What is a package manager?

Installing software on Linux works a little differently than on Windows or macOS. Instead of downloading an installer file from a website and running it, on Linux you use something called a **package manager**.

A package manager is a tool that lets you **install**, **update**, and **remove** software from the command line. It pulls software from online sources called **repositories** and handles some of the messy work, like installing **dependencies** (other files that the program needs in order to work).

If you've ever installed an app from the App Store or the Microsoft Store, a package manager is kind of like that, but faster and with more control.

There are a few different package managers, and the one you use depends on your distribution. Here are the ones we're concerned with right now:

APT (Advanced Package Tool)

Default package manager for Debian-based distros like Ubuntu and Linux Mint (which means it's the one we care most about right now.)

apt is very beginner-friendly. Some commands you need to know:

```
sudo apt update                  # Refresh list of available packages
sudo apt install [package]       # Install a package
sudo apt remove [package]        # Uninstall a package
apt search [package]             # Search for a package
apt show [package]               # Show info about a package
```

By the way, you'll need to type **sudo** before most of these commands in order to give yourself permission to install system software. "**sudo**" stands for "**s**uper-**u**ser **do**" and it allows you to temporarily run commands with elevated privileges without switching to a different user. It's the equivalent of "Run as administrator" on Windows.

Snap

Also installed on Ubuntu-based distros by default. Snap packages are **sandboxed**, meaning they are self-contained and isolated from the rest of your system. They're also (mostly) **portable** meaning the app should work on any distro that also supports Snap. The caveat is that they tend to be slower to start and might use more disk space.

```
sudo snap install [package]

sudo snap remove [package]
```

Flatpak

Another universal sandbox-style format, similar to Snap. So, why would you need one if you have the other? Well, different package managers have their own separate repositories. Flatpak's is called Flathub. Apps from Flathub are sometimes more up-to-date than the ones on Snap. Some apps aren't available *at all* in apt or Snap, but are on Flathub (or vice versa).

To use Flatpak, you might need to install it first:

```
sudo apt install flatpak
```

And then you can install and run packages like this:

```
flatpak install flathub [package]    # Install from Flathub

flatpak run [package]                # Launch the app
```

AppImage

AppImage isn't actually a package manager itself, but a portable app **format**. An .AppImage file bundles the app and all its dependencies into a single executable file, almost like a .zip file that you can run without needing to extract anything.

You download a .AppImage file (from a website, for example) and then make it executable with this command:

```
chmod +x [appImage]        # Make the executable
./[appImage]               # Run it
```

Summary

	Sandboxed	**Portable**	**Uses a repo**	**Installation**
APT	No	No	Yes (apt repos)	Yes
Snap	Yes	Mostly	Yes (Snap store)	Yes
Flatpak	Yes	Mostly	Yes (Flathub)	Yes
AppImage	Yes	Yes	No	No; just run

There are plenty of other package managers, but we'll call this good for now. The point is that there are many different methods of installing software on Linux and there's no need to panic if you come across one you've never seen. It's all part of the learning curve.