Section 5

May 20, 2021

Katherine Michel, Section Leader, Stanford Code in Place, 2021

Today’s Agenda

- Social Time (5 minutes)
- Recap/New (10 minutes)
- Index Game problem (15 minutes)
- Heads Up Game problem (15 minutes)
- Say goodbye (5 min)

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Where We Are At

- Assignment 3 is due on Friday, May 21st
- Lessons 1-13 have been published
- This weeks: dictionaries, files, data science
- Next week: complete and submit final project

Social Time

- How was your week?
- Triumphs? Challenges?
- Any aha moments?
- Any new ideas for how to use Python?

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Recap: Data Structures, Files

- Common list operations (relevant to Index Game Problem)
- Looping over sequences (lists versus strings)
- Finding answers (official Python docs, Google, etc.)
- List and string methods
- Try it out!
- Read a file line by line and print the content

Recap: Lists

Create a list:	a_list = [‘a’, 1, True]
Add a value to a list:	a_list.append(‘hello’)
	a_list = [‘a’, 1, True, ‘hello’]
Randomly select an index:	max_index = len(a_list) - 1
	index = random.randint(0, max_index)
Access a value through index:	answer = a_list[index]

Recap: Looping Over Sequences

Looping through a list

```
a_list = [‘a’, 1, True]

for item in a_list:
    print(item)
```

```
a
1
True
```

Looping through a string

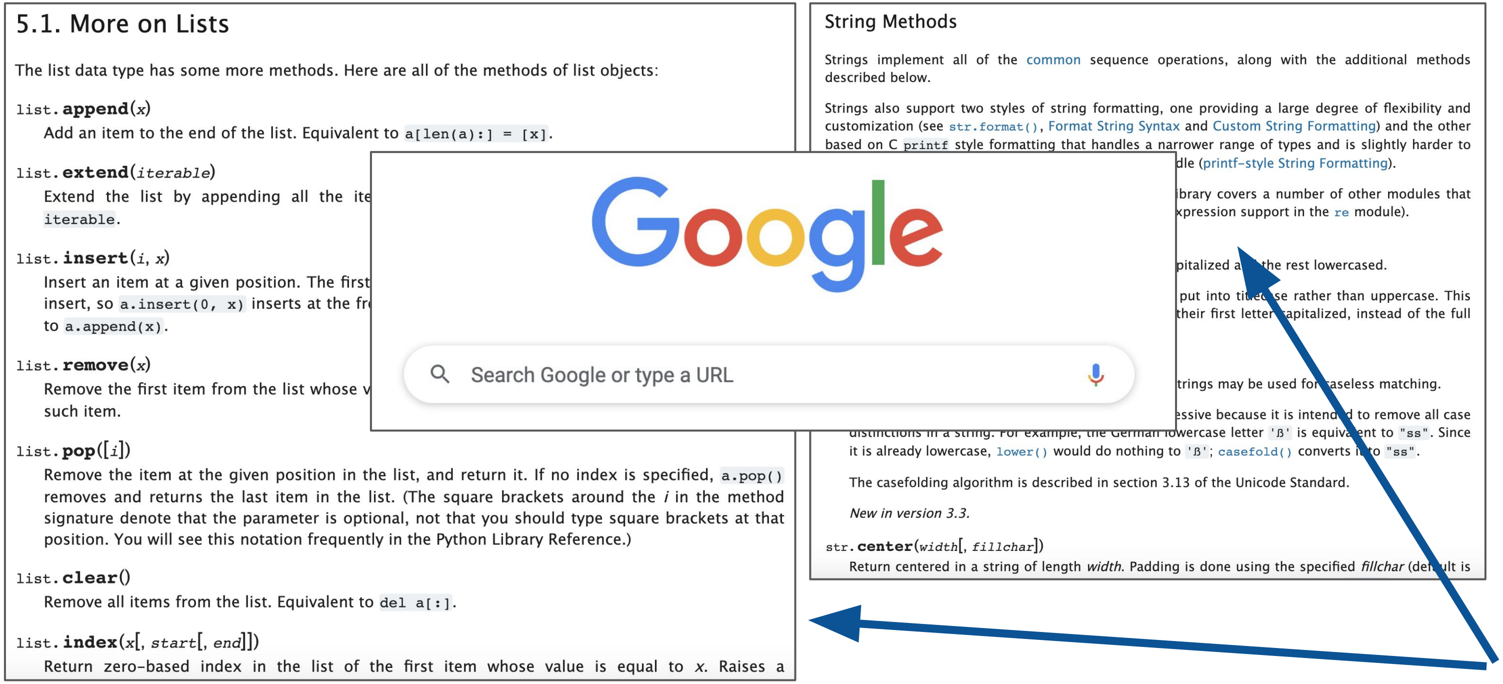
```
a_string = “hello”

for character in a_string:
    print(character)
```

```
h
e
l
l
o
```

Iterate through items in an iterable/sequence (list, tuple, string)

Recap: Finding Answers… No Need to Memorize!



5.1. More on Lists

The list data type has some more methods. Here are all of the methods of list objects:

list.**append**(*x*)
Add an item to the end of the list. Equivalent to `a[len(a):] = [x]`.

list.**extend**(*iterable*)
Extend the list by appending all the ite
`iterable`.

list.**insert**(*i*, *x*)
Insert an item at a given position. The first
insert, so `a.insert(0, x)` inserts at the fr
to `a.append(x)`.

list.**remove**(*x*)
Remove the first item from the list whose v
such item.

list.**pop**([*i*])
Remove the item at the given position in the list, and return it. If no index is specified, `a.pop()` removes and returns the last item in the list. (The square brackets around the *i* in the method signature denote that the parameter is optional, not that you should type square brackets at that position. You will see this notation frequently in the Python Library Reference.)

list.**clear**()
Remove all items from the list. Equivalent to `del a[:]`.

list.**index**(*x*[, *start*[, *end*]])
Return zero-based index in the list of the first item whose value is equal to *x*. Raises a

String Methods

Strings implement all of the common sequence operations, along with the additional methods described below.

Strings also support two styles of string formatting, one providing a large degree of flexibility and customization (see `str.format()`, Format String Syntax and Custom String Formatting) and the other based on C `printf` style formatting that handles a narrower range of types and is slightly harder to
dle (printf-style String Formatting).

ibrary covers a number of other modules that
xpression support in the `re` module).

pitalized and the rest lowercased.

put into titlecase rather than uppercase. This
their first letter capitalized, instead of the full

trings may be used for caseless matching.

essive because it is intended to remove all case
distinctions in a string. For example, the German lowercase letter `'ß'` is equivalent to `"ss"`. Since it is already lowercase, `lower()` would do nothing to `'ß'`; `casefold()` converts it to `"ss"`.

The casefolding algorithm is described in section 3.13 of the Unicode Standard.

New in version 3.3.

str.**center**(*width*[, *fillchar*])
Return centered in a string of length *width*. Padding is done using the specified *fillchar* (default is

Use the official docs, Google, and other resources to find answers

More list and string methods in the official Python docs!

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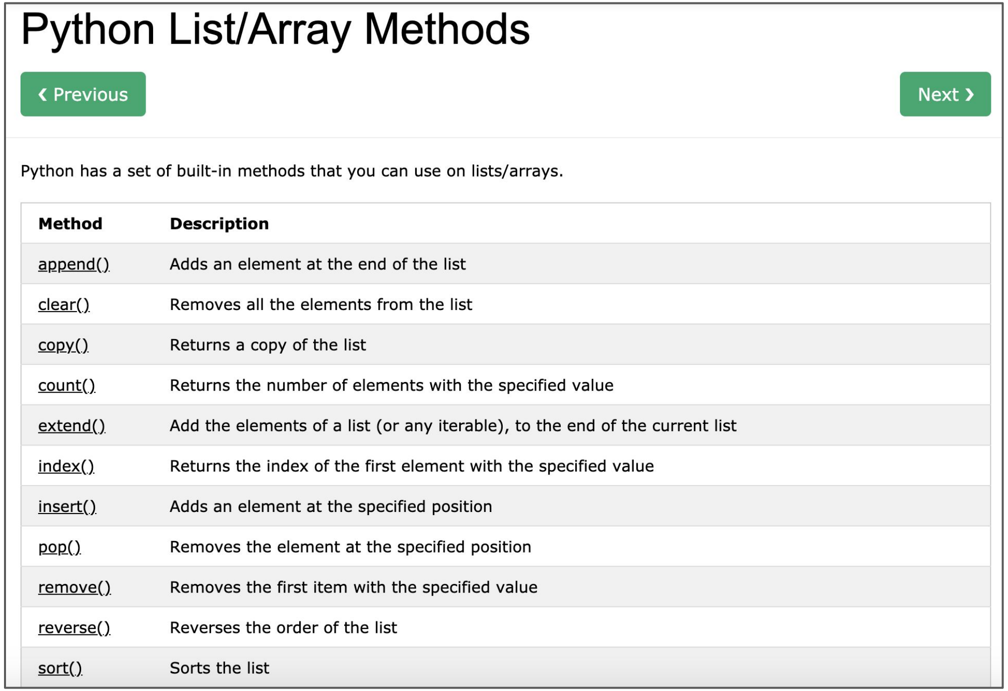
Recap: List and String Methods

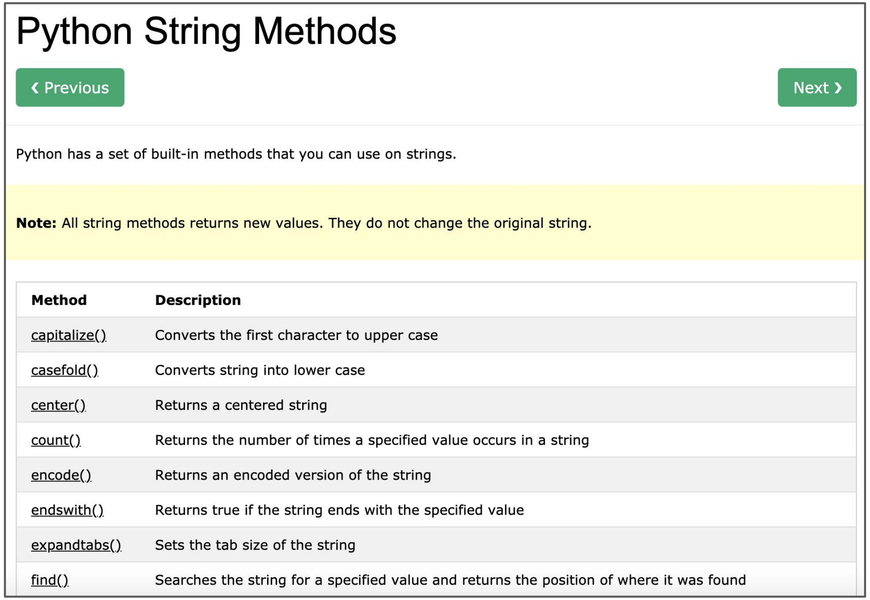
W3Schools (Use at your own risk!)



Python List/Array Methods

Python has a set of built-in methods that you can use on lists/arrays.

Method	Description
append()	Adds an element at the end of the list
clear()	Removes all the elements from the list
copy()	Returns a copy of the list
count()	Returns the number of elements with the specified value
extend()	Add the elements of a list (or any iterable), to the end of the current list
index()	Returns the index of the first element with the specified value
insert()	Adds an element at the specified position
pop()	Removes the element at the specified position
remove()	Removes the first item with the specified value
reverse()	Reverses the order of the list
sort()	Sorts the list



Python String Methods

Python has a set of built-in methods that you can use on strings.

Note: All string methods returns new values. They do not change the original string.

Method	Description
capitalize()	Converts the first character to upper case
casefold()	Converts string into lower case
center()	Returns a centered string
count()	Returns the number of times a specified value occurs in a string
encode()	Returns an encoded version of the string
endswith()	Returns true if the string ends with the specified value
expandtabs()	Sets the tab size of the string
find()	Searches the string for a specified value and returns the position of where it was found

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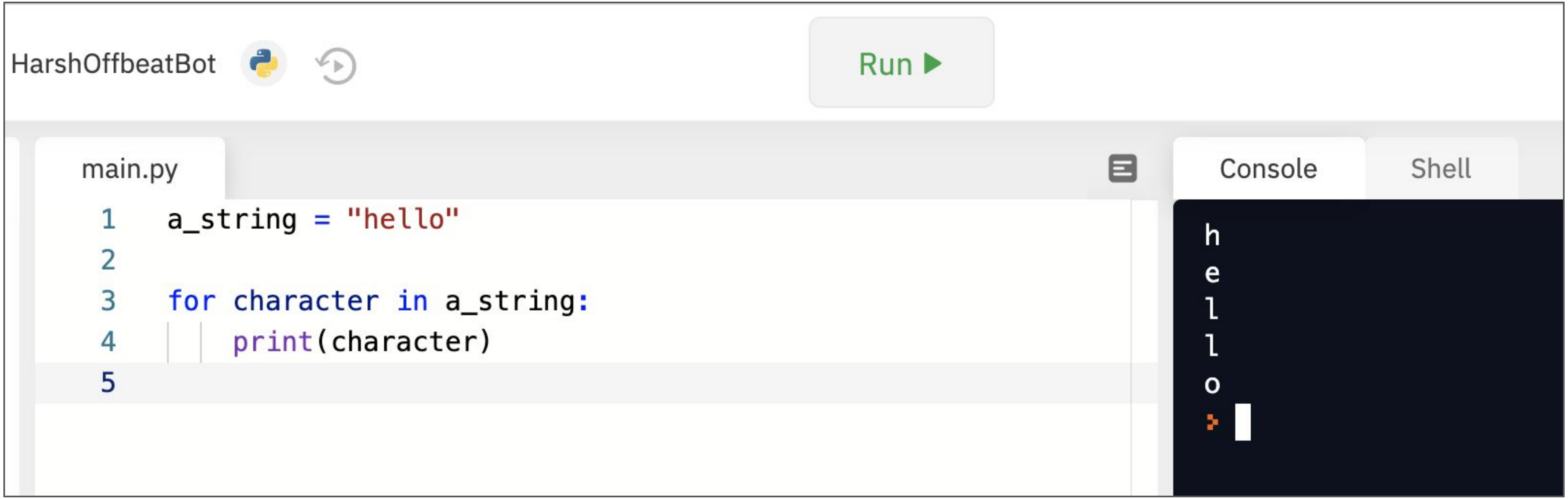
Recap: Try It Out

A “repl” in replit.com (similar to an IDE)



```
a_string = "hello"

for character in a_string:
    print(character)

```

```
h
e
l
l
o
>
```

You can use Ed, sites like replit.com, glitch.com, or your computer terminal

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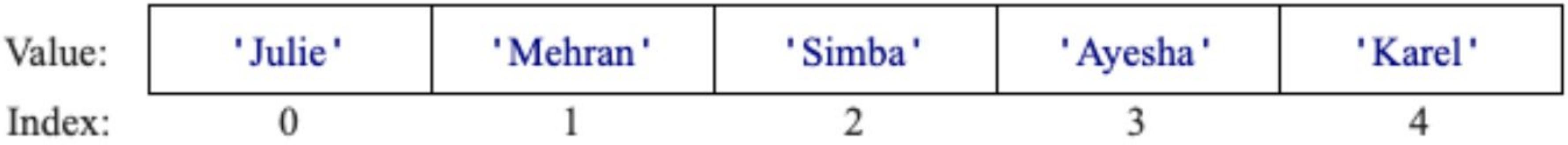
Index Game Problem

- Create a list
- Add values to a list
- Loop over a list
- Look up the length of a list
- Randomly select an index
- Access a value through its index
- Khansole Academy, index version

Mental Model



Value:	'Julie'	'Mehran'	'Simba'	'Ayesha'	'Karel'
Index:	0	1	2	3	4

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Recap: Files

- Files are a series of bits
- Plain text bits represent characters
- JPEG bits represent image structure
- MPS bits represent music frequency info

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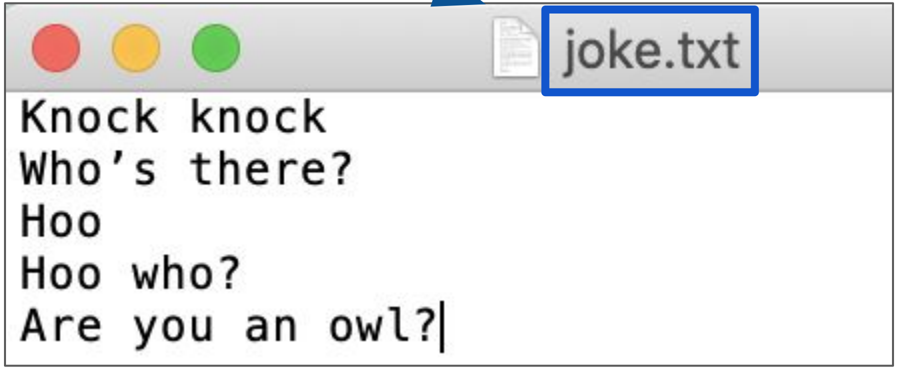
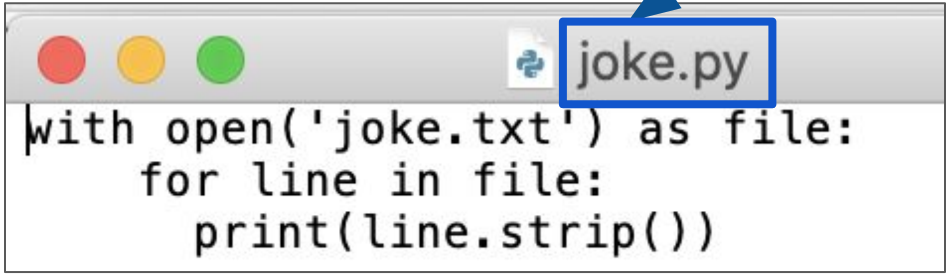
Recap: Files

Text File

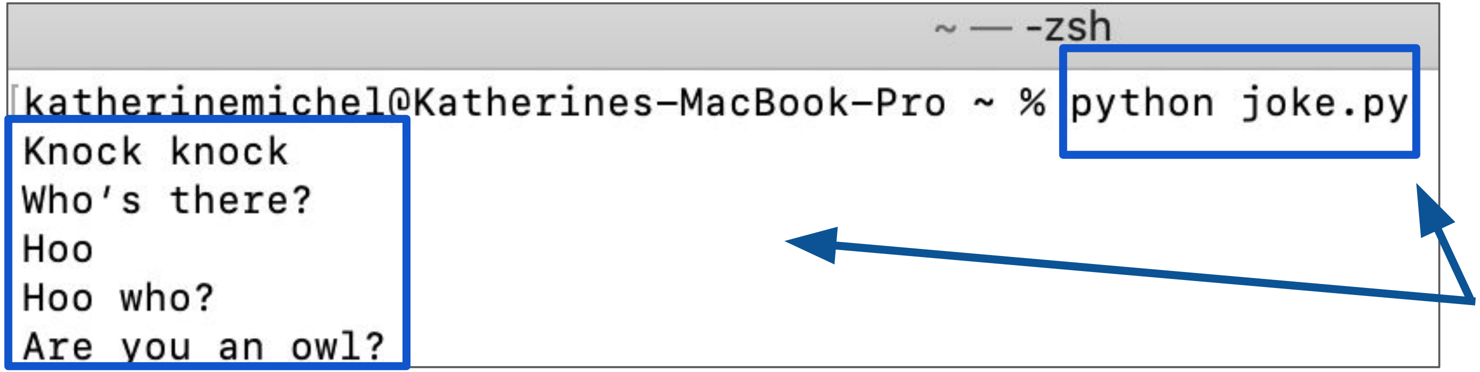


```
Knock knock
Who’s there?
Hoo
Hoo who?
Are you an owl?
```

Python File



```python
with open('joke.txt') as file:
    for line in file:
        print(line.strip())
```



```
katherinemichel@Katherines-MacBook-Pro ~ % python joke.py
Knock knock
Who’s there?
Hoo
Hoo who?
Are you an owl?
```

In my console, use Python to print the content of a text file

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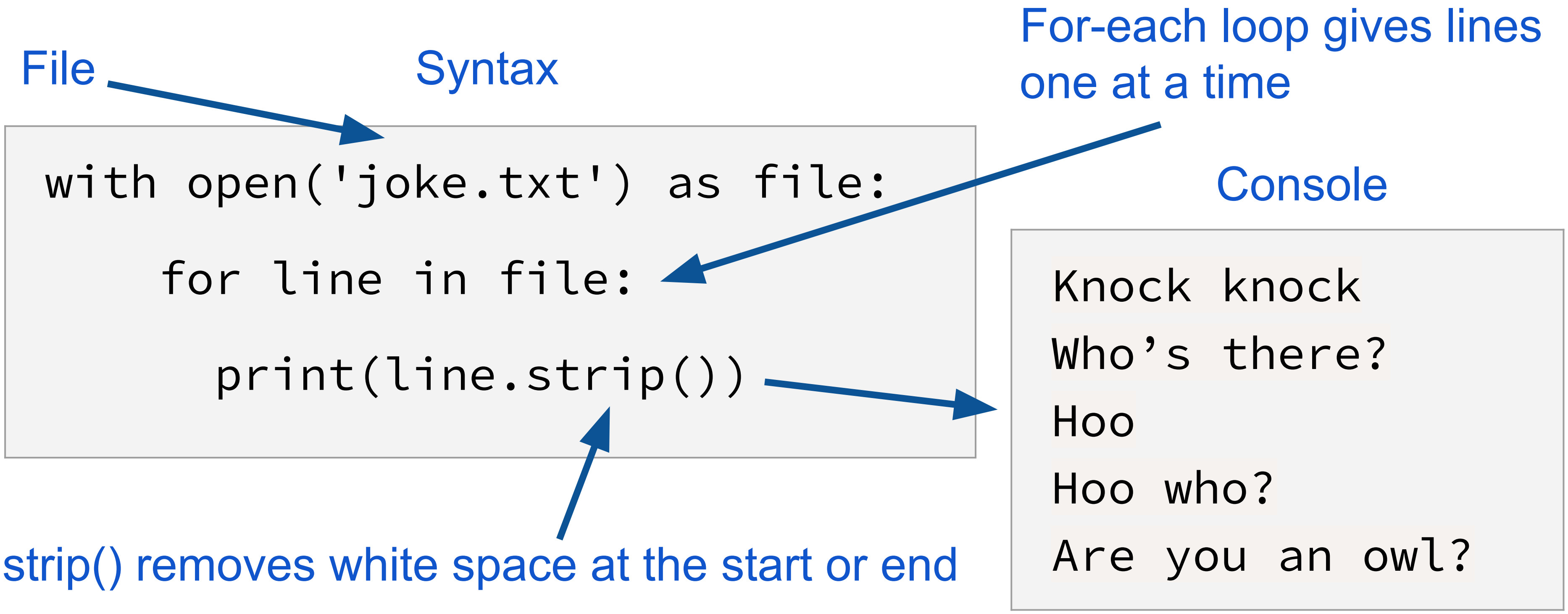
Recap: Read Files Line by Line



File

Syntax

For-each loop gives lines one at a time

```
with open('joke.txt') as file:
    for line in file:
        print(line.strip())
```

Console

```
Knock knock
Who’s there?
Hoo
Hoo who?
Are you an owl?
```

strip() removes white space at the start or end

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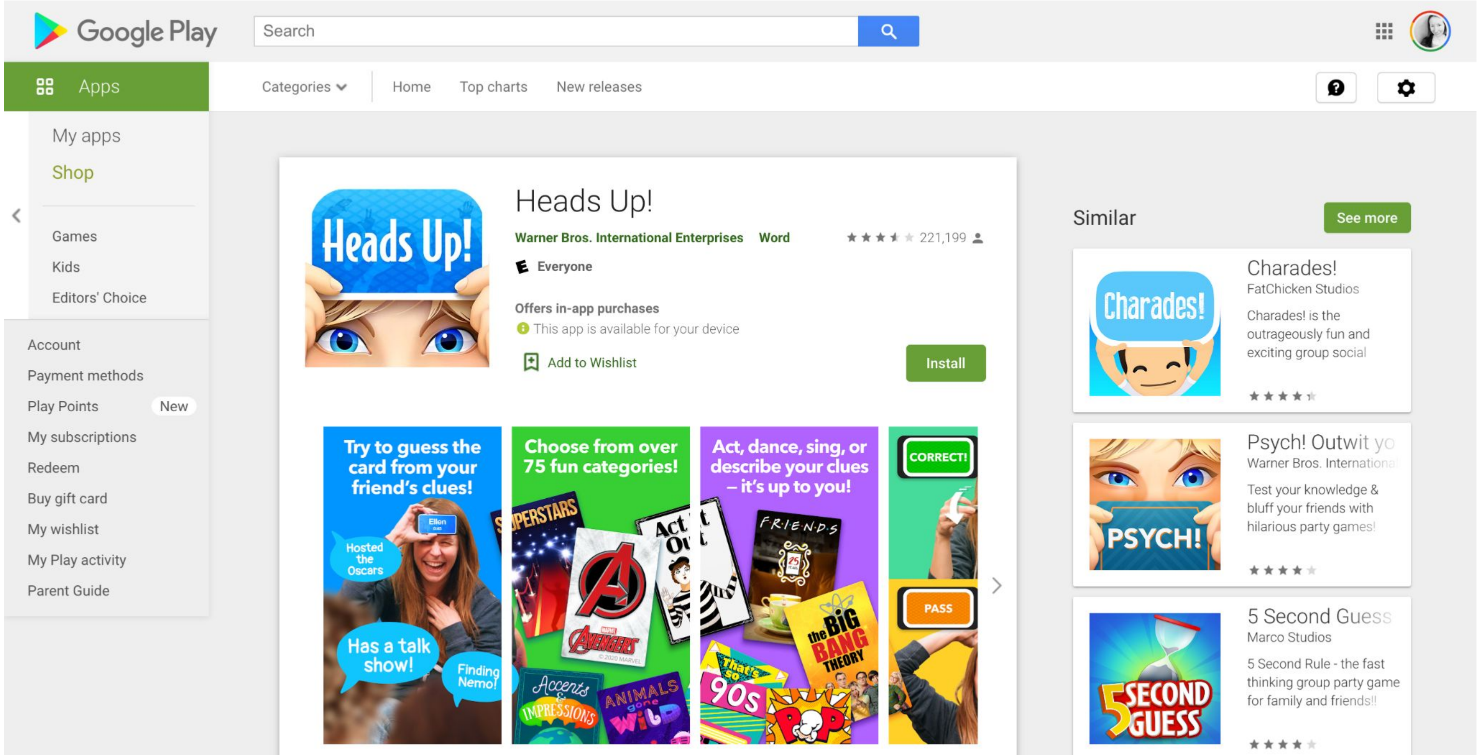
Heads Up: A Real Mobile Game



Heads Up!

Warner Bros. International Enterprises Word ★★★★☆ 221,199

Everyone

Offers in-app purchases

This app is available for your device

Charades!
FatChicken Studios
Charades! is the outrageously fun and exciting group social

Psych! Outwit yo
Warner Bros. Internationa
Test your knowledge & bluff your friends with hilarious party games!

5 Second Guess
Marco Studios
5 Second Rule - the fast thinking group party game for family and friends!!

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Heads Up Problem

Write a program that runs a console version of the game Heads Up!

1. Player closes eyes
2. Program displays a word
3. Rest of section tries to describe word without saying it
4. Player guesses word

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Heads Up Problem: Milestones

1. Load words from cswords.txt into a list
2. Show a randomly chosen word from the list
3. When user hits enter, show another word

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Covid-19 Data Science Problem

- Demonstrates how file reading and lists allow for data science
- Much of the Covid-19 data from different countries is public
- A file named countries/Italy.txt is provided
- The file lists the total number of confirmed cases in Italy, one value per day, starting on Jan 22nd, 2020 and going up until May 12, 2021.
- This is real data provided by Johns Hopkins University.

Covid-19 Data Science Problem: Milestones

1. Load all the values from the file into a list of integers.
2. Count the number of non-zero values in the file
   (this is days since first case)
3. Create a list which stores how many new cases there were each day

```
  Total cases on that day
- Total cases on the previous day
  New cases on a given day
```

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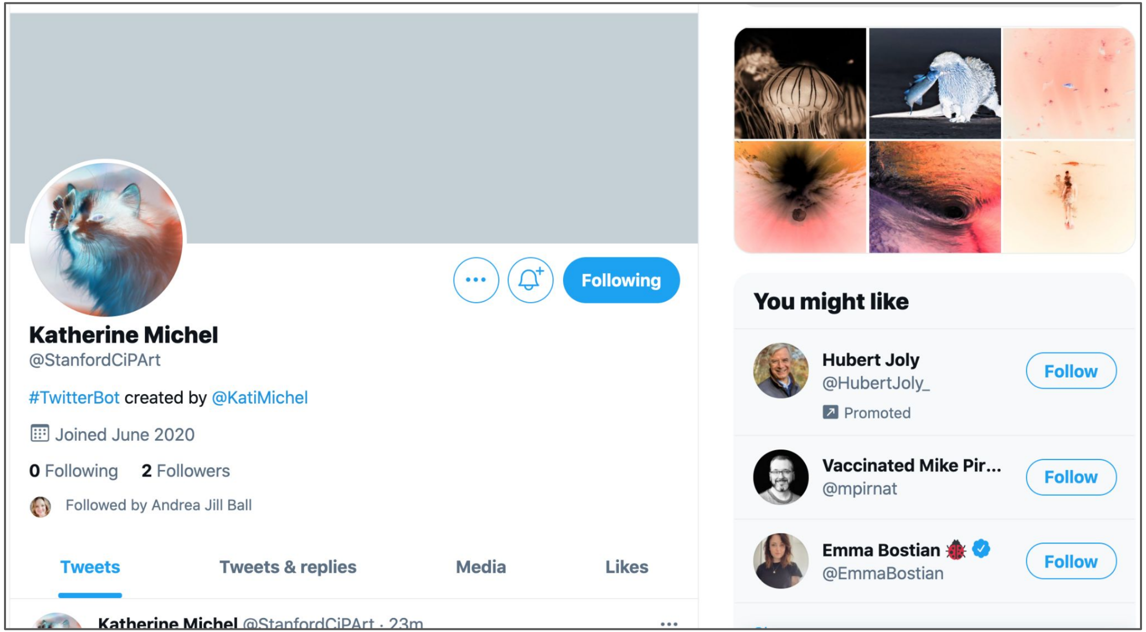
My Final Project:
Create an “Art Gallery”



Katherine Michel
@StanfordCiPArt

#TwitterBot created by @KatiMichel

Joined June 2020

0 Following 2 Followers

Followed by Andrea Jill Ball

Katherine Michel @StanfordCiPArt · 23m

You might like

Hubert Joly
@HubertJoly_
Promoted

Vaccinated Mike Pir...
@mpirnat

Emma Bostian
@EmmaBostian

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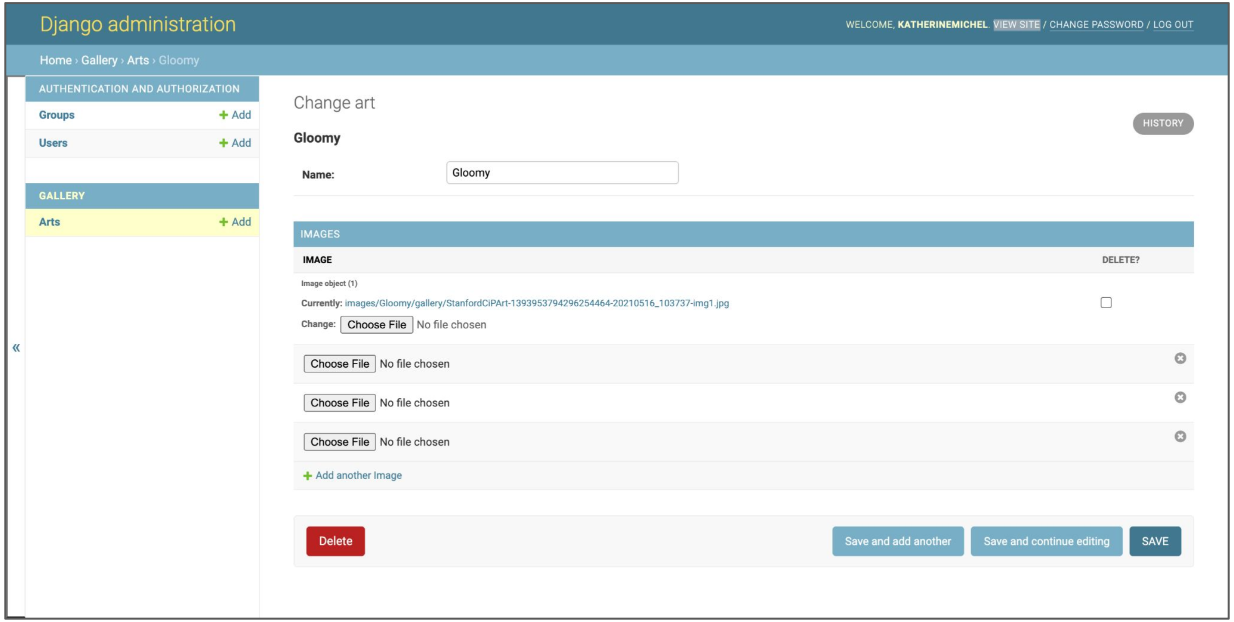
My Final Project:
Create an “Art Gallery”


Django administration
WELCOME, KATHERINEMICHEL. VIEW SITE / CHANGE PASSWORD / LOG OUT
Home › Gallery › Arts › Gloomy
AUTHENTICATION AND AUTHORIZATION
Groups + Add
Users + Add
GALLERY
Arts + Add
«
HISTORY
IMAGES
IMAGE
DELETE?
+ Add another Image
Delete
Save and add another
Save and continue editing
SAVE

Change art

Gloomy

Name: Gloomy

Image object (1)

Currently: images/Gloomy/gallery/StanfordCiPArt-1393953794296254464-20210516_103737-img1.jpg □

Change: Choose File No file chosen

Choose File No file chosen

Choose File No file chosen

Choose File No file chosen

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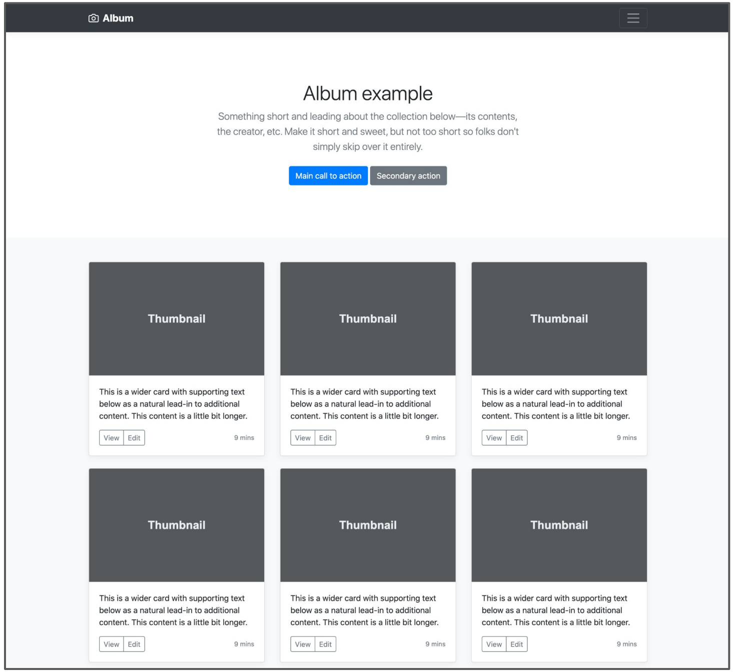
My Final Project:
Create an “Art Gallery”



Album

Album example

Something short and leading about the collection below—its contents, the creator, etc. Make it short and sweet, but not too short so folks don't simply skip over it entirely.

Main call to action | Secondary action

Thumbnail

This is a wider card with supporting text below as a natural lead-in to additional content. This content is a little bit longer.

View | Edit 9 mins

Thumbnail

This is a wider card with supporting text below as a natural lead-in to additional content. This content is a little bit longer.

View | Edit 9 mins

Thumbnail

This is a wider card with supporting text below as a natural lead-in to additional content. This content is a little bit longer.

View | Edit 9 mins

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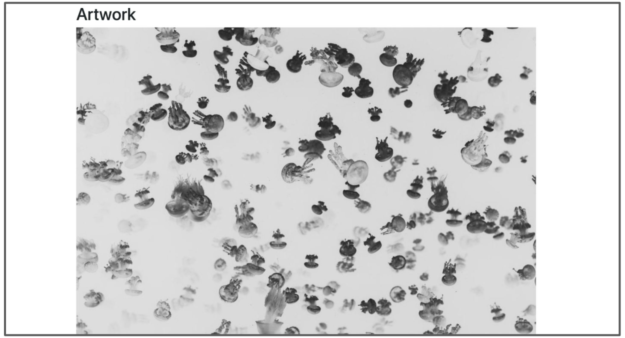
View | Edit 9 mins

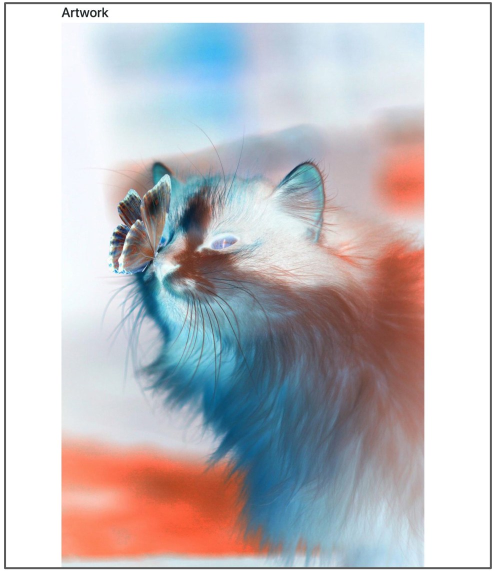
Thumbnail

This is a wider card with supporting text below as a natural lead-in to additional content. This content is a little bit longer.

View | Edit 9 mins



Artwork



Artwork

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Thank You!

- I loved being your Section Leader
- This was a great experience for me. :)
- Hope you had a great experience too!

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Feel Free to Keep in Touch!

- Katherine “Kati” Michel
- Email: kthrnmichel@gmail.com
- Twitter: @KatiMichel
- GitHub: KatherineMichel

For Continued Learning

- The course materials will continue to be available
- A list of resources to continue will be made available
- It will include the second part of CS106A (CS106B)
- I believe it is taught in C++

New Adventures

- Not “goodbye”… new adventures!
- What you have learned
- What are your thoughts on Python/programming?
- The impact it has had? Will you continue to learn?