**Objectives**

1. Research information about software for a specific operating system (OS) environment. You will be assigned one of the operating systems form the list of: Windows, Mac OS, Linux. You will also be provided with a list of topics to investigate.
2. Organize your rough research information into a list of topics, sub-topics and facts. This process will involve identifying sub-topics, rearranging your rough research notes, and selecting (or highlighting) interesting facts.
3. Report a summary of your research in the form of a “concept map”. Use the PowerPoint template provided as a starting point. The concept map should only include the best and most interesting information from your organized research notes.

Your assigned operating system is:

* Windows (safe marking)
* Mac OS (safe marking)
* Linux (double bonus marking)
* IOS (bonus marking)
* Android (bonus marking)

The concept map template can be downloaded from the “Topic A” folder on the class GitHub repository.

**Step 1 – Rough Research**

Research information about the software for your assigned operating system (OS) environment.

* Guide your research according to the suggested topic list below
* Feel free to copy-and-paste as long as you keep track of your bibliographic references.
* Do not be too picky or concerned about formatting as you will organize this information later in step 2
* Select things that look interesting and don’t forget to include graphics images as well
* Upload your rough research notes to your repository when you are done.

Topic A – Productivity & Application Software

Topic B – Entertainment & Media Software

Topic C – Programming Tools & Environment

Topic D – System Tools

Topic E – Software Security & Updates

Topic F – File System & User Accounts

Topic G – Special Features of your OS

Topic H – Limitations of your OS

**Productivity and Application Software:**

Productivity: applications that are used for work.

ONLYOFFICE Desktop Editors:

ONLYOFFICE Desktop Editors is a free office suite that combines text, spreadsheet and presentation editors allowing you to create, view and edit documents stored on your computer without an Internet connection. It is fully compatible with Office Open XML used in Microsoft Office products

Mozilla Firefox:

Firefox is a Web [browser](https://searchwindevelopment.techtarget.com/definition/browser) that is smaller, faster, and in some ways more secure than the [Mozilla](https://searchmicroservices.techtarget.com/definition/Mozilla) browser from which much of its code was originally derived.

As of 2017, it is the fourth-most popular browser after Google [Chrome](https://www.computerhope.com/jargon/c/chrome.htm), Apple [Safari](https://www.computerhope.com/jargon/s/safari.htm), and UC Browser.

Firefox features [tabbed browsing](https://www.computerhope.com/jargon/t/tabbrows.htm) with individual [processes](https://www.computerhope.com/jargon/p/process.htm) per tab, [popup](https://www.computerhope.com/jargon/p/popup.htm) blocking, [private browsing](https://www.computerhope.com/issues/ch001378.htm), [phishing](https://www.computerhope.com/jargon/p/phishing.htm) detection, and a [sandbox](https://www.computerhope.com/jargon/s/sandbox.htm) security model

Mozilla Thunderbird:

Mozilla Thunderbird is a [cross-platform](https://www.webopedia.com/TERM/C/cross_platform.html), [open source](https://www.webopedia.com/TERM/O/open_source.html) [e-mail](https://www.webopedia.com/TERM/E/e_mail.html) client that competes with the likes of [Microsoft Outlook](https://www.webopedia.com/TERM/M/Microsoft_Outlook.html) and Eudora Mail.

Mozilla Thunderbird originated as an offshoot of the [Mozilla Firefox](https://www.webopedia.com/TERM/F/Firefox.html)[Web browser](https://www.webopedia.com/TERM/B/browser.html) project and was developed by the same team until Mozilla Corporation released development to an independent organization in order to focus efforts on Firefox.

From the guys that brought us Firefox, Thunderbird is Mozilla’s email client.

One of the key extensions available for Mozilla Thunderbird is Mozilla Lightning, an extension that adds calendar and personal information manager (PIM) capabilities to Thunderbird.

**Entertainment and Media Software:**

Darktable:

Darktable is an open source photography workflow application and raw developer. A virtual lighttable and darkroom for photographers, it manages your digital negatives and lets you view and enhance them.

darktable has built-in [ICC profile](http://www.defaultlogic.com/learn?s=ICC_profile) support for [sRGB](http://www.defaultlogic.com/learn?s=SRGB), [Adobe RGB](http://www.defaultlogic.com/learn?s=Adobe_RGB), [XYZ](http://www.defaultlogic.com/learn?s=CIE_1931_color_space) and linear [RGB](http://www.defaultlogic.com/learn?s=RGB_color_space) color spaces

Rather than being immediately applied to raster data of the image, the program keeps the original image data until final rendering at the exporting stage (the adjustment parameters made by a user are however visible in real-time).

Shotcut:

Shotcut is a free, open source, cross-platform video editor.

3-way (shadows, mids, highlights) color wheels for color correction and grading

Trimming on source clip player or timeline with ripple option

VLC:

VLC is the def-facto video player to unwind with your downloaded video content.

With hardware accelerated decoding to take the load off your CPU and extend your battery life, VLC is the best way to watch content offline.

VLC is a media player that can play a number of video formats, like MPEG-1, MPEG-2, MPEG-4, DivX, and WMV files.

**Programming Tools and Environment:**

Bluefish:

Bluefish is one of the most popular IDEs for Web development available. It can handle programming and markup languages, but it focuses on creating dynamic and interactive Web sites.

Like many Linux applications, Bluefish is lightweight (using about 30% to 40% of the resources that similar applications use) and fast. Bluefish can open multiple documents at once (up to 3,500 documents, if needed).

It includes project support, remote file support, search and replace (including regular expressions), unlimited undo/redo, customizable syntax highlighting for many languages, anti-aliased text in windows, and multiple encodings support, among other features.

Anjuta:

Anjuta is a free, open source IDE for the C and C++ languages. It's easy to install (urpmi anjuta on Mandriva, for example) and offers such features as project management, application wizards, an interactive debugger, and a powerful source code editor (with source browsing, code completion, and syntax highlighting)

Anjuta has a flexible and powerful user interface that allows you to drag and drop the tools in the layout to arrange the GUI nearly any way you like.

Anjuta also enjoys a powerful plug-in system that allows you to decide which plug-ins are active and which are not for each project.

Kdevelop:

Kdevelop was created in 1998 to be an easy-to-use IDE for the KDE desktop.

It's plug-in based, so you can add and remove plugs to create the exact feature set you need.

Kdevelop supports 15 programming languages, with each having language-specific features.

Kdevelop also offers an included debugger, version control system (Subversion), application wizard, documentation viewer, code snippets, Doxygen integration, RAD tools, Ctags support, code reformatting, QuickOpen support, and dockable windows and toolbars.

**System Tools:**

Cockpit:

Cockpit is software developed by Red Hat that provides an interactive browser based Linux administration interface. Its graphical interface allows beginner system administrators to perform common sysadmin tasks without the requisite skills on the command line.

Performance Co-Pilot (PCP):

Red Hat Enterprise Linux 7 includes a program called Performance Co-Pilot, provided by the PCP RPM package. Performance Co-Pilot, or PCP, allows the administrator to collect and query data from various subsystems.

Additionally, the machine will also have various command line tools for querying system performance data.

The pcp package provides a variety of command line utilities to gather and display data on the machine.

Puppet:

Puppet allows the systems administrator to write infrastructure as code using a descriptive language to configure machines, instead of using individualised and customised scripts to do so.

Puppet’s domain-specific language is used to describe the state of a machine, and Puppet can enforce this state.

Puppet uses a server/client model. The server is called a Puppet master and it stores recipes and manifests for the clients.

**Software Security and Updates:**

Nmap:

Nmap is an open source port scanner that is provided by the Red Hat Enterprise Linux 7 distribution. It is a tool that administrators use to rapidly scan large networks but it can also do a more intensive port scan on individual hosts. Nmap uses the raw IP package in novel ways to determine what hosts are available on the network, what services those hosts are offering, what OS they are running, what type of packet filters/firewalls are in use and dozens of other characteristics.

ClamAV:

My favorite antivirus software for Linux is Sourcefire's ClamAV, a free, open source package designed to detect Trojans, viruses, malware and other malicious threats. Included in the software, which now comes preinstalled in several Linux distributions, are a multithreaded scanning daemon, command line utilities for on-demand file scanning, and an intelligent tool for automatic signature updates.

Snort:

Also offered by Sourcefire is Snort, an open source network intrusion prevention and detection system that combines the benefits of signature, protocol and anomaly-based inspection. With millions of downloads and more than 300,000 registered users to its credit, Snort is the most widely deployed such technology worldwide, Sourcefire says.

John the Ripper:

John the Ripper is a free and open source password cracker that can help you detect weak passwords. It's distributed primarily in source code form, but native "pro" versions are available for both Linux and Macs as well; the prepackaged Linux version is priced starting at $39.95. Another similar tool, incidentally, is THC Hydra.

**File System and User Accounts:**

/ – Root:

Every single file and directory starts from the root directory.

Only root user has write privilege under this directory.

Please note that /root is root user’s home directory, which is not same as /.

/bin – User Binaries:

Contains binary executables.

Common linux commands you need to use in single-user modes are located under this directory.

Commands used by all the users of the system are located here.

/sbin – System Binaries:

Just like /bin, /sbin also contains binary executables.

But, the linux commands located under this directory are used typically by system aministrator, for system maintenance purpose.

**Special features of Linux:**

Customized Keyboards:

This feature includes customized keyboards that have the accessible languages for different nations.

Virtual keyboards come in handy in many situations, for example, when your physical keyboard becomes unusable or if it’s difficult for you to type using a hardware keyboard.

Users of Debian-based systems, like Ubuntu, can easily download and install the Florence virtual keyboard using the following command:

sudo apt-get install

Live CD Or USB:

Most of all the distributed Linux systems come with a Live CD or USB feature in which a user can use and run the operating system without the need of installing it to your computer or laptop.

Linux live operating systems are the linux distributions which can be booted directly from a CD or USB drive without installation, without making any changes to the existing system. That's why it's called live. But CDs and DVDs are almost obsolete now, live CD is evolved to live USB, however kept it's old name.

But the real potential of a live CD is more than the above. They're immensely useful to remove malware from a infected system, or to recover data from a crashed system.

Application Support:

A Linux OS comes with a software repository in which a user can easily download or install a huge amount of applications by just providing a command to the terminal or shell of Linux.

**Limitations of Linux:**

Use PhotoShop:

The moment you mention Photoshop you will have enthusiastic Linux users telling you that you don't need PhotoShop for image editing and GIMP would do fine. But that's not entirely true for all users. It depends heavily on what you do with your images.

GIMP is undoubtedly great software for hobbyists or casual users, but for professionals Photoshop and Lightroom are the right tools. The lack of CMYK support in GIMP alone keeps it out of the professional market.

Use Google Drive:

I wonder what kind of technical challenges are stopping Google from launching a Google Drive client for Linux. There are much smaller companies that are capable of offering Linux clients for their cloud storage and sync services.

There are third party paid clients like inSync that can talk to Google drive, but they add extra cost, if you are a paid user of Drive just to be able to use Drive on Linux.

One main issue with Linux is drivers. Before you can install any hardware component in your computer, you must make sure the hardware has drivers available. Hardware manufacturers usually write drivers for Windows, but not all brands write drivers for Linux. This means that some of your hardware might not be compatible with Linux if you decide to switch.

**Step 2 – Organized Research**

Organize your rough research information to provide more stricture and meaning.

* Re-read your rough research to identify (highlight) important sub-topics and facts
* Rearrange (cut–and-paste) your rough research so that related sub topics and facts are next to each other.
* Your finished organization should look like the template provided below.
* Upload your rough research notes to your repository when you are done.

Suggested organization template:

* Topic A – Productivity & Application Software
  + Sub-Topic 1
    - Fact 1
    - Fact 2
    - …
  + Sub-Topic 2
    - …
  + …
* Topic B – Entertainment & Media Software
  + …

**Organized Research Answers:**

* Topic A – Productivity & Application Software
  + ONLYOFFICE Desktop Editors
    - It is an office suite productivity software
    - Can be used for presentations, spreadsheets, and text
    - An internet connection is not required to access or create documents within this software
  + Mozilla Firefox
    - It is an internet browser
    - Mozilla Firefox was the fourth most used internet browser in the year 2017
    - It detects fraudulent behaviour, blocks popup advertisements, includes a private option for browsing, etc.
  + Mozilla Thunderbird
    - It is an e-mail website that can be used on multiple different kinds of software platforms
    - It is an e-mail client for the internet browser, Mozilla Firefox
    - Contains an extension that can incorporate a personal information manager as well as a calendar
* Topic B – Entertainment & Media Software
  + Darktable
    - It is an application for editing images
    - An ICC profile is included in this software to support multiple colour spaces
    - Information of the original photo is kept until the last step for image rendering is reached
  + Shotcut
    - It is a video editing software that can be used on multiple software platforms
    - It can correct colour using colour wheels, highlight images, add shadows to images, etc.
    - A ripple option is included for the process of trimming video clips
  + VLC
    - It is a video player that plays uploaded video content
    - The work amount of the CPU is decreased because of the deciphering process that is performed by accelerated hardware
    - Video content in VLC can be watched offline
* Topic C – Programming Tools & Environment
  + Bluefish
    - It can access up to 3,500 documents at the same time
    - There is no limit for how many times the redo and undo control can be used
    - Highlighting for syntax can be modified and can be used for a number of other different languages
  + Anjuta
    - The two languages, C and C++ are used in this IDE programming tool
    - The GUI’s tools can be modified by being dragged and dropped with your mouse
    - Multiple plug-ins for the plug-in system can be turned on and off
  + Kdevelop
    - The KDE desktop is supported by this IDE programming tool
    - 15 different programming languages are supported
    - A debugger is offered in this programming software
* Topic D – System Tools
  + Cockpit
    - Used in the internet browser
    - Created by a company with the name Red Hat
    - No professional skills are required to use this system
  + Performance Co-Pilot (PCP)
    - It is issued by the PCP RPM package
    - Information from other subsystems can be collected by the user
    - A large amount of command line utilities can be shown and can be collected
  + Puppet
    - In order to arrange things in the computer, Puppet functions with information written in code by the user
    - In order to report the condition of your computer, a fixed language of Puppet’s is used
    - Puppet is a server that stores content for each user
* Topic E – Software Security & Updates
  + Nmap
    - It is a port scanner in the form of open source
    - Used to scan single hosts and large amounts of networks
    - Used to identify available hosts on the network and many other attributes with the given unedited IP collection
  + ClamAV
    - It is an antivirus software that is used to uncover malware for example viruses and trojans
    - For the scan process, command line utilities are used
    - Contains a device for automated updates
  + Snort
    - It is used to detect the system and to stop the network from getting invaded
    - Number of enrolled users of Snort is 300,000
    - Most extensively installed software in the world
* Topic F – File Systems & User Accounts
  + / – Root
    - All directories and files begin from this
    - This directory only gives possession to the rightful owner
    - The rightful client’s directory is only this directory name
  + /bin – User Binaries
    - Files and programs run on the computer are contained in this binary
    - Directory contains sole client commands
    - Also contains commands used by all users of the structure
  + /sbin – System Binaries
    - Files and programs run on the computer are contained in this binary
    - Directory contains client system commands
    - Contains commands that are for the continuance of the system
* Topic G – Special Features of Linux
  + Keyboard Modification
    - Can be changed into different languages
    - It is a digital keyboard on the screen
    - Can be downloaded by typing in a command, “sudo apt-get install” in the systems of Debian
  + Live CD and USB
    - Used to run an operating system on the computer without installation
    - The real operating system on the computer is not changed
    - Used to retrieve information and remove malware from systems
  + Application Support
    - Includes a repository that contains information about software
    - Large amount of applications can be accessed from this repository
    - A command is only required to be inserted
* Topic H – Limitations of Linux
  + Adobe Photoshop
    - Not all image editing software is on Linux
    - Professional Image editing software such as PhotoShop is not compatible
    - Linux Image editing software such as GIMP have a deficiency of CMYK support
  + Google Drive
    - Websites such as Google Drive do not support Linux
    - Not all professional sync and cloud service websites are on Linux
    - Payment is required in order to use a client website that can access Google Drive
  + Drivers
    - Drivers are required for each hardware unit
    - Linux contains only a few written driver brands
    - Not all hardware units are supported by drivers

**Step 3 – Concept Map**

Create a “concept map” as a final report of your organized research.

Use the PowerPoint template provided as a starting point.

You can use PowerPoint or another concept mapping tool of your choice.

Select the best and most interesting information from your organized research.

Summarize and edit your information to fit on the concept map.

Share your finished concept map with Mr. Nestor at p0079141@pdsb.net

The concept map template can be downloaded from the “Topic A” folder on the class GitHub repository



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