





# GitHub and Version Control

Data Science Unit 1



multiverse

# Filesystems





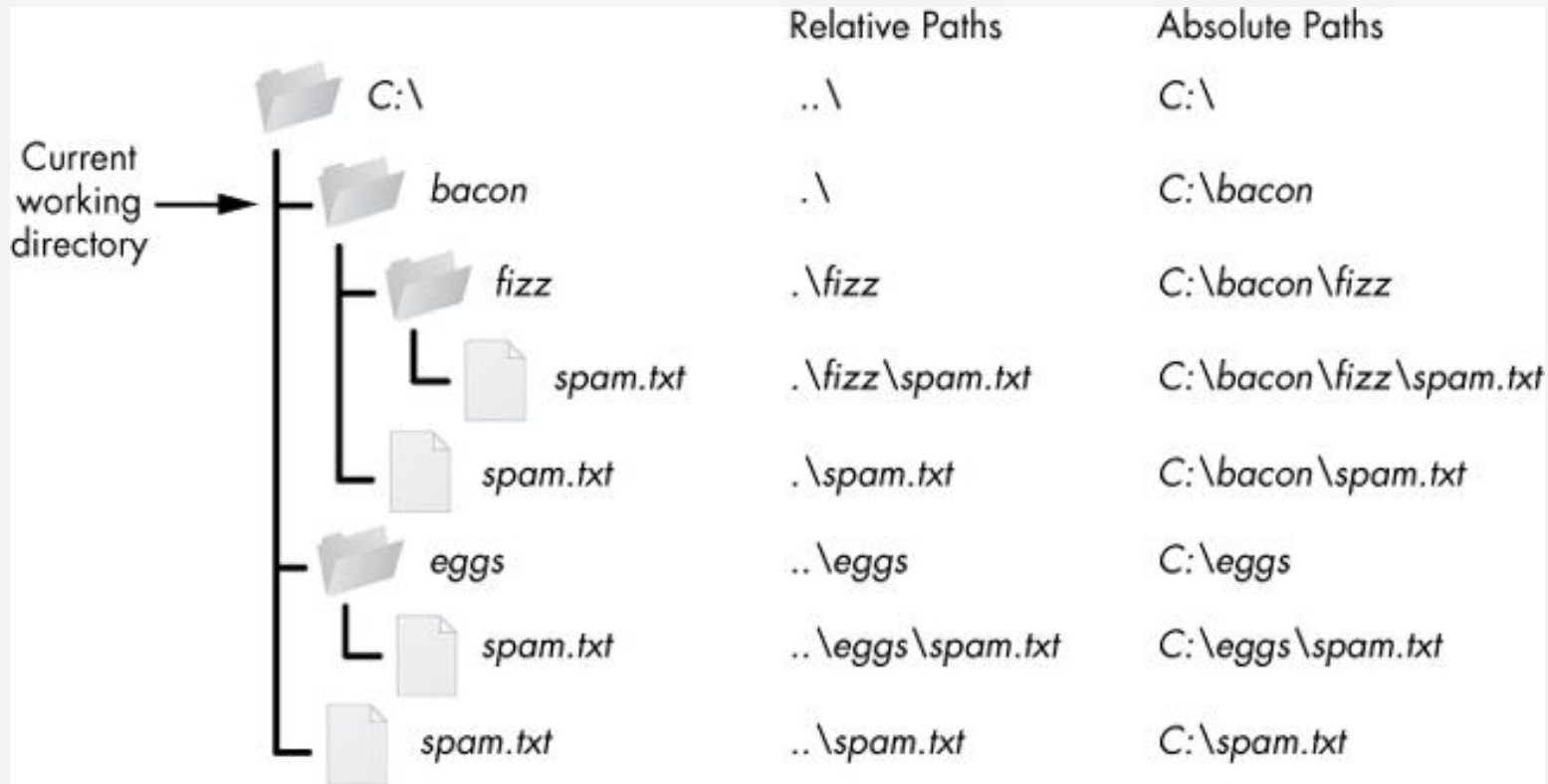
# Filesystems

What is a “filesystem”?

- The system used by your OS to store and manage all of your files
- Usually hierarchical
- `/` (Root) -> In most OS, your filesystem is a tree and the top of the tree is known as the root directory, written with a forward slash (`/`).
- `~` (Home) -> In most OS, your user is at the home directory, written with a tilde (`~`).
- `C:\` (C-Drive) -> For Windows OS, the top of your tree will usually start from the C-Drive, depending on the drive. Here we assume the default C-drive is being used (`C:\`).



# Filesystems





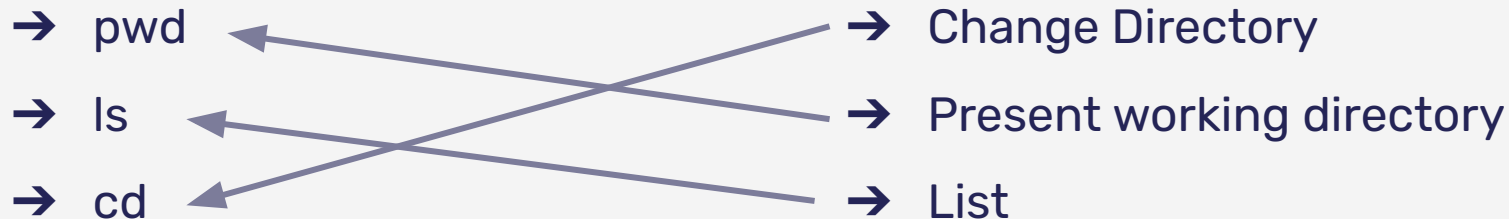
multiverse

# Getting Around





## Getting Around: Commands



```
[eduardo]$ ls -lah my_directory
```



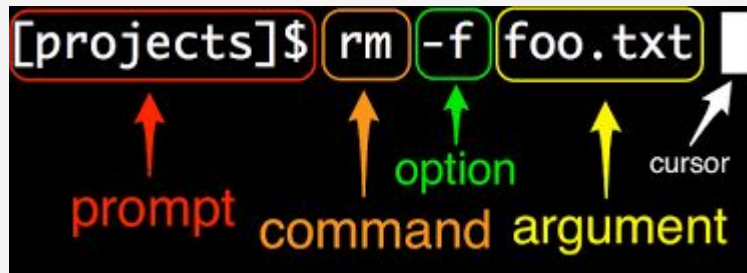
# Getting Around: Exercise

1. Open “File Explorer”
  - a. Find a file not in your home directory (ideally a few levels in, challenge yourself!)
  - b. Write down the absolute and relative path of your target and send it in the chat
2. Open “GitBash”
  - a. Navigate from your home directory to your chosen target directory

→ pwd

→ ls

→ cd







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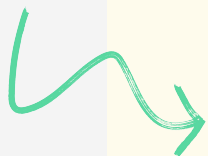


# What is Version Control?





# Version Control



VERSION CONTROL

a developer's best friend



# What?

A way to keep track of changes and the change history of a (set of) file(s) and share the changes.

Encourages collaboration and  
Agility



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# What is Source Control?





What?

**See above**



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# Why Version Control?





# Why?



app.py



app-2.py



app-3.py



final-app.py



finalfinal-app.py



fixed-app.py



thisisthelastonei  
promiseapp.py



uberfinalapp.py



# Why?

- Helps keep track of files
- Helps keep track of ANY change made to a file EVER
- Helps keep track of the entire edit history
- Helps share the files, changes made and entire edit history with others
- Can revert changes quickly
- Can be used with CI/CD pipelines
- Because I think it's awesome





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# What is Git?



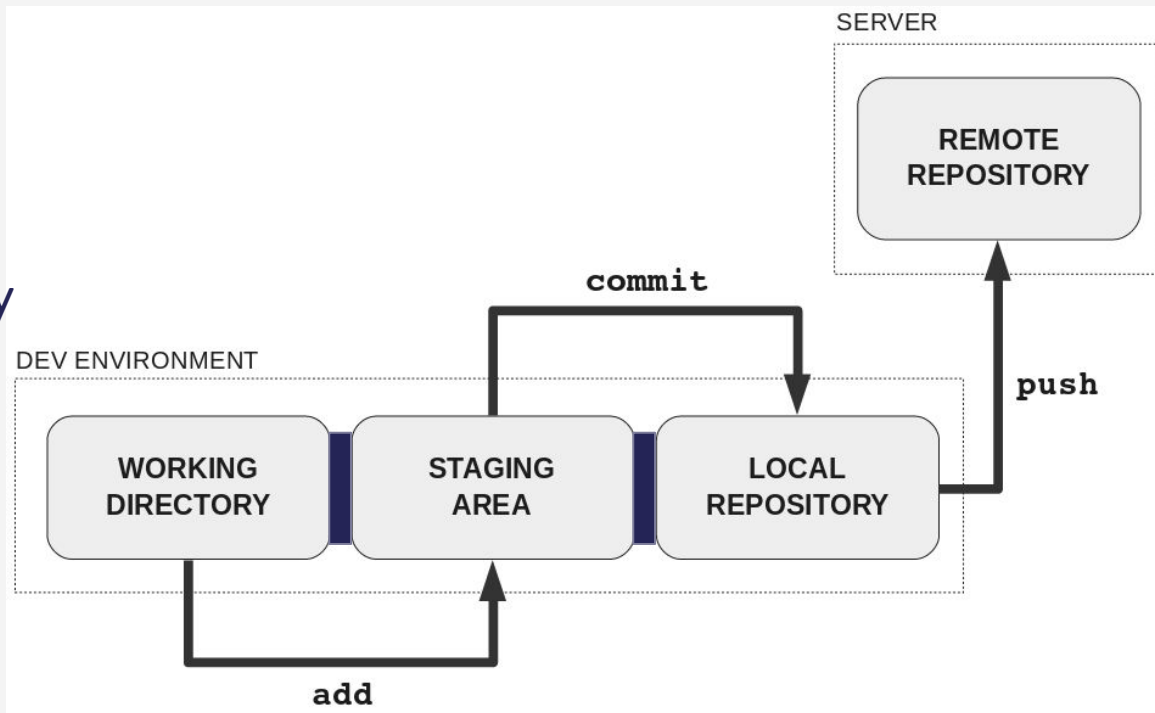


# Git: What?

→ Distributed source control management system (SCM)

→ Key components:

- ◆ Server
- ◆ Dev environment
  - Working directory
  - Staging area
  - Local repository





# Git: What?

- Working Directory
  - ◆ You do what you want
  - ◆ Tracked files
  - ◆ Untracked files
- Staging area:
  - ◆ Bundle of changes
  - ◆ Package things nicely for repository
- Local Repository
  - ◆ Clone of the remote repository



# Git Commands: Exercise

- 1. git init
  - 2. git add
  - 3. git commit
  - 4. git push
- git status

1. Create a local git repository for my\_project  
(Normally the first commit would happen much earlier on in the lifetime of the project)
2. Stage all of your code so far as one commit. Use the -m flag to add a commit message: "First commit"
3. Don't worry about uploading your git repository to a remote location (i.e. hosting service)
4. From now on, every new change(s) you make to your project should be committed to your git repository



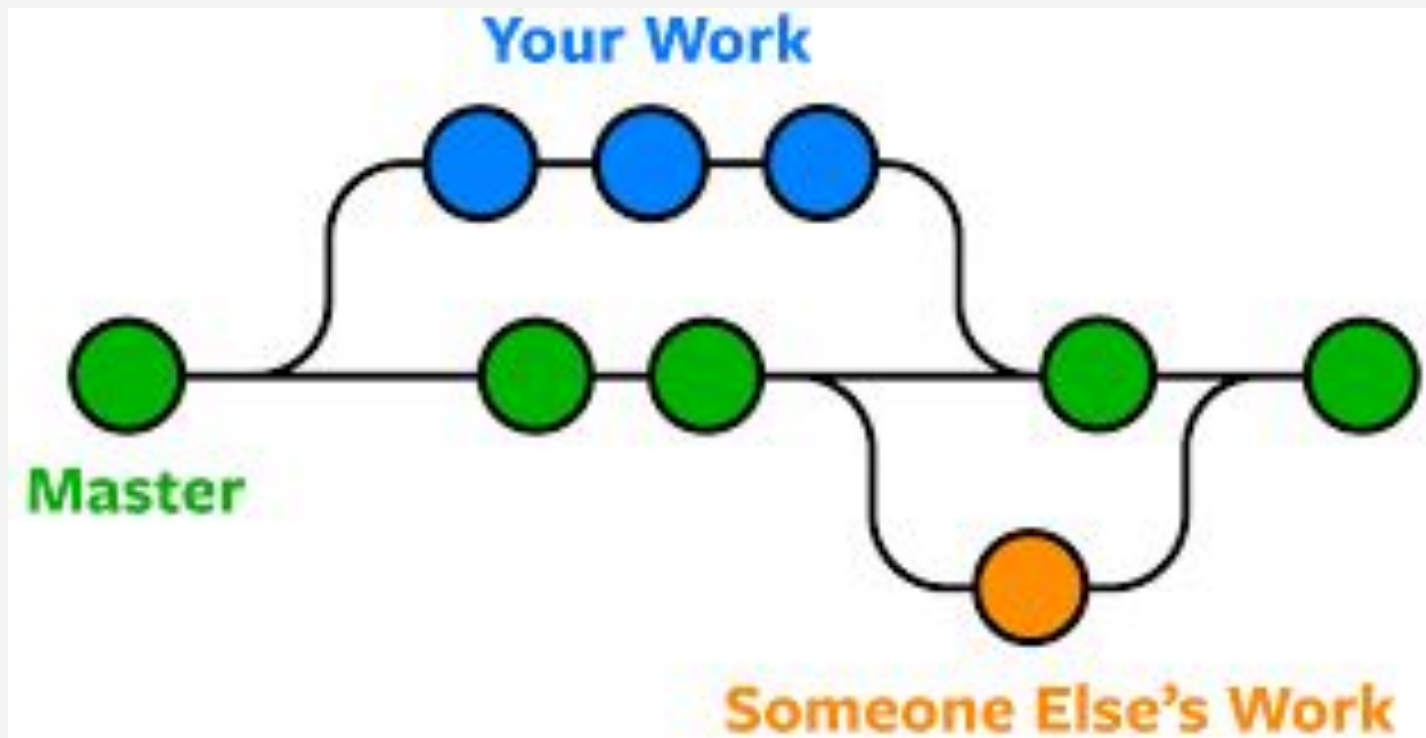
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# Branching & Navigation





# Branching and Navigation





# Branching and Navigation

<https://learngitbranching.js.org/>



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What is GitHub?







# GitHub: What?

- Most popular code hosting website (rivalled by GitLab)
- Free, with lots of functionality to help developers in any field:
  - ◆ Code hosting
  - ◆ Code discovery and search
  - ◆ Bug reports
  - ◆ Project task boards
  - ◆ Project wikis
  - ◆ GitHub Actions (automation)
  - ◆ (GitLab has CI/CD as well)



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# Why use GitHub?





## GitHub: Why?

Sharing is caring!



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Set Up






Github






[Create an account](#)









# Github: Set Up



[Pull requests](#) [Issues](#) [Marketplace](#) [Explore](#)

 Overview  Repositories 18  Projects 1  Packages





**Alastair Tyson**  
Alastair-Tyson


Data Coach | Mathematician | Cricket Fan

[Edit profile](#)



2 followers · 2 following · 0 stars



 WhiteHat



 Brentwood, UK



 <https://www.atyson-datascience.com/>



**Pinned** [Customize your pins](#)



 [capstone-project](#)   
Python

 [titanic](#)   
JavaScript

 [wwe-analysis](#)   
Jupyter Notebook

 [Regression-Demonstration](#)   
Linear Regression Demonstration: Enter in coordinates and watch how regression line changes.  
Python

 [underground](#)   
JavaScript

 [Escape room](#)   


```
1 #The following code runs an Escape Room I have made to help
2 import time
3 import threading
4 import sys
5 import string
```

49 contributions in the last year [Contribution settings](#)

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mon													
Wed													
Fri													



# Github: Set Up

 Search or jump to... Pull requests Issues Marketplace Explore

Alastair-Tyson / Regression-Demonstration

Unwatch 1 Star 0 Fork 0

<> Code Issues Pull requests Actions Projects Wiki Security Insights Settings

master 1 branch 0 tags Go to file Add file Code

Alastair Tyson and Alastair Tyson ready to upload 546c354 on 8 Mar 4 commits

.gitignore	ready to upload	7 months ago
README.md	Update README.md	7 months ago
application.py	lin regress first upload	7 months ago
requirements.txt	lin regress first upload	7 months ago

README.md

## Regression-Demonstration

Linear Regression Demonstration

Enter x and y coordinates to table and watch how regression line tries to best fit the data. Option to add in residual lines and mean line for comparison  $R^2$ , MAE and RMSE returned below.

Activities:

1. Enter in 10 values and observe the metric scores underneath

About

Linear Regression Demonstration: Enter in coordinates and watch how regression line changes.

Readme

Releases

No releases published  
[Create a new release](#)

Packages

No packages published  
[Publish your first package](#)

Languages

Python 100.0%



# Github: Set Up

Search or jump to... Pull requests Issues Marketplace Explore

Alastair-Tyson / Regression-Demonstration Unwatch 1 Star 0 Fork 0

Code Issues Pull requests Actions Projects Wiki Security Insights Settings

master

Commits on Mar 8, 2020

ready to upload Alastair Tyson authored and Alastair Tyson committed on 8 Mar	546c354	<>
lin regress first upload Alastair Tyson authored and Alastair Tyson committed on 8 Mar	940764f	<>
Update README.md Alastair-Tyson committed on 8 Mar	Verified 86a213c	<>
Initial commit Alastair-Tyson committed on 8 Mar	Verified a6cc3b2	<>

Newer Older





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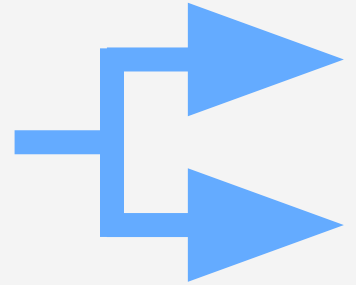
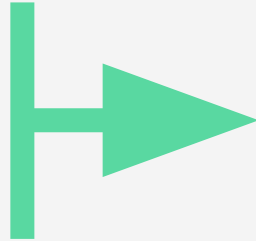
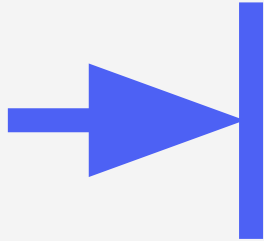


# Glossary





# Glossary





# Glossary

- **repository:** stores all your code and all history and tracking metadata
- **push:** sends your changes in your local repository to the remote repository (“upload”)
- **pull:** brings in any changes from the remote repository into your local repository (“download”)
- **branch:** alternative code path originating from a specific commit in another branch
- **staging:** telling git what changes we want to include in the next commit
- **commit:** a number of changes bundled up as a single transaction



# Glossary

- **clone**: copy a remote git repository and all of its metadata into our local environment
- **fork**: make a copy of a repo hosted online into another hosted repo under our account so we can freely change it
- **pull request**: aka merge request. Request to merge a branch/fork into the main branch/fork it originated from (upstream)



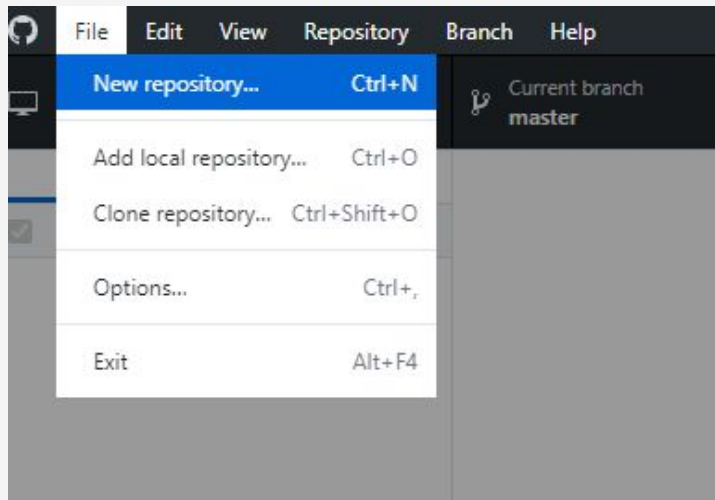
multiverse

# Using the app





# Github: Demo





# Github: Demo

Create a new repository

Name

white\_hat\_ds\_bootcamp

Description

Local path

C:\Users\Alastair Tyson\Documents\GitHub

Choose...

☒ Initialize this repository with a README

Git ignore

None

License

None

Create repository

Cancel




# Github: Demo

FileEditViewRepositoryBranchHelp

Current repository  
**white\_hat\_ds\_bootcamp**

Current branch  
**master**


 **Publish repository**  
Publish this repository to GitHub

Changes 1

History

Hello.txt

☒ 1 changed file

☒ Hello.txt 





# Github: Demo

The screenshot shows the GitHub profile of a user named Alastair Tyson. The profile includes a circular profile picture of a man with glasses and a bow tie, and a bio that is partially visible. The repository list shows two items: 'white\_hat\_ds\_bootcamp' (marked as Private) and 'Plotly-Dash-Demo' (a Jupyter Notebook). The interface includes a search bar, navigation links for Pull requests, Issues, Marketplace, and Explore, and tabs for Overview, Repositories (19), Projects (1), and Packages.

Search or jump to... Pull requests Issues Marketplace Explore

Overview Repositories 19 Projects 1 Packages

Find a repository... Type: All Language: All New

[white\\_hat\\_ds\\_bootcamp](#) Private Star

Updated 2 minutes ago

[Plotly-Dash-Demo](#) Star

Jupyter Notebook Updated on 11 May

**Alastair Tyson**



# Github: Demo


master ▾


1 branch

0 tags


Go to file

Add file ▾

 Code ▾


 Alastair-Tyson Initial commit

cfbfdb0 36 minutes ago 1 commits

 .gitattributes

Initial commit


36 minutes ago

 README.md

Initial commit

36 minutes ago

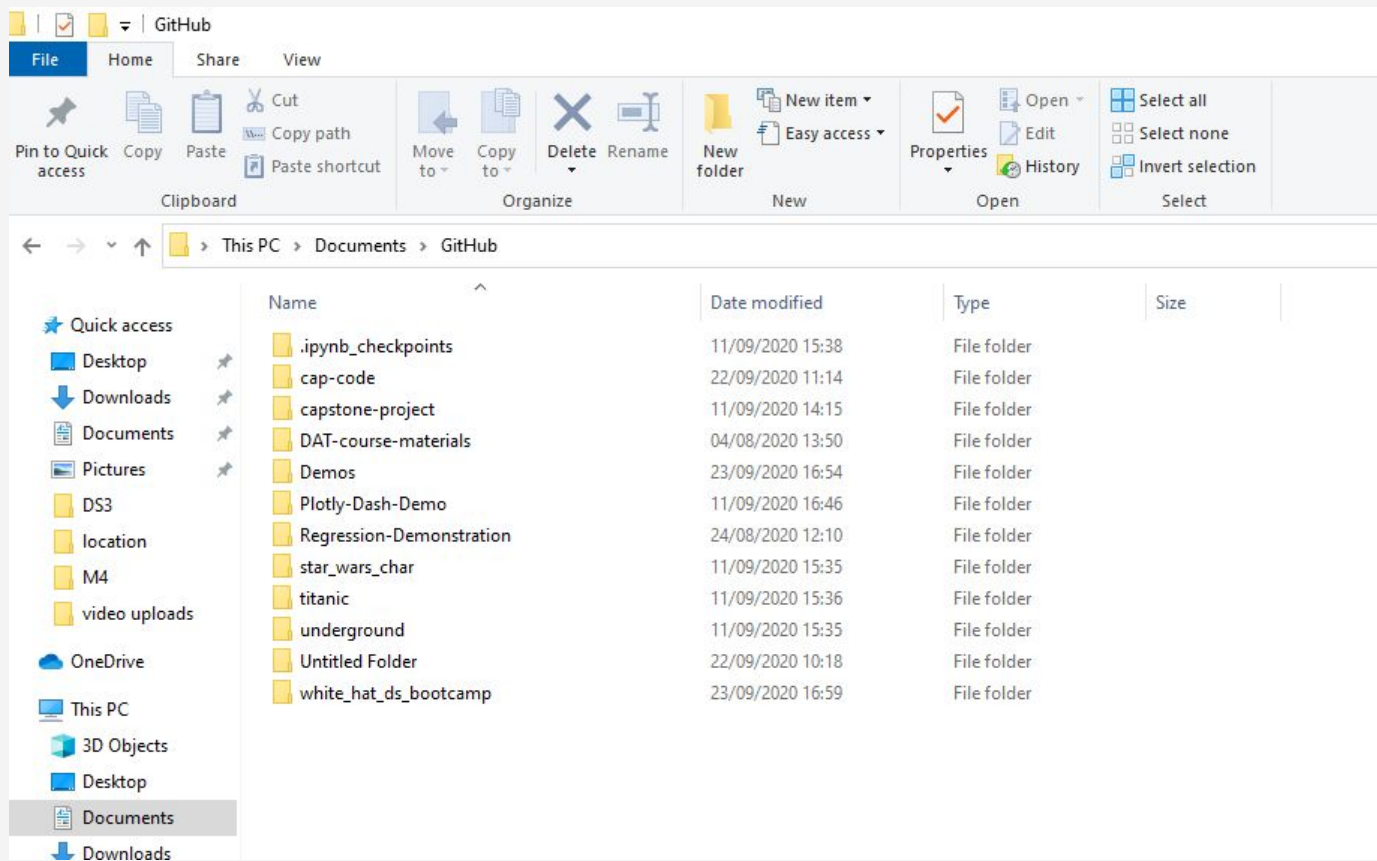
README.md



## white\_hat\_ds\_bootcamp

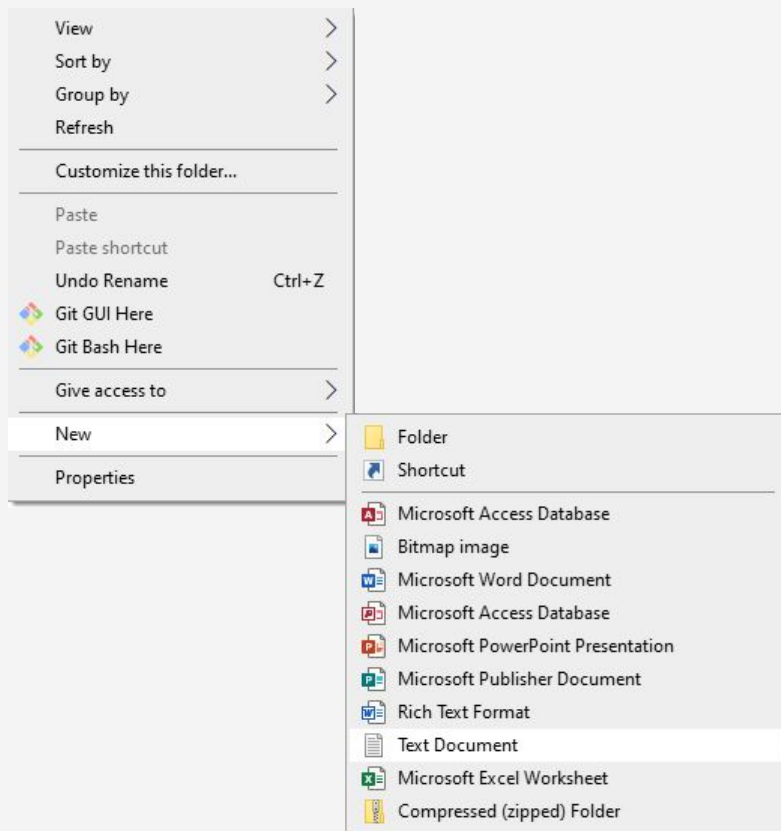


# Github: Demo



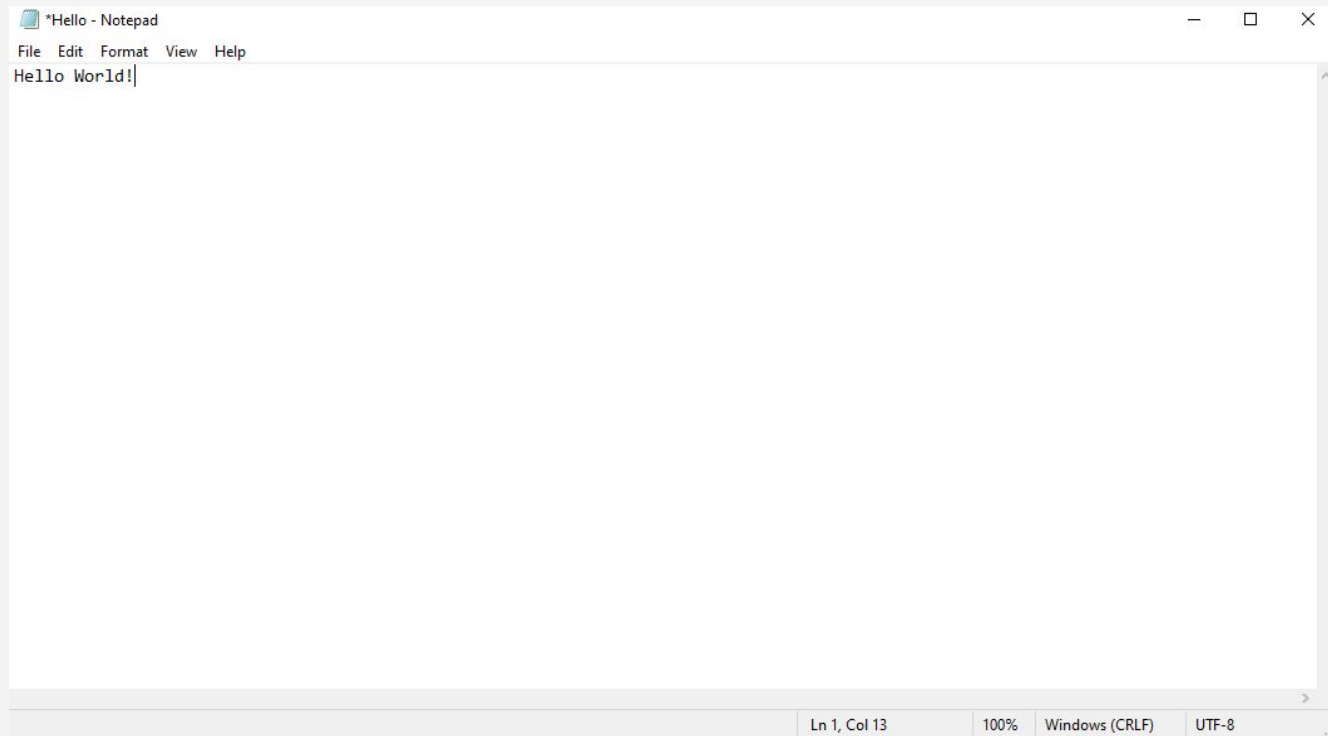


# Github: Demo





# Github: Demo





# Github: Demo

Current repository  
white\_hat\_ds\_bootcamp

Current branch  
master

Push origin  
Last fetched 7 minutes ago

Changes 1

History

1 changed file


Hello.txt

Hello.txt

@@ -0,0 +1 @@  
+Hello World!



# Github: Demo



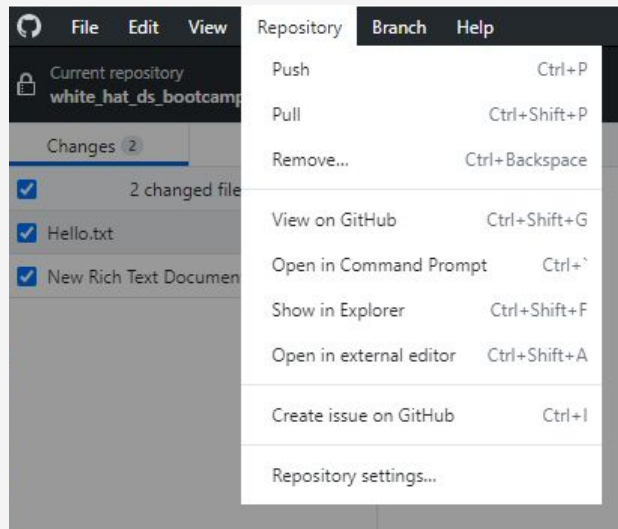
Description

1+

Commit to **master**



# Github: Demo







# Github: Demo

Alastair-Tyson / [white\\_hat\\_ds\\_bootcamp](#) Private

[Code](#) [Issues](#) [Pull requests](#) [Actions](#) [Projects](#) [Security](#) [Insights](#) [Settings](#)

master 1 branch 0 tags

[Go to file](#)

[Add file](#)

[Code](#)



Alastair-Tyson Update Hello.txt

efd8490 1 minute ago 3 commits



.gitattributes

Initial commit

1 hour ago



Hello.txt

Update Hello.txt

1 minute ago



New Rich Text Document.rtf

first edit

13 minutes ago



README.md

Initial commit

1 hour ago


README.md



## white\_hat\_ds\_bootcamp



# Github: Demo

 Search or jump to... Pull requests Issues Marketplace Explore

Alastair-Tyson / white\_hat\_ds\_bootcamp Private Unwatch

<> Code ! Issues 🛠 Pull requests ▶ Actions 📁 Projects ! Security 📈 Insights ⚙ Settings

white\_hat\_ds\_bootcamp / demo\_pull Cancel

<> Edit new file Preview

Spaces 2 No wrap

1 How to pull from Github

Commit new file

Create diff






Add an optional extended description...

☒ Commit directly to the master branch.  
☐ Create a new branch for this commit and start a pull request. [Learn more about pull requests.](#)

Commit new file Cancel






# Github: Demo


 Search or jump to...  [Pull requests](#) [Issues](#) [Marketplace](#) [Explore](#)   






Alastair-Tyson / [white\\_hat\\_ds\\_bootcamp](#) Private Unwatch


[Code](#) [Issues](#) [Pull requests](#) [Actions](#) [Projects](#) [Security](#) [Insights](#) [Settings](#)

 master  1 branch  0 tags

[Go to file](#) [Add file](#) [Code](#)

 Alastair-Tyson Create demo\_pull 35cf390 2 minutes ago 4 commits

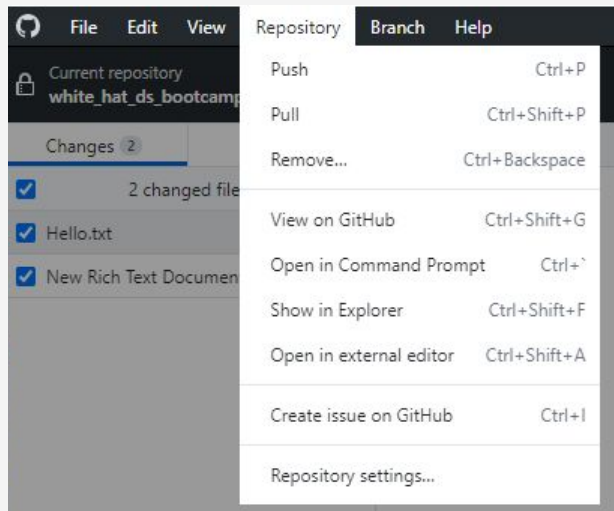
 .gitattributes	Initial commit	1 hour ago
 Hello.txt	Update Hello.txt	6 minutes ago
 New Rich Text Document.rtf	first edit	18 minutes ago
 README.md	Initial commit	1 hour ago
 demo_pull	Create demo_pull	2 minutes ago

README.md 

white\_hat\_ds\_bootcamp

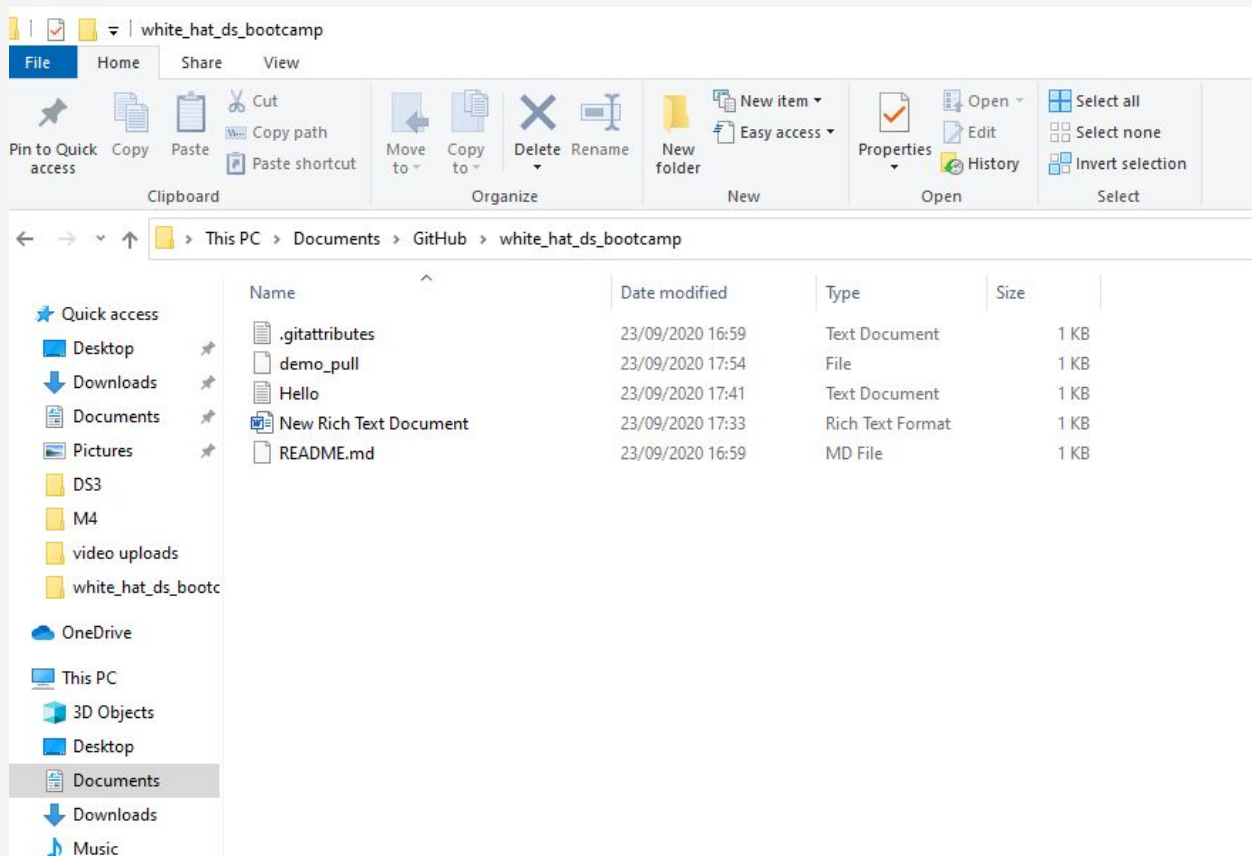


# Github: Demo





# Github: Demo





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Activity





# Activity



- Create a new repository on your online Github account. This is the repository you will use
- On your desktop app, go to file and select 'clone repository' and pull the new one you just created
- Put your *df\_programming\_basics-main* folder in your repository
- Change to this repository on your app and commit the changes
- Push to the remote repository and check to see if it worked



multiverse

# Jupyter Notebook







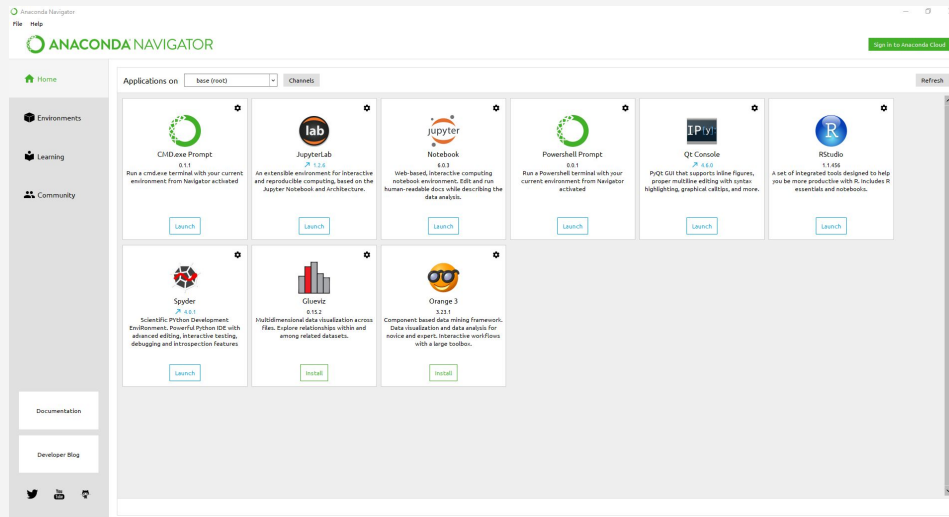
# Python





# Jupyter Notebook

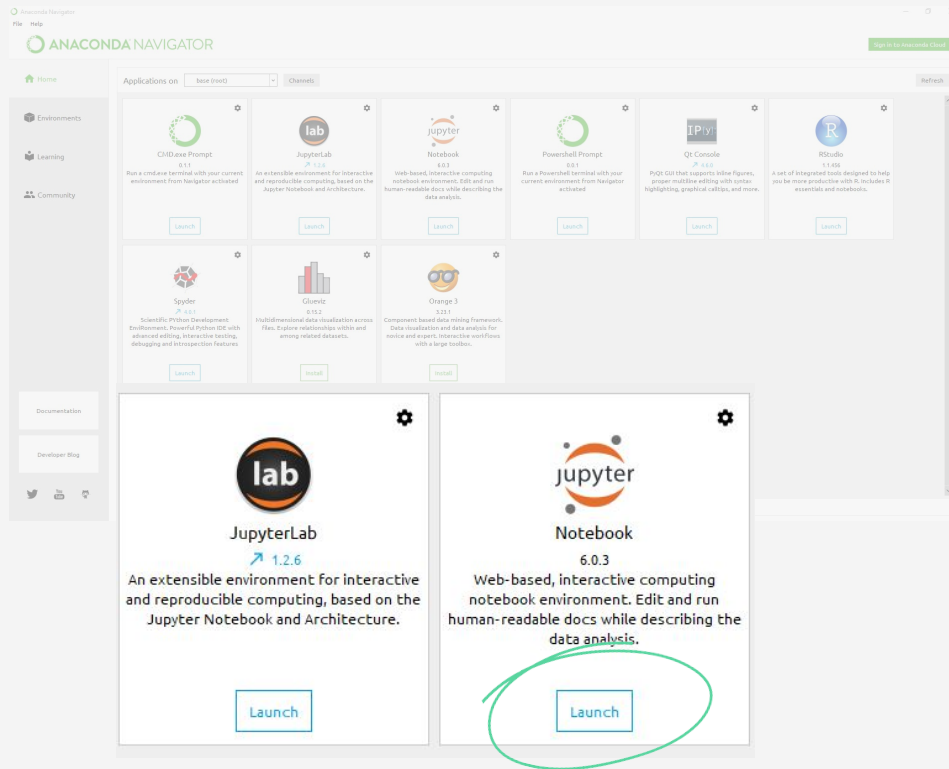
- You should have installed Anaconda by now.
- Open “Anaconda Navigator”. You should see this:





# Jupyter Notebook

- You should have installed Anaconda by now.
- Open “Anaconda Navigator”. You should see this:
- Check to see if Jupyterlab and Jupyter notebook are installed. They should show “Launch”





# Jupyter Notebook

 jupyter

QuitLogout

FilesRunningClusters

Select items to perform actions on them.

UploadNew ↕

☐ 0 ▾


/

Name ▾Last ModifiedFile size

<input type="checkbox"/>	3D Objects	a month ago	
<input type="checkbox"/>	anaconda3	5 months ago	
<input type="checkbox"/>	Contacts	a month ago	
<input type="checkbox"/>	Desktop	10 days ago	
<input type="checkbox"/>	Documents	14 days ago	
<input type="checkbox"/>	Downloads	a day ago	
<input type="checkbox"/>	Favorites	17 days ago	
<input type="checkbox"/>	Links	a month ago	
<input type="checkbox"/>	Music	a month ago	
<input type="checkbox"/>	OneDrive	9 hours ago	
<input type="checkbox"/>	Pictures	5 days ago	
<input type="checkbox"/>	Projects	5 months ago	
<input type="checkbox"/>	Saved Games	a month ago	



# Jupyter Notebook



QuitLogout

FilesRunningClusters

Select items to perform actions on them.

UploadNew↺

☐ 0 ▾


/ Documents / GitHub / white\_hat\_ds\_bootcamp


Name ▾Last ModifiedFile size

<input type="checkbox"/> ..	seconds ago	
<input type="checkbox"/> demo_pull	16 minutes ago	25 B
<input type="checkbox"/> Hello.txt	30 minutes ago	12 B
<input type="checkbox"/> New Rich Text Document.rtf	37 minutes ago	7 B
<input type="checkbox"/> README.md	an hour ago	26 B

















# Jupyter Notebook

 **jupyter** Untitled Last Checkpoint: a few seconds ago (unsaved changes)

 Logout

File Edit View Insert Cell Kernel Widgets Help

Trusted  Python 3 

          Code  

In [ ]: |



# Jupyter Notebook

```
In [1]: print('Hello World')
```

```
Hello World
```

```
In [ ]: |
```



multiverse

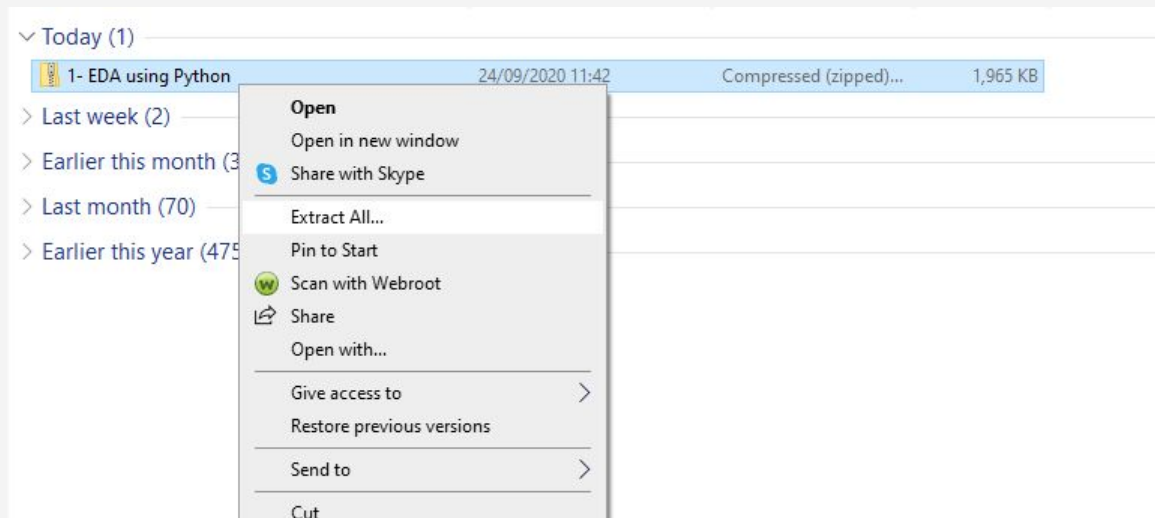
# Moving Forward







# Jupyter Notebook





# Jupyter Notebook

Today (1)

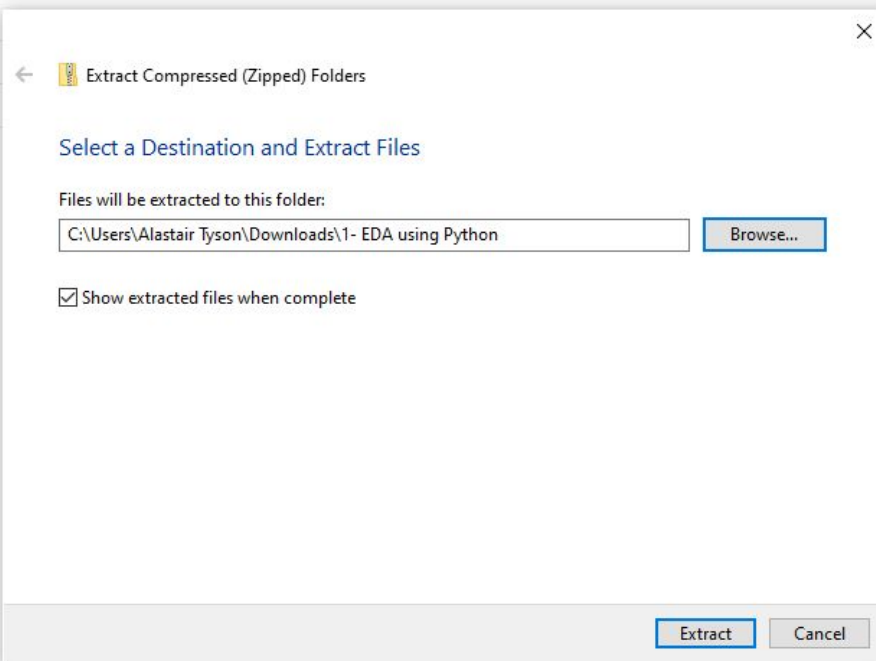
1- EDA using Python 24/09/2020 11:42 Compressed (zipped)... 1,965 KB

Last week (2)

Earlier this month (37)

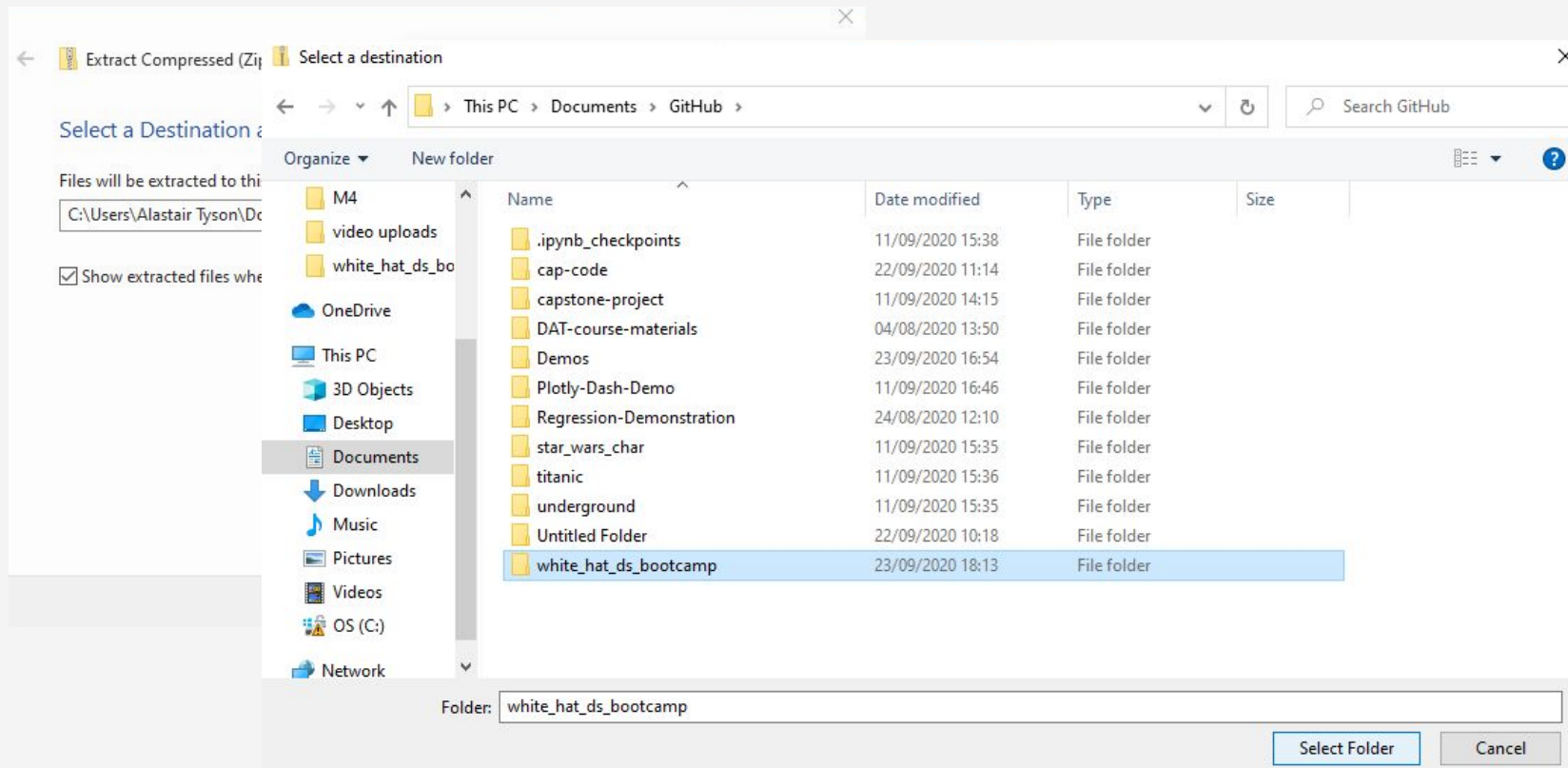
Last month (70)

Earlier this year (475)













# Jupyter Notebook





# Jupyter Notebook

 .ipynb_checkpoints	23/09/2020 18:12	File folder	
 exploratory-data-analysis	24/09/2020 11:45	File folder	
 .gitattributes	23/09/2020 16:59	Text Document	1 KB
 demo	23/09/2020 18:13	IPYNB File	1 KB
 demo_pull	23/09/2020 17:54	File	1 KB
 Hello	23/09/2020 17:41	Text Document	1 KB
 New Rich Text Document	23/09/2020 17:33	Rich Text Format	1 KB
 README.md	23/09/2020 16:59	MD File	1 KB