Introduction to Computing

Operating Systems and Package Managers

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Operating Systems

Every computer has what is called an *Operating System* – in fact, this system is the primary differentiator between types of computers. For example, a *Windows* Computer uses *Microsoft Windows*, and an *Apple* Computer uses *OSX*. Even things like smart-phones have an operating system. I-phones, for example, use the *IOS* operating system.

The operating system acts as the translator between the human and the computer chip. This allows a human to click on a button, or run a program – and the operating system will translate this action into *Machine Code* or *Assembly Language*. Machine code is the most basic way to communicate with a computer – without using binary.

Because of this, applications must be able to speak the language of an operating system in order to use the computer – in the same way that a human needs to learn the differences between Apple and Windows computers. Finding applications (a.k.a. Software) for your specific operating system can sometimes be difficult when looking for them on the Internet – instead, most operating systems have a *Package Manager* which allows you to quickly and easily find and download software for your computer. Its like the *App Store* on an I-phone, accept it is on the command line!

Package Managers

Every operating system has a package manager – in fact, some have many different package managers to choose from. Package managers are essentially software which allows you to manage, install, delete, and update applications – without having to do these processes manually. They allow you to avoid doing things that might make your files messy – like having a bunch of useless files in your Downloads folder after you install an application – and they give you piece of mind as you have a program that knows every application you have installed.

Different operating systems can have multiple options for package managers – for example:

- Windows has:
  - `winget`
  - `scoop`
  - `chocolatey`
- Apple has:
  - `brew`
- Linux has many different package managers, but the most common ones are:
  - `apt`
  - `pacman`

Each package manager has different commands for using it, however they tend to follow this format:

```
packagemanager command packageName
```

where the different `command`s always include:

```
search packageName      -- searches for a package to install
install packageName     -- installs a package
update packageName      -- updates a package
delete packageName      -- deletes a package
```

Exercises

0. Try to search for a package you want to install, like `Minecraft`
1. Try to update `cowsay`
2. Try to list all the different commands you can use with your package manager (normally this can be done by only entering the name of the package manager and pressing enter)