W200 - Intro to Python

with an orientation towards Data Science

Week 1: Class Mechanics … Reviewing the tools, getting to know your colleagues.

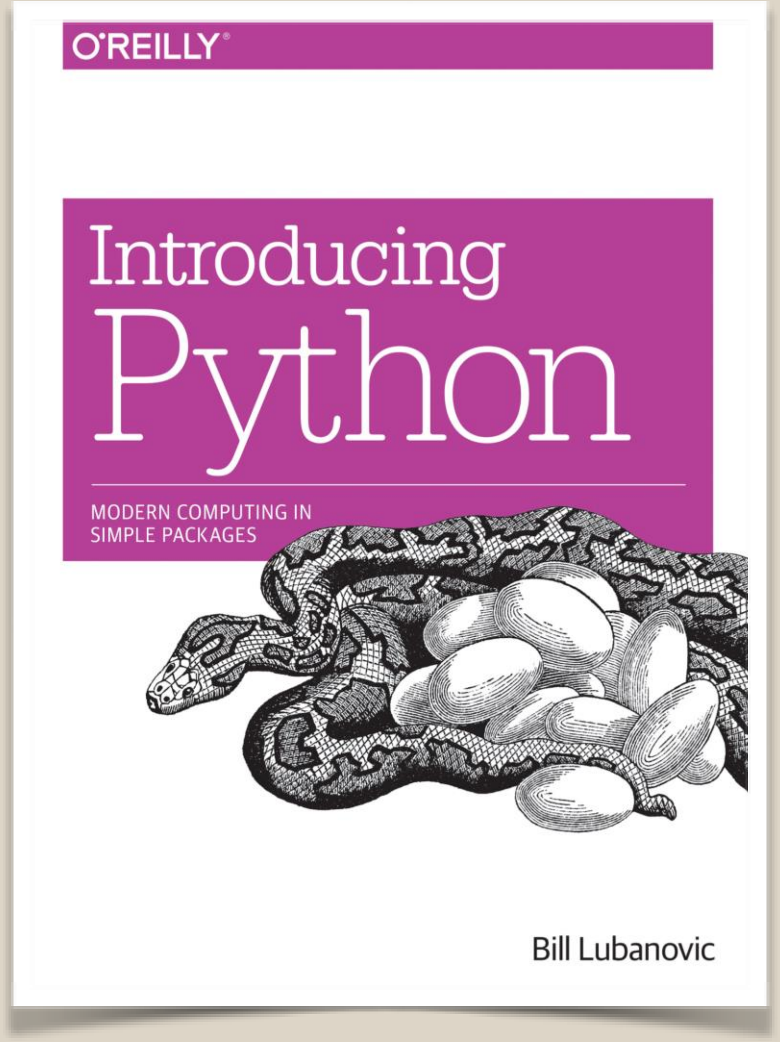
Welcome! Today's agenda:

Overview: Class Mechanics

- Introductions
- Syllabus & Schedule
  - *Vast variety of skill sets, experiences, goals so some assignments may be easy, others may be difficult. We want to ensure students of all levels establish a strong foundation for the advanced courses. Please ask questions! If you can help your fellow students, please do because your real-world experience complements our course.*
- GitHub Examples
- Shell script example
- Summary

Class Mechanics

- Complete the asynchronous parts *before* our video chats
- Readings: from study.net
- Assignments are posted by Rob Foster and Michael Berger, the TAs, after the video chat session.
- Most materials are posted to GitHub (https://github.com) in the UCB-INFO-PYTHON/
- You'll *pull* homework down from that site and *push* your completed work up.



Goodrich, M. T. 2013. Data Structures and Algorithms in Python. Chapter 3: Algorithm Analysis

Welcome | Grading

Homework (30%)

Project 1 object oriented, individual (20%)

Project 2 data analysis, group (20%)

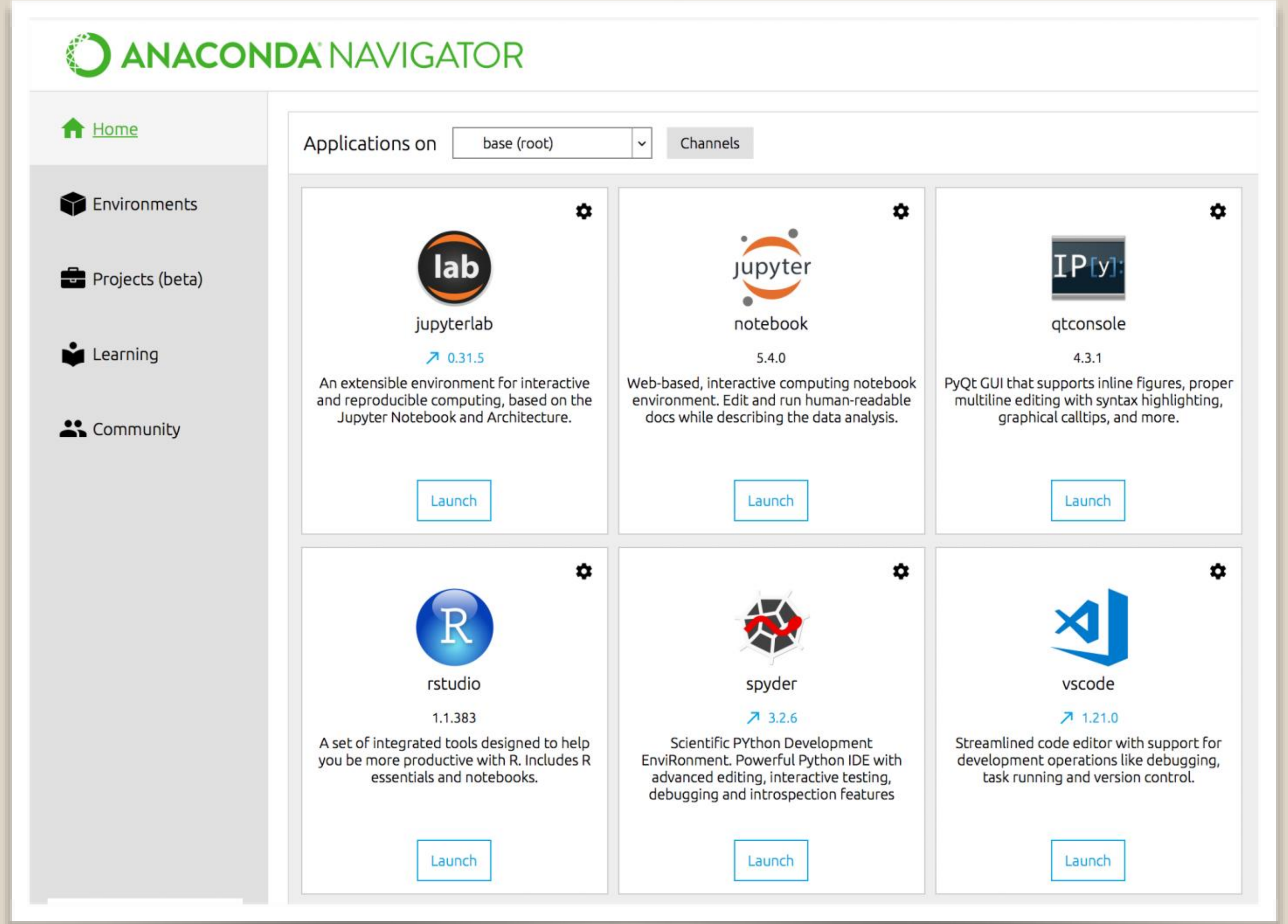
Participation (10%)

Midterm (10%)

Final (10%)

Class Mechanics

- What you'll need:
  - Python3
  - Anaconda
  - Jupiter Notebooks
  - Terminal



  - Text Editor (try to avoid PyCharm, Spyder for the moment)

Class Mechanics

- During video sessions, we'll review main points, answer questions … and then have "breakout rooms"
  - Breakout rooms are video chats of smaller groups of students to work on a problem - see one, do one, teach one.
  - Today we'll demonstrate some of Zoom's features
    - *Video, chat options, breakout rooms, polls*

Syllabus & Schedule

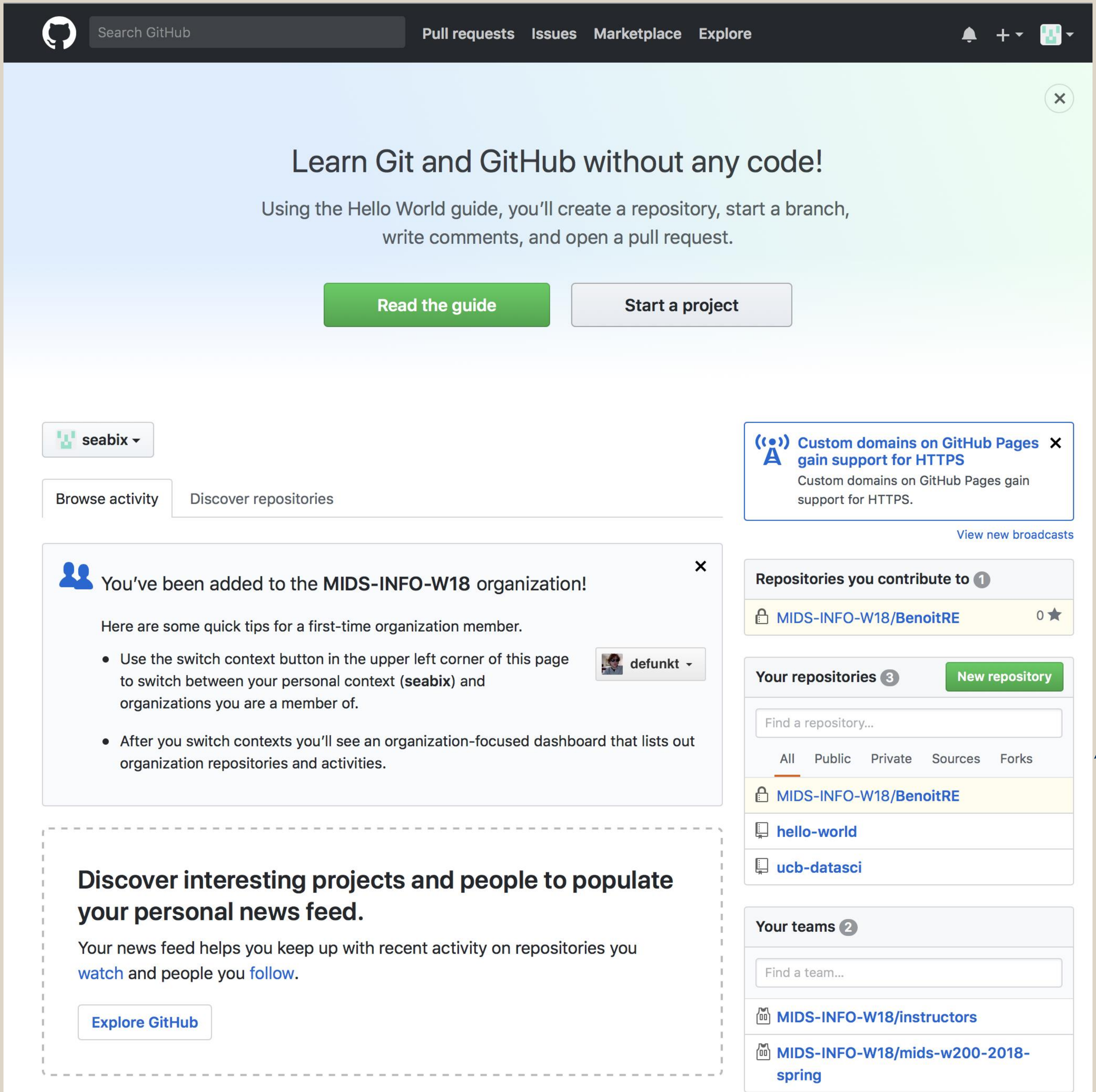
Mon	Tues	Weds	Thurs	Async Unit	Sync Week	Async to Review (Prior to Class)	Projects (20% each)	Exams (10% each)	HW Assigned (30% total)	HW Due	Notes
Python for Data Science: Fall 2018						**All due dates are tentative and may be changed by instructors. Homework due dates are 11:59pm PST the night before live session.**					
Sep 3	Sep 4	Sep 5	Sep 6	1	1	Introduction to Programming, the Command Line, and Source Control			unit 1		A make-up class will be scheduled for Monday class.*
Sep 6											[This is the make-up for Monday 4 pm session.]
Sep 10	Sep 11	Sep 12	Sep 13	2	2	Starting Out with Python			unit 2	unit 1	
Sep 17	Sep 18	Sep 19	Sep 20	3	3	Sequence Types and Dictionaries			unit 3	unit 2	9/17/2018 - Last day to add or drop a class
Sep 24	Sep 25	Sep 26	Sep 27	4	4	More About Control and Algorithms			unit 4	unit 3	
Oct 1	Oct 2	Oct 3	Oct 4	5	5	Functions			unit 5	unit 4	
Oct 8	Oct 9	Oct 10	Oct 11	6	6	Complexity	Project 1 Assigned		scrabble	unit 5	
Oct 15	Oct 16	Oct 17	Oct 18	7	7	Classes			unit 7	scrabble	
Oct 22	Oct 23	Oct 24	Oct 25	8	8	Object-Oriented Programming	Project 1 Final Proposal Due	Exam 1 Start	x	unit 7	
Oct 29	Oct 30	Oct 31	Nov 1	9	9	Working With Text and Binary Data		Exam 1 Due	x		
Nov 5 - 9 Fall Break & Immersion											
Nov 12	Nov 13	Nov 14	Nov 15	10	10	NumPy	Project 1 Presentations		unit 9 / HW10		A make-up class will be scheduled for Monday Class
Nov 19	Nov 20	Nov 21	**Nov 22**	11	11	Data Analysis With Pandas	Project 2 Assigned		unit 10 / HW11	unit 9 / HW10	A make-up class will be scheduled for the Thursday Classes
Nov 26	Nov 27	Nov 28	Nov 29	12	12	Plotting and Visualization	Project 2 Proposal Due		unit 11 / HW12	unit 10 / HW11	
Dec 3	Dec 4	Dec 5	Dec 6	13	13	Pandas Aggregation and Group Operations		Exam 2 Start	x	unit 11 / HW12	
Dec 10	Dec 11	Dec 12	Dec 13	14	14	Testing	Project 2 Presentations!	Exam 2 Due	x		Last Day of Class. bring beer Congratulations!
Last Day of Instruction - December 14											

Live Schedule: https://docs.google.com/spreadsheets/d/1sVV7-4OHZ-EDNqkMJ55OPUfz_QLJ4LZNuZl-cRaxgV0/edit?usp=sharing

Syllabus: https://docs.google.com/document/d/1_lLP7iM11lWNdtZL80-axCznLZUGz4oaVxB4FuryCH0/edit?usp=sharing

Introductions

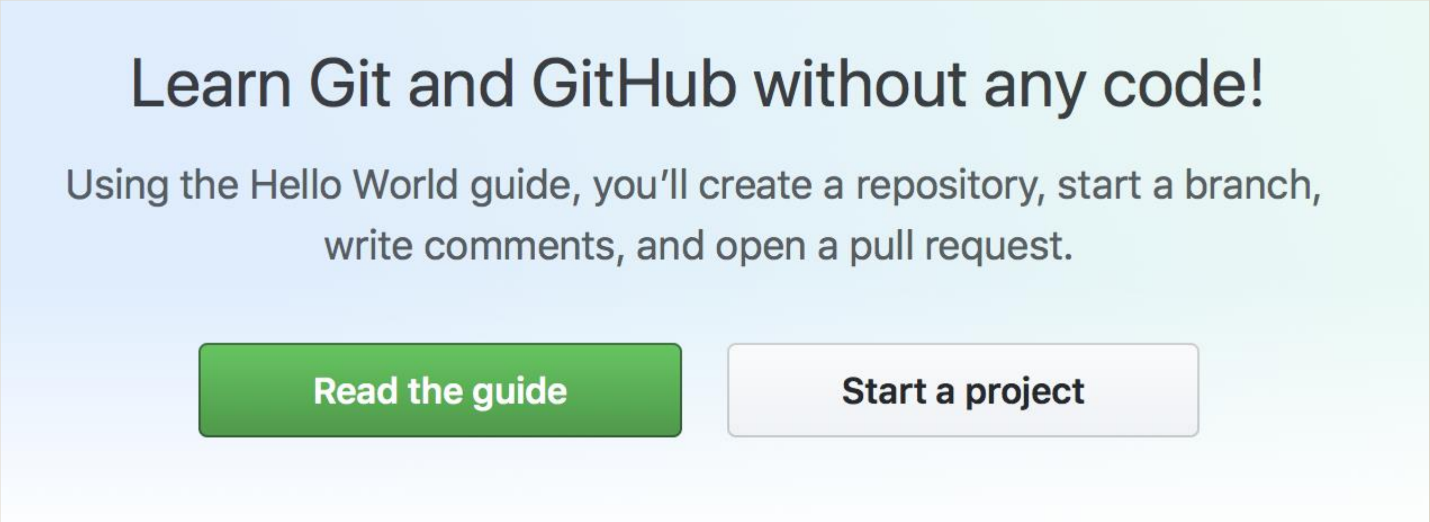
- Give a brief intro about yourself -
  - where you live,
  - what you do,
  - why you'd like to use Data Science.
- Why MIDS?



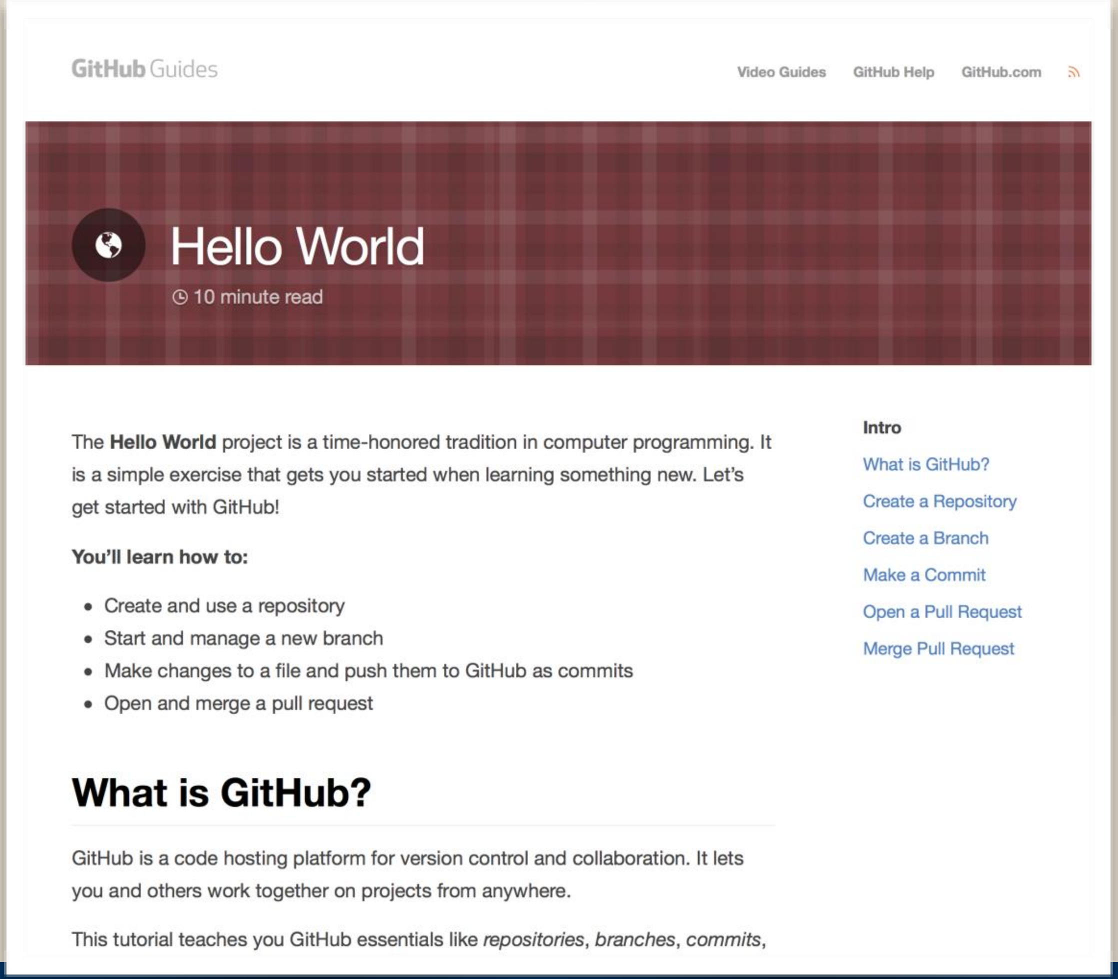
Where your work (your REPO) will appear

GitHub …

- File sharing and version-control site.
- In a nutshell … https://github.com

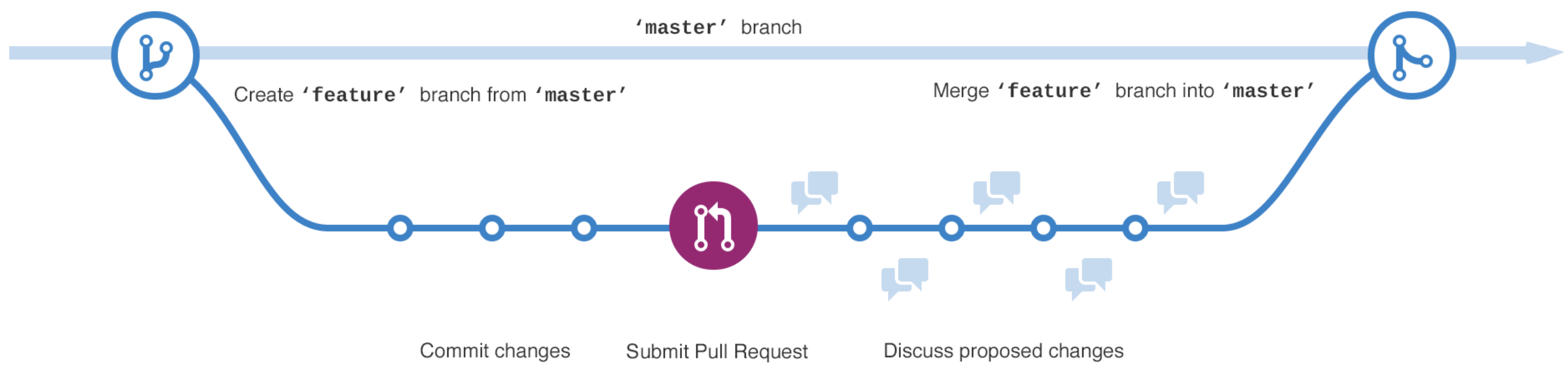


Please complete the 10-minute "Read the guide" from GitHub



How GitHub works

When you create a repository, there's a "master" of your files, e.g., TomJonesREPO/SUBMISSIONS/week1.py



https://guides.github.com/activities/hello-world/

Create and edit your file (e.g., week1.py) on your <u>local</u> computer - e.g., c://w200/TomJonesREPO/SUBMISSIONS/week1.py

When you're ready to push your file (upstream) it to GitHub you'll issue a command to add your file to git and then upload your file.

How GitHub works

Students – work on the master locally … and then push to the master on the server.

[If you're already experienced with GitHub, note that we won't be using branches in this class.]

Before merging, we add a message (e.g., "File Updated by Tom's Group").

- There are several ways to communicate with GitHub - using a terminal window and command line, a Desktop Application, or configure your text editor (such as Atom) to integrate pull/push, commits …. For this course and others in the program, we rely on the command line.

Example of command line

Create a "Hello, World!" page

Get started in an empty working directory (for example, work, if you downloaded the file from the previous step) and create an empty directory named "hello", then create a `hello.html` file in it with the following contents.

RUN:

```
mkdir hello
cd hello
touch hello.html
```

FILE: *HELLO.HTML*

```
Hello, World!
```

Add the page to the repository

Now let's add the "Hello, World" page to the repository.

RUN:

```
git add hello.html
git commit -m "First Commit"
```

You will see ...

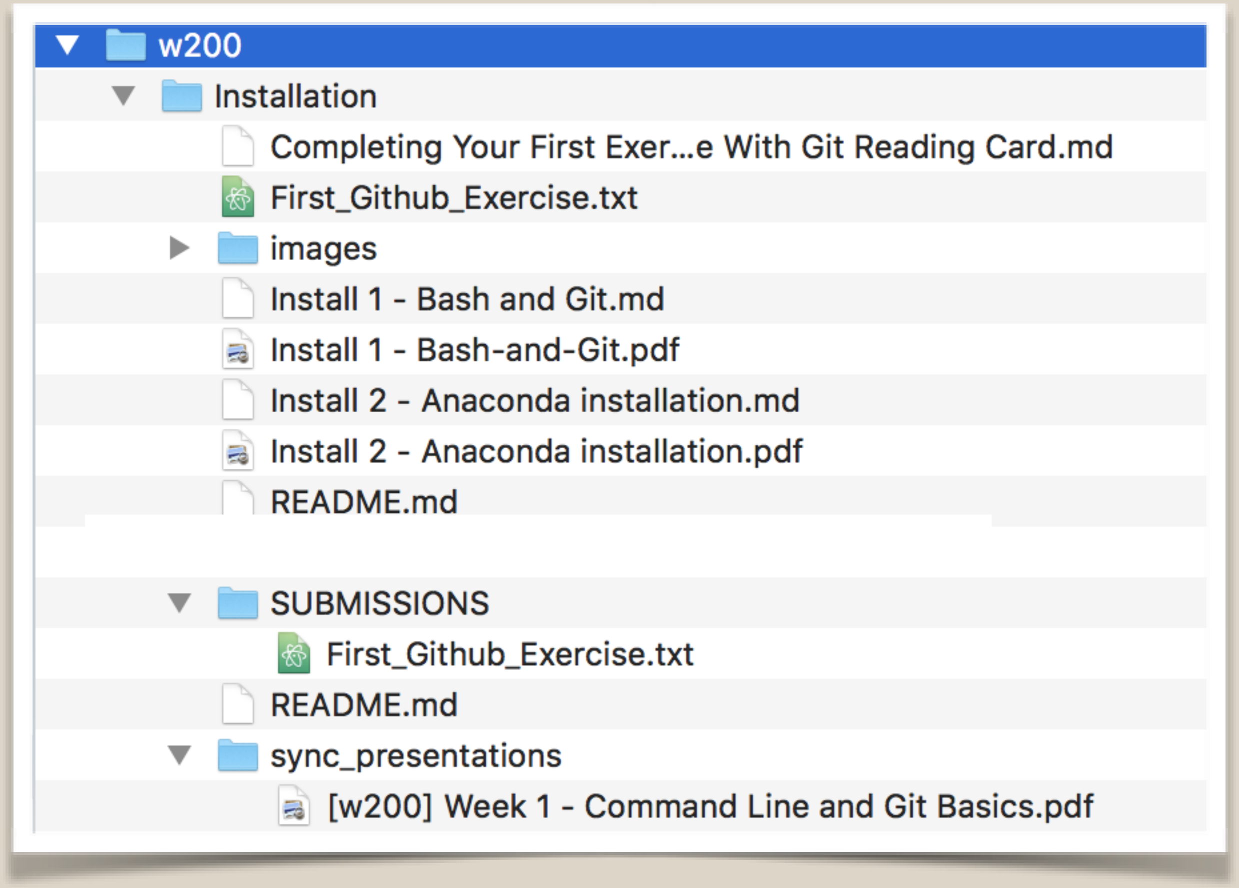
RESULT:

```
$ git add hello.html
$ git commit -m "First Commit"
[master (root-commit) 911e8c9] First Commit
 1 files changed, 1 insertions(+), 0 deletions(-)
 create mode 100644 hello.html
```

GitHub for class - what to expect

- You'll make a repository (firstnameLastnameREPO)
- Enable GitHub and your computer to communicate to share files (.git)
- Use GitHub to download the exercise and push your completed exercise back up in your SUBMISSIONS folder.
- GitHub records the time of the upload and the message you attach to the upload …

```
/Users/tom/w200/
/Users/tom/w200/firstnameLastnameREPO/
/Users/tom/w200/firstnameLastnameREPO/SUBMISSIONS/
```

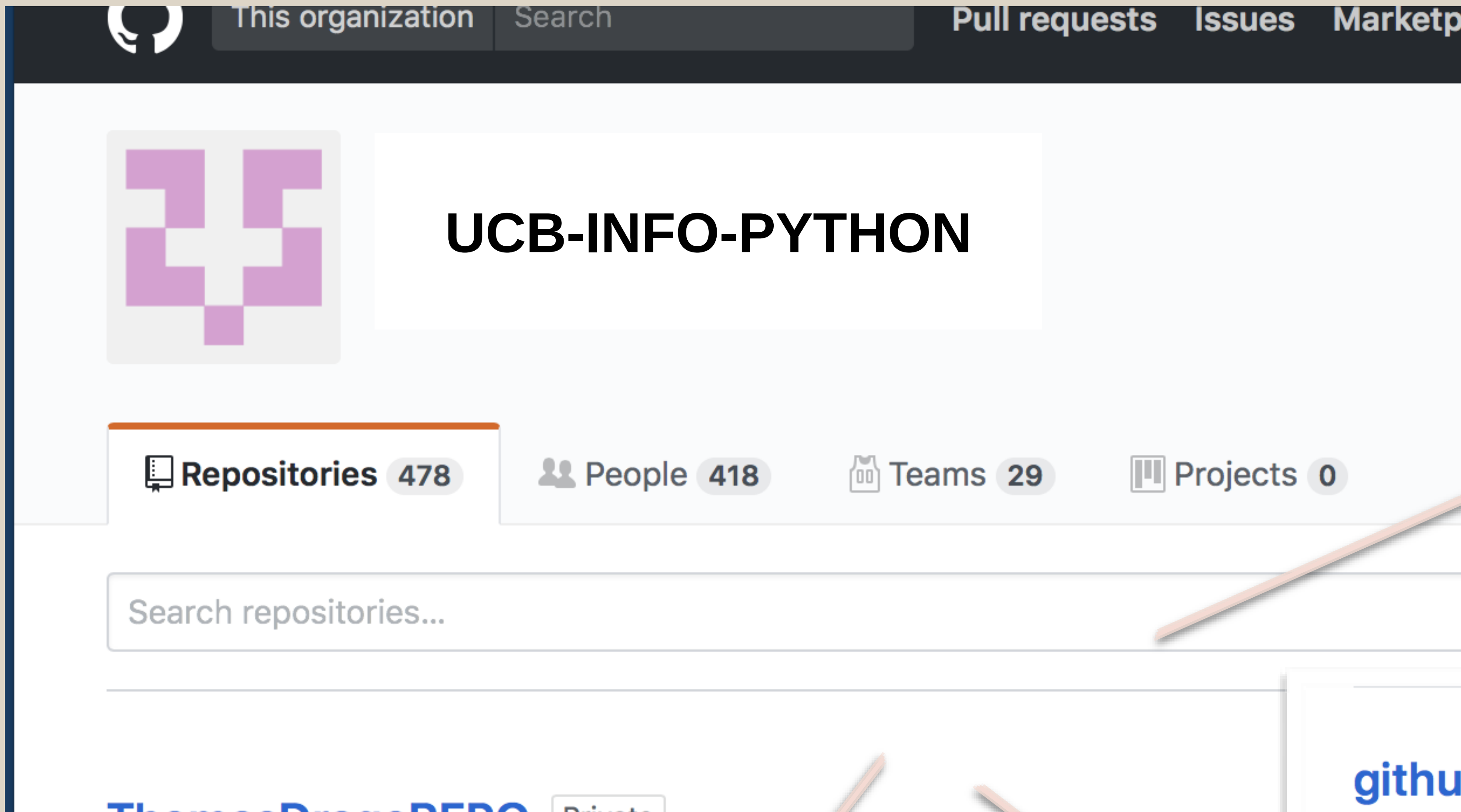


Example of what will be downloaded to your computer

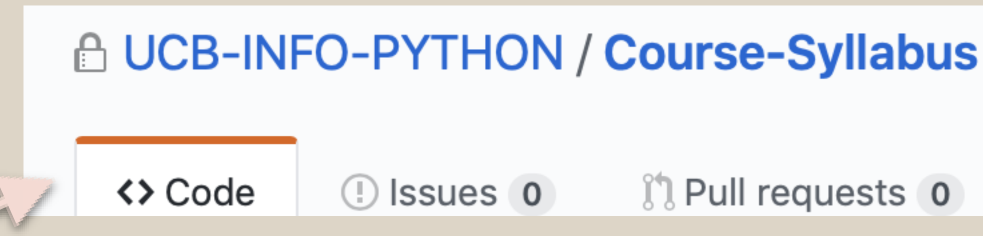
In the assignment, you'll download the `assignments_upstream_fall18` directory.
And you'll create your own `SUBMISSIONS` folder on your hard drive.
Note – you will see this folder titled "firstnameLastnameREPO" locally, unlike above

Here's the assignment to guide you.

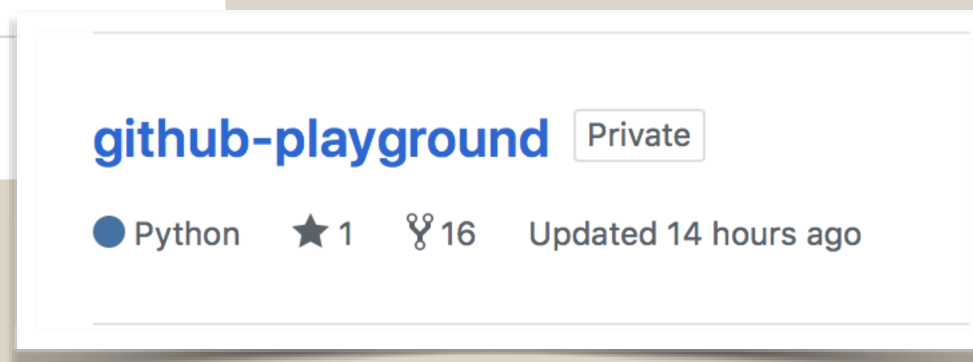
https://github.com/MIDS-INFO-W18/Installation/blob/master/Completing%20Your%20First%20Exercise%20With%20Git%20Reading%20Card.md



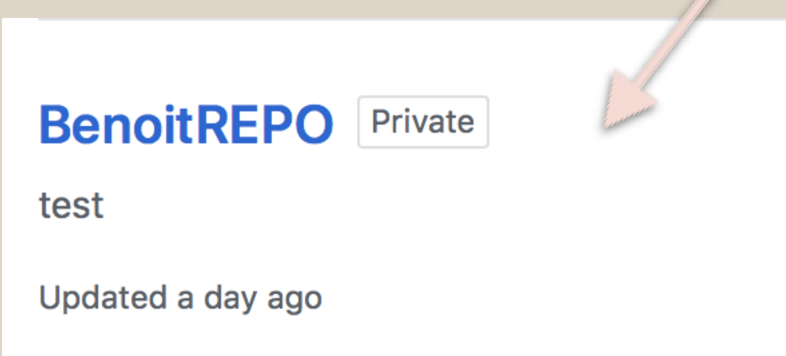
Syllabus



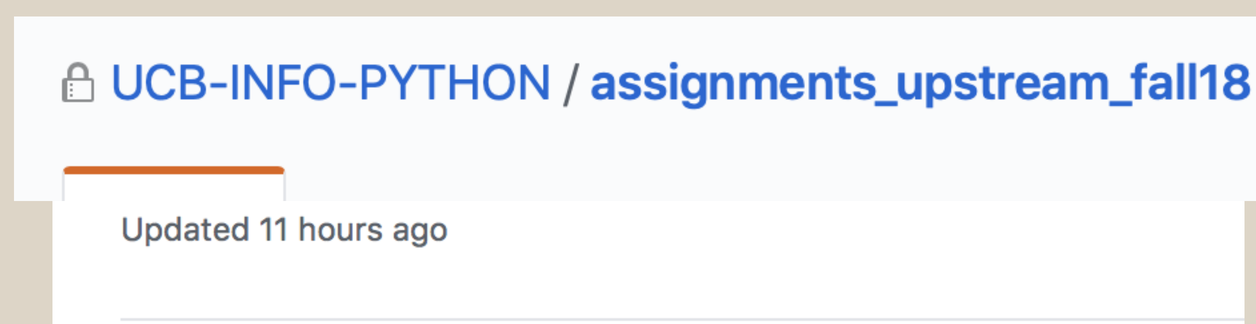
Your fun stuff…



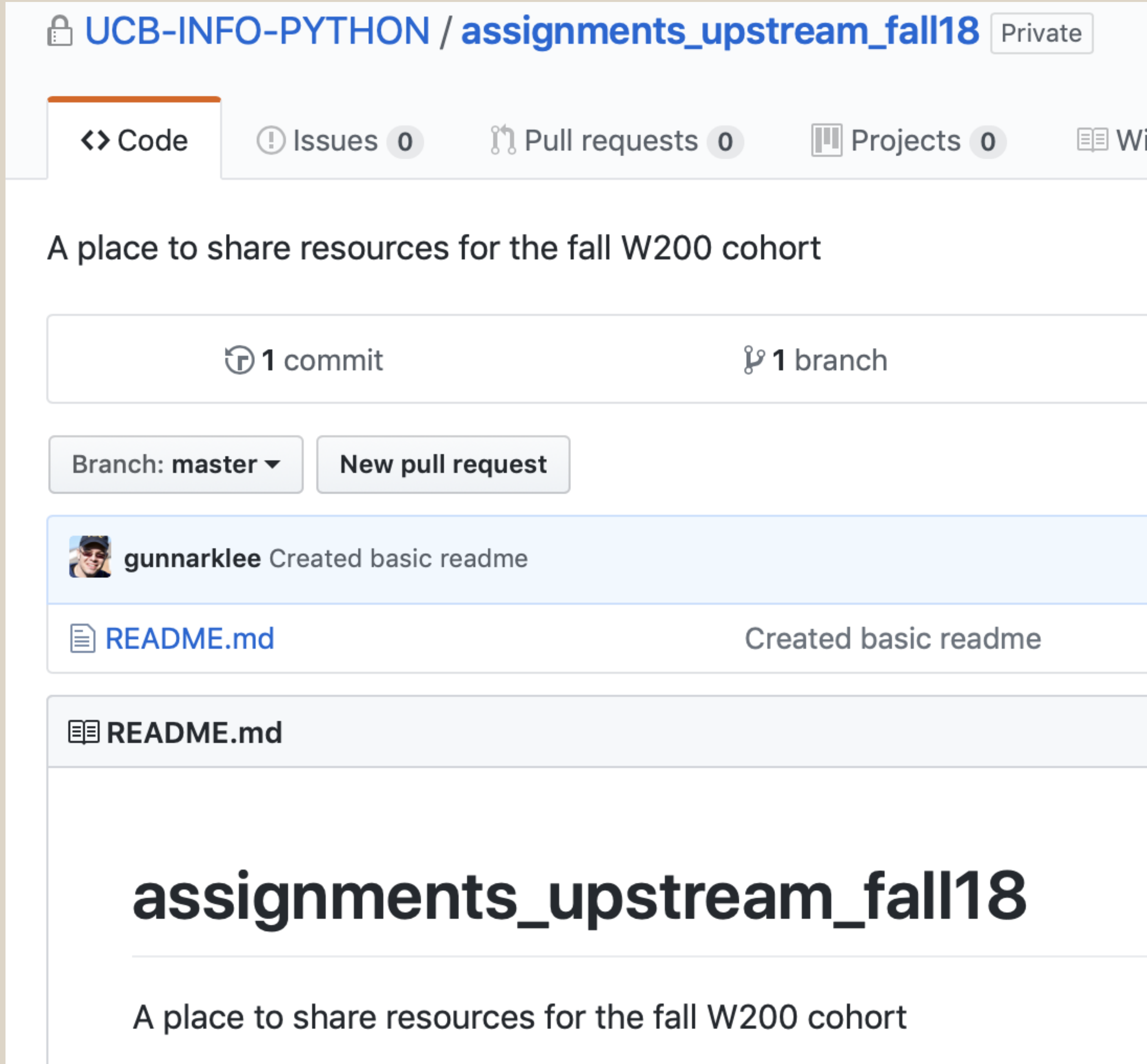
https://github.com/UCB-INFO-PYTHON/github-playground



Your “Repo”



The assignments upload …


UCB-INFO-PYTHON / assignments_upstream_fall18 Private
Code
Issues 0
Pull requests 0
Projects 0
Wi
A place to share resources for the fall W200 cohort
1 commit
1 branch
Branch: master
New pull request
gunnarklee Created basic readme
README.md
Created basic readme
README.md
assignments_upstream_fall18
A place to share resources for the fall W200 cohort

Shell scripts

- If you've never made a script … a brief demo (Mac/Linux):

1

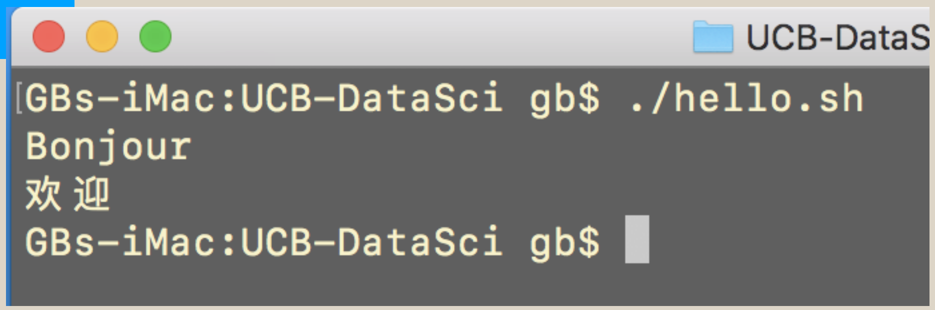
```
#!/bin/sh
# a comment
echo Bonjour  # a comment in French
echo "欢迎"
```

Text Editor

2

```
$  chmod 755 hello.sh
$  ./hello.sh
```

Output



- Windows users will need to save as ".bat" and do not need to include #!/bin/sh. Some commands will be slightly different – Google is your friend to troubleshoot! Double click on the .bat file to run it.

Summary

- Part 1 – First 8 weeks - Data Analysis

Unit 1 | Introduction, Command Line, and Source Control

Unit 2 | Starting Out with Python

Unit 3 | Sequence Types and Dictionaries

Unit 4 | More about Control and Algorithms

Unit 5 | Functions

Unit 6 | Complexity

Unit 7 | Classes

Unit 8 | Object Oriented Programming

Summary

- Part 2 - Last 7 weeks - Data Analysis

Unit 9 | Working with text and binary files

Unit 10 | NumPy

Unit 11 | Data Analysis with Pandas

Unit 12 | Plotting & Visualization

Unit 13 | Pandas aggregations & groups

Unit 14 | Projects

Summary - Resources

Course Schedule

Homeworks & Assignments
- https://github.com/UCB-INFO-PYTHON/Installation
- https://github.com/UCB-INFO-PYTHON/assignments_upstream_fall18

Google Group List
  - https://groups.google.com/forum/#!forum/w200-python-2018-summer

Slack Channels [for students]
- ucbischool.slack.com
- channel #w200-python
- *In your browser:*
  - *https://ucbischool.slack.com/messages/C5AL99BU6/*

Help? Use Slack to ask each other questions and to provide answers (but please don't share code); search the net (StackOverflow is pretty good); Email the instruction team - send your code for a check, too. Office hours are available, too.

Enjoy the course

- Thanks for attending today. Best wishes!

- If you get stuck after an hour or so, please reach out.