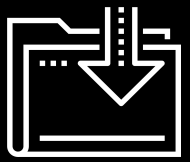
Python Deeper Dive

Data Boot Camp

Lesson 3.3



© 2019 Trilogy Education Services, Inc.

Class Objectives

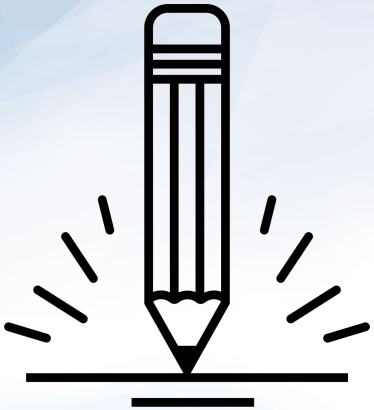
By the end of today's class you will be able to:

- Add, commit, and push code up to GitHub from the command line.
- Create and use Python dictionaries.
- Read data in from a dictionary.
- Use list comprehensions.
- Write and re use Python function.
- Have a firm understanding of coding logic and reasoning.

Bem vindos
ようこそ
Welcome

...that's our menu for today's class **topped with command line...**

```
cd
ls
la
../
```



Activity: Cereal Cleaner

In this activity, you will be creating an application that reads in cereal data from CSV and then prints only those cereals that have more than 5 grams of fiber in them.

Suggested Time:
20 Minutes

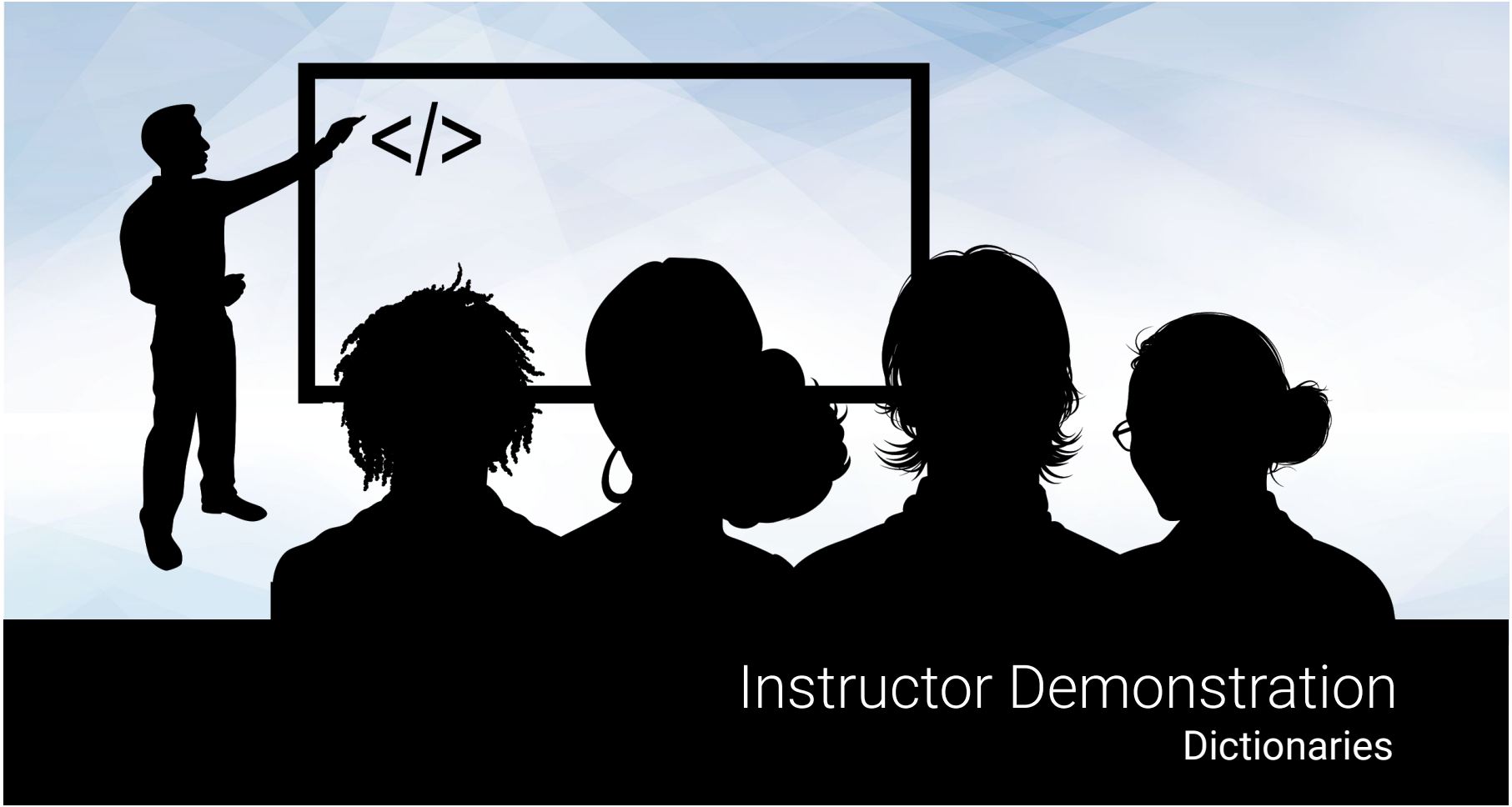
Instructions:

Activity: Cereal Cleaner

- Read through `cereal.csv` and find the cereals that contain five grams of fiber or more, printing the data from those rows to the terminal.
- **Hint:**

  - Every value within the csv is stored as a string and certain values have a decimal. This means that they will have to be cast to be used.
  - `csv.reader` begins reading the csv file at the first row. Explain that `next(csv_reader, None)` will skip the header row.
  - Integers are whole numbers and, as such, cannot contain decimals. Decimal numbers will have to be cast as a `float` or `double`.
- **Bonus:**
  - Try the following again but this time using `cereal_bonus`, which does not includes a header.

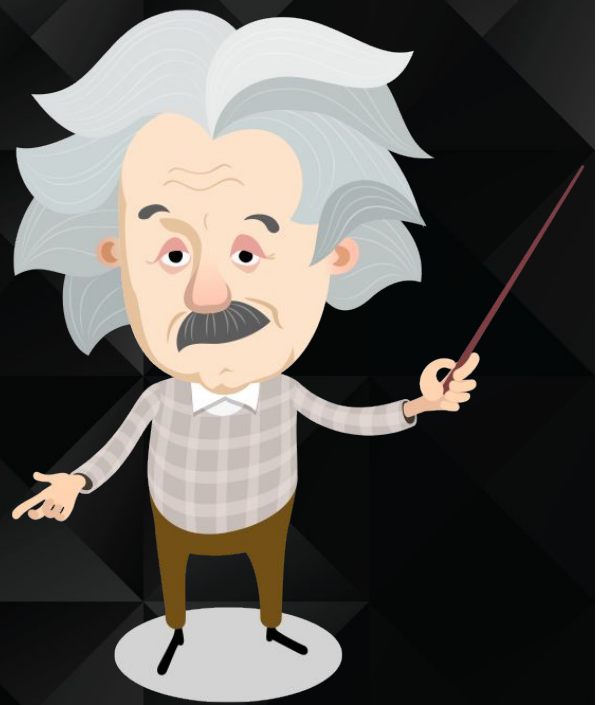
Time’s Up! Let’s Review.



Instructor Demonstration

Dictionaries

Another data type that is commonly used in Python is the dictionary, or ‘dict’.



Dictionaries

A dictionary is an object that stores a collection of data.

- Like lists and tuples, dictionaries can contain multiple values and data types within them.
- Unlike lists and tuples, however, dictionaries store data in key-value pairs. The key in a dictionary is a string that can be referenced in order to collect the value it is associated with.
- Very similar to a dictionary that contains definitions, the words in the dictionary would be considered the keys, and the definitions of those words would be the values.

Let’s
code...

Dictionaries

- To initialize or create an empty dictionary we use the following syntax, `actors ={}`.

```
# Create a dictionary to hold the actor's names.
actors = {}
```

- Or, you can create a dictionary with the built-in Python `dict()` function, `actors = dict()`.

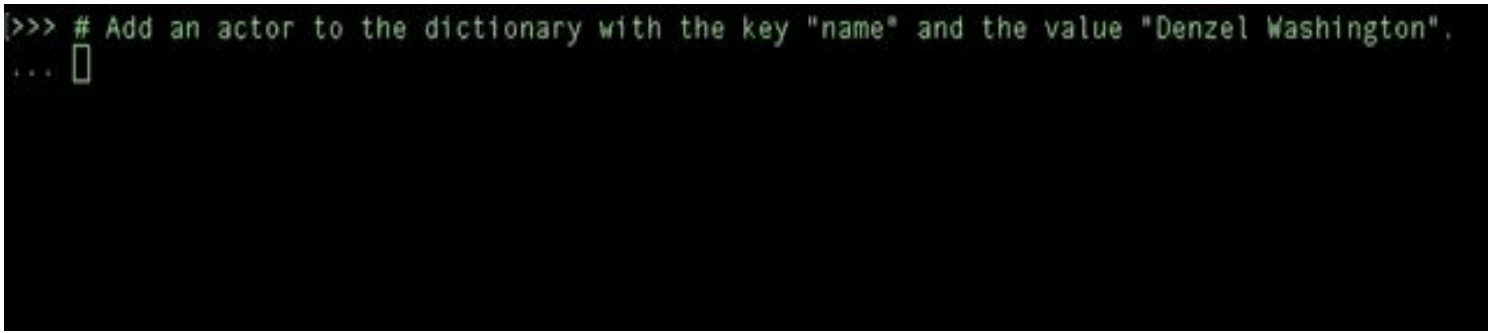
```
# Create a dictionary using the built-in function.
actors = dict()
```

Dictionaries

- Values can be added to dictionaries at declaration by creating a key that is stored within a string, following it with a colon, and then placing the value desired afterwards.
- Referencing a value within a dictionary is as simple as calling the dictionary and following it up with a pair of brackets containing the key for the value desired.

Dictionaries

- Values can also be added to dictionaries by placing the key within single or double quotes inside brackets, and then assigning the key a value, and values can be changed or overwritten by assigning the key a new value.

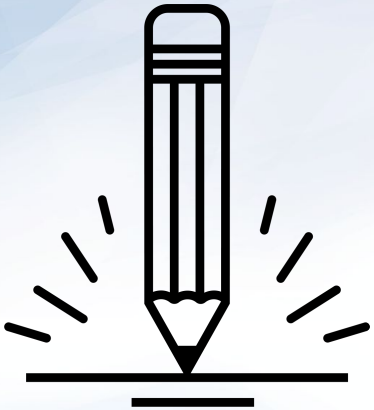


Dictionaries

- Dictionaries can hold multiple pieces of information by following up each key-value pairing with a comma and then placing another key-value pair afterwards.
  - Keys are immutable objects, like integers, floating-point decimals, or strings. Keys cannot be lists or any other type of mutable object.
  - Values in a dictionary can be objects of any type: integers, floating-point decimals, strings, Boolean values, datetime values, and lists.

Dictionaries

- Dictionaries can also contain other dictionaries. In order to access the values inside nested dictionaries, simply add another key to the reference.



Activity: Hobby-Book

In this activity, you will be creating and accessing yours own dictionaries based upon your hobbies.

Suggested Time:
10 Minutes

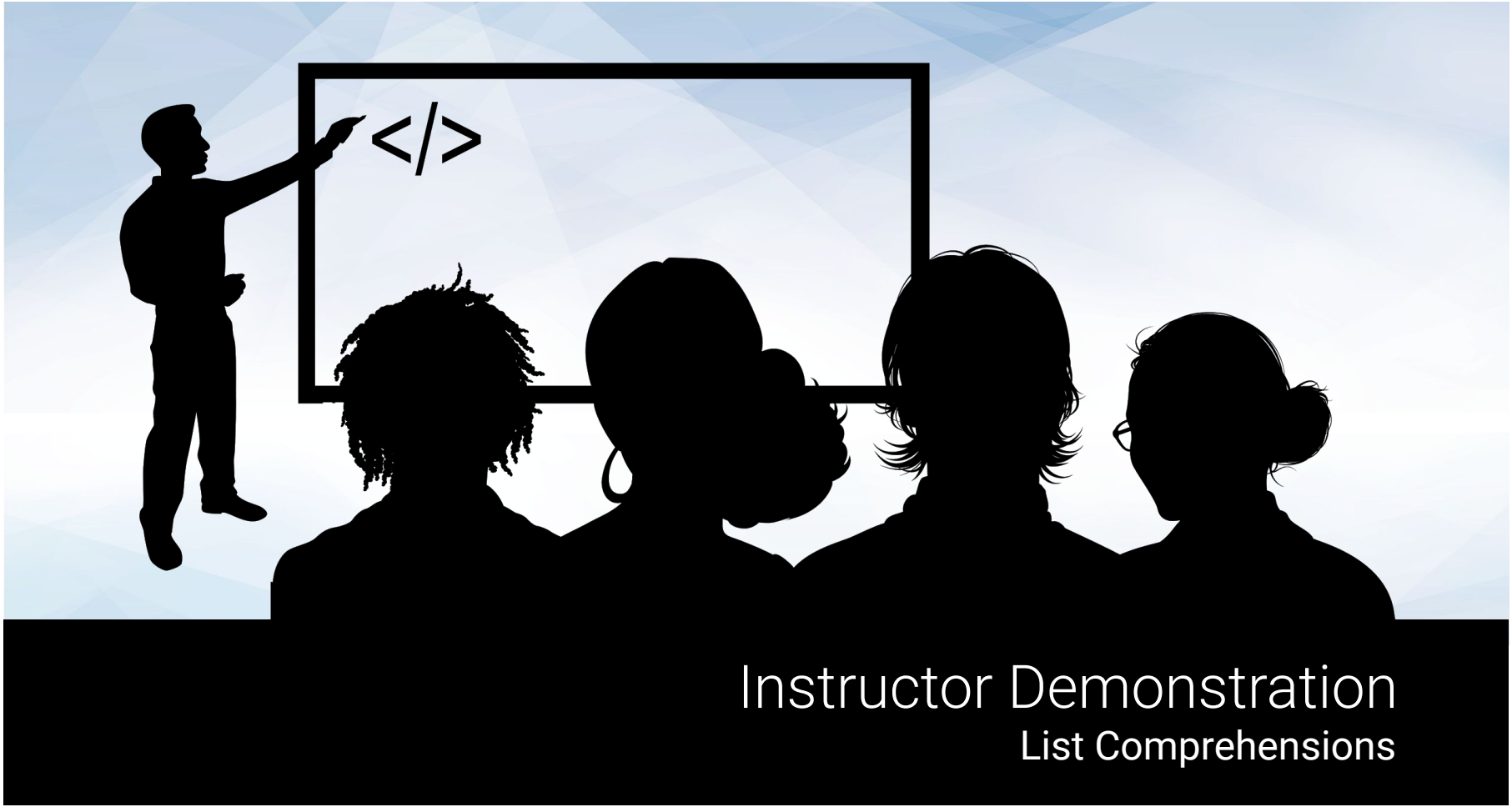
Activity: Hobby-Book

Instructions:

- Create a dictionary that will store the following:
  - Your name
  - Your age
  - A list of a few of your hobbies
  - A dictionary of a few days and the time you wake up on those days

- Print out your name, how many hobbies you have and a time you get up during the week.

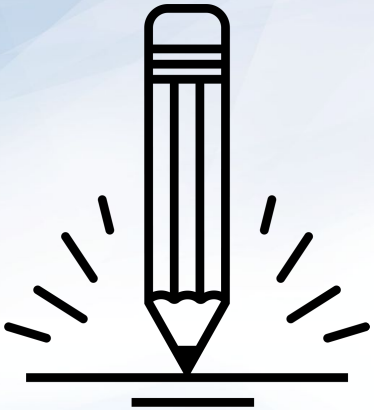
Time’s Up! Let’s Review.



Instructor Demonstration

List Comprehensions

Get ready
for
some live coding...



Activity: List Comprehensions

In this activity, you will use list comprehensions to compose a wedding invitation to send to every name on your mailing list.

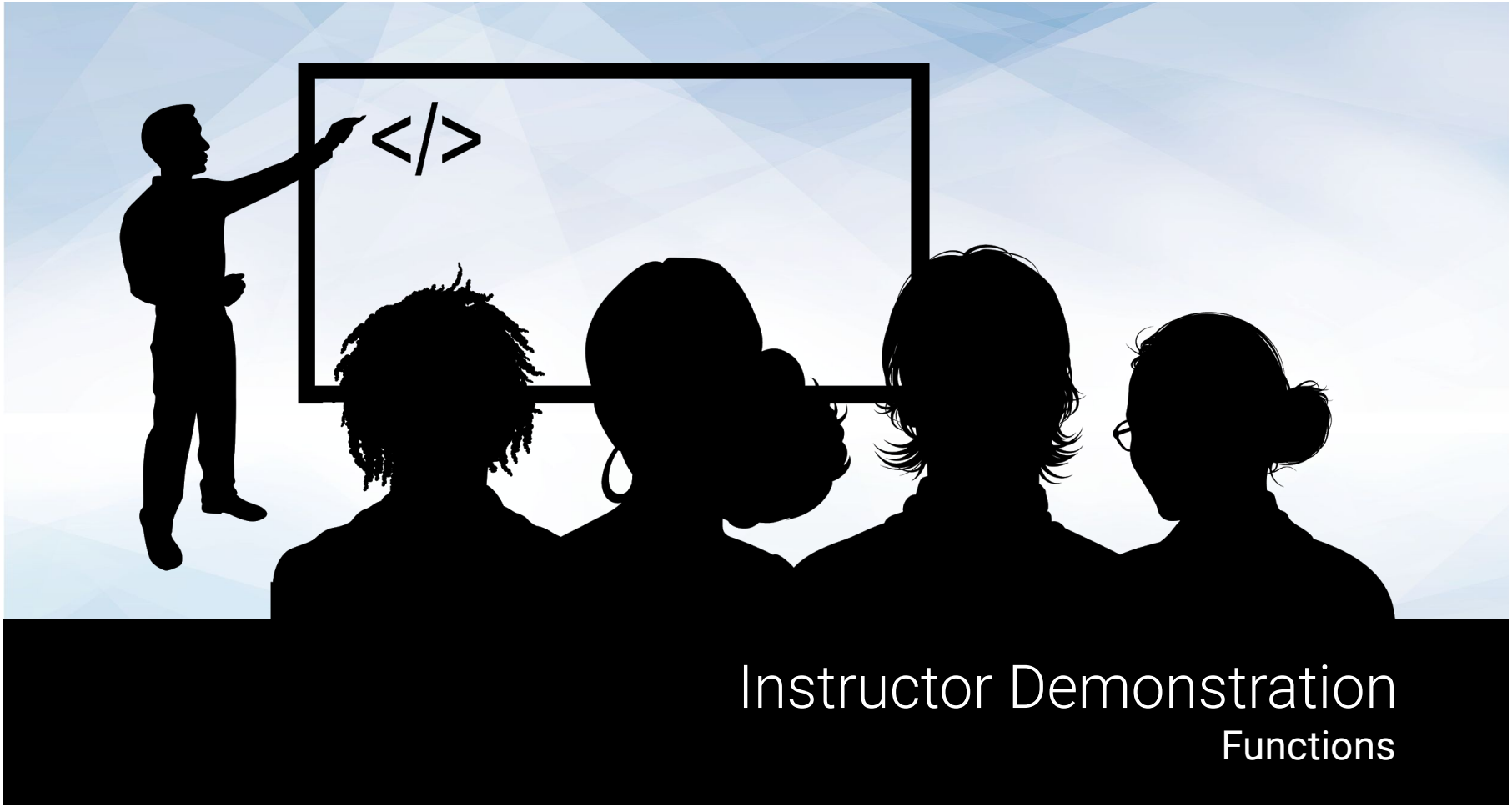
Suggested Time:
10 Minutes

Instructions:

Activity: List Comprehensions

- Open the file called `comprehension.py`.
- Create a list that prompts the user for the names of five people they know.
- Run the provided program. Note that nothing forces you to write the name "properly"—e.g., as "Jane" instead of "jAnE". You will use list comprehensions to fix this.
    - First, use list comprehensions to create a new list that contains the lowercase version of each of the names your user provided.
    - Then, use list comprehensions to create a new list that contains the title-cased versions of each of the names in your lower-cased list.
- **Bonus**:
    - Instead of creating a lower-cased list and *then* a title-cased list, create the title-cased list in a single comprehension.
- **Hints**:
    - See the documentation for the title method.

Time’s Up! Let’s Review.

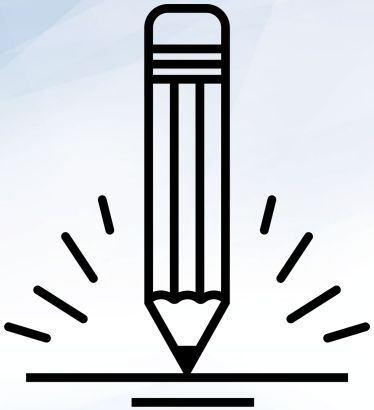


Instructor Demonstration

Functions

DRY - Don’t Repeat Yourself is a principle of software development to reduce repetition of the written code.

Get ready
for
some live coding...



Activity: Functions

In this activity, you will write a function that returns the arithmetic average for a list of numbers.

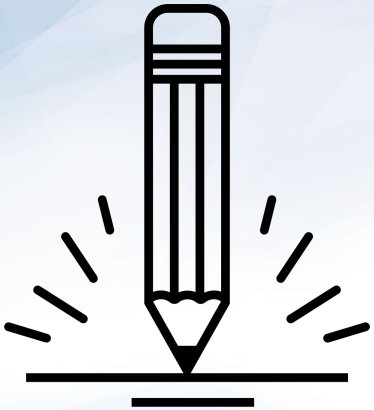
Suggested Time:
10 Minutes

Instructions:

Activity: Functions

- Write a function called average that accepts a list of numbers as a single argument.
  - The function average should return the arithmetic mean (average) for a list of numbers.
- Test your function by calling it with different values and printing the results.
- **Hint**
  - Arithmetic Mean (average)

Time’s Up! Let’s Review.



Activity: Wrestling With Functions

In this activity, you will create a function capable to search through a list of wrestlers to determine their win, loss, and draw percentages.

Suggested Time:
15 Minutes

Instructions:

Activity: Wrestling With Functions

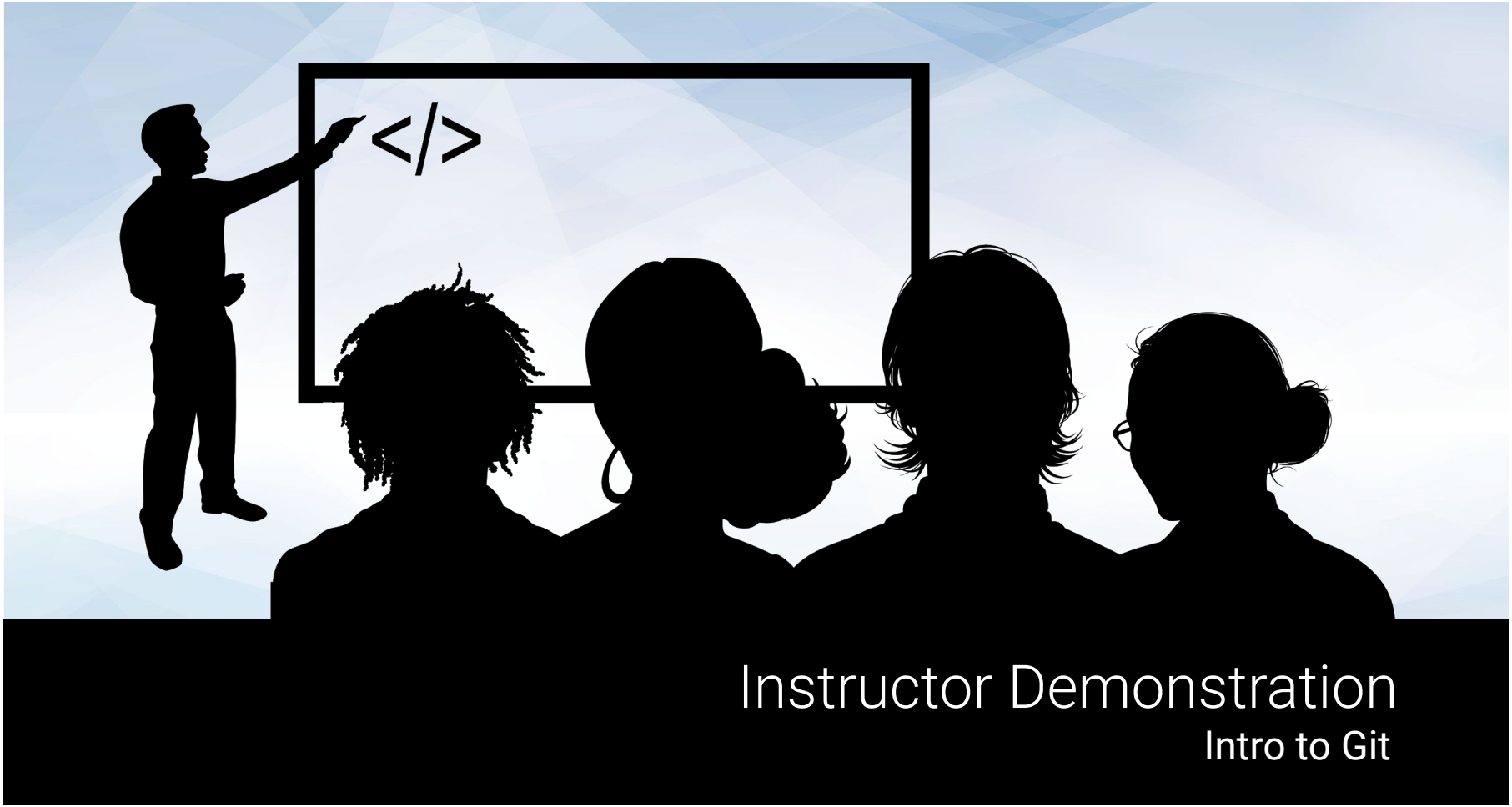
- Analyze the code and CSV provided, looking specifically for what needs to still be added to the application.
  - Note that `header = next(reader)` will read the header row from the csv file.
- Using the starter code provided, create a function called `print_percentages` which takes in a parameter called `wrestler_data` and does the following:
  - Uses the data stored within `wrestler_data` to calculate the percentage of matches the wrestler won, lost, and drew over the course of a year.
  - Prints out the stats for the wrestler to the terminal
- **Bonus:**
  - Still within the `print_percentages()` function, create a conditional that checks a wrestler's loss percentage and prints either "Jobber" to the screen if the number was greater than fifty or "Superstar" if the number was less than 50.

Time’s Up! Let’s Review.

Countdown timer

40:00

(with alarm)



Instructor Demonstration

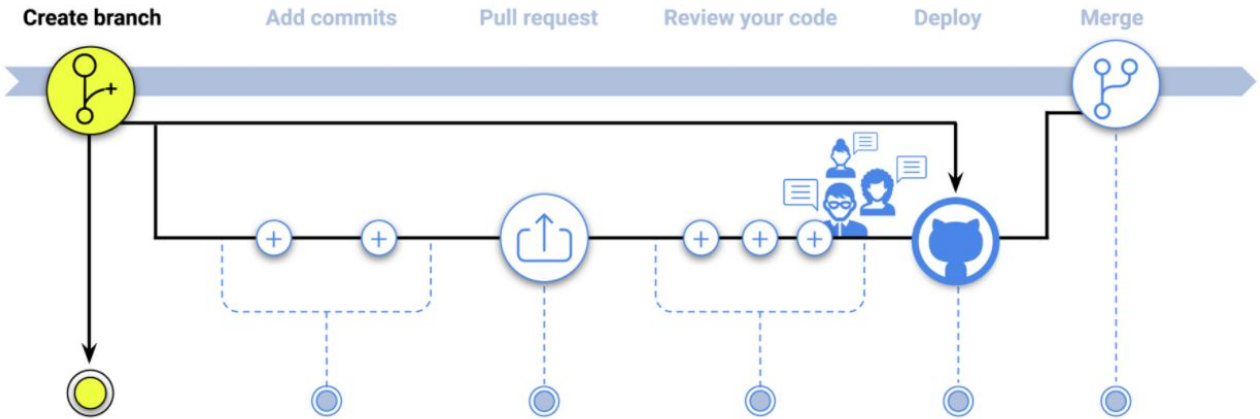
Intro to Git

Intro to Git

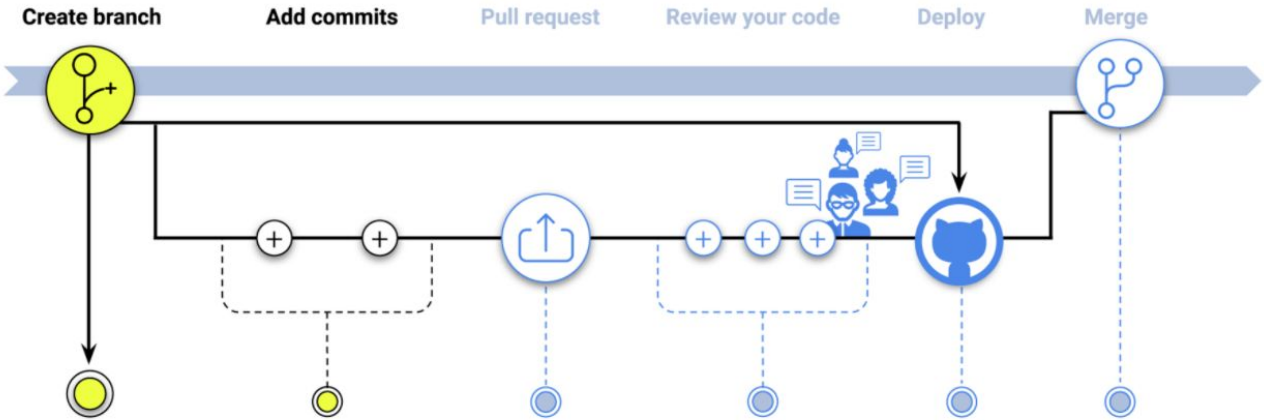
- More than 40 million people use GitHub.
- It is an essential tool for best code practices.
- It is the biggest platform for developers to showcase their work.
- Using GitHub makes it easier to collaborate with colleagues and peers and to review previous versions of one's work.

- GitHub is an essential tool for your academic development, and it will transition with you through your professional career.
- Think of your knowledge blueprint—it will raise your visibility among potential employers and could translate into a high-paying job.

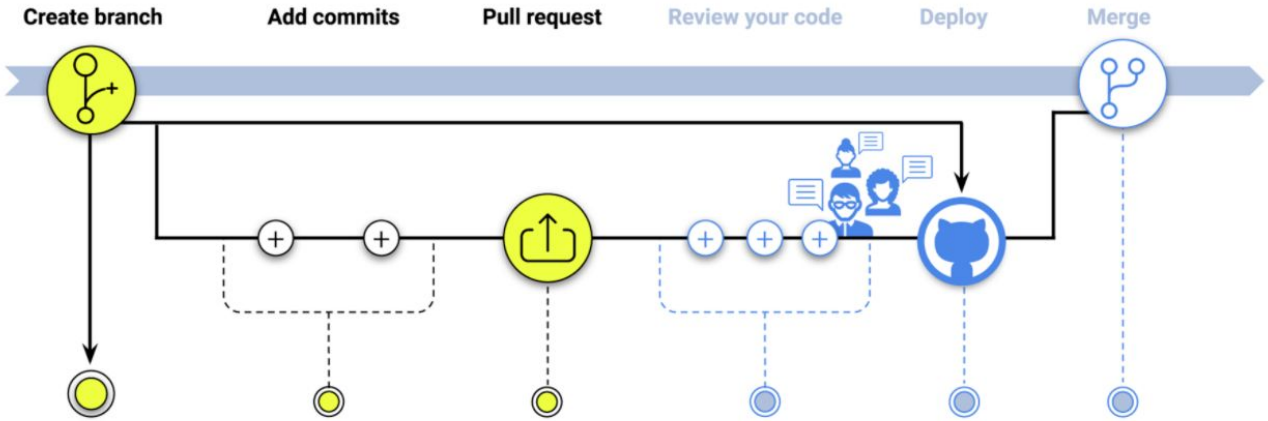
GitHub Flow: Create a Branch



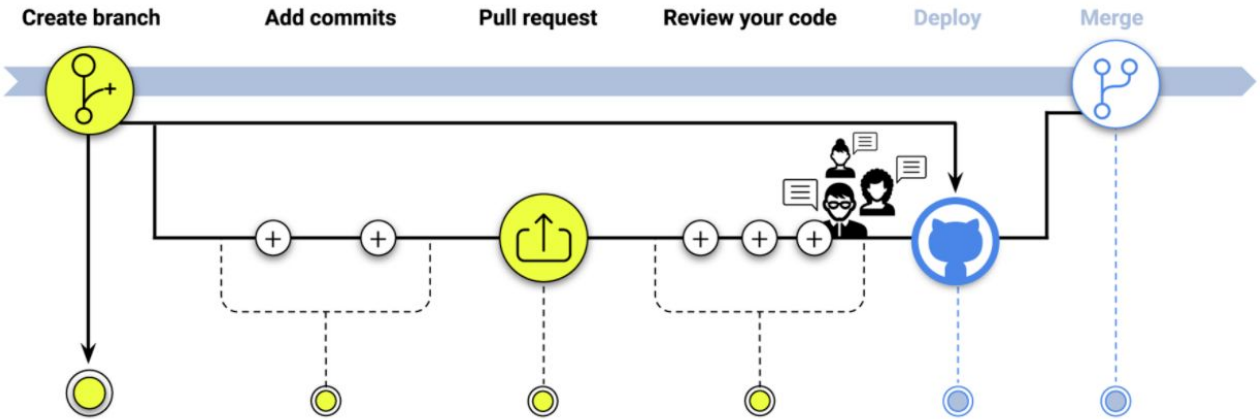
GitHub Flow: Add Commits



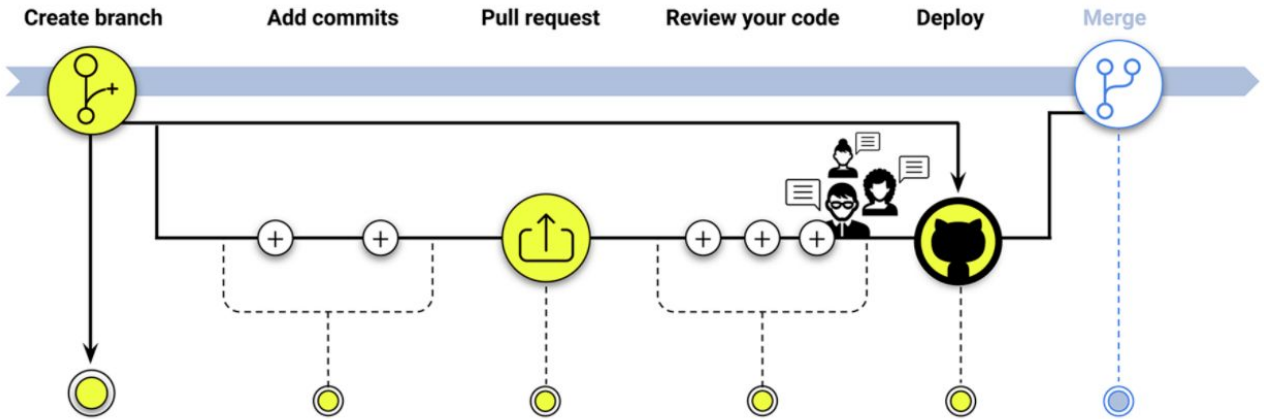
GitHub Flow: Pull Request



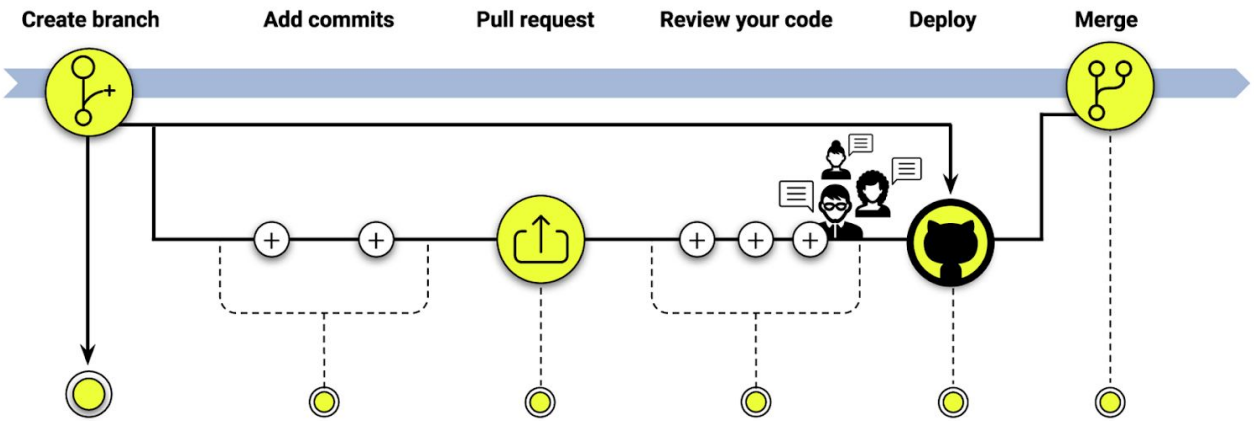
GitHub Flow: Review your Code

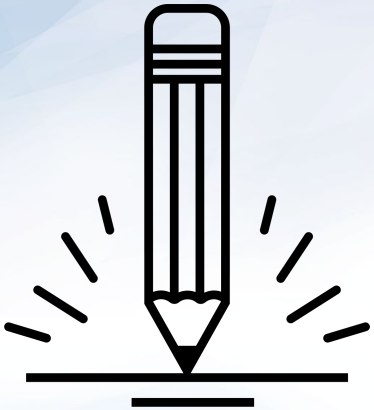


GitHub Flow: Deploy



GitHub Flow: Merge Your Code





Activity: Adding Files from the Command Line

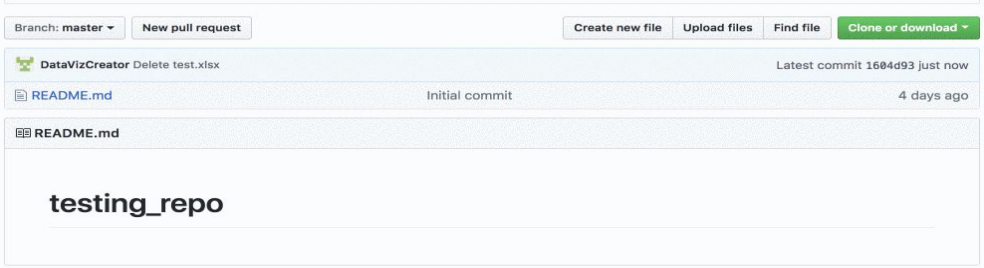
In this activity, we will create a new repository, clone it and add files via command line.

Suggested Time:
10 Minutes

Instructions:

Activity: Adding Files from the Command Line

- Create a new repo.



- Open terminal (or git-bash for Windows users) and navigate to the home folder using `cd ~`.
- Type in `git clone <repository link>` in the terminal to clone the repo to the current directory. Once this has run, everyone should now see a folder with the same name as the repo.

Instructions:

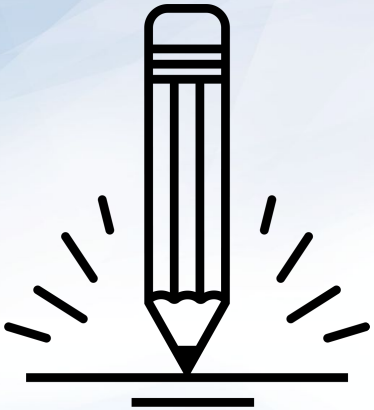
Activity: Adding Files from the Command Line

- Open the folder in VS Code and create two python script files named `script01.py` and `script02.py`.
- Once the files have been created, open up Terminal/git-bash and navigate to the repo folder. Run the following lines and explain each as you go through them.

```
# Displays that status of files in the folder
git status

# Adds all the files into a staging area
git add .

# Check that thr files were added correctly
git status

# Commits all the files to your repo and adds a message
git commit -m <add commit message here>

# Pushes the changes up to GitHub
git push origin master
```

Activity: Adding Files from the Command Line

- Historically, the most common name for the main body of a codebase has been **master**. Recently, however, **main** has been gaining in popularity. In fact, GitHub now uses **main** as the default name for its repositories - as do the projects in this course. Be aware that you might see instances of both throughout your development career, or hear experienced coders use the term "master branch" out of habit.



Activity: Adding more to the repo.

In this activity, we will create a new repository, clone it and add files via command line.

Suggested Time:
10 Minutes

Instructions:

Activity: Adding more to the repo

- Using the repo that just created, make or add the following changes:
  - Add new lines of code to one of the python files.
  - Create a new folder.
  - Add a file to the newly created folder.
  - Add, commit and push the changes.
  - Delete the new folder.
  - Add, commit and push the changes again.

Time’s Up! Let’s Review.

last
but
not least..