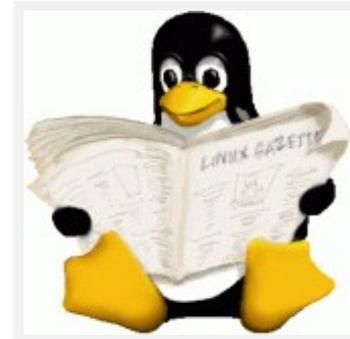
A Linux logo that Linus Torvalds likes. Image is built with The Gimp and Permission to use and/or modify this image is granted by lewing@isc.tamu.edu.

In 1990, a college student in Helsinki Finland, named Linus Torvalds, thought that it would be nice to have something like UNIX that would fit on an 80486 PC computer. There was nothing like it at the time so he wrote one based upon the specifications for Minix to fit on an 80486 PC. Many people liked his program and a worldwide community gathered to use and improve it. Like UNIX, it is very reliable. Though it is not the most common operating system on the front desks in American business office today, it is the most common platform for places that need reliability and security, such as web, email, and file servers, and it is still free because Linus desired his work to be available to everyone.

<http://en.wikipedia.org/wiki/Linux>says of Linux:

**Linux** (commonly pronounced *[/ˈlɪnəks/](#)* [LIN-əks](#) in *American English*,[\[4\]\[5\]](#) also pronounced *[/ˈlɪnɒks/](#)* [LIN-ooks](#)[\[6\]](#) in Europe) refers to the family of [Unix-like](#) computer [operating systems](#) using the [Linux kernel](#). Linux can be installed on a wide variety of computer [hardware](#), ranging from [mobile phones](#), [tablet computers](#) and [video game consoles](#), to [mainframes](#) and [supercomputers](#).[\[7\]\[8\]\[9\]\[10\]](#) Linux is a leading [server](#) operating system, and runs the 10 fastest [supercomputers](#) in the world.[\[11\]](#)

The development of Linux is one of the most prominent examples of [free and open source software](#) collaboration; typically all the underlying [source code](#) can be used, freely modified, and redistributed, both commercially and non-commercially, by anyone under licenses such as the [GNU General Public License](#).



Tux reading a Linux Gazette. Image is built with The Gimp and Permission to use and/or modify this image is granted by [lewing@isc.tamu.edu](mailto:lewing@isc.tamu.edu) and others.



The Oak Ridge National Laboratory's Jaguar supercomputer, until recently the world's fastest supercomputer. It uses the Cray Linux Environment as its operating system. This work is in the public domain in the United States because it is a work of the United States Federal Government under the terms of Title 17, Chapter 1, Section 105 of the US Code.

Common Linux distributions that come to my mind right now are [Ubuntu](#), the most popular version to download for normal people on their desktop or notebook computer and which is the one that we have in our lab here, [Chrome](#) and [Android](#) which are two versions made by [Google.com](http://Google.com) and used in mobile devices and price efficient notebook computers, [MythTV](#) which is a full featured home theater computer reminiscent of a very powerful TIVO setup, [Red Hat](#) which is often used by businesses in their file servers, [CentOS](#) which is often used by businesses in their

file servers who don't want to pay Red Hat for updates, Mandrake (now

called [Mandriva](#)) which is French, [SuSE](#) (now owned by Novell, the business networking giants) which is German, and [Fedora](#) which is experimental. The Linux Distributions typically contain everything needed, including the office software, while Microsoft sells the office software and other parts separately.

*“For years Linux has been the platform of choice in the film industry. The first major film produced on Linux servers was 1997’s [Titanic](#). Since then major studios including [Dreamworks Animation](#), [Pixar](#), [Weta Digital](#), and [Industrial Light & Magic](#) have migrated to Linux.<sup>[87][88][89]</sup> According to the Linux Movies Group, more than 95% of the servers and desktops at large animation and visual effects companies use Linux.<sup>[90]</sup>”* from [WikiPedia.org](#), article on “Linux”.

Most Linux “distributions” are downloaded from the Internet for free and burned to a DVD, CD, or USB memory stick for use, or shipped as a part of a fairly expensive large computer to corporations which can afford to buy them, however some copies of Linux are also sold to normal people at retailers as a boxed product for a small price, usually around \$39.



A multitude of selling prices exist for Microsoft products such as \$20 per DVD for university students, or around \$149 for “Home” editions, or retail prices of Microsoft [Windows™ 7 Ultimate at \\$319.99](#) or [Microsoft Office Professional 2010 at \\$499.99](#) each.

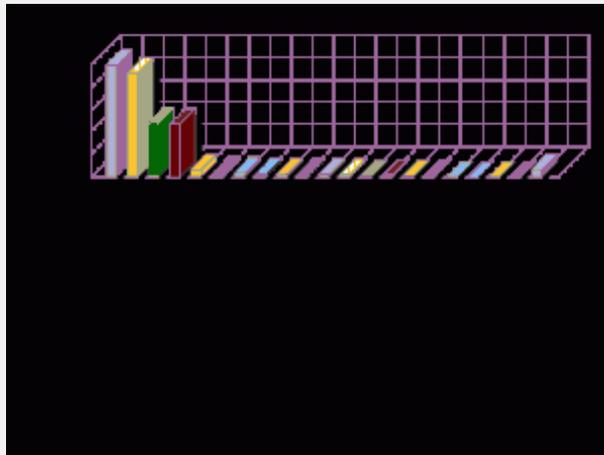
Telephone support is usually included with purchased Microsoft products and sold as an annual contract with Linux, so the monetary cost usually works out to be about the same across the life of the computer.

With the recent economic uneasiness and the expense of buying new licenses some companies and resource starved non-profit organizations are choosing to use Linux instead of Microsoft products. Our web stats from 2010 showed about 30% of the computers calling our web sites were using



The famous Samsung i9000 Galaxy S is an Android Phone. Android phones were the market leader, supplanting Apple's iPhone, in year 2010.

some form of Linux while in year 2003 about 90% of the computers were running Microsoft. Linux is catching on. Microsoft is still very important, but it is becoming less important.



Bar Graph of Web Browser popularity -- the one marked "Safari" is most likely Google Chrome. Click for full size image.

Operating System	Number of requests	Number of page requests
1 Windows	194,882	24,192
2 Linux	55,365	20,730
3 Microsoft Windows	43,884	8,402
4 Windows Server 2003	2,314	688
5 Windows 2000	1,536	573
6 Windows NT	751	308
7 Windows 98	343	188
8 Windows 95	283	136
9 Windows 96	246	112
10 Windows CE	91	36
11 Windows 3.1	85	25
12 OS unknown	48,524	24,281
13 Apple Macintosh	18,789	11,858
14 Unix	79,822	9,388
15 IRIX	79,462	9,953
16 BSD	11	2
17 Solaris	2,888	1,822
18 SunOS	12	2

Statistics from our collection of web sites (17 sites) as of 20101231. Ratio of Microsoft to Linux computers is about 3:1: much more Linux than a decade ago when it was 10:1.

Both Linux and Microsoft Windows can look and act very much alike, the main differences being in the philosophy of the people who produced each product, the expense involved in acquiring the licenses needed to use the products, the expense in keeping

legal records to prove the right to use the software, the persistent risk of being sued or extorted if those records cannot prove your legal right to use that software, the quality of the software, warranties of merchantability and fitness for intended purpose, and (for “free” Open Source software) the legal risk that an here-to-for unknown contributing author will sue the organization for infringement of intellectual property rights against which the organization has not been indemnified.

I really do not know what will happen in the market because there are more costs involved than merely the license cost of the product, but this is clearly a time when prospective employees should be well versed in both Microsoft and Linux software to fit easily into whatever job opportunities arise. With that reality in mind, let us proceed to upgrading your job skills so that you can work with any type of computer system a job opportunity may require.

## Notes:

2. For history please see Asaf Goldschmidt and Atsushi Akera, John W. Mauchly and the Development of the ENIAC Computer, The UNIVAC and the Legacy of the ENIAC, Penn Library Exhibitions



Market Place at Messiah 2010. Photographer Jolene Nash. Used by permission.

<http://www.library.upenn.edu/exhibits/rbm/mauchly/jwm11.html>,  
Department of History and Sociology of Science, University of Pennsylvania.

3. Geek Speak: Read about it from the programmers' perspectives at <http://www.bricklin.com>.

4. To "click" with a mouse, a the very tip of a pointer on the computer screen is positioned directly over the center of the object to be "clicked" and then a button on the mouse is quickly pressed and released, making a clicking sound.

5. Geek Speak: This word is commonly shortened to "distros" in the Linux communities.

6. Geek Speak: Many modern Linux based operating systems are available for free download at their website. Usually, all that is required is to burn a CD from the large downloaded files.

7. <http://www.microsoft.com/business/en-us/products/windows7/default.aspx>

8. <http://www.microsoft.com/business/en-us/products/officeprofessional2010/default.aspx>

## Computer Basics

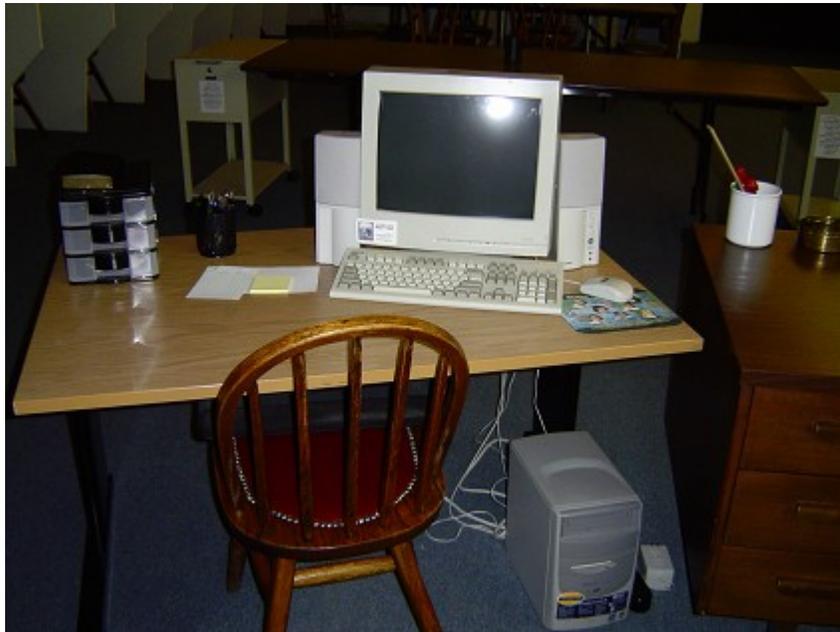
### Prelude

If you were hit over the head in a parking lot, stuffed into the trunk of a car, driven out to the country side, and dumped onto the side of the road, you would probably not sit down on the road and cry “Oh, I don't know where I am!”, “Oh, I just can't figure this out!”, or “Oh, I can't do this! I've never seen this road before!” Most likely, after uttering a few choice comments, you would rub your head and begin looking for landmarks: road signs, nearby buildings, anything you could recognize that would help you know where you are and how to get home. <sup>2</sup>

It sounds ridiculous, but it is exactly what people do when they see a new computer: the color or shape is different, and they immediately throw up their hands and cry : “Oh, I can't do this! I've never seen this kind of computer before!!” And then they get passed up for jobs. Every computer must have certain things – a power button, a display, a keyboard. Those things are your landmarks – you must find them. Once you do find them you can probably work the computer, be it Linux, Apple, or Microsoft flavors. They all must have certain things, and they all work in very similar ways.

### Parts of the computer.

Your instructor will show you actual computer parts through this section. Look at the picture below and find these parts: display, computer (CPU), keyboard, and mouse.

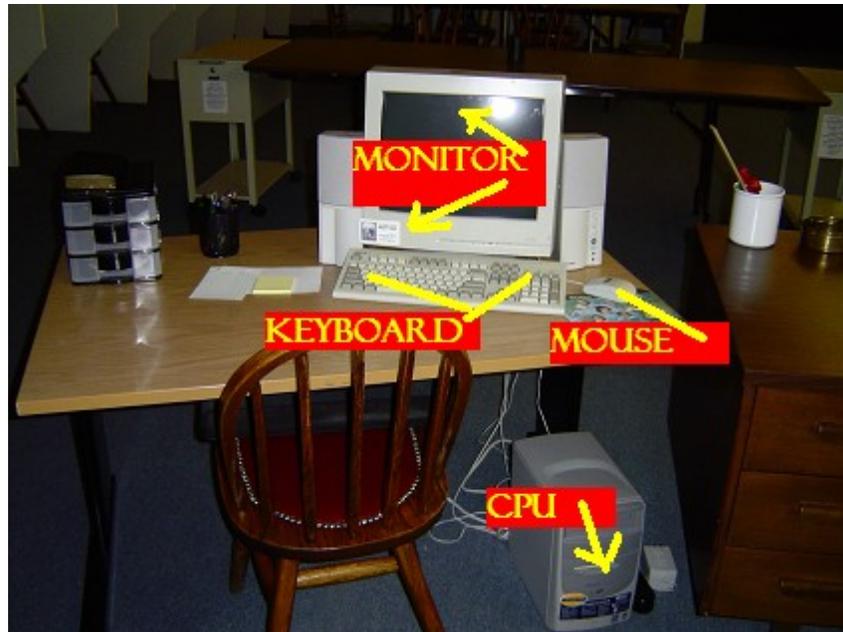


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<sup>2</sup> People have told us that this example helped keep them focus when they were especially stressed in front of a unfamiliar computer during a job interview.

### Display or Monitor

First, the MONITOR (or DISPLAY) is the box that shows the picture. It usually sits on top of another square box, called the computer, or, if the computer is in a “mini-tower” box, the display sits on the desktop. The display has no brains and the display is NOT the computer. A common mistake people make when they are asked to turn on the computer is to push the power button on the display. This only turns the display on or off, and does not turn on the computer at all. We must be careful of this because it makes us look bad if we are trying to turn on the computer by playing with the monitor power button: others around us lose confidence in our ability.<sup>3</sup>



### CPU and Case (“the Box”)

Under the monitor (in the illustration) is a square box that all of the other things plug into.<sup>4</sup> This is the actual computer. The display, keyboard, mouse, speakers, and network all plug into the CPU box, usually in back. Any USB devices, such as a USB keyboard, some new kinds of printers, or a Personal Digital Assistant (PDA) plug into the USB ports, which can often also be found in front of the case as well. The CPU is what has all the computational and storage parts: the main board, the disk drives, and the interface cards.

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<sup>3</sup> Geek Speak: There are two common types of displays available today: the CRT (Cathode Ray Tube) and the LCD (Liquid Crystal Display). The CRT is the old, heavy, and thick type, with the long back. The LCD is thin, and can even be mounted like a picture on a wall!

<sup>4</sup> Geek Speak: A Peripheral is a device the plugs into the computer for input, output, or other functions. Common peripherals: a mouse, joystick, camera, microphone, or scanner.



## The Keyboard



*The keyboard is used for typed input to the computer. The keyboard has evolved from those of early typewriters, with a few keys only used for typing words, to the modern Internet keyboards with keys for cruising the 'net, sending email, and controlling multimedia. Here are the basics.*

### Typewriter Keys

Please find these keys on your computer keyboard.

The first section of the keyboard has stayed pretty much the same since the beginning. It still looks very much as it did on the original IBM Selectric typewriter. It has letters, numbers, and punctuation keys. The **Shift** key is used to print upper case letters or the special characters on the top of the number keys. There is a shift key at the left and right sides of the keyboard.

As you might remember, on the typewriter the **Return** key started a new line. On a computer keyboard this key may be called **Return** or **Enter**, since it is used to “Enter” data or to send a

command. The Enter key is on the right side of the keyboard in the middle, and also at the bottom right of the numeric keypad.

The ALT and CTRL keys send commands rather than print letters. They work like the SHIFT key works: you press the CTRL or ALT key, then, while holding it down, you press and release some other key. To press “Control Z” (CTRL-Z, as we will be referring to it) you press and hold **CTRL**, press and release the **Z** key, and finally release the **CTRL** key. Do not hold the **Z** key down for a long time, just press it and let go.

Holding the **CTRL**, or **ALT** key down will not do anything by itself, just as holding the **SHIFT** key down will not hurt anything. Holding a letter key down will do the same thing as pressing the letter key repeatedly at a rate of about 5 times a second. This is called “repeating” and it is like holding down the “X” key on an IBM Selectric typewriter to make a line of X's.

### Function Keys

Along the top of the keyboard are some keys used for controlling the computer, the Function keys. These keys are marked F1 through F12. Some people get confused when instructed to press a function key. and press the letter “F” and then a number instead. When asked to “Press F1” press the key marked “F1” not an “F” and then a “1”. There are usually 12 function keys across the top of the keyboard, labeled F1 through F12, although there can be more in special situations, such as a custom workstation.

### Escape Key



At the top left of the keyboard is the ESC (escape) key. Pressing ESC will usually close the unwanted windows that pop up when I ask you to *click* and instead you *right click* by mistake. It also lets you escape from typing data in a spreadsheet.

### Motion Keys



To the right of the main keyboard is a set of keys used to move around in spreadsheets and word processing programs. There are four arrow keys at the bottom and six keys together at the top marked **PGUP** (Page Up), **PGDN** (Page Down), **HOME** (go to the beginning), and **END** (go to the end).

## Number Keypad



At the far right side of the keyboard is the number keypad. It is a keypad like you would find on a calculator. This is to make it easier to rapidly enter numbers. The five (5) key has a little bump on it so that you can find your “home” position (your middle finger on the five key) without looking (you can feel the bump with your middle finger). This is like the bumps on the “F” and “J” typewriter keys, which are for the same purpose.

There is a duplicate **ENTER** key where your right pinky finger can reach it, and keys for +, -, \* (times) and / (divide). The **NUM LOCK** key at the top turns on the numbers on this keypad, if it is not activated, the keys will act as arrows, not numbers. In most cases, **NUM LOCK** should stay on. If it is activated, there should be a light above the pad marked “**NUM LOCK**.”

## The Mouse

The mouse is the newest member of the computer input devices. It is held under the hand and rolled smoothly across a cloth pad. Laser mice are also available today, and “air mice” that work by an internal gyroscope, cordless mice, and trackballs that are similar to mice but the rolling ball is on top, not underneath, so they remain stationary on the table when used. Most commonly, however, you will find the typical “rolling ball” mouse in the work environment. Laser mice have nothing to clean, but old-style roller mice have a ball that comes out for cleaning.

### A Typical Mouse on a Mouse Pad



The roller mouse has two rollers inside it, one at the top or bottom and one at the side. A rubber ball rests on these rollers inside the mouse, and touches the mouse pad outside. Moving the mouse moves the ball, which moves the rollers. When the rollers spin, that tells the computer to move the pointer on the screen. A laser mouse simply has a laser shining on the mouse pad or table to notice when the mouse moves.

### The Ball



The ball in a roller mouse is rubber with a heavy metal center. It can be removed by loosening the cap on the bottom of the mouse and turning the mouse over. The ball will fall out. If you forget to put your hand under it it will roll across the floor. Clean the ball with soapy water and dry with a towel. You can also clean the rollers with a q-tip or your finger nail. Laser mice do not have a ball.

### The Rollers



The rollers in a roller mouse are what actually control the pointer on the computer display. If the top roller moves then the pointer moves up or down (vertically). If the side roller moves then the pointer moves right or left (horizontally). In laser mice the laser beam is deflected off of the tiny bumps and dents in whatever surface it is sitting on and that lets it know which direction it is moving. However moving the laser mouse up, down, left, and right still moves the pointer up, down, left, or right. If the mouse is turned sideways instead of straight, then the pointer will move unpredictably on the screen.

Moving the mouse straight up or down will move the pointer straight up or down because it spins the top roller. Moving the mouse to the side will likewise move the pointer to the side. Moving the mouse at an angle will move the pointer at an angle. What do you think happens if instead of holding the mouse straight, someone holds it sideways? Will the pointer move in the expected way?

### *Holding the Mouse*

Hold the mouse straight with your first two fingers resting straight over the top of the two buttons. Do not push the mouse with one finger or let your fingers move sideways across the mouse. Pushing the mouse away from you moves the arrow cursor on the screen up, to your left moves it left, toward you moves it down on the screen, and to your right moves it to the right.

### *Cleaning the Mouse*

When the mouse moves, any dirt on the mouse pad (or the table if a mouse pad is not being used) gets on the little rubber ball. From the ball it gets onto the rollers. Once on the rollers it sticks and forms a paper like band that does not let the roller spin well. On the computer screen the pointer skips around more and is harder to control. You can fix this situation by removing the ball, washing it, and removing the “paper” buildup from the rollers with your finger nail. If the buildup is gummy instead of papery, you can use a q-tip and some water or rubbing alcohol.

### *Left-clicking or just “Clicking”*

Press your first finger down to click. You will hear a faint click sound when you click. The click must be *crisp*, sharp, quick: a fraction of a second. Most of the time when you are asked to “click the mouse”, the instruction will be referring to a left-click. The exception is that to get a pop-up menu you right-click.

### *Right-clicking*

Press your second finger (ring-finger) down to click. You will hear a faint “click” sound when you click. You will right-click to get pop-up menus, but not for anything else. To activate programs or select a menu item you always left (normal) click.

## Dragging

You move things on the screen by dragging them around. First point to whatever you are trying to move with the sharp, pointy tip of the arrow pointer on the screen, like you are stabbing a marshmallow. Next click and hold (press the mouse left button) but **DO NOT RELEASE THE MOUSE BUTTON**. Hold the mouse button down and move the mouse to point to the new location for whatever it is you are dragging around the screen. When the object is where you want it, then release the left mouse button. This is called a click and drag, or simply dragging.

## Other Computer Parts

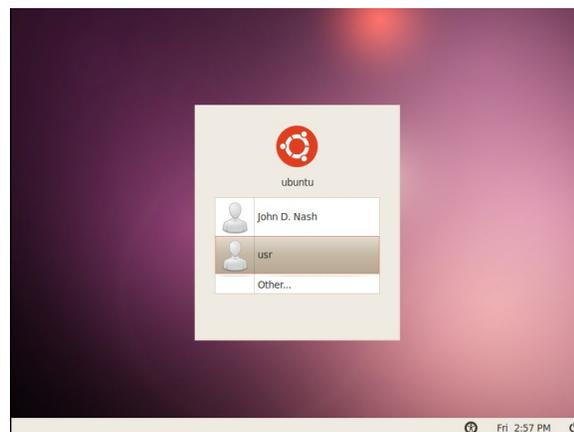
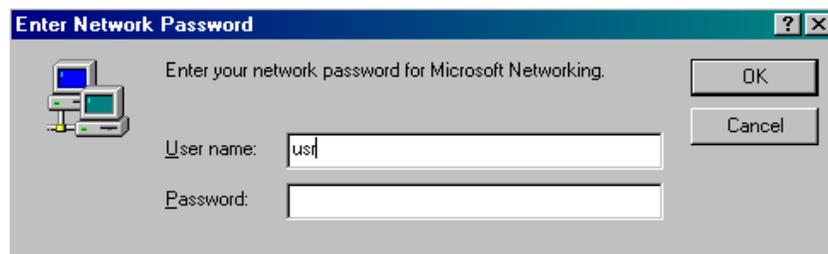
### Computer Power Switch:

Before a computer can be used it must first be powered on. Be sure that all of the computer cables have been attached to the computer before turning it on, and that the computer is plugged into the wall outlet.

Find the power switch or power switches on your computer. New machines usually have two buttons on the front, one for power and the other to reset the computer. Usually the bigger one is the power, and the smaller one is reset. Pressing the reset button does *almost* the same thing as turning the computer off and then back on, immediately. Sometimes there is another power switch on the back, and if there is one, then it must also be on to use the computer.

Press the button or switch to power up the computer. The computer should start up.

## Login



After the computer starts, you will probably see a login box, especially if your computer is connected to a network. This feature can be turned off if you are not part of a network, but most places today will require their employees to log in for control purposes. The login screen might be some pictures to click the login, or boxes into which you type the login. If there is no login box then you should be logged in and ready to use the computer, so you can skip to the next step.

The login box in the illustration above is for a Microsoft computer. If you are using Microsoft you see two edit boxes for typing. Type the login name that you are assigned by your employer in the box marked “User name:”, and then type the password you are assigned in the box marked “Password:”. The computer shows little stars instead of the letters you type for your password, so that no one can read your password over your shoulder. Type accurately or it will not let you in. When both boxes are filled in correctly either press ENTER or click the OK button.

If you are using a Linux system you might see one box at a time. Type in the login name that you are assigned in the box marked user name, press ENTER and then you will then see the password box. Type your password in the box marked password and press ENTER again. The computer shows little stars instead of the letters you type for your password, so that no one can read your password over your shoulder. Type accurately or it will not let you in. Pay attention to the label next to the box so that you do not enter a password in the user name box or vice versa.

### *Why Bother with a Log In?*

A network is a special arrangement of wires and electronic boxes usually found in offices today, to allow computers and people to communicate. The network allows a business to share printers, Internet, e-mail, and other expensive resources instead of buying a separate one for every employee. It also allows the employer to track everything that you do on the computer – every e-mail you receive, every Internet page that you view, every file that you use. Do not fall into the trap of using your work computer for personal reasons.

To login to a computer one uses a user name or login ID and a password. The **user name** is a computer name given to you by your employer so that you may use the computer. Usually it is the first letter of your first name, followed by your entire surname. If your surname is long, then the last part of it may not be included in your login name. Your employer will take care of the details. Other login name schemes are also used.

Example: The employee’s name is John Nash. A typical login ID would be “jnash.”

Your employer also assigns the **password** to you, but sometimes he will allow you to change it to a trick word or phrase of your liking. Sometimes it matters if the letters are upper case (capital letters) or lower case (little letters), and sometimes it does not. Always try to type exactly what you are told.

You should never share your password with anyone else, because it protects you. If someone else has your user ID and password then he or she can login to the computer as if they were you, and do anything that you can do. It would look as if you did it. If my user ID is usr and my password is let-me-in, then to login I would answer the Windows prompts like this:

USER ID: usr  
PASSWORD: let-me-in

If your instructor gives you a login you may write it down here or on one of the post-it notes provided. It is a good idea to change your password every so often, such as once a month. At work, DON'T write your password on a post-it note and stick it to your computer. One of the biggest security breaches in banks was not hackers guessing passwords to break into the bank computers, but rather bank managers sticking passwords to their computer screens that could be read by anyone passing by.

All of the computers in this lab use:

User ID: **usr**  
Password: **let-me-in**

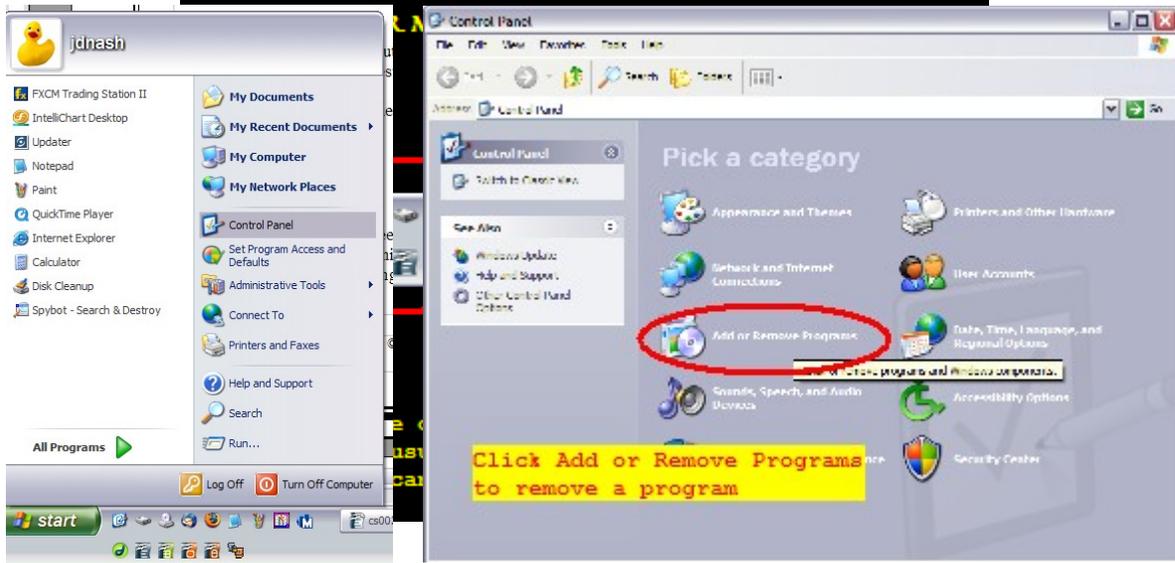
## Navigating the Desktop

Now that you have your user interface (“Windows<sup>TM</sup>”) up and running, take a moment to look around. You should see a few *Icons* (pictures that start a program) on the screen. Under each icon is a *title* or a short description or name of what the icon does. The whole screen is referred to as your *desktop*. The gray bar across the bottom is your *Task Bar*.

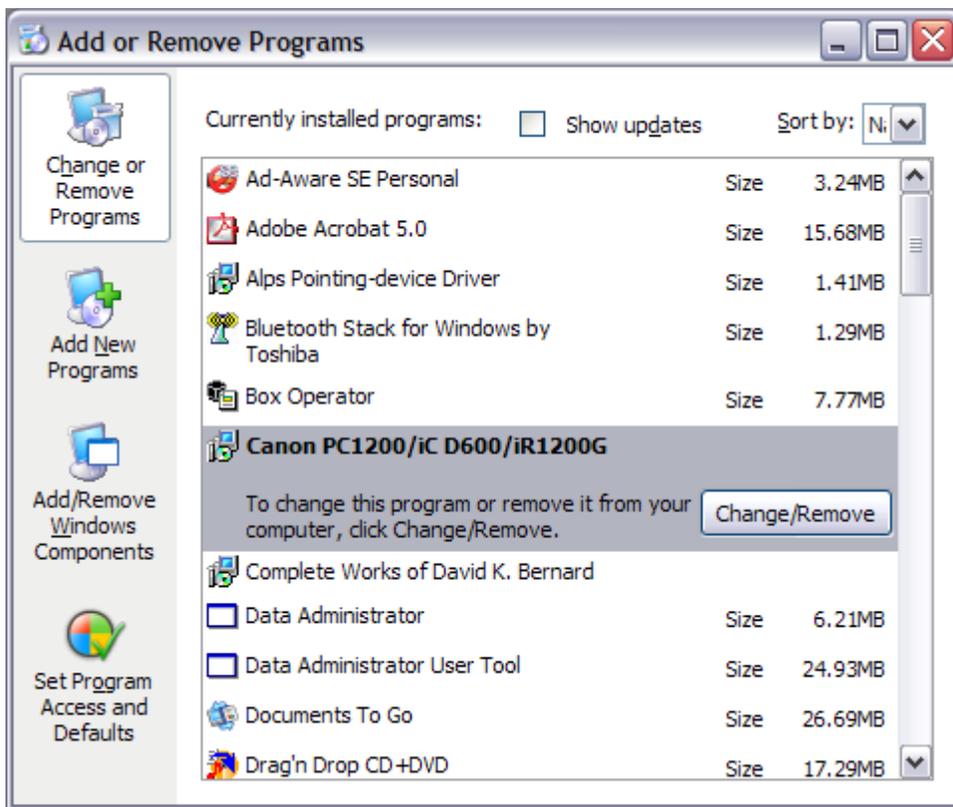
Most likely, on the left side of your screen you will see two special icons: on Microsoft they are called *My Computer* and *Recycle Bin* and on Linux they are called *Computer* and *Trash*. If your computer is connected to a network you may also see an icon titled *My Network Places* (on Microsoft). There is also usually an icon called *My Documents* on Microsoft or *Home* on Linux. These icons are very helpful in getting work done. We will discuss them after we finish our quick look around the desktop.

### The Start Button and Menus

At the bottom of your screen you should see a gray bar with a clock at the right end and a button marked “Start”  or just a colorful circle  (Microsoft) or a picture of a gear  (Linux) at the left end. This bar is called the *task bar*. The names of programs, or *tasks*, actively running in the computer appear in the middle on this gray task bar. Those names can be used to open the task on the screen, remove it from the screen without stopping it from running, or ending the task.



Next to the Start button are *Launchers* that let you quickly start a program without need of



opening the main menu. You can point (without clicking) to each one and hold the mouse still for about 5 seconds to see a yellow “hint box” pop up that describes what they do.

Click on the *Start* button (or the menu gear). You will see a menu with commands such as *Programs, Documents, Settings, Search, Help, Run, Log Off, and Shutdown*. Exactly what is on

this “main menu” differs from system to system, but if you prowl around enough you can usually find what you need.

Move the mouse pointer up the main menu to an item that has the little triangle on the right and hold the mouse still for a few seconds. You will see another menu open. And the menus get deeper. That is one of the confusing things about working with windows: sometimes you know what command you want to run, but forget where it is in the menus. If you use a command a lot, then you can put an icon for it on the desktop to make it easier and faster for you to use it. You would not want to put *all* the commands on the desktop, as it would become too cluttered to find anything. People might also laugh, as a messy computer desktop does not convey professional respect.

If you are sitting at a Microsoft system, click *Start* again to get the menu. Mouse over *Documents*, or click it. You will see a list of the documents that you have most recently used. One fast way to continue working on something is to click on the document in *Documents*. Windows keeps track of what program you will need to do the work and will start it for you. This is just for your convenience.

Click *Start* again to get the menu. Mouse over *Settings*, or click it. On Linux this is called *Preferences*. You will see several commands, among which will be *Control Panel* and *Printers*. These are used to configure many parts of Windows, and it is best to stay out of the *Control Panel* until you are more experienced or have instructions on exactly what to do. In *Printers* you can see what printers are connected to your computer. Double-clicking on a printer will show you what is currently printing. If you look enough you will see that with both Linux and Microsoft basically the same stuff is in the menus.

### Pop-up Menu

Position the mouse pointer over a blank spot on the screen and right-click. You will see a *pop-up menu* on your main work area. On the menu you will see some standard commands: Properties (at the bottom), Paste, New, and others specific to the desktop. You can control the way your desktop looks by using this menu.

#### *Using a Pop Up Menu to Personalize Your Desktop Settings*

**Click on the bottom line** (“Properties” on Microsoft, “Change Background Image” on Linux). If you lose the pop-up menu, just right-click on an empty spot on the desktop again. On Microsoft you should see a *Tabbed Notebook*, on Linux a single box.

By using a tabbed notebook there is more related information on the screen organized in a way that we can understand. On each tab you will see a label for the category of information on that tab. If you click the tab, the notebook will show the information that goes with that tab. In Microsoft, the tabs are named *Themes*, *Desktop*, *Screen Saver*, *Appearance*, and *Settings*.

In Linux you must click the Red Hat, then Preferences, then Screen Saver to change the screen saver. In Microsoft it is all in this one Tabbed Notebook with one tab for Background and another tab for Screen Saver.



*Themes* lets you choose a general theme for the colors and styles on the screen.

*Desktop* lets you choose a picture or pattern to decorate your desktop. You can change it at will; even add a family photo instead of the standard patterns.

*Screen Saver* lets you choose to have the desktop change to some entertaining sequence of patterns if the computer is not used for a period of time. By way of example, if you choose the **Marquee** screen saver and type “**I am Great**” in the banner text box, then the words “I am Great” will move across the screen when you are not using the computer. Here, you can adjust the power settings for your monitor to tell the computer how long to wait before the monitor goes into standby mode (dark). If you check the box “**Password Protected**” (“Lock Screen after” in Linux) then once the screen saver starts your password must be typed before the computer will let someone use it again. This helps keep people from using your computer when you walk away from it for a few minutes. Many themes are available and more can be purchased in stores.

*Appearance* lets you choose the overall appearance of the desktop from many possible colors and arrangements. You can play with them as you wish.

You should avoid the *Settings* tab for now. You can change the size of the desktop, the number of colors displayed, and other things related to the display hardware card inside the computer here. Of all the things I have done in Windows, this is the most likely place to have a really bad experience. It should be safe enough to change the size of your desktop<sup>5</sup> as you wish, but DO NOT click the ADVANCED button or change anything in there unless you have help from someone who really knows what they are doing. It won't explode but the display may stop working.

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<sup>5</sup> Geek Speak: The size of the desktop is actually the resolution. Resolution is the number of pixels per inch.

Adjust the desktop to your liking. I recommend that you focus on choosing themes and backgrounds that fit your tastes. **Please do not change the video adapter or display settings.**

## Standard Parts of a Window

Look at the window that you have open for personalizing your desktop. Notice the following parts and experiment to see how they function. Your instructor will have you try each standard feature of a window to see how they work. It doesn't matter if you are sitting in front of a Microsoft or a Linux computer for this.

### Close



There are three little boxes in the upper right hand corner of almost every window. The right most box has a little X in it. Click the little X in the box at the top right corner of the window to close the window.

### Minimize



Click the minimize button in the box at the top right corner of the window to minimize it: that is to remove it from the screen and place it only on the task bar. Clicking the window's button on the task bar will also do this if the window is visible, or if the window is not visible clicking the button will put the window back on top on the screen again. Try clicking the button on the task bar a few times until you see how it works. Please do not confuse “minimize” here with the next button, “maximize:” they are not opposites in this situation.

### Maximize



The center box has one square in it if the window is NOT maximized (full screen) and two overlapping little boxes if the window is currently full screen. This button toggles back and forth each time you click it. Click the button when it has one little square in the box it will *maximize* the window and change the button to two little squares. Click the button when it has two little squares and it will *un-maximize* the window and the button will change to one little square. Try clicking the maximize button a few times until you see how it works.

## Standard Window Activities

### Title Bar and moving

Notice in particular there is a blue bar across the top of the window with a title in it. This bar turns a darker color when the window is not selected. This bar is called the **Title Bar**. Click and hold in the center of the title bar, then drag. The window will follow your mouse anywhere until

you release the button. Double-click on the title bar: it is a shortcut to toggle between full screen (maximize) and not full screen (restore or un-maximized).

## Resizing a Window

Re-sizing means to change the size of the window. Drag the outside border or a corner to change the size of the window: Use the mouse to hover the very pointy tip of the arrow exactly over the outside edge of the window. The mouse icon will turn into two arrows facing away from each other. While it is in this mode, click and drag to make the window bigger. Click and drag again to make it smaller. Be careful not to drag the edge off of the screen. You can use this same technique at the corners of the windows, except that you will be able to adjust both the window's width and height.

## Pop-up Menus

Right-click for a pop-up menu in most cases. The menu that appears will depend upon exactly what you were pointing at when you right-clicked.

## Optional Parts

The next two sections are option for the beginner class and may be Instructor Led if time permits. They are otherwise covered in the Files module. If these sections are not used then please skip to the final section, Shutdown.

## Browsing Files

My Computer vs. Explorer

Open My Computer and click on the C drive. Your instructor will lead you through this together.

## Recycle Bin

A pilot can tell you that three things are utterly useless to him: the sky above him, the runway behind him, and what he could have done half a second ago. Until Windows 95, we could add on the file I didn't mean to delete. Now there is a second chance. We call that the Recycle Bin. The Recycle Bin gives you an extra chance to decide not to delete a file.

Your instructor will lead you through some ways to delete and restore a file.

- **Deleting**
  - Drag the item into the *Recycle Bin*
  - Hi-Light the item and press the *DELeTe* key
  - Select several items and press the *DELeTe* key
  - Select several items and right-click the group of them, then choose *Delete* from the pop-up menu
- **Restoring a deleted items**
  - Drag the item out of the Recycle Bin
  - Right-click the item in the *Recycle Bin* and select *Restore* from the pop-up menu
  - Select several items and right-click the group of them, then choose *Restore* from the pop-up menu
- **Emptying the Recycle Bin**

- Right-click the *Recycle Bin* and choose *Empty* from the pop-up menu
- Open the *Recycle Bin* and choose *File>>Empty*
- Select an item in the Recycle Bin and press the DELete key.
- right-click an item in the Recycle Bin and choose delete from the pop-up menu.
- Select several items and press the DELete key
- Select several items and right-click the group of them, then choose delete from the pop-up menu

When you delete something in Windows, usually it will end up in the Recycle Bin. By right-clicking the item while it is in the Recycle Bin and choosing the RESTORE command, the item will be undeleted. Click on the Recycle Bin to open it up. You should see a window open with a list of any items that are in the Recycle Bin. This looks very much like the listing that you will see for your disk files in My Computer.

If there is an item in here to undelete, right-click on it and choose Restore. When you are sure that you do not need to keep anything that is in the Recycle Bin then you can empty the bin. You cannot get things emptied from the Recycle Bin back again. Click the [X] in the upper right corner of the *Recycle Bin* window to close it.

**Right-click** on the Recycle Bin icon. You will see a pop-up menu (usually when you right-click you will get a pop-up menu). One of the commands on the pop-up menu is *Empty Recycle Bin*. You can use this command to empty the bin without bothering to open it. Be sure. When your hard disk gets very full, you may be able to get some room back by emptying the Recycle Bin.<sup>6</sup>

## My Computer

*My Computer* has two distinct useful purposes:

- First, it lets you see all the contents of your computer the files including network files that you can see if you are logged into a network.
- Second, the right-click pop-up menu command Properties lets you change the drivers in your computer.

**Click** on *My Computer* to open it up. You should see your disk drives and a shortcut to the Control Panel, and perhaps a couple of other items. Clicking on a disk drive shows the folders and files in it, clicking on a folder opens the folder and shows the folders and files in it, *ad infinitum*. Clicking on a file will open the file with whatever program Windows believes should be used: a word processor for word processing documents, a spreadsheet program for spreadsheets, and so forth.

## Installing Software

With a Microsoft flavor computer, most of installing software involves inserting a CD-ROM or DVD into the computer's CD/DVD disk drive, closing the drive door, and clicking on "Next" buttons when they appear on the screen. Under Linux, this is a topic best left for later.

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<sup>6</sup> Geek Speak: If you would like to skip the Recycle Bin and actually delete the file, you can use SHIFT+DEL. This is not recommended for most people or most uses. Be very careful in its use.

Your instructor will provide a “typical windows program” CD for use in this exercise. Insert the CD into your computer's CD/DVD drive and close the drive door when so instructed.

### **Standard Menus**

Follow along as your instructor walks you through these typical menus using the Typical Windows Program you just installed, or a game or other program already installed in the computer. These common menus are found in most applications that you will be using. Take notes as you feel wise.

#### *File*

New, Open, Close, Save, Save As, Print, Exit

#### *Edit*

UnDo (Ctrl-Z), Cut (Ctrl-X), Copy (Ctrl-C), Paste (Ctrl-V), Find (Ctrl-F), Replace (Ctrl-H)

#### *Window*

Tile Vertical, Tile Horizontal, Cascade

#### *Help*

Contents, Index, About Box

### **Removing Software**

With a Microsoft flavor computer, most of removing software involves clicking a few buttons. Under Linux, this is a topic best left for later.

To remove a program, open the control panel by clicking the Start button, then Control Panel, then Add Remove Programs. This process is show in pictures on the next page.

## Shut down

### *The reason why*

Modern Operating Systems keep a lot of information in a temporary storage area called RAM (Random Access Memory). This information is lost if the computer is turned off before it is properly put away. If everything were stored to the hard disk where it would not be lost, then the computer would run much more slowly than it does. The shut down procedure saves anything necessary before turning off the computer.

To shut down the computer with Microsoft:

- Click the START button
- Select SHUTDOWN
- Click OK
- Wait for the screen that says it is now safe to turn off your computer
- If your computer does not turn itself off, then turn it off

To shut down the computer with Linux:

- Click the Desktop Menu (beside the Launchers)
- Click Log Out
- Select SHUTDOWN
- Click OK
- Wait for shutdown to finish
- If your computer does not turn itself off, then turn it off

## Certification Test for CS 2.0 Beginners

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, they will use their standardized certification form to do so.

Start the computer and log on.

Run a program / Open a window

Perform all routine window operations (move, resize, max, un-max, min, restore, close)

(optional) Personalize the desktop (Background Picture, Screen Saver)

Shut down the computer

Name : \_\_\_\_\_

Address: \_\_\_\_\_

City, State, Zip: \_\_\_\_\_

Phone: \_\_\_\_\_

Today's Date: \_\_\_\_\_

Instructor: \_\_\_\_\_