**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 (bonus marking)
* Linux (double bonus marking)
* iOS (double bonus marking)
* Android (double 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**

~Google apps, such as Google Docs, Slides, Sheets and Sites; compiled together, they are stored in Google Drive

->Google Drive is a file storage and synchronization software; it lets users store and save files, and share them with others

~iOS uses an App Store, where people can publish and purchase applications developed by Apple themselves and other companies

->The App Store lets people purchase different kinds of apps, including productivity software, games, and etc.

**Topic B – Entertainment & Media Software**

~There are lots of applications and software related to entertainment and media, many of them not natively made by Apple themselves

->They include apps such as Netflix, SoundCloud, YouTube (TV, Kids, etc.)

**Topic C – Programming Tools & Environment**

~ iOS uses Swift as its programming language. Swift is a general-purpose, compiled programming language developed by Apple for iOS, macOS, watchOS, tvOS, and Linux

~Apple intended Swift to support many core concepts associated with Objective-C, including dynamic dispatch, extensible programming and similar features, but in a “safer” way, which makes it easier to catch software bugs

~Swift 4 (the newest version) was developed in the open at Swift.org, with source code, a bug tracker, mailing lists, and regular development builds available for everyone. Swift already supports all Apple platforms as well as Linux, with community members actively working to port to even more platforms

**Topic E – Software Security & Updates**

~Updates for Ios are released through the iTunes software and over-the-air software updates

~Major new iOS releases are announced yearly during the Apple Worldwide Developers Conference (WWDC), and are usually released in September of the same year, usually coinciding with the release of new iPhone models

~iOS utilizes many security features in both hardware and software

-> Before fully booting into iOS, there is low-level code that runs from the Boot ROM. Its task is to verify that the Low-Level Bootloader is signed by the Apple Root CA public key before running it. This process is to ensure that no malicious or otherwise unauthorized software can be run on an iOS device

-> iOS devices can have a passcode that is used to unlock the device, make changes to system settings, and encrypt the device's contents. They were typically four numerical digits long. However, since unlocking the devices with a fingerprint by using Touch ID has become more widespread, six-digit passcodes are now the default on iOS with the option to switch back to four or use an alphanumeric passcode

-> Touch ID is a fingerprint scanner that is embedded in the home button and can be used to unlock the device, make purchases, and log into applications among other functions

-> Third-party applications such as those distributed through the App Store must be code signed with an Apple-issued certificate. This continues the chain of trust all the way from the Secure Boot process as mentioned above to the actions of the applications installed on the device by users

-> Two-factor authentication is an option in iOS to ensure that even if an unauthorized person knows an Apple ID and password combination, they cannot gain access to the account

**Topic F – File System & User Accounts**

~ A file system handles the persistent storage of data files, apps, and the files associated with the operating system itself. Therefore, the file system is one of the fundamental resources used by all processes. APFS is the default file system in macOS, iOS, watchOS, and tvOS. APFS replaces HFS+ as the default file system for iOS 10.3 and later, and macOS High Sierra and later

~ The iOS file system is geared toward apps running on their own. To keep the system simple, users of iOS devices do not have direct access to the file system and apps are expected to follow this convention

~ For security purposes, an iOS app’s interactions with the file system are limited to the directories inside the app’s sandbox directory. During installation of a new app, the installer creates a number of container directories for the app inside the sandbox directory. Each container directory has a specific role. The bundle container directory holds the app’s bundle, whereas the data container directory holds data for both the app and the user. The data container directory is further divided into a number of subdirectories that the app can use to sort and organize its data. The app may also request access to additional container directories—for example, the iCloud container—at runtime

~ OS X is designed for multiple users; iOS, however, is not

-> iOS does give you restrictions, the ability to limit the type of content accessible from your device

~ Apple offers its own user account creation service, known as an Apple ID

-> Your Apple ID is the account you use to access Apple services like the App Store, Apple Music, iCloud, iMessage, FaceTime, and more

**Topic G – Special Features of your OS**

**Topic H – Limitations of your OS**

**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
  + …

**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

