

ISA 401: Business Intelligence & Data Visualization

08: Connecting to APIs in

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 Automated Scheduler for Office Hours

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Quick Refresher from Last Week

- ✓ Understand when can we scrape data (i.e., `robots.txt`)
- ✓ Scrape a webpage Using 
- ✓ Utilize loops to scrape data from multiple webpages

Kahoot Competition # 2

To assess your understanding and retention of the topics covered last week, you will **compete in a Kahoot competition (consisting of 9 questions)**:

- Go to <https://kahoot.it/>
- Enter the game pin, which will be shown during class
- Provide your first (preferred) and last name
- Answer each question within the allocated 20-second window (**fast and correct answers provide more points**)

Winning the competition involves having as many correct answers as possible AND taking the shortest duration to answer these questions. The winner 🏆 of the competition from each section will receive: 0.25 on their Web Scraping II Assignment. Good luck!!!

Learning Objectives for Today's Class

- Describe what we mean by an API
- Explain how APIs will be a huge part of your career as a business analyst and/or data scientist
- Use APIs for extracting web data

What is an API?

(A Web Server Based Perspective)

What is an API? [1]

- An **API** is an acronym for application programming interface.
- It is a **popular** approach to interact with an application/service or data since it:
 - Defines a set of functionalities independent of implementation (i.e., it only exposes information that a programmer might find useful and keep those parts consistent even if the implementation changes later)
 - Provides some level of privacy/control over one's internal data and the rate at which it can be accessed.

What is an API? [2]

What is an API?



What is an API? [3]


Scenario: Alone, you went into a warehouse and are trying to retrieve 3 screwdrivers, a toolbox, and 15 Phillips screws. But you do not know, where those things are in the warehouse.



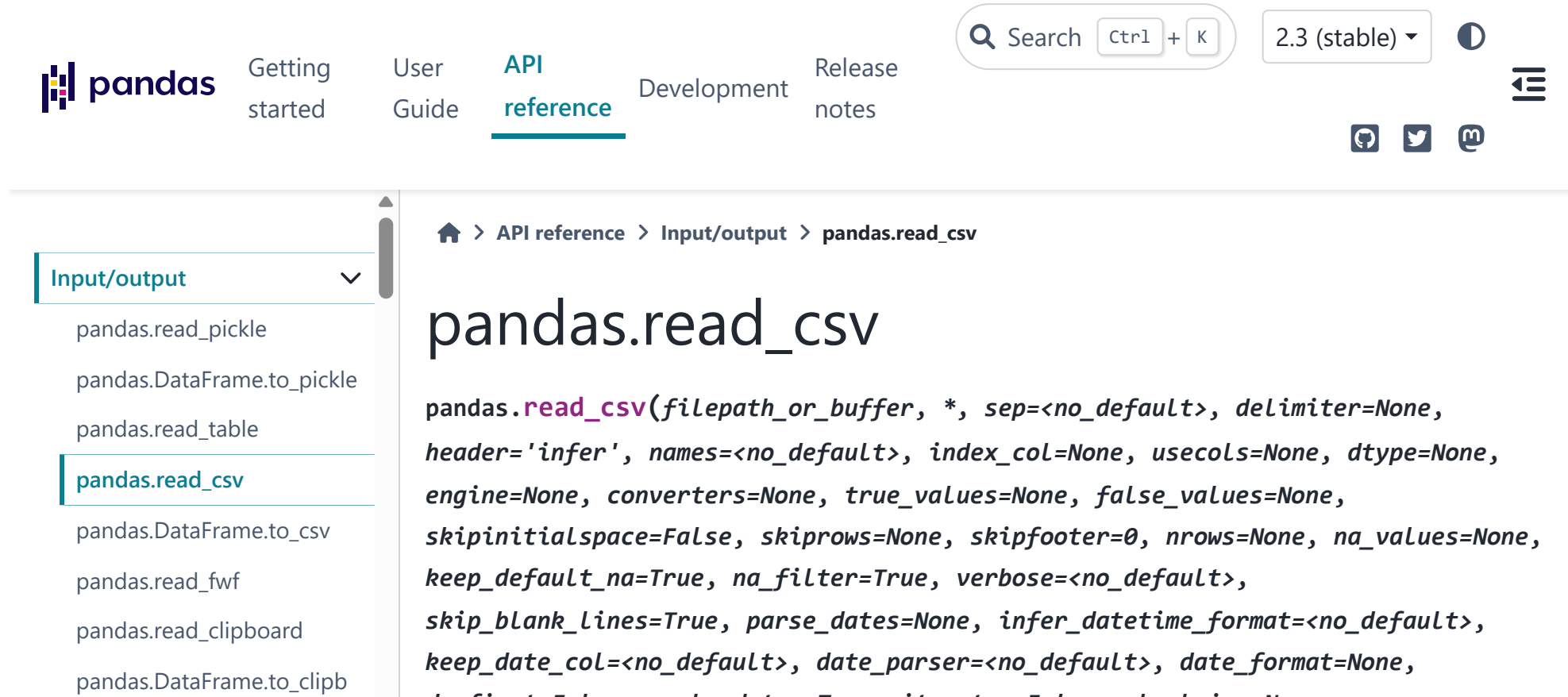
The API is the set of instructions provided by the warehouse manager on where/how to retrieve this information without touching/accessing other things in there.

API Useages for Business Analysts and Data Scientists

Application #1: Request Data from Web Server

This is the **classical** example, which was explained in the previous slides and we will be coding several in-class demos to illustrate how to perform such operations in .

Application #2: Access Python Libraries



The screenshot shows the pandas documentation website. The top navigation bar includes the pandas logo, links for 'Getting started', 'User Guide', 'API reference' (which is highlighted with a blue underline), 'Development', and 'Release notes'. To the right of these links is a search bar with the text 'Search' and a keyboard shortcut 'Ctrl + K'. Next to the search bar is a dropdown menu showing '2.3 (stable)' and a dark mode toggle icon. On the far right of the navigation bar are icons for GitHub, Twitter, and a mail icon, along with a hamburger menu icon.

On the left side of the page, there is a sidebar with a 'Input/output' section. Under this section, a list of functions is shown: 'pandas.read_pickle', 'pandas.DataFrame.to_pickle', 'pandas.read_table', 'pandas.read_csv' (which is highlighted with a blue border), 'pandas.DataFrame.to_csv', 'pandas.read_fwf', 'pandas.read_clipboard', and 'pandas.DataFrame.to_clipb'.

The main content area of the page shows the breadcrumb path: 'Home > API reference > Input/output > pandas.read_csv'. Below this, the title 'pandas.read_csv' is displayed in a large font. The function signature is shown in a code block: `pandas.read_csv(filepath_or_buffer, *, sep=<no_default>, delimiter=None, header='infer', names=<no_default>, index_col=None, usecols=None, dtype=None, engine=None, converters=None, true_values=None, false_values=None, skipinitialspace=False, skiprows=None, skipfooter=0, nrows=None, na_values=None, keep_default_na=True, na_filter=True, verbose=<no_default>, skip_blank_lines=True, parse_dates=None, infer_datetime_format=<no_default>, keep_date_col=<no_default>, date_parser=<no_default>, date_format=None, dayfirst=False, cache_dates=True, iterator=False, chunksize=None, compression=None, storage_options=None, **kwargs)`. The text is partially cut off at the bottom.

Application #3: Use a Pretrained ML Model

02:47

Please click on the ["Watch on Vimeo"](#) to see OpenAI's explanation of their DALL·E 2 model.

Accessing APIs in

The 3 Step Process

Before you dive into the API documentation, you **should first check if there is a R (or Python if you are familiar)** package/library that serves as a wrapper for that API.

- **Find** the **API's documentation** and find information about the following:
 - A. Does the API require an **authentication key**?
 - B. What are the API's **base URL** and **query parameters**?
 - C. How does the request URL look like?
- Craft your **request**. My recommendations are to:
 - A. First, start with a simple request.
 - B. Test that request in your browser and see what results you get.
- Construct that request in **R** by **either**:
 - A. If the generated content seems to be a **JSON** file/webpage, you can capitalize on the reading the content from `jsonlite::fromJSON()`; **OR**
 - B. By passing the **base url** inside the `httr::GET()` and parsing the results with `httr::content()`.

Demo: The CryptoCompare API

Demo Description

Code and Results

- Create a Personal (Free) account at CryptoCompare.com
- Click on create your free key to create your API key and copy the key.
- Go to the [documentation](#), and test their sample call by executing the call after you have pasted your API key in the call.
 - The executed call returns the price of BTC (Bitcoin) in USD, JPY and EUR.
- Now click on the Historical Data Tab on the left
 - Click on Daily Pair OHLCV and Execute the Sample Call for BTC
 - This returns 10 days worth of OHLCV for BTC in USD.
- **Let us obtain the price for \$BTC over the past 100 days.**

Recap

Summary of Main Points

By now, you should be able to do the following:

- Describe what we mean by an API
- Explain how APIs will be a huge part of your career as a business analyst and/or data scientist
- Use APIs for extracting web data

Things to Do to Prepare for Next Class

- Getting Started with http
- Getting Started with http2
- Managing secrets