



# PRACTICAL CS WORKSHOP #1

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# Overview

- Workshop Series Introduction & Objectives
- Environment Setup (AWS EC2)
- Linux & Linux Utilities
- Git & GitHub
- Agile Development
- Python Development in Linux

# Workshop Series Introduction

- 8~12 Workshops. Totally around 16~24 Hours
- Free & voluntary
- Tutorials for practical CS knowledge and tools
- Practice with real world examples
- Team up to finish industrial level projects

# Workshop Series Topics



CS Basic - Git, Agile, Linux etc.



Advanced Python



Data Structure & Algorithm



Data Process, Cleaning, Visualization & Analysis



Web Scraper & Database



Other topics (optional): RabbitMQ, Kafka, Celery, Spark, etc.



Career Advice (Resume, LinkedIn, Networking etc.)



Capstone Projects

# Objective

- Overcome the fear to Computer Science (coding, terminal etc.)
- Build foundation of Computer Science for further study
- Refine resume from a technical perspective (Keyword & Projects)
- Prepare for interview, summer projects & internship
- Broaden potential job opportunities

# Environment Setup

- **Amazon Web Service (AWS):**
  - On-demand cloud computing platform by Amazon
- **Amazon Elastic Compute Cloud (EC2):**
  - A major part of AWS
  - Provide virtual machine rental service
- We will run our own Linux (Ubuntu) instance on AWS!

# Environment Setup

- Create an AWS account:
  - [AWS official site](#)
  - [Click for tutorial](#)
- Launch Instance (*Ubuntu Server 18.04 LTS (HVM), SSD Volume Type*)
  - Go to [instance site](#)
  - Click **Launch Instance** -> Select **Ubuntu Server 18.04 LTS**
  - Select **t2.micro** (free for 12 months) -> **Review and Launch**
  - **Launch** -> **Create a new key pair** and give it a name
  - **Download Key Pair**
  - Be sure to remember the location of key pair file (**\*.pem**)

# Environment Setup

- Under **Instance** section, select **Instance** tab
- Find your instance and click **Connect** (the **Example** part is important)
- For Mac & Linux users [Click for tutorial](#)
  - Copy string from **Example** (start with ``ssh -i ``), then run it in terminal
- For Windows users [Click for tutorial](#)
  - Download **putty.exe** and **puttygen.exe** from [here](#)
  - Open **puttgen.exe**, load the key pair file you got from EC2 (**\*.pem**)
  - Then, **Save Private Key**, be sure you know the location of it (you will have a **\*.ppk** file)
  - Back to **Example** from Instance page, copy string starting from ``ubuntu@`` all the way to the end
  - Open **putty.exe**, paste it under **Host Name**, at **Saved Session**, type "ec2", then click **Save**
  - On left side, find **Connect** -> **SSH** -> **Auth** -> **Browse**, find the **\*.ppk** file you saved before
  - Click **Open**



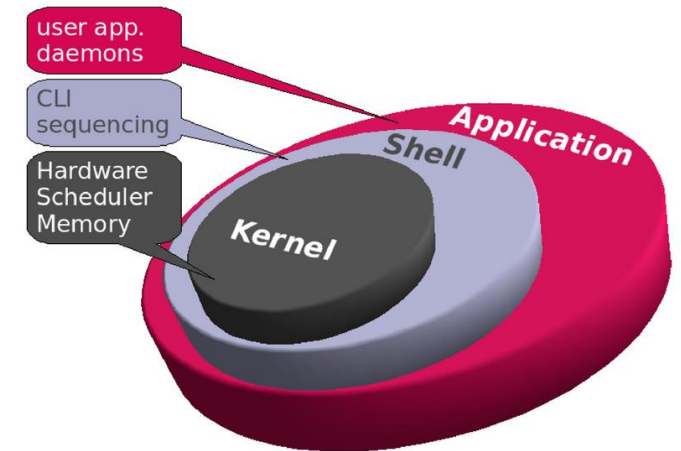
# Time Out

- Now you just had your very first interaction with Cloud Computing & AWS
- Remember EC2 is customizable and scalable, you can extend it as you need
- Add **AWS** to your resume, you will have a better chance to be noticed by recruiters
- AWS is very popular among small/midsize companies
- Now, it's time for some Linux tutorial

# Linux

- Linux is a family of Unix-like Operating System
- Linux vs Linux Kernel
- Linux Distributions (Distros)
  - Ubuntu (popular distro world wide)
  - Red Hat (popular commercial Linux)
  - Debian
  - Linux Mint
- Desktop Environment (GUI)
  - MATE
  - KDE
  - GNOME

## What is kernel



# Things to know about Linux

- Linux distros share lots of commands with MacOS, since they are both Unix-like OSs
- More than 90% of servers in the world are running Linux
- 100% of top 500 supercomputers are running Linux
- Android is the most popular Linux-based OS
- Ubuntu is the most popular Linux-based desktop OS
- The author of Linux Kernel, Linus Torvalds, also created Git version control system

# Job Description Example

"Linux Experience" in job description:

- Experience working under Unix-like Operating Systems (commands, tools and projects)

*Fixed Income Desk Strategist / Quantitative Developer at Morgan Stanley*

## Skills Required

Bachelor's degree or higher in computer science, engineering, physics or related discipline

Commercial experience of Q/KDB

Commercial experience of HTML5, JavaScript, AngularJS

Knowledge of C++, Java or Scala would be advantageous

Time series analysis and machine learning experience would be advantageous

Experienced in both Linux and Windows environments

# Linux Commands

- [Cheatsheet](#)
- Most common Linux commands:
  - *ls, pwd, cd, rm, rmdir, mkdir, cp, mv, cat, touch, head, tail, less, chmod, cal, date, whoami, df, du, free, which, ping, clear, sudo*
- Let's Practice!

# Redirect, Append & Pipe

- **>**: Redirect output to some file
  - ``echo "HELLO" > hello.txt`` *hello.txt* file now should have content "Hello"
  - ``2>&1`` *redirect standard error(2) to standard output(1)*
  - ``command >/dev/null`` *discard standard output(1) from command*
  - ``command 2>/dev/null`` *discard standard error(2) from command*
  - ``command >/dev/null 2>&1`` *discard both standard output(1) & error(2)*
- **>>**: Append output to some file
  - ``echo "World" >> hello.txt``
  - *hello.txt* file now should have content "Hello\nWorld"
- **|**: Take output from left side and use as input for command on right
  - ``cat hello.txt | grep "llo"``
  - Command above will find the line has "llo", hence display "Hello"

# find

- Recursively find files, which contains "file-name" in file name under current directory
  - `find . -name "*file-name*" ``
- Find files, which contains "abc-" in file name under */dev* directory (not its subdirectory)
  - `find /dev -maxdepth 1 -name "abc-*" ``
- [Documentation](#)

# grep

- Display line with word 'echo' in file test.txt
  - `grep 'echo' text.txt`
- Display all line & line# with exact word "echo" in file a directory (recursively)
  - `grep -rnw 'echo' text.txt`
  - *-r: Recursively*
  - *-n: Line Number*
  - *-w: Exact word only (doesn't match substring)*
- [Documentation](#)



# Other Linux Utilities

- Vi / Vim
- Tmux
- Bash/Zsh
- sed
- awk
- git
- ...

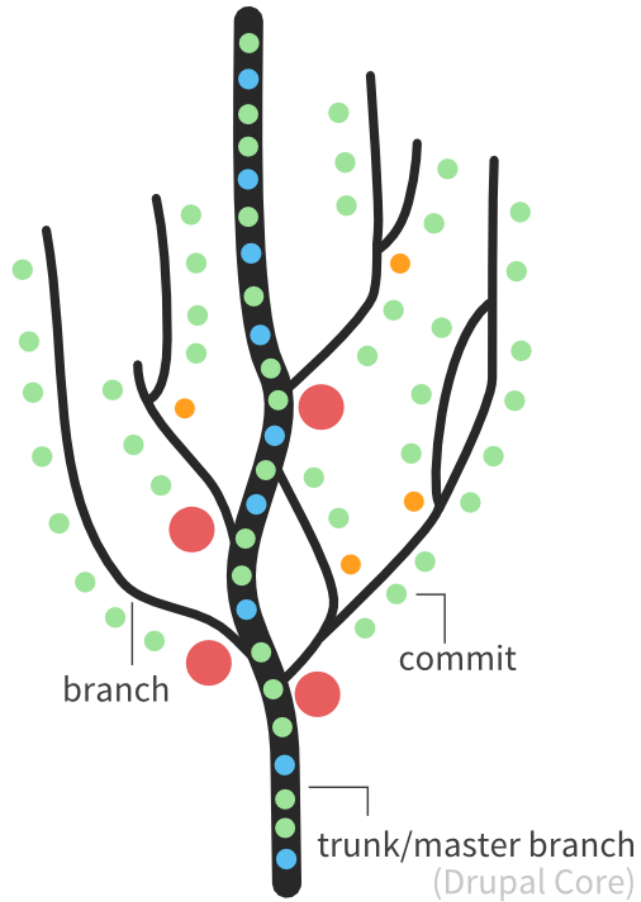
# Practice Makes Perfect

- Practice and repeat, then you can have **Linux** on your resume
- There are tons of other commands/tools in Linux, you are welcome to explore more

# Git vs GitHub

- **Git** is a distributed version control system for tracking changes in source code during software development
- **GitHub** is a website that provides repository hosting service
- **Git** is a tool, **GitHub** is a website for projects that use Git

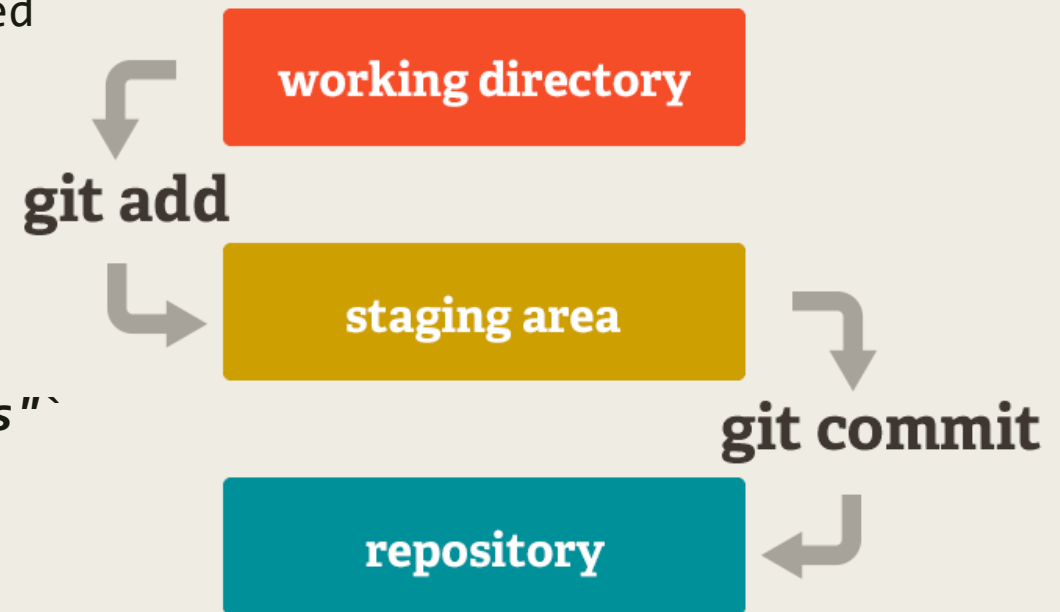
# Git



- **Repository (Repo):** A directory contains project source and git histories. Imagine a folder with Git histories and features.
- **Local:** All source and git history in your local machine
- **Remote:** Oppose to **Local**, source and git history hosted *remotely* by service like GitHub (like a cloud)
- **Branch:** A develop line that is independent to other
  - **master** branch: Main develop line by default (can be changed)
  - **develop** branch: A separate branch from master named “develop”

# Git

- Working directory: You local code
- Staging area: Code that ready to be committed
- Commit: Ask git to record change
- Push: Update remote repository
- Workflow:
  - Add to staging area: ``git add .``
  - Record change: ``git commit -m "add files"``
  - Update remote repo: ``git push``



# Setup Git Credential

- [Click for tutorial](#)
- Create SSH key:
  - ``ssh-keygen -t rsa -b 4096 -C your github email@xxx.com``
- Press Enter 3 times
- Start SSH agent and add SSH key
  - ``eval $(ssh-agent -s)``
  - ``ssh-add ~/.ssh/id_rsa``
- Set SSH key in GitHub
  - ``cat ~/.ssh/id_rsa.pub`` copy the output
  - Paste it [here](#) and give your key a name you like

```
ubuntu@ip-172-31-95-207:~$ ssh-keygen -t rsa -b 4096 -C "qzuo@fordham.edu"
Generating public/private rsa key pair.
Enter file in which to save the key (/home/ubuntu/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/ubuntu/.ssh/id_rsa.
Your public key has been saved in /home/ubuntu/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:VjYXzkcRUziP2pgwOMHkcrcdGVfcxAC4SyPaar9y8i7s qzuo@fordham.edu
The key's randomart image is:
+---[RSA 4096]---+
|    . .+. .+oBBo|
|    + .+ .+ ooo+|
|    . o.o+*.+ .+.|
|    ++=++ .. .|
|    o S.oo =|
|    o . . + .|
|    .|
|    . +.|
|    E+=o|
+----[SHA256]-----+
ubuntu@ip-172-31-95-207:~$ eval $(ssh-agent -s)
Agent pid 1092
ubuntu@ip-172-31-95-207:~$ ssh-add ~/.ssh/id_rsa
Identity added: /home/ubuntu/.ssh/id_rsa (/home/ubuntu/.ssh/id_rsa)
```

```
ubuntu@ip-172-31-95-207:~$ cat ~/.ssh/id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQCAQCYTJyzB9I9PJZd0xX4WDrEE2q8afjBHMQm1s
+Bu5QiC2C0zh801wGP0UKIx9FDyWwm0LKkDepFDqo6gRqvoMb0Az90fXjKVbC8H06IWmGXQ4TyPF7v
+6zkIIFEGVmeQU9r6ltsqdKWj3j/iGShU1SaEDM9izNnhTzU91N2A1XL2t7yXC6jGY1JWsGIPHUiEio9XwrfpCT71kRNghSu34W
b7DRo+U0MF7YnoSIjd2XG/mYUpkzhvY6UGavz8euw40LWN
+Ov3Syd1/XTXyqn15mMD0P6biBg7GXIlHT6wahj5UFgUxfrw4zMBxYeB94rm3AI7IThy2Wc3IjPbXEbwfk1fU31vjgKr22FXEc
9rHSI+bmaDroblbxSm1ch4hoQLVqCHK43i5Gee5B909o5WdIKrBCf8uD08b+9PVz3joce0IT/NQ
+ApqUpFEUeW2gX7xkE2IhPqcSMmWygCB1D18J07wGv95pIzISloZSI/ub+hZQ8nC3Das
+CxQqSHrKnQbmNAuQm5W2H4JgkGyltIJ0hwM1zNUN2h9LHuzQmX2tARiCYK3zY/n0j+qjbM4DmgQVPJvas1FiH
+1wVmNC4aKge/gEx9ywmCdhjVdaQyDSvLoFPCioi09DyXwjLLfLT6KGBnFsAyNWzwXnKu0EIc8RsUJAqLrfjM/Q5kojkaKJYQ==
qzuo@fordham.edu
```



## SSH keys / Add new

---

Title

EC2

Key

ssh-rsa

```
AAAAB3NzaC1yc2EAAAADAQABAAQCAQCYTJyzB9I9PJZd0xX4WDrEE2q8afjBHMQm1s+Bu5QiC2C0zh801wGP0UKI
x9FDyWwm0LKkDepFDqo6gRqvoMbOAz9OfXjKVbC8H06IWmGXQ4TyPF7v+6zkllFEGVmeQU9r6ltsqdKWj3j/iGShU
1SaEDM9izNnhTzU91N2A1XL2t7yXC6jGYIJWsGIPHUiEio9XwrfpCT7lkRNghSu34Wb7DRo+U0MF7YnoSljd2XG/mYU
pkzhvY6UGavz8euw4OLWN+Ov3Syd1/XTXyqn15mMD0P6biBg7GXIIHT6wahj5UFgUxffrw4zMBxYeB94rm3AI7IThy2
Wc3IjPbXEbwfk1fU31vjgKr22FXEc9rHSI+bmaDroblbxSm1ch4hoQLVqcCHK43i5Gee5B9O9o5WdIKrBCf8uDO8b+9PVz
3joce0IT/NQ+ApqUpFEUeW2gX7xkE2IhPqcSMmWygCBID18J07wGv95plzISloZSI/ub+hZQ8nC3Das+CxQqSHrKnQ
bmNAuQm5W2H4JgkGyltIJ0hwMIzNUN2h9LHuzQmX2tARiCYK3zY/nOj+qjbM4DmgQVPJvas1FiH+1wVmNC4aKge/
gEx9ywmCdhjVdaQyDSvLoFPCioi09DyXwjLLfLT6KGBnFsAyNWzwXnKu0Elc8RsUJAqLrfjM/Q5kojkaKJYQ==
qzuo@fordham.edu
```

Add SSH key

# Git Scenario #1 - Standalone

- Say you create a repository on GitHub and you want to work on this repo on you own
- Workflow:
  - Find SSH/HTTP remote URL for this repo on GitHub
    - `git@github.com:your_username/repo_name.git`
  - Clone to local:
    - ``git clone git@github.com:your\_username/repo\_name.git``
  - Add your information (always do this when you have a new repo):
    - ``git config --local user.name "your_github_username"``
    - ``git config --local user.email your_github_email@xxx.com``
  - Now you can use ``add, commit, push`` as long as you are working under this directory

```
ubuntu@ip-172-31-95-207:~$ cat ~/.ssh/id_rsa.pub
ubuntu@ip-172-31-95-207:~$ git clone git@github.com:qz-fordham/project-zero.git
Cloning into 'project-zero'...
The authenticity of host 'github.com (192.30.253.113)' can't be established.
RSA key fingerprint is SHA256:nThbg6kXUpJWGl7E1IGOCspRomTxdCARLviKw6E5SY8.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'github.com,192.30.253.113' (RSA) to the list of known hosts.
remote: Enumerating objects: 11, done.
remote: Counting objects: 100% (11/11), done.
remote: Compressing objects: 100% (9/9), done.
remote: Total 11 (delta 2), reused 7 (delta 1), pack-reused 0
Receiving objects: 100% (11/11), done.
Resolving deltas: 100% (2/2), done.
ubuntu@ip-172-31-95-207:~$ cd project-zero/
ubuntu@ip-172-31-95-207:~/project-zero$ git config --local user.email "qzuo@fordham.edu"
ubuntu@ip-172-31-95-207:~/project-zero$ git config --local user.name "qz-fordham"
```

```
ubuntu@ip-172-31-95-207:~/project-zero$ git status
```

```
On branch master
```

```
Your branch is up to date with 'origin/master'.
```

```
nothing to commit, working tree clean
```

```
ubuntu@ip-172-31-95-207:~/project-zero$ touch test_file
```

```
ubuntu@ip-172-31-95-207:~/project-zero$ git status
```

```
On branch master
```

```
Your branch is up to date with 'origin/master'.
```

```
Untracked files:
```

```
(use "git add <file>..." to include in what will be committed)
```

```
test_file
```

```
nothing added to commit but untracked files present (use "git add" to track)
```

```
ubuntu@ip-172-31-95-207:~/project-zero$ git add .
ubuntu@ip-172-31-95-207:~/project-zero$ git status
On branch master
Your branch is up to date with 'origin/master'.
```

```
Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)
```

```
    new file:   test_file
```

```
ubuntu@ip-172-31-95-207:~/project-zero$ git commit -m "add test file"
[master 42e53e0] add test file
 1 file changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 test_file
ubuntu@ip-172-31-95-207:~/project-zero$ git status
On branch master
Your branch is ahead of 'origin/master' by 1 commit.
  (use "git push" to publish your local commits)

nothing to commit, working tree clean
```

```
ubuntu@ip-172-31-95-207:~/project-zero$ git push
Counting objects: 3, done.
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 303 bytes | 303.00 KiB/s, done.
Total 3 (delta 0), reused 1 (delta 0)
To github.com:qz-fordham/project-zero.git
    8a5d923..42e53e0  master -> master
```

# Git Scenario #2 - Collaboration (part 1)

- Say you and your teammates are working on same repo (create by other), you want to make some change but not affect master branch before you are ready
- Workflow:
  - **Fork** the repo you want to work on from repo page
    - Fork means that you are making a copy of a repo in your account
  - Repeat **clone & config** setup in scenario #1

# Git Scenario #2 - Collaboration (part 2)

- Make a new branch and checkout:
  - ``git checkout -b feature-branch-name``
  - Make your code change
  - Repeat ``add, commit, push`` step in scenario #1 (push to new branch, not *master*)
  - Setup remote to original repo: ``git remote add upstream https://original_repo_url.git``
  - Switch to forked master branch: ``git checkout master``
  - Make forked master sync with remote (upstream) master: ``git pull upstream master``
    - Forked Master is up to date with remote upstream master
  - Switch back to feature branch: ``git checkout feature-branch-name``
  - Merge forked master in your feature branch: ``git merge master``
  - Go to the repo website and make a *Pull Request (PR)*
  - Wait for other team member to review your code
  - Once your PR is approved, you can merge the PR and close it



- Original repo is from `git@github.com:fordham-msqf-official/project-zero.git`
- Now forked to `git@github.com:qz-fordham/project-zero.git`

```
ubuntu@ip-172-31-95-207:~$ git clone git@github.com:qz-fordham/project-zero.git
```

```
Cloning into 'project-zero'...
```

```
remote: Enumerating objects: 13, done.
```

```
remote: Counting objects: 100% (13/13), done.
```

```
remote: Compressing objects: 100% (11/11), done.
```

```
remote: Total 13 (delta 3), reused 8 (delta 1), pack-reused 0
```

```
Receiving objects: 100% (13/13), done.
```

```
Resolving deltas: 100% (3/3), done.
```

```
ubuntu@ip-172-31-95-207:~$ git config --local user.email "qzuo@fordham.edu"
```

```
fatal: --local can only be used inside a git repository
```


```
ubuntu@ip-172-31-95-207:~$ cd project-zero/
```

```
ubuntu@ip-172-31-95-207:~/project-zero$ git config --local user.email "qzuo@fordham.edu"
```


```
ubuntu@ip-172-31-95-207:~/project-zero$ git config --local user.name "qz-fordham"
```

```
ubuntu@ip-172-31-95-207:~/project-zero$ git checkout -b develop
Switched to a new branch 'develop'
ubuntu@ip-172-31-95-207:~/project-zero$ touch test_file
ubuntu@ip-172-31-95-207:~/project-zero$ git add .
ubuntu@ip-172-31-95-207:~/project-zero$ git commit -m "add test_file to develop branch in forked repo"
On branch develop
nothing to commit, working tree clean
ubuntu@ip-172-31-95-207:~/project-zero$ git checkout master
Switched to branch 'master'
Your branch is up to date with 'origin/master'.
ubuntu@ip-172-31-95-207:~/project-zero$ git pull
Already up to date.
ubuntu@ip-172-31-95-207:~/project-zero$ git checkout develop
Switched to branch 'develop'
ubuntu@ip-172-31-95-207:~/project-zero$ git merge master
Already up to date.
ubuntu@ip-172-31-95-207:~/project-zero$ git push origin develop
Total 0 (delta 0), reused 0 (delta 0)
remote:
remote: Create a pull request for 'develop' on GitHub by visiting:
remote:   https://github.com/qz-fordham/project-zero/pull/new/develop
remote:
To github.com:qz-fordham/project-zero.git
 * [new branch]      develop -> develop
```

 [fordham-msqf-official](#) / [project-zero](#)

 Watch ▾

0

 Star


0

 Fork

1


 Code

 Issues 0

 Pull requests 0

 Projects 1

 Wiki

 Insights

# Comparing changes

Choose two branches to see what's changed or to start a new pull request. If you need to, you can also [compare across forks](#).



base repository: [fordham-msqf-official/project-zero](#) ▾


base: [master](#) ▾



head repository: [qz-fordham/project-zero](#) ▾

compare: [develop](#) ▾

✓ **Able to merge.** These branches can be automatically merged.

 [Create pull request](#)

Discuss and review the changes in this comparison with others.

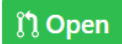


# Your part is finished temporarily

- Now, your teammates will review your code change and justify if they are good enough to be merged in main develop line (**master branch**)
- If your code is not good enough, you can keep working on your local code and repeat ``add, commit, checkout master, pull, checkout feature-branch, merge master, push`` until your PR is approved by peers
- To demonstrate review process, let's switch to the GitHub account of the original repo owner (***fordham-msqf***)

## Develop #1

Edit



qz-fordham wants to merge 3 commits into fordham-msqf-official:master from qz-fordham:develop

Conversation 0

Commits 3

Checks 0

Files changed 1

Changes from all commits ▾

File filter... ▾

Jump to... ▾

+0 -0

Diff settings ▾

Review changes ▾

0 test\_file

No changes.



Write

Preview

AA B i “ &lt;&gt; 🔗 ⋮ 1/2/3 ✓ @ 📌 ↶

Leave a comment

Attach files by dragging &amp; dropping, selecting them, or pasting from the clipboard.

☐ Comment

Submit general feedback without explicit approval.

☒ Approve

Submit feedback and approve merging these changes.

☐ Request changes

Submit feedback that must be addressed before merging.

Submit review

Add more commits by pushing to the **develop** branch on [qz-fordham/project-zero](#).



### Changes approved

1 approving review by reviewers with write access. [Learn more](#).

[Show all reviewers](#)



### Continuous integration has not been set up

[Several apps are available](#) to automatically catch bugs and enforce style.



### This branch has no conflicts with the base branch

Merging can be performed automatically.

**Merge pull request**



You can also [open this in GitHub Desktop](#) or view [command line instructions](#).

## Tutorials of practical Computer Science knowledge &amp; tools for Quants

Edit

[Manage topics](#)

🔄 8 commits

🌿 1 branch

📦 0 releases

👤 1 contributor

📜 MIT

Branch: master ▾

New pull request

Create new file

Upload files

Find file

Clone or download ▾

qz-fordham and fordham-msqf Develop (#1) ⌵

Latest commit c0054b6 19 seconds ago

```
* test  
  
* rm test  
  
* add test file
```

📄 LICENSE	Initial commit	3 days ago
📄 README.md	Initial commit	3 days ago
📄 test_file	Develop (#1)	19 seconds ago

# When you made a mistake

`git reset & git rm -cached`

- To undo git add:
  - ``git reset .``
- To undo git commit:
  - *Un-stage changes* ``git reset --soft HEAD~1``
  - *Un-stage & discard changes* ``git reset --hard HEAD~1``
- Remove file/directory in remote repo but keep it in local:
  - ``git rm --cached file_name``, then commit
  - ``git rm -r --cached directory_name``, then commit



# Solve conflict & management

## git diff & git log

- Compare your local un-added change
  - ``git diff file_name``
- Compare change since last commit
  - ``git diff``
- Compare two branches
  - ``git diff branch_1...branch_2``
- Compare file from two branches
  - ``git diff branch_1 branch_2 file_name``
- Check git log, show one-line version of log, graph and branches
  - ``git log --graph --oneline --decorate``

# Switch branches in between work

## git stash

- If your current branch has changes and you don't want to commit yet, but you need to switch to other branches, use ``git stash`` to store you change in a [Stack\(LIFO\)](#) like structure
  - *Stash un-committed code ``git stash``*
  - *List all stashes ``git stash list``*
  - *Show difference between stash and local ``git stash show``*
- When you done with your work in other branch and you want to keep working on previously stashed code
  - *Recover latest stash in current branch ``git stash pop``*
  - *Same as above ``git stash pop stash@{0}``*
  - *Recover the 3<sup>rd</sup> most recent stash ``git stash pop stash@{2}``*

# .git & .gitignore

- **.git** is a hidden directory under your local repo directory, it contains all git tracking information, including config, commit etc. If you delete **.git**, your local repo will no longer be tracked by git
- **.gitignore** is a hidden file under your local repo directory, it excludes files & dirs, which you don't want to commit to remote repo. It's good to have and always remember to put **.gitignore** in itself.

# More about Git & GitHub

- [Git Documentation](#)
- [GitHub collaboration control](#)

# Team Project #1 – Git & GitHub



Create your own GitHub account



Team up with at least 2 others (recommend 3-5 in total)



Download [team-project-1.py](#) from [project zero](#)



1 team member create a repository with “team-project-1.py”



Once repo is created, proceed to Team Project #2



Don’t work on project #1 before setup is done for project #2



Setup your local working directory with Git



Finish task described in that file with steps in “Scenario #2”

# Practice Makes Perfect

- Team up and practice, then you can have **Git** on your resume
- Something nice to have (things companies will like!):
  - A highly active GitHub account with meaningful code/projects
  - A [personal GitHub page](#) to show case your projects
  - Keep using Git for your personal projects

# Agile Development

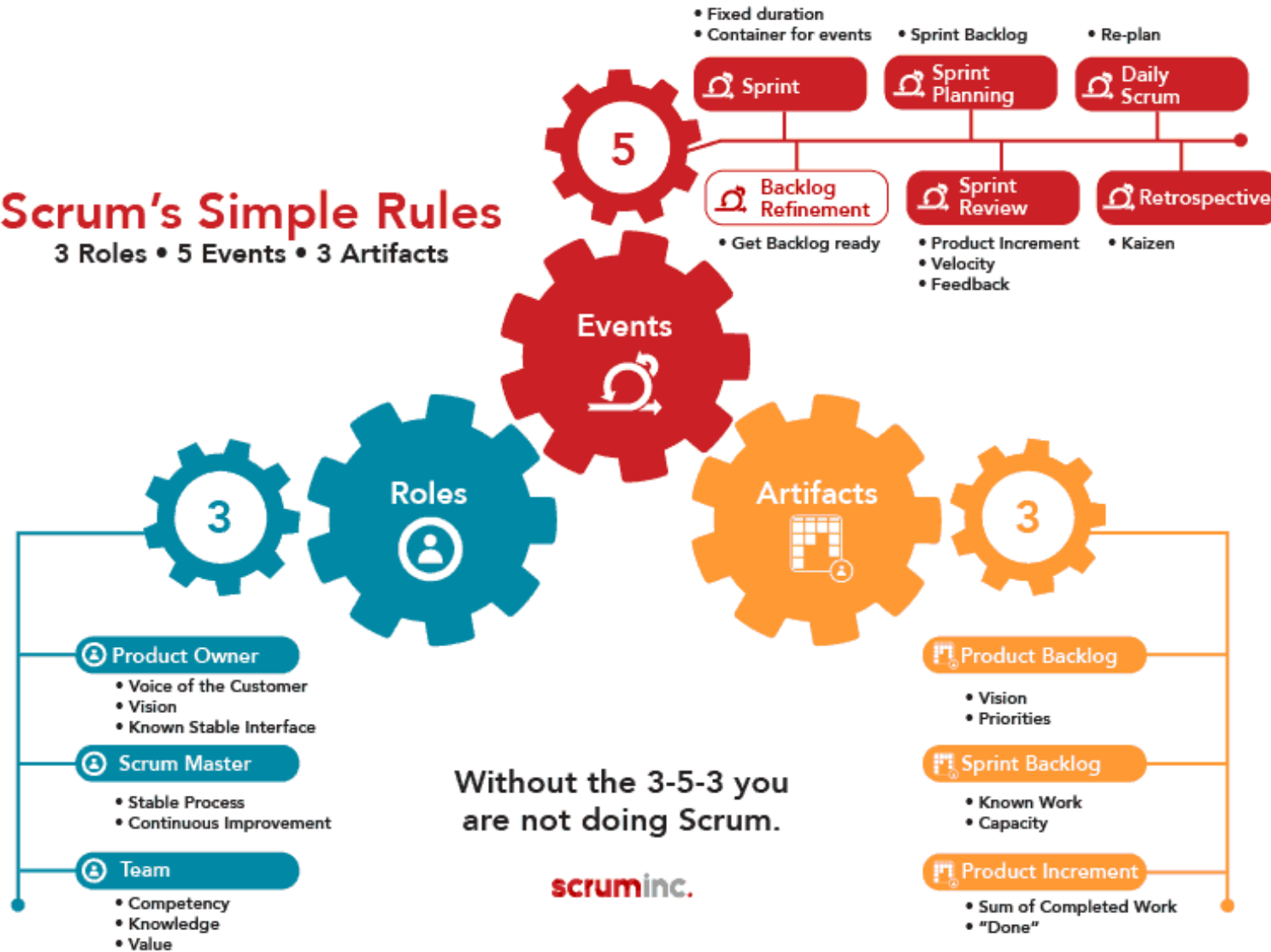
- “Agile Software Development is **an approach to software development** under which requirements and solutions evolve through the collaborative effort of self-organizing and cross-functional **teams** and their **customer(s)/end user(s)**.”

--- From Wikipedia

- **Scrum**: An Agile framework (practice), widely used in industry
- **Kanban**: Another main stream Agile framework
- [Silicon Valley Scrum scene](#)

# Scrum's Simple Rules

3 Roles • 5 Events • 3 Artifacts





# Roles in Scrum

## ■ Product Owner

- Represent product's stakeholders and voice of the customers
- Responsible for product backlog and deliverables
- Bridge between team & customers; 1 PO per Scrum team

## ■ Scrum Master

- Help a Scrum team to reduce distractions (meetings/calls)
- Ensure and guide team to follow Scrum processes

## ■ Development Team

- Engineers who bring actual value to deliverable products
- A Scrum team normally has 3-9 developers

# Scrum Workflow

## Sprint

- Basic unit of Scrum development cycle
- 2-3 weeks/Sprint

## Sprint Planning

- Team discussion for planning the upcoming Sprint.
- 2-4 hours/Sprint
- Clear scope and detail so that team agrees to goal and understand tasks

## Backlog refinement

- Clear uncertainties to get prepared for Sprint Planning.
- 2-4 hours/Sprint

## Daily Scrum (stand up)

- Daily review of individual progress for current Sprint.
- 5-20 mins/day

## Sprint Review

- Review complete/un-complete work for finished Sprint.
- 2-4 hours/Sprint

## Retrospective

- Reflect on finished Sprint. More/Neutral/Less (Good/Ok/Bad).
- Help team improve collaboration and efficiency continuously
- 1-2 hours/Sprint

# Scrum Artifacts

- **Project Backlog**

- A priority list of product expected tasks

- **Sprint Backlog**

- Tasks development team must address during the next Sprint

- **Product Increment**

- Potential deliverable items/features
- PI should be completed/tested by the end of a Sprint

# Scrum Board

- GitHub project board – GitHub native board
  - Customizable and free, very nice tools for team projects
- JIRA – Proprietary development tracking board
  - Powerful but not free, widely used in industry
- [Other Scrum Board](#)

As part of our Continued Service Resiliency efforts, All JIRA Services will be failed over to Carlstadt on coming weekend. Services will remain unavailable from 25th Jan (21:30 EST) to 26th Jan (11:30 AM EST). For any queries, please reach out to Service Desk

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ICP Virtual Machine Service

VMS Sprint 19.02

QUICK FILTERS: Japan Audit Prod V1 Boilermaker Tech\_Debt BELV-Softlaunch Retro Action Items Reported Externally Only My Issues Recently Updated

To Do

In Progress

In Dev

In DIT

Done

ICPVMS-1471

PROD - BKUP nic supplied and it shouldn't be from Magister to VMS

VMS Prod Support

1

ICPVMS-1509

EPV AIM: move to the new EPV vault.

VMS Prod Support

3

ICPVMS-1525

Confirm VMS monitoring process

ICPVMS-1353

DevOps/BMS - Retag cluster to have ST\_IDENTIFIER=MULTI\_TENA

VMS PSF

0

ICPVMS-1505

ITRC Break SSH Encryption needs sha1 removed.

VMS Risk / Breaks

1

ICPVMS-163

Able to search by mac on the network interfaces admin page

VMS Technical Debt

2

ICPVMS-1347

Ensure BMS nightly sync works with Duplicate Data Centers

VMS PSF

3

ICPVMS-1473

Requirement for Test VMs

VMS Non-Prod Support

1

ICPVMS-1370

VMS PSF - DIT Story Tracker

VMS PSF

5

ICPVMS-1514

DIT: MDM returning 500 Server Errors

VMS Non-Prod Support

1

ICPVMS-1520

PROD: Different clusters have same vnum ID

ICPVMS-1349

Add the new Tenant Field name to VM Create

VMS PSF

5

ICPVMS-1351

Send Tenant constraint to the TBN Placement call

VMS PSF

5

ICPVMS-1382

Hyperlink to cluster parent in read-only VM admin

VMS Technical Debt

1

ICPVMS-1523

Map the ALL tenant type to MULTI\_TENANT

VMS PSF

1

ICPVMS-1352

Update AZ API to include Tenant information

VMS PSF

5

ICPVMS-1249

Updated Validation check for Sophia Builds

VMS Technical Debt

2

ICPVMS-1429

Fix SSAP Scan Flags

VMS Risk / Breaks

2

ICPVMS-1348

wps/create API changes for disks.

VMS BUGS

3

ICPVMS-125

As 'Q', I want to automatically delete VMs that fail during build.

VMS CleanUp

5

ICPVMS-140

As 'Q' I want to fix deleteVM\_workflow code to initialize task\_id before use

VMS CleanUp

ICPVMS-924

MVP - Repave - Create new WF

VMS Repave

ICPVMS-1527

ESD 400 Conflict Errors

🕒 3 days remaining Complete Sprint

Board ▾



Virtual Machine Service / ICPVMS-1352

## Update AZ API to include Tenant information

[Edit](#)[Comment](#)[Assign](#)[More](#)[Open](#)[In Progress](#)[Workflow](#)[Export](#)

### Details

Type: [Story](#)

Status: [IN SIT](#)

Priority: [Medium](#)

Resolution: [Unresolved](#)

Affects Version/s: [None](#)

Fix Version/s: [None](#)

Labels: [VmsApiV4](#)

Story Points: [5](#)

Epic Link: [VMS PSF](#)

Sprint: [VMS Sprint 19.01](#), [VMS Sprint 19.02](#)

### Description

Update AZ API (AZ GET) to include Tenant

- Return tenant field in the list
- decouple tenant from service

Currently we return service: ["Gold", "WEBCO"], It should be:

```
Service:["gold"]
tenant: ["WEBCO"]
```

Sample JSON:

```
{ "platform" : ["ICP-V2"], "service" : ["DEDICATED", "DEDICATED.CLUSTER",
"NONPROD", "PROD"], "network_zone" : ["ESF"], "tenant" : ["ALL", "PSF"] }
,
"data_center" : "10030",
"links" : [
```

### People

Assignee:

[QIAODAN ZUO](#)

Reporter:

[GAURAV CHOUDHARY](#)

Votes:

[0](#) [Vote for this issue](#)

Watchers:

[3](#) [Stop watching this issue](#)

### Dates

Created:

[29/Nov/18 2:47 PM](#)

Updated:

[6 hours ago](#)

### Development

[2 branches](#)

[Updated Yesterday](#)

[25 commits](#)

[Latest Yesterday](#)

[3 pull requests](#) [MERGED](#)

[Updated Yesterday](#)

# Open Source Project Management Examples

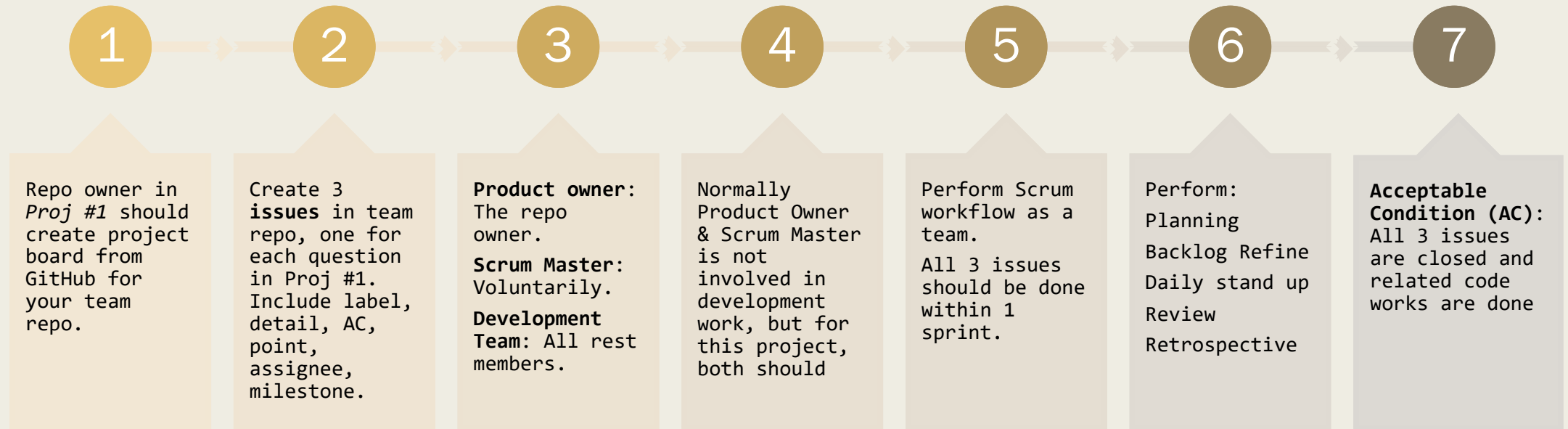
- [VUE.js – Frontend Framework](#)
- [VS Code – Text Editor/IDE](#)
- [TensorFlow – Machine Learning Framework](#)

# Agile Master!

- To have **Agile/Scrum** on your resume, you need practice Scrum workflow with your team. Don't be Lazy!
- Things to remember:
  - Scrum roles
  - Scrum artifacts
  - Scrum workflow



# Team Project #2 – GitHub Project Management



# Python Development in Linux

- Pip
- Virtual Environment
- Text Editor
- IDE (Jupyter Notebook, PyCharm)

# Pip

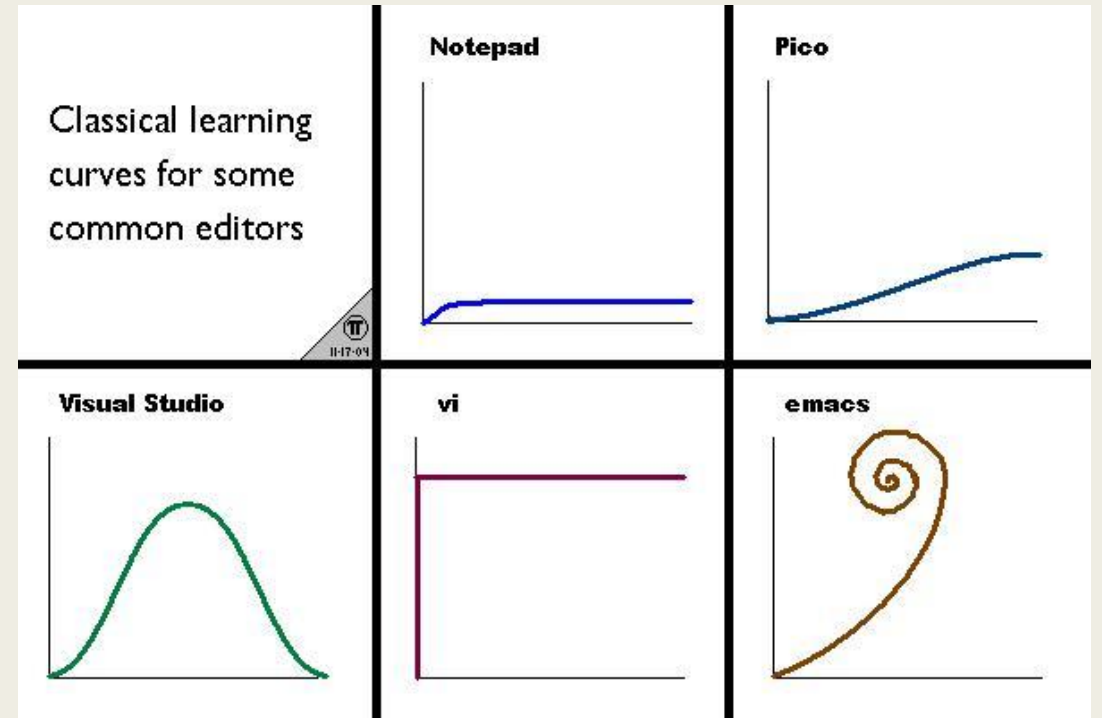
- Package management system for Python
- Install package using pip (you might need `sudo` before following commands to give pip superuser permission)
  - `pip install package-name`
  - `pip3 install package-name` install package for Python3, when both Python2 and Python3 exist in your OS

# Virtual Environment

- A tool that helps to keep dependencies required by different projects separated by creating isolated python virtual environments for them.
  - Isolation
  - Portable
- [Anaconda](#) (*Recommend*): Powerful package manager & virtual environment
- [Virtualenv](#): Light-weight virtual environment for Python

# Text Editor

- [Vi/Vim](#): Ancient editor people can't give up
  - *Vi comes with all Linux distros*
  - *Extremely efficient in terms of editing*
  - *Vim is highly customizable*
  - *Most popular editors/IDEs have embedded "Vim Mode", which allows you to use Vim key bindings*
- [VS Code](#): Microsoft opensource project
- [Atom](#): Highly customizable modern text editor with beautiful GUI
- [Sublime Text](#): Popular light-weight editor



# Integrated Development Environment (IDE)

- **Text Editor**

- Use text editor for small projects

- **Jupyter Notebook**

- Interactive Python IDE
- Nice tool for learning, taking notes, research and visualization

- **PyCharm/IntelliJ**

- Industrial level IDE from **JetBrains** used by most professional
- IDEs are good at **testing, tracking** and **handling dependencies**
- IntelliJ is majorly used by Java developers, but it has plug-ins that support Python related functionalities
- PyCharm is Python native IDE
- Student can request for free version from JetBrains

# My Python Development Setup

- Student at Fordham
  - *Ubuntu, Jupyter Notebook, Vim, Sublime Text, pip*
- Front-desk Developer at Hedge Fund
  - *Red Hat, Jupyter Notebook, Vim, PyCharm, virtualenv*
- Backend Developer at Bank
  - *Windows, Red Hat, IntelliJ, Vim, conda, pip*
- Personal Project
  - *Ubuntu, Jupyter Notebook, Vim, PyCharm, conda, pip*

# Todo List

- Setup your Linux Environment with EC2
- Team up and set up your Git & GitHub repository
- Team lead should start a project board
- Work on 2 projects together and perform Scrum workflow
- Setup Pip, Conda for further development
- Practice



# What we learned today?

- Amazon Web Service (**AWS**) EC2
- **Linux** & Utilities
- GitHub & **Git**
- Agile Development & **Scrum**
- Python Development tools (**Pip**)

# Ready to Go!

- Review what we learned today and keep practicing with your team
- Update your resume once you feel confident
- **Practice! Practice! Practice!**
- Setup your development environment and understand knowledge is essential for our further workshops

Questions?