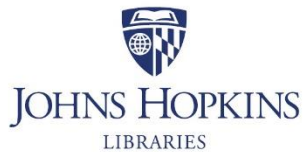




Scripting with Python in ArcGIS Online

Reina Murray and Bonni Wittstadt
April 27, 2022



Data Services

JHU Data Services



These materials are licensed under a Creative Commons [Attribution-NonCommercial-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-nc-sa/4.0/), attributable to [Data Services](#), Johns Hopkins University.

Workshop Logistics

• Using Zoom

- Mute your audio
- Turn off your camera
- To ask questions:
 - Raise your hand – we'll be with you shortly
 - Write in the public chat or private chat a TA directly
 - Unmute your mic and speak up!
- During hands-on activities:
 - Mark **YES** or **NO** to let us know if you're having trouble
 - Write in the public chat





• About this webinar

- This webinar will **NOT** be recorded
- This webinar consists of a presentation and coding exercises
- We encourage you to code along – it's the best way to learn!
- After the workshop, you'll receive a complete ArcGIS Notebook
- If you have any questions after the workshop, email us at dataservices@jhu.edu

About Data Services

A large, dark blue arrow pointing horizontally to the right. The arrow is centered on a light blue background. The text "About Data Services" is written in white, bold, sans-serif font across the middle of the arrow.

JHU DATA SERVICES

HELPING YOU NAVIGATE DATA

WE HELP FACULTY, RESEARCHERS AND STUDENTS



FIND



USE



MANAGE



VISUALIZE



SHARE

FIND OUT
MORE

GO TO dataservices.library.jhu.edu

EMAIL dataservices@jhu.edu

SHARE AT archive.data.jhu.edu



JOHNS HOPKINS
LIBRARIES

Data Services

Poll

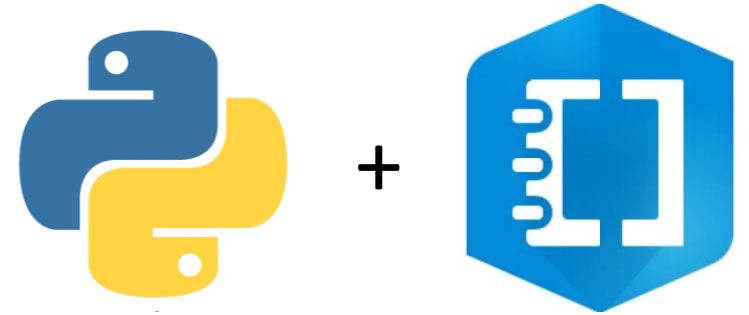
About Today's Workshop

Today's Software



ArcGIS Online

Mapping and analysis: location intelligence for everyone





• Workshop Goal

Learn how to **get started** with the
ArcGIS API for Python to
script and create
reproducible, automated geospatial
visualization and analysis
workflows in ArcGIS Online.



• Agenda / What we will cover

Part 1 – Introductions

- What is the API? What is an ArcGIS Notebook?

Part 2 – Hands-on Activity 1

- Familiarize ourselves with ArcGIS Notebooks
- Basic user queries

Break (5 mins)

Part 3 – Hands-on Activity 2

- Class exercise demonstrating sample workflow for geospatial analysis



• Class Exercise

We'll be examining Low-Income Housing Tax Credit (LIHTC) property data collected and produced by the US Department of Housing and Urban Development. For the purposes of this workshop, we'll use a cleaned subset of this data produced by Data Services. You can find this dataset on our [JHU ArcGIS Online organization](#).

We'll be examining the distribution of LIHTC properties and low-income housing units in Baltimore neighborhoods.

Which neighborhood has the most LIHTC properties? Which has the least?

Which has the most and least number of low-income housing units funded by the LIHTC program?



• What we WON'T cover

Introductory Python Concepts

- Basic Python syntax and terminology
- Installing and loading packages

Introductory Concepts on ArcGIS Online

- Webmaps, feature layers, groups

Advanced ArcGIS API Concepts

- User and content management
- Content publishing
- Machine learning



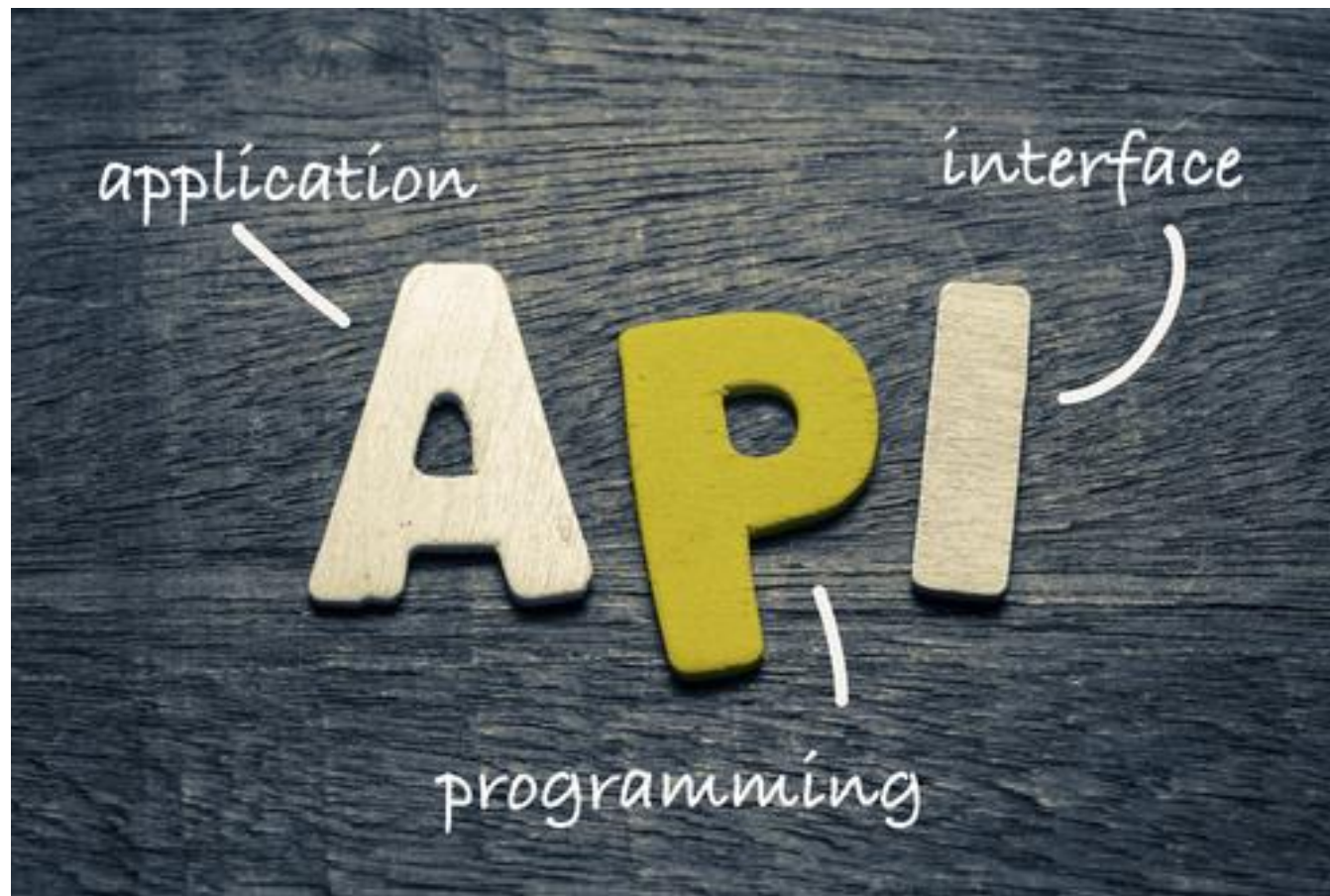
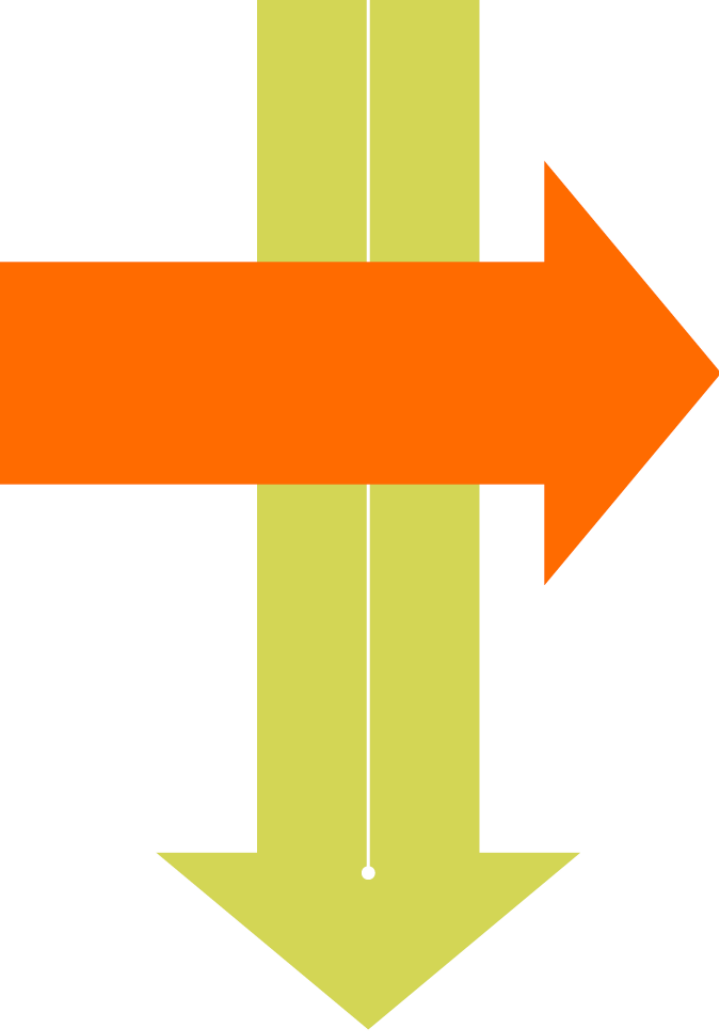
• Additional notes

- This workshop is designed to be a starting point:
 - give you a basic understanding of the ArcGIS API for Python
 - provide enough background to get started using it
- Your feedback helps us develop additional workshops!
 - Please complete the survey, link will be shared at the end

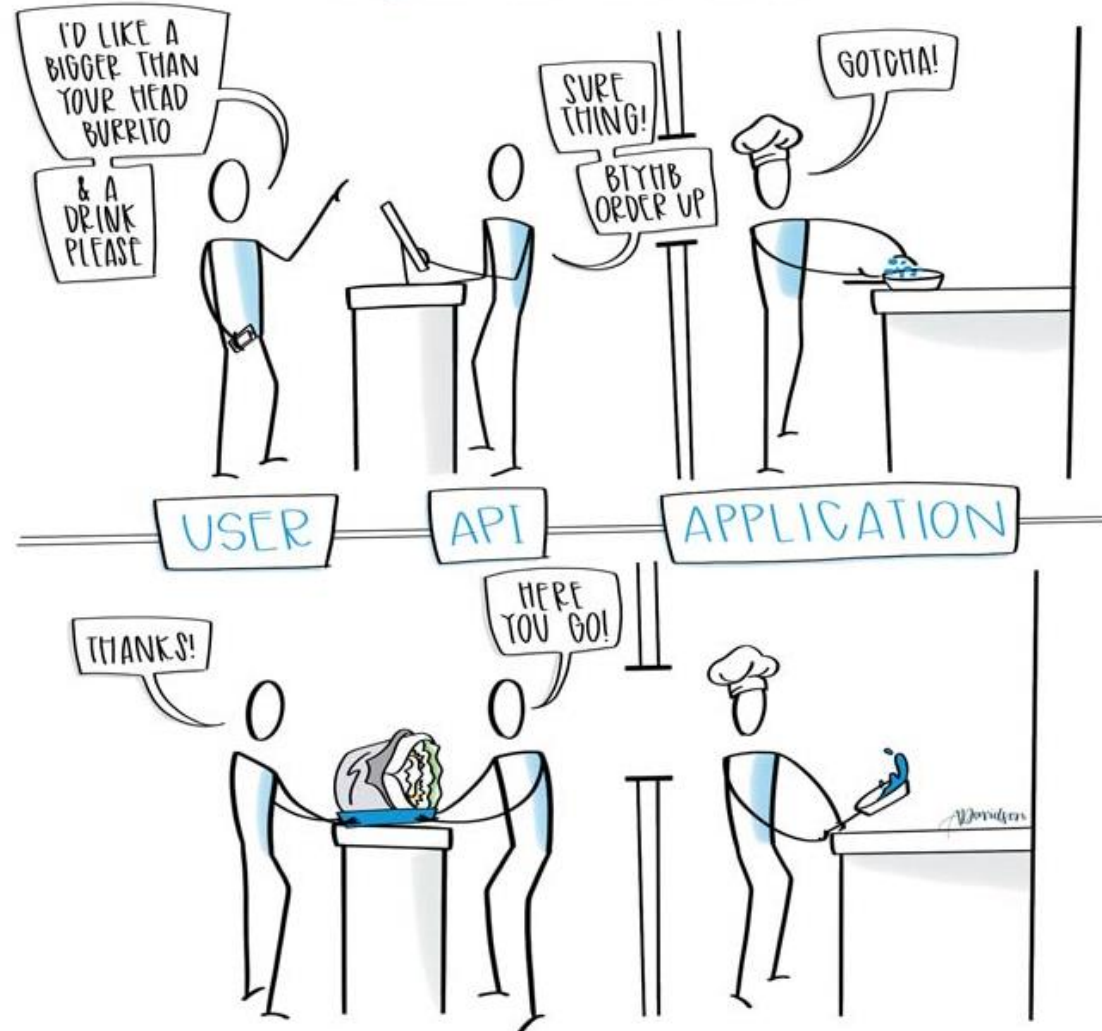
Any questions?



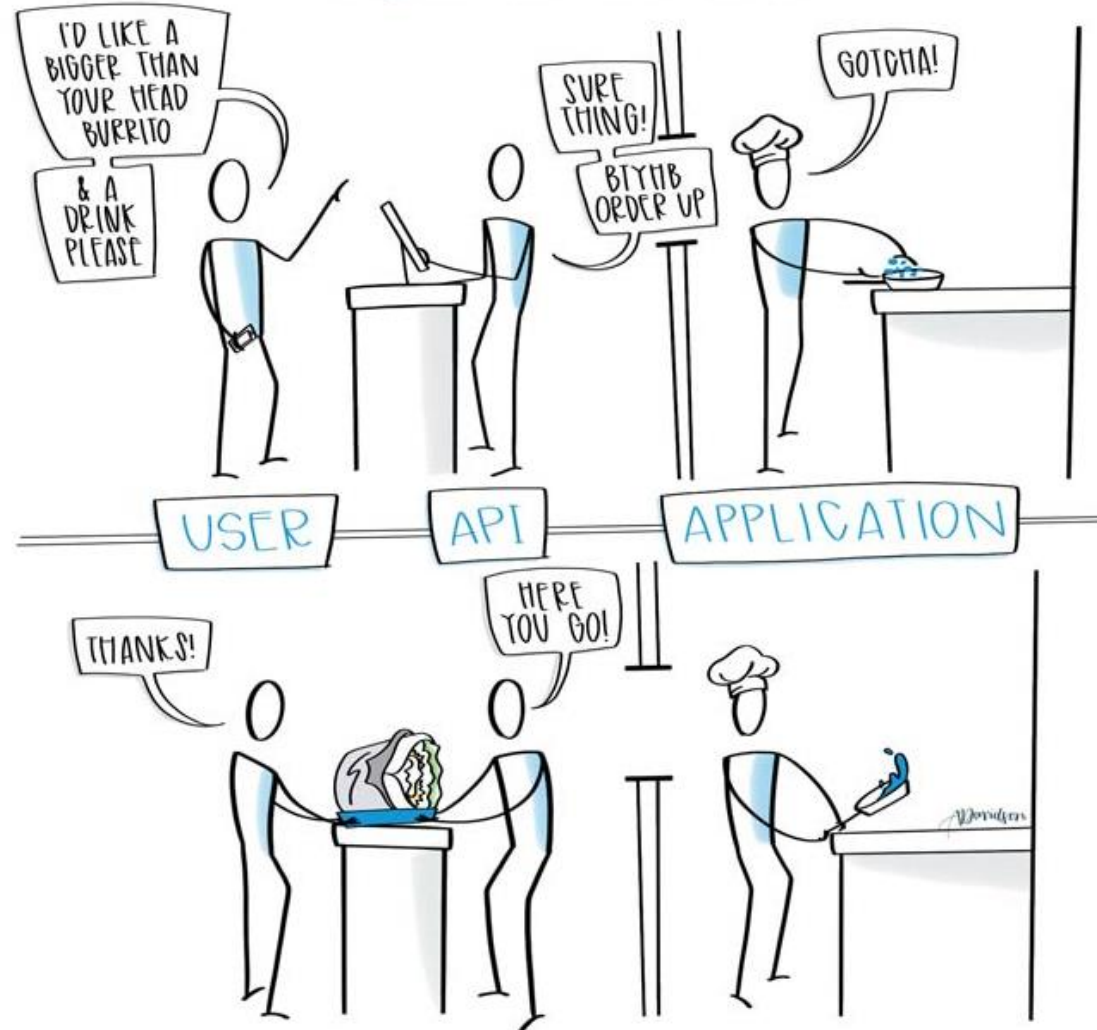
What is an API?



WHAT IS AN API?



WHAT IS AN API?



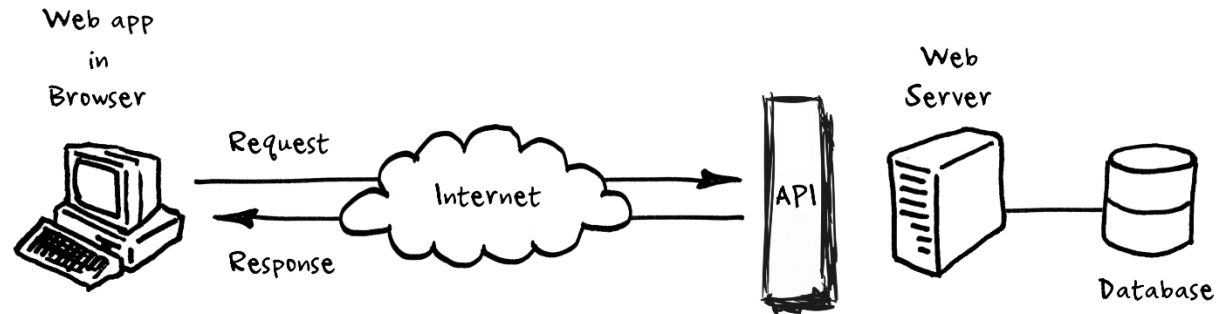
A Transaction

- Customer makes an order
- Server takes down order, processes it, and passes it to cook
- Cook acknowledges order
- Cook makes the order and gives it to the server
- Server gives the customer their order



JOHNS HOPKINS
LIBRARIES

Data Services

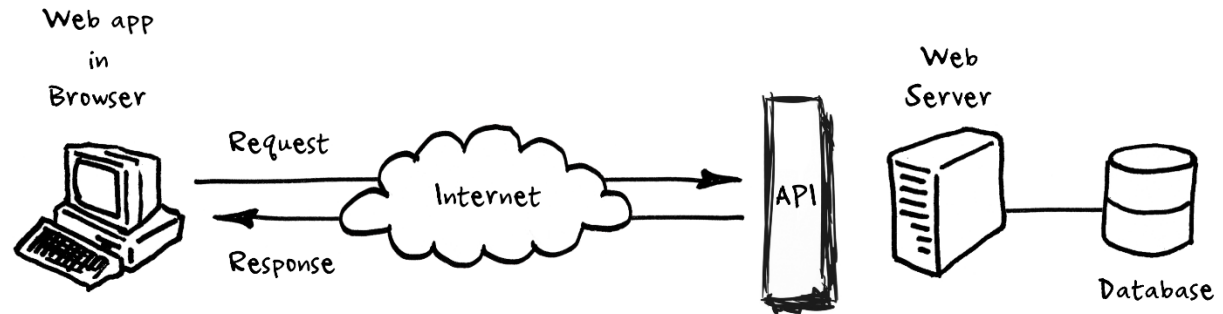


A Transaction

- Customer makes an order
- Server takes down order, processes it, and passes it to cook
- Cook acknowledges order
- Cook makes the order and gives it to the server
- Server gives the customer their order

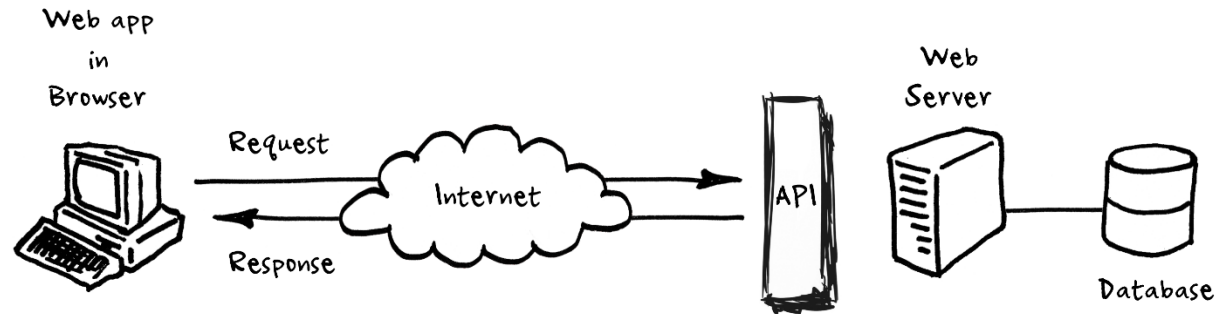
Application Programming Interface

- User (client) makes a request
- API takes down request processes it, and passes it to the application
- Application acknowledges request
- Application processes request and signals API
- API returns request to user



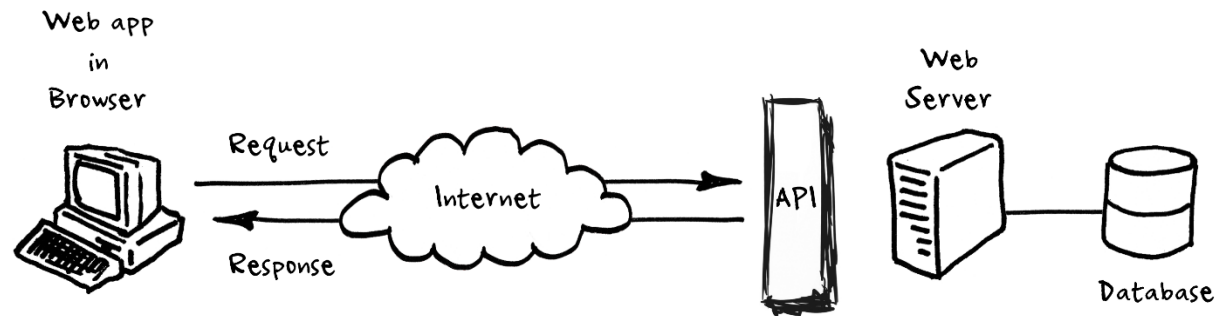
Application Programming Interface

- The API is NOT the database or server – it is the code that governs the access point(s) for the server
- APIs cover a broad category that includes all interfaces that facilitate communication between computer applications
- **Web APIs** – APIs that expose an application's data and functionality over the internet where two computers (client and server) interact with each other to request and provide data



Application Programming Interface

- 4 main types of web APIs:
 1. Open/Public APIs
no restrictions to access
 2. Partner APIs
requires specific rights and/or licenses
 3. Internal APIs
designed for internal use within an organization
 4. Composite APIs
combines different data and service APIs



Application Programming Interface

- 4 main types of web APIs:
 1. Open/Public APIs
no restrictions to access
 2. Partner APIs
requires specific rights and/or licenses
 3. Internal APIs
designed for internal use within an organization
 4. Composite APIs
combines different data and service APIs





ArcGIS API for Python

A powerful Python library for mapping, spatial analysis, data science, geospatial AI and automation.

- Python library created and maintained by Esri for use with ArcGIS Online or Enterprise
- Use for GIS – from managing and searching for data to spatial analysis and mapping
- An automation and data science tool
- Note: ArcGIS API for Python is distinct from Arcpy. ArcPy is another python library created and maintained by Esri, for use with desktop ArcGIS software like ArcGIS Pro or ArcMap.



JOHNS HOPKINS
LIBRARIES

Data Services

**Why might you
use the ArcGIS API for Python?**



ArcGIS API for Python

A powerful Python library for mapping, spatial analysis, data science, geospatial AI and automation.

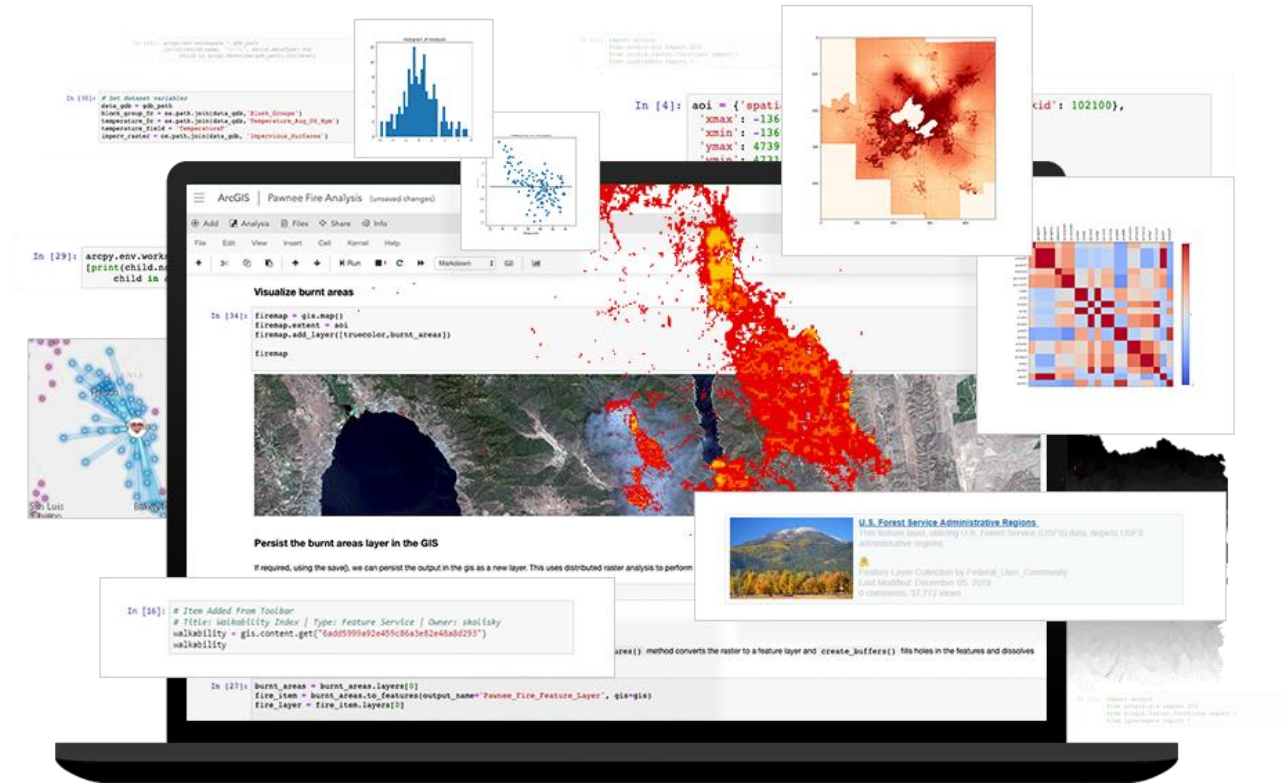
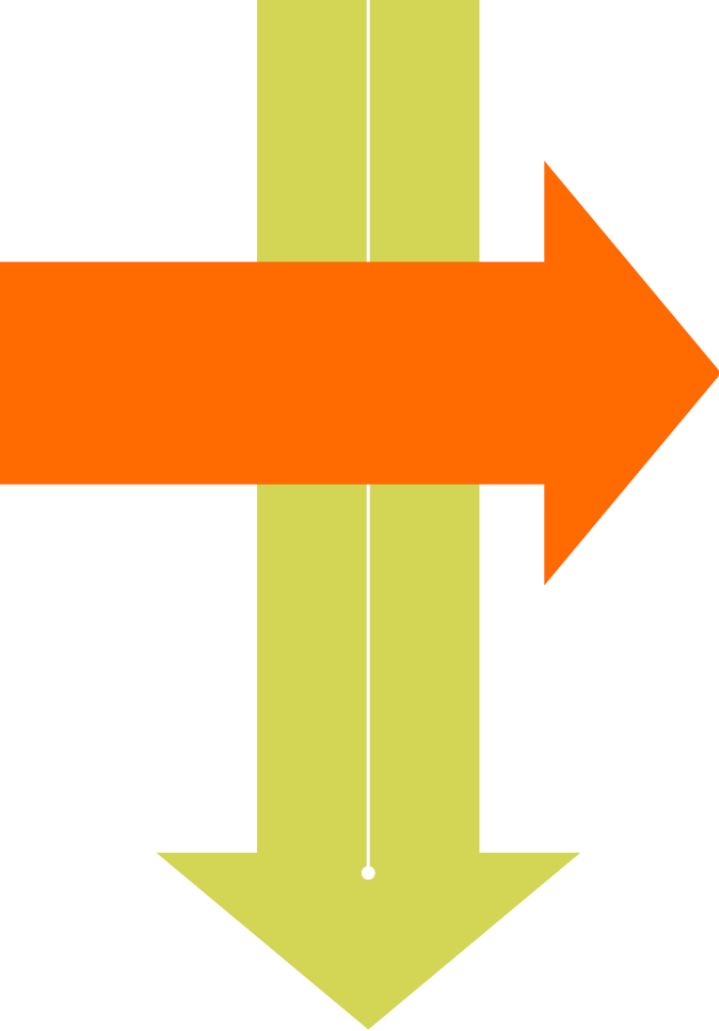
- Python library created and maintained by Esri for use with ArcGIS Online or Enterprise
- Use for GIS – from managing and searching for data to spatial analysis and mapping
- An **automation and data science tool**
- Note: ArcGIS API for Python is distinct from Arcpy. ArcPy is another python library created and maintained by Esri, for use with desktop ArcGIS software like ArcGIS Pro or ArcMap.



JOHNS HOPKINS
LIBRARIES

Data Services

ArcGIS Notebooks



- ArcGIS Notebooks = specialized Jupyter Notebooks
- Accessed and hosted via ArcGIS Online
- Integrated with ArcGIS Online
- Designed for spatial analysis

Let's Dive In!

A large orange arrow pointing to the right, spanning the width of the slide, with a small white dot at its tail.

• Thank you!

- Take our survey:

https://www.surveymonkey.com/r/arctgis_python_api

- Email us at dataservices@jhu.edu with any questions