THE OFFICIAL

CLASS HANDOUT, SYLLABUS,

AND RESOURCE GUIDE

CONTAINING MISCELLANEOUS INFORMATION ON THE CLL CLASS ENTITLED

LINUX: FREE SOFTWARE FOR THE WORLD

MUCH OF WHICH IS CROSS-PLATFORM,

FOR THE ENLIGHTENMENT OF GEEKS

AND OTHER CLASSES OF COMPUTER USERS.

BY THOMAS M. BROWDER, JR.

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The title page of this work is based on Peter Wilson's "`\titleRB`" in his article, *Some Examples of Title Pages*, which can be found at http://tug.ctan.org/tex-archive/info/latex-samples/TitlePages/.

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1 Introduction

Welcome to the world of Linux and FOSS (Free and Open Source Software). In the next few weeks I hope to interest you in that domain. It is the one in which I work and is also my avocation.

The appendix contains some links of special interest to me, and I want to explore as many of them as interest you. Of course we also want to learn how to get around in the Linux world, and that will be the focus of the first class.

Note that if you would like to get a digital copy of this document, with active links, please e-mail me at <tom.browder@gmail.com>. It would be helpful if you would add the phrase "[CLL]" to the subject line.

If you have any suggestions about other topics of interest, please feel free to e-mail me. I plan to update this document periodically as I incorporate your suggestions.

2 Objectives

This course will present to the student the Linux computer operating system and the broad spectrum of open source, free software (for both Linux/Unix and Windows) available to meet nearly any need. A survey of programs, resources, and programming languages will introduce the student to a rich variety of computer-centered topics and suggestions for further research in those areas.

3 Tentative Lesson Plan

The following will be covered in more or less detail as class interest dictates:

- What is Linux?
  - What advantage does it offer?
  - Comparison with Windows or Mac OS X
- How can you get a Linux system?
  - dedicated computer
    - removable hard drive
    - bootable USB drives
  - dual boot
  - Windows host
    - Cygwin
    - MingW
  - live CD's
- A tour of a Linux system
  - getting around

  - root versus user
  - disks, partitions, and file systems
  - user-preferences and customizations
  - CLI versus GUI
  - distributions
  - installation
- A hands-on installation of a Linux system
  - Sun Virtual Box
  - Ubuntu 9.10
- A survey of freely available, useful programs
  - GnuCash
  - Gnumeric
  - Open Office
  - Scribus
  - Inkscape
  - Scibase
- A survey of databases
  - Tokyo Cabinet
  - MySql
  - Firebird
  - Postgresql
- A survey of text editors and IDE's
  - XEmacs
  - vi
  - Eclipse
  - Sun's NetBeans
- A survey of programming languages
  - bash
  - Perl
  - PostScript
  - TeX, LaTex, ConTeXt, XeTeX
  - C++

  - Ruby
  - Java
  - Python
  - Fortran
  - COBOL
  - Lua
  - Erlang
  - Lisp
- A real C++ programming project
  - structure
  - build system
    * make
    * autotools
- E-mail lists and etiquette

Some of My Favorite Programs

R http://www.r-project.org

R is a language and environment for statistical computing and graphics. It is a GNU project which is similar to the S language and environment which was developed at Bell Laboratories (formerly AT&T, now Lucent Technologies) by John Chambers and colleagues. *R* can be considered as a different implementation of S. There are some important differences, but much code written for S runs unaltered under *R*.

Scribus http://www.scribus.net

Scribus is an open-source program that brings award-winning professional page layout to Linux/UNIX, Mac OS X, OS/2 and Windows desktops with a combination of "press-ready" output and new approaches to page layout. Underneath the modern and user friendly interface, *Scribus* supports professional publishing features, such as CMYK color, separations, ICC color management, and versatile PDF creation.

GnuCash http://www.gnucash.org

GnuCash is personal and small-business financial-accounting software, freely licensed under the GNU GPL and available for GNU/Linux, BSD, Solaris, Mac OS X, and Microsoft Windows.

[Note: *GNU* is an acronym referring to the *GNU Project*, supported by the Free Software Foundation (see http://www.gnu.org). It is recursively defined as "GNU's not Unix!" The *GPL* is the "General Public License," a free, copyleft license for software and other kinds of works.]

Designed to be easy to use, yet powerful and flexible, *GnuCash* allows you to track bank accounts, stocks, income and expenses. As quick and intuitive to use as a checkbook register, it is based on professional accounting principles to ensure balanced books and accurate reports.

Inkscape http://www.inkscape.org

Inkscape is an Open Source vector graphics editor, with capabilities similar to Illustrator, CorelDraw, or Xara X, using the W3C standard Scalable Vector Graphics (SVG) file format.

BRL-CAD http://brlcad.org

BRL-CAD is a powerful cross-platform open source solid modeling system that includes interactive geometry editing, high-performance ray-tracing for rendering and geometric analysis, image and signal-processing tools, a system performance analysis benchmark suite, and libraries for robust geometric representation, BRL-CAD has had more than 20 years of active development.

Perl http://www.perl.org
http://www.perlfoundation.org

Perl is one of the oldest and most popular interpreted programming languages around.

GraphicsMagick http://www.graphicsmagick.org

GraphicsMagick is the swiss army knife of image processing. Comprised of 259K physical lines (according to David A. Wheeler's SLOCCount) of source code in the base package (or 900K including 3rd party libraries) it provides a robust and efficient collection of tools and libraries which support reading, writing, and manipulating an image in over 88 major formats including important formats like DPX, GIF, JPEG, JPEG-2000, PNG, PDF, PNM, and TIFF.

Subversion http://subversion.tigris.org

Subversion is an open source version control system.

GimPhoto http://www.gimphoto.com

GimPhoto is a free Photoshop alternative for photo and image editing.

Scilab http://www.scilab.org

Scilab is a free Matlab clone.

Blender http://www.blender.org

Blender is the free open source 3D content creation suite.

GNU PSPP http://www.gnu.org/software/pspp/pspp.html

PSPP is a program for statistical analysis of sampled data. It is a free replacement for the proprietary program SPSS, and appears very similar to it with a few exceptions.

Some Other Sources

Free Software Foundation http://directory.fsf.org/GNU

The FSF's site has a wealth of FOSS. Note that most programs are licensed under the GNU General Public License (GPL) which basically limits the program to non-commercial use in some cases. See http://www.gnu.org/licenses/gpl.html for details.

Source Forge http://sourceforge.net

A desciption from the site:

> SourceForge.net is the world's largest open source software development web site. We provide free services that help people build cool stuff and share it with a global audience.
>
> As of February, 2009, more than 230,000 software projects have been registered to use our services by more than 2 million registered users, making SourceForge.net the largest collection of open source tools and applications on the net.

Wikipedia http://tinyurl.com/pmst7

Preview this link at http://preview.tinyurl.com/pmst7. The link at the upper right should link to:
http://en.wikipedia.org/wiki/List_of_open_source_software_packages.

A desciption from the site:

> This is a list of Free software / open source software packages: computer software licensed under an open source license / Free software license. Software that fits the Free software definition may be more appropriately called free software; the GNU project in particular objects to their works being referred to as open source. For more information about the philosophical background for open source software, see free software movement and Open Source Initiative. However, nearly all software meeting the Open Source Definition also meets The Free Software Definition and vice versa. Software that meets either is listed here.

The Instructor

Tom Browder is an analyst with ManTech SRS Technologies (http://www.mantech.com/msrs/). He has had a passion for computers since his days as a card-punching, Algol- and Fortran-programming cadet at the U.S. Air Force Academy. Since his retirement from the USAF in 1987, he has earned a master of science degree in Engineering Mechanics from Clemson University, and has been employed otherwise as a vulnerability analyst, program manager, computer network system administrator for mixed Windows and Unix/Linux networks, and software engineer. His interests include PostScript, Perl, and C++ programming, and the whole world of Linux and Free and Open Source Software in general.