

Level up your workflow

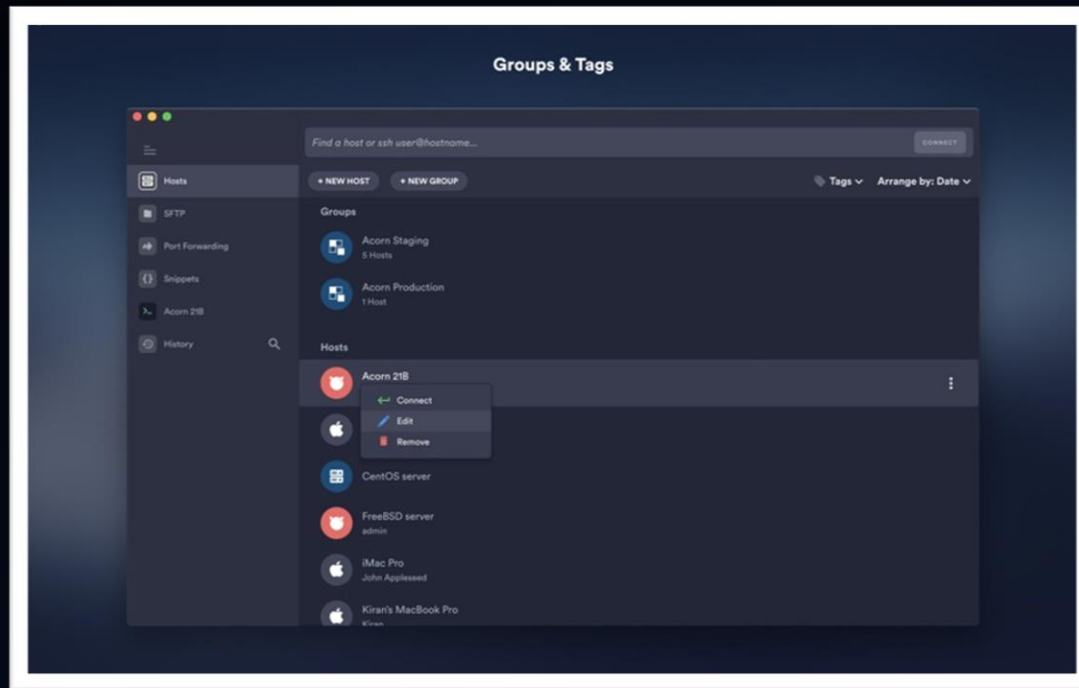
A PRESENTATION ABOUT THE TOOLS YOU CAN USE
IN THE I-ASK CENTER TO MAKE YOURSELF AN
UNSTOPPABLE PROBLEM-SOLVING MACHINE

Table of Contents

- Expert SSH Clients
- Virtualization Tools
- Software Tools/User-level package managers
- Source code editors
- Online Resources
- Some good books

Expert SSH Clients

Termius



Termius Pros and Cons

THE PROS 😊

- Cross-Platform
 - Your account settings travel with you
- Save and run code snippets
- Easy to use built-in SFTP client
- Free Basic Plan
- Ad Free

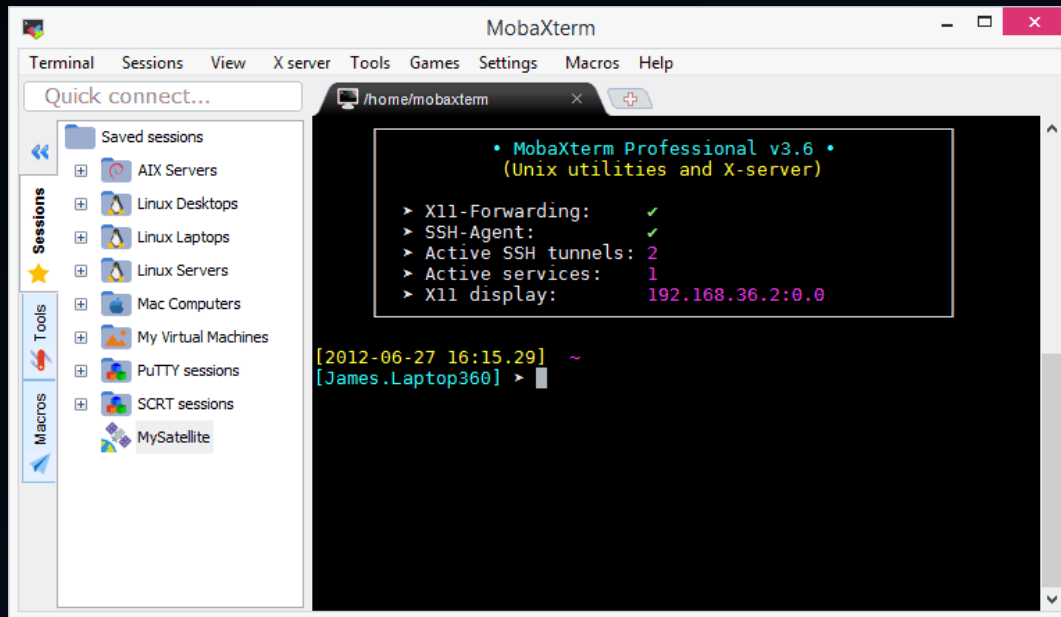
THE CONS 😞

- Premium plan with all the cool features costs money
 - Free with [GitHub Student](#)
- Doesn't have all the bells and whistles of other professional SSH clients
- No X11 forwarding capability

The background is a solid dark blue. On the left side, there are several parallel teal lines that form a series of nested L-shapes, extending from the top left towards the center. On the bottom right, there are several parallel teal lines that form a series of nested shapes, extending from the bottom right towards the center. These lines create a sense of depth and geometric structure.

Terminus in Action!

MobaXterm



MobaXterm Pros and Cons

THE PROS 😊

- Can save hosts
- Embedded X server
 - Has X11-Forwarding capability
- Highly configurable with plugins
- Graphical SFTP browser

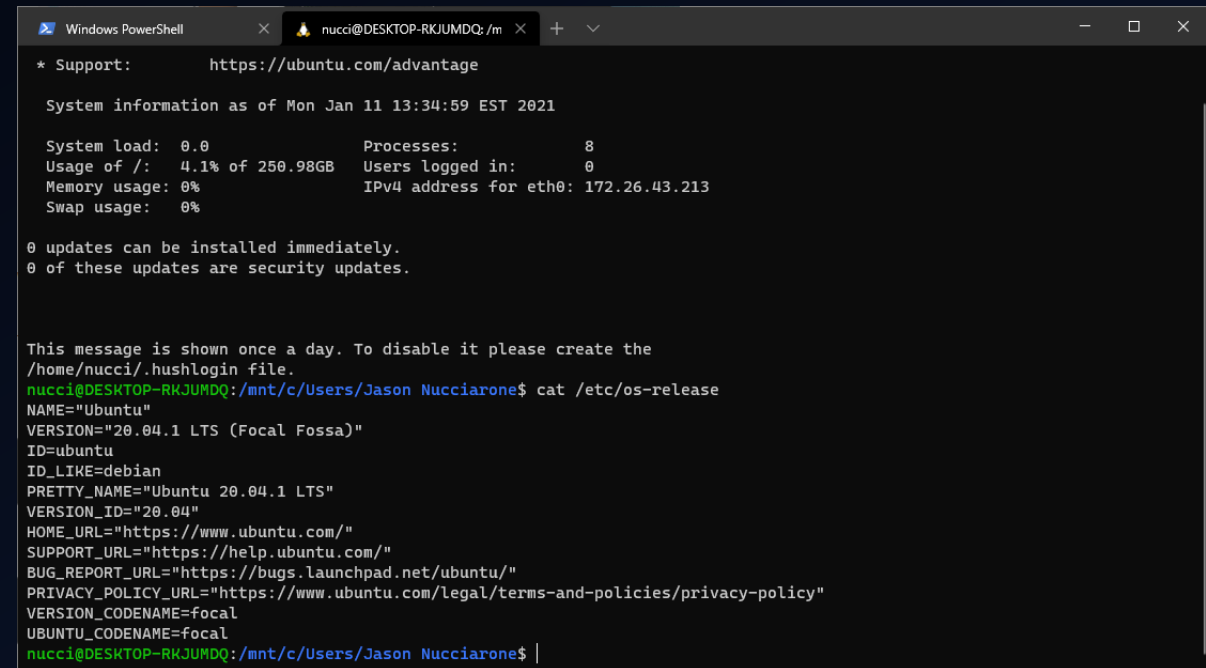
THE CONS 😞

- Ads come with Home edition
- Featuritis
 - Many features are outside the scope of what i-ASK techs do. More geared towards SysAdmins like Chad Franklin
- Windows-Only

Virtualization Tools

Windows-Subsystem Linux 2 (WSL2)

- Light-weight virtualization platform
- Run Linux Distro from the Windows command prompt
 - Can download distros from Windows Store
- Can run Singularity*
- Run Docker back-end
- Can run graphical Linux/Unix Apps



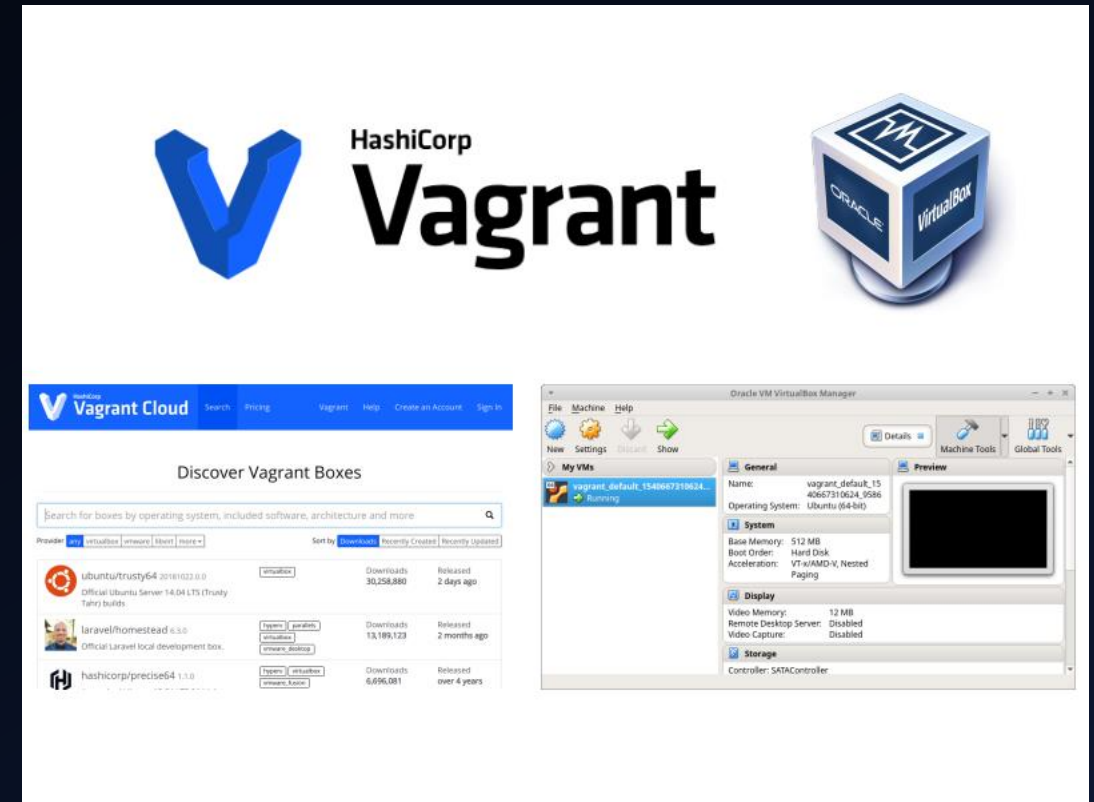
```
Windows PowerShell
nucci@DESKTOP-RKJUMDQ: /mnt/c/Users/Jason Nucciarone$ cat /etc/os-release
NAME="Ubuntu"
VERSION="20.04.1 LTS (Focal Fossa)"
ID=ubuntu
ID_LIKE=debian
PRETTY_NAME="Ubuntu 20.04.1 LTS"
VERSION_ID="20.04"
HOME_URL="https://www.ubuntu.com/"
SUPPORT_URL="https://help.ubuntu.com/"
BUG_REPORT_URL="https://bugs.launchpad.net/ubuntu/"
PRIVACY_POLICY_URL="https://www.ubuntu.com/legal/terms-and-policies/privacy-policy"
VERSION_CODENAME=focal
UBUNTU_CODENAME=focal
nucci@DESKTOP-RKJUMDQ: /mnt/c/Users/Jason Nucciarone$
```

The image features a dark navy blue background. In the top-left corner, there are several parallel teal lines that form a series of nested L-shapes, extending towards the center. In the bottom-right corner, there are several parallel teal lines that form a series of nested L-shapes, also extending towards the center. The text "WSL2 in Action!" is centered in the middle of the image in a white, sans-serif font.

WSL2 in Action!


Vagrant

- Another light-weight virtualization tool
 - Doesn't mount hard drive like WSL2
- Have more distros to choose from
- Uses Oracle VirtualBox or VMWare to run VMs
- Can run graphical Linux/Unix apps



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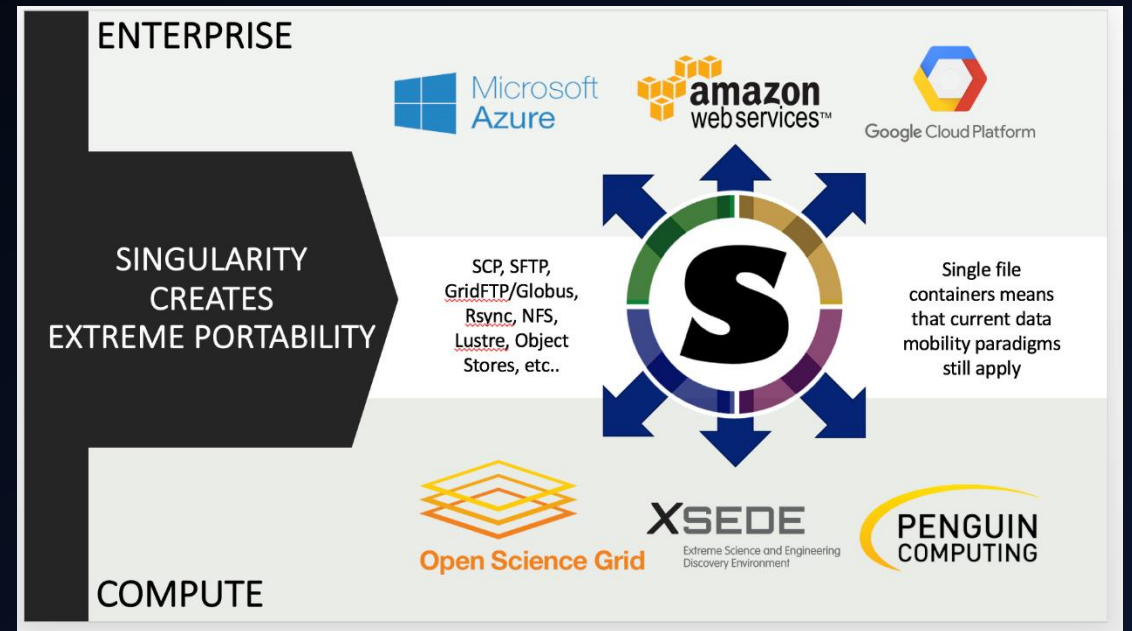
Vagrant in Action!

The background is a dark navy blue. In the top-left corner, there are several parallel teal lines that form a sort of 'L' shape, extending towards the center. In the bottom-left corner, there are similar parallel teal lines. In the bottom-right corner, there are several parallel teal lines that form a diagonal shape, extending from the bottom towards the center.

Software Tools/ User-level package managers

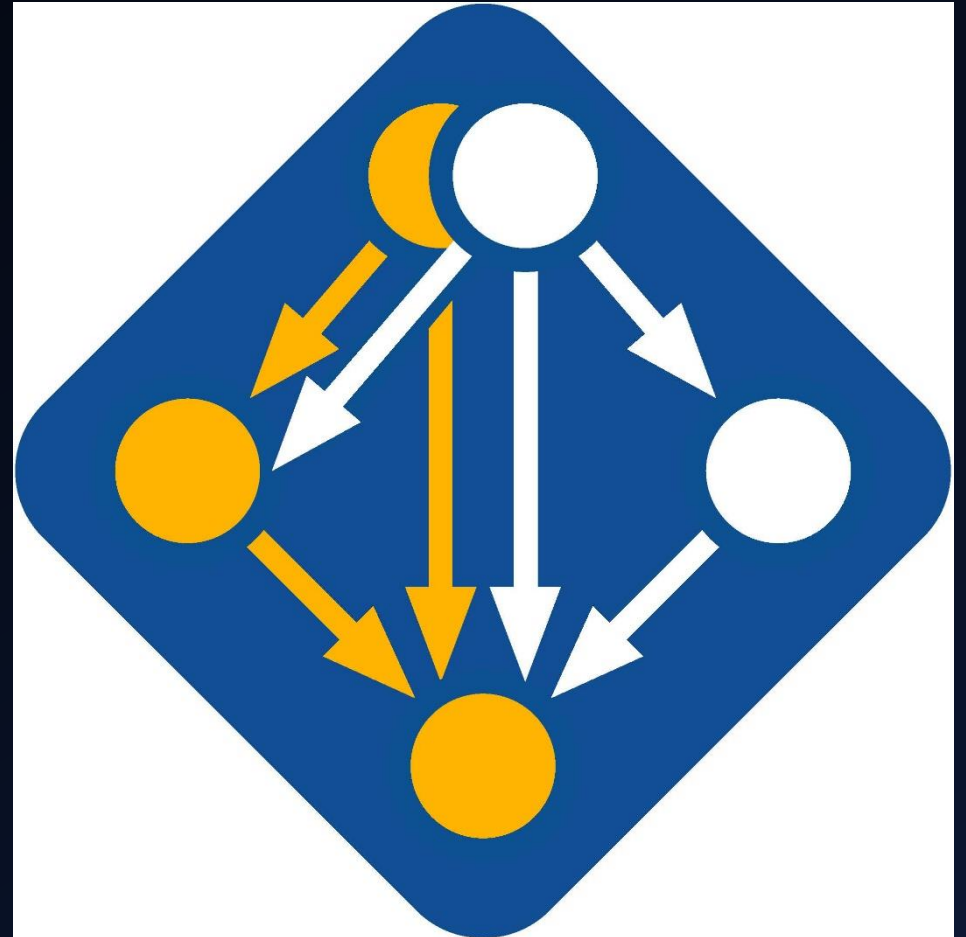
Singularity

- The gold-standard for containerization on HPC clusters
- Like Docker but more secure
 - The same person inside the container as you are outside of it
- Great for managing system-level dependencies
- Example of [Build Definition Files](#)



Spack: A Flexible package manager for HPC

- New tool on the block
 - Main software stack is deployed using spack
- Thousands of [packages](#) available!
- Can find more documentation [here](#)
- [Example of Spack in use on the cluster](#) (GitHub Repo still a work in progress)



Anaconda (and Anaconda Cloud)

- Amazing for all things Python and R
 - Has packages for C/C++/Perl too!
- Packages are handled in the form of environments
- “Duct-tape of the cluster”
- Can use environments in Jupyter Notebook
- Environments are versatile thanks to YAML files



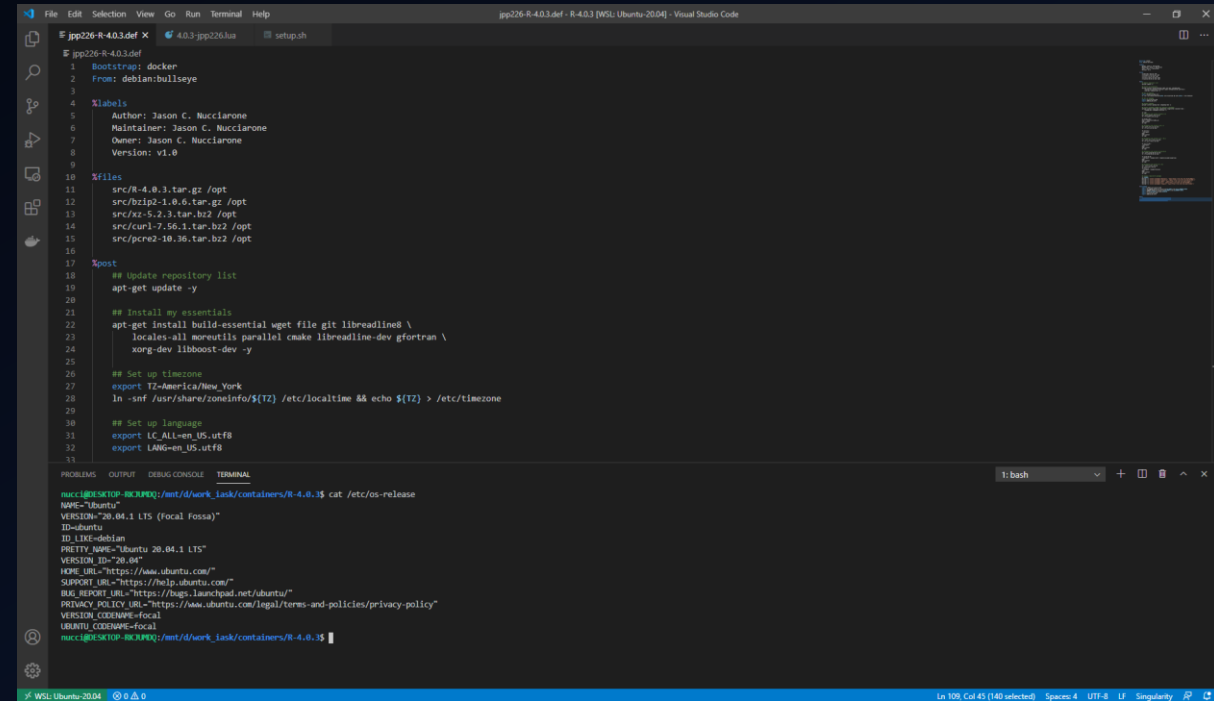
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Anaconda in Action!

Source Code Editors

VSCode (or VSCodium)

- Awesome source code editor put out by Microsoft
- Highly configurable thanks to plugins
 - I have plugins for Git, GitLab, Singularity, Docker, etc.
- Built-in Markdown Previewer
 - Great for writing READMEs!
- Remote Development plugin allows for working in WSL2



The screenshot shows the Visual Studio Code (VS Code) editor interface. The main editor window displays a Dockerfile with the following content:

```
1 # syntax=docker/dockerfile:1
2 FROM debian:bullseye
3
4 LABELS
5   Author: Jason C. Nucciarone
6   Maintainer: Jason C. Nucciarone
7   Owner: Jason C. Nucciarone
8   Version: v1.0
9
10 %files
11   src/R-4.0.3.tar.gz /opt
12   src/bzip2-1.0.6.tar.gz /opt
13   src/xz-5.2.1.tar.bz2 /opt
14   src/curl-7.55.1.tar.bz2 /opt
15   src/pcr2-10.36.tar.bz2 /opt
16
17 %post
18   # Update repository list
19   apt-get update -y
20
21   # Install my essentials
22   apt-get install build-essential wget file git libreadline8 \
23     locales-all moreutils parallel cmake libreadline-dev gfortran \
24     xorg-dev libboost-dev -y
25
26   # Set up timezone
27   export TZ=America/New_York
28   ln -snf /usr/share/zoneinfo/${TZ} /etc/localtime && echo ${TZ} > /etc/timezone
29
30   # Set up language
31   export LC_ALL=en_US.UTF8
32   export LANG=en_US.UTF8
33
```

The terminal window at the bottom shows the output of the command `cat /etc/os-release`:

```
macciej@WSKTOP-8K3UP8Q:/mnt/d/work_iask/containers/R-4.0.3$ cat /etc/os-release
NAME="Ubuntu"
VERSION="20.04.1 LTS (Focal Fossa)"
ID=ubuntu
ID_LIKE=debian
PRETTY_NAME="Ubuntu 20.04.1 LTS"
VERSION_ID="20.04"
HOME_URL="https://www.ubuntu.com/"
SUPPORT_URL="https://help.ubuntu.com/"
BUG_REPORT_URL="https://bugs.launchpad.net/ubuntu/"
PRIVACY_POLICY_URL="https://www.ubuntu.com/legal/terms-and-policies/privacy-policy"
VERSION_CODENAME=focal
UBUNTU_CODENAME=focal
macciej@WSKTOP-8K3UP8Q:/mnt/d/work_iask/containers/R-4.0.3$
```

Online Resources

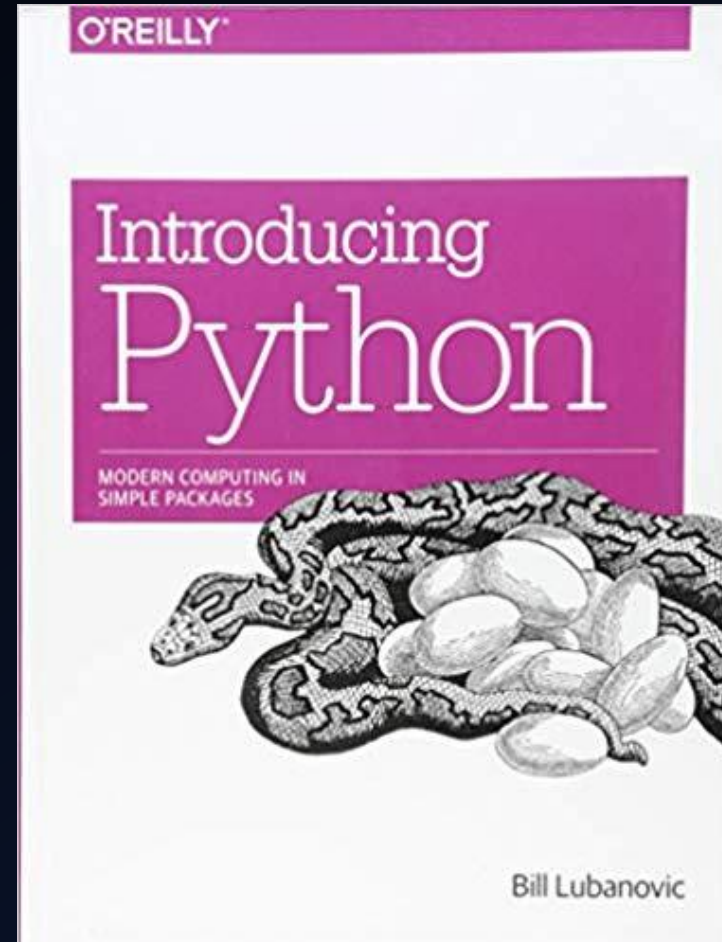
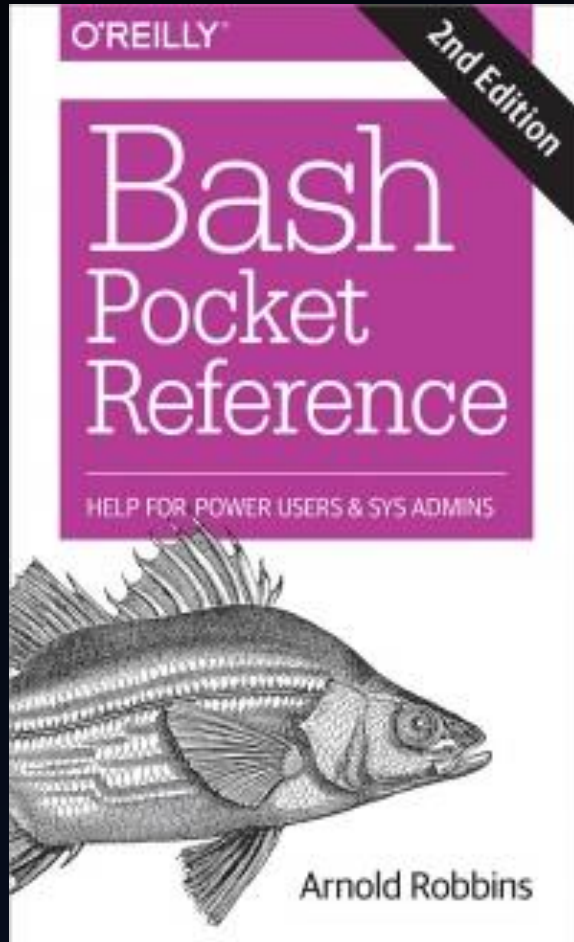
So Many Resources!

- [Stack Overflow](#)
- [Tutorialspoint](#)
 - Their shell scripting tutorial is very helpful
- [Lmod Documentation](#)
- [i-ASK Center GitHub](#)
- [My own GitHub](#)
 - And other [projects](#)

The background is a solid dark blue. In the corners, there are abstract, multi-lined teal geometric shapes. In the top-left corner, several parallel lines form a corner-like structure. In the bottom-left corner, there are horizontal and diagonal lines. In the bottom-right corner, there are several parallel diagonal lines.

Some Good Books

My two favorites





That's all Folks!