API Mania!

FinTech

Lesson 5.2

Class Objectives

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

- Use an API key to fetch authenticated requests using the Requests Library.
- Set/Export environment variables in Windows and Mac and retrieve them in Python.
- Explain the difference between an API and SDK.
- Set authentication for a Python SDK.
- Use SDKs to fetch and analyze financial data.
- Retrieve historical stock information using the Quandl API.
- Acknowledge the general regulations for FinTech companies in Canada.

The Rise of APIs

APIs in FinTech

There are a number of FinTech APIs available that grant users the ability to create and execute analytic pipelines on various forms of financial data.

Because APIs often offer practical services, they may require subscriptions or payment.

Quandl

Alpaca

Canadian Regulations for FinTech

The Personal Information Protection and Electronic Documents Act (PIPEDA)

Canada's Anti-Money Laundering and Anti-Terrorist Financing Regime (AML/CT)

Canadian Securities Administrators (CSA) Staff Notice 46-308 Securities Law Implications for Offerings of Tokens

API Keys

API Keys

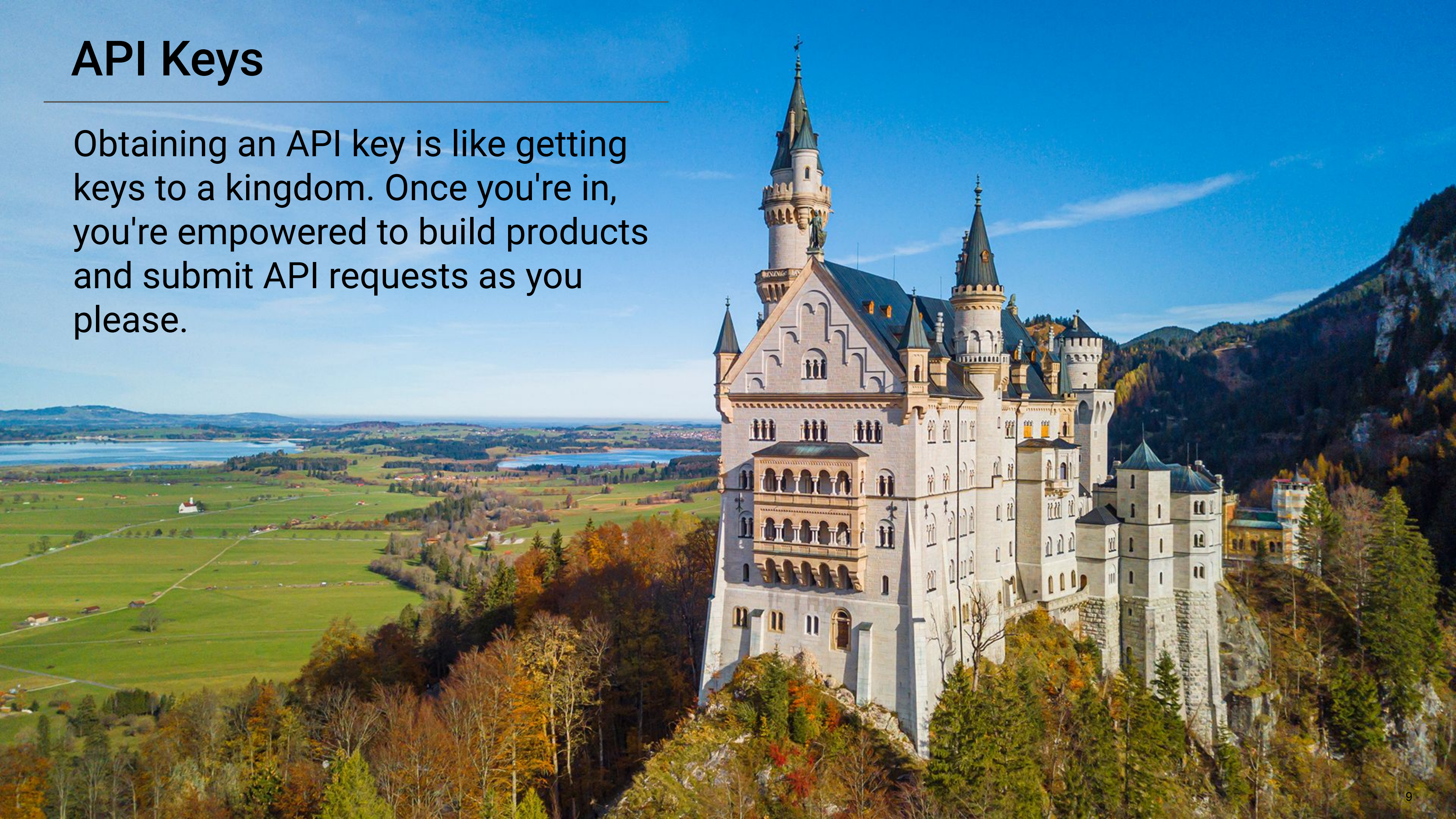
API keys are like keys to a house or car: they're used to get access to resources.

A key must be provided with every request for APIs that require keys.

API Keys

Companies use API keys as a means to secure data, as well as monitor traffic. Using keys in this manner allows companies to limit and block requests as needed.

API Keys



Obtaining an API key is like getting keys to a kingdom. Once you're in, you're empowered to build products and submit API requests as you please.

Keys to the FinTech Kingdom

Do *all* APIs require API keys?

Do *all* APIs require API keys?

Answer: No. Only some APIs require keys to be used. Others allow users to submit requests for free (with rate limits).

Why require users to have an API key, when requests can be sent without APIs?

Do *all* APIs require API keys?

Answer: API keys allow companies to monitor, analyze, and enforce rate limits.

What happens when the `?api_key=` tag is used? Is a function executed, or is a parameter passed?

What happens when the `?api_key=` tag is used? Is a function executed, or is a parameter passed?

Answer: A parameter is passed.

Can more than one user have the same API key?

Can more than one user have the same API key?

Answer: No. API keys are unique identifiers. Each key is assigned to one user.

Do you think API keys are naturally secure?

Do you think API keys are naturally secure?

Answer: No, they are not. API keys are transmitted across the network and are not naturally encrypted. API keys can be encrypted to make them private.

Is there a problem with sharing an API key?

Is there a problem with sharing an API key?

Answer: Yes. Rate limits are tied to API keys. Sharing API keys means sharing total allowed requests with another individual. Sharing keys could result in someone charging your account for billable services.

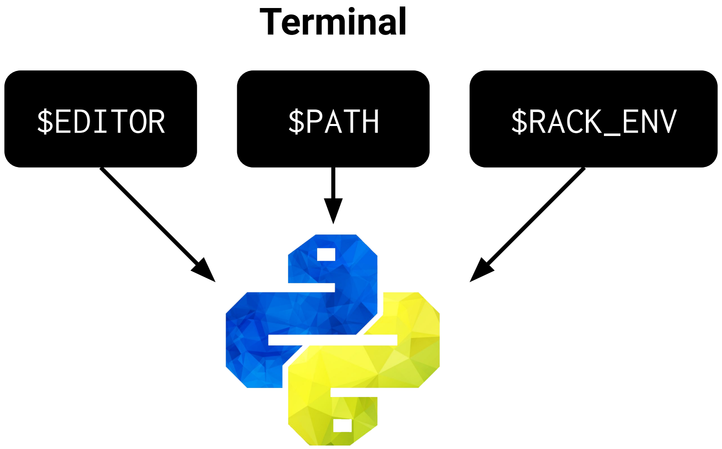
Environment Variables

Environment Variables

API keys are accessed when stored as environment variables.

Environment Variables

Child process gets copies of parent's environment variables



Terminal

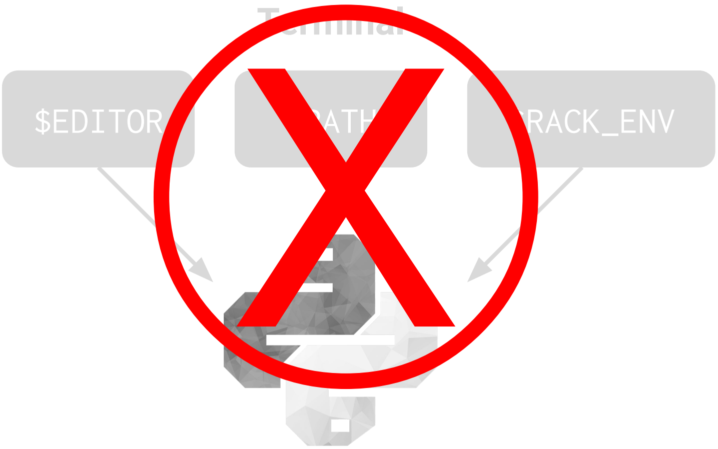
$EDITOR

$PATH

$RACK_ENV

Local Variables

Child process doesn't get any copies of local variables



Terminal

$EDITOR

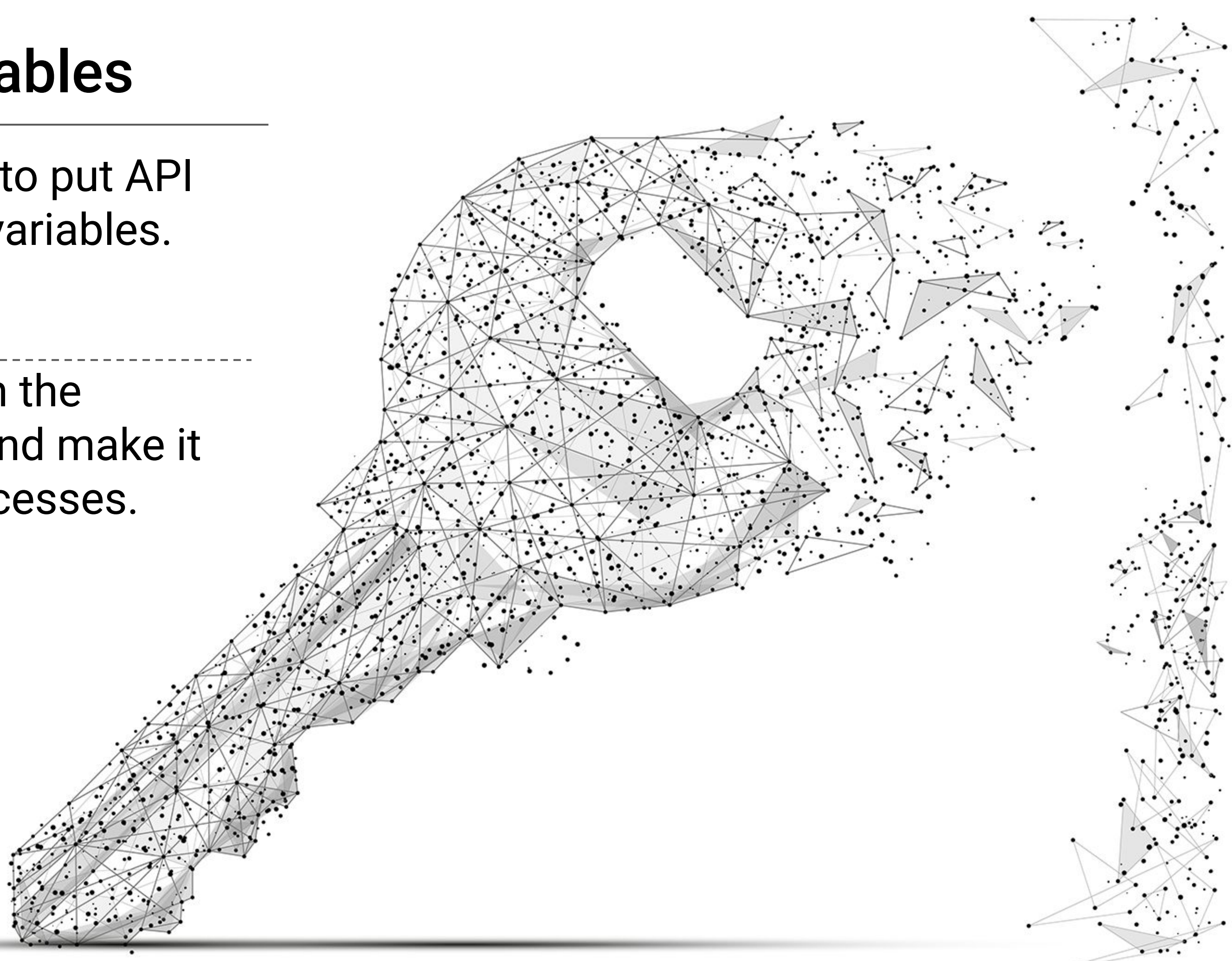
$PATH

$RACK_ENV

Environment Variables

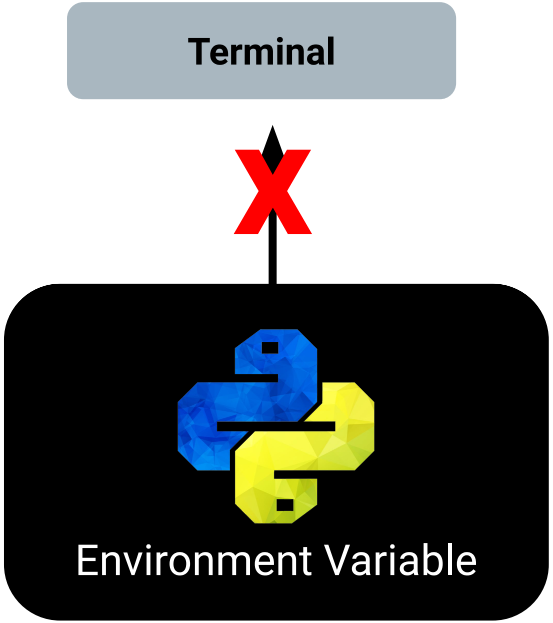
A `.env` file can be used to put API keys into environment variables.

The `.env` file will contain the environment variable, and make it accessible by child processes.

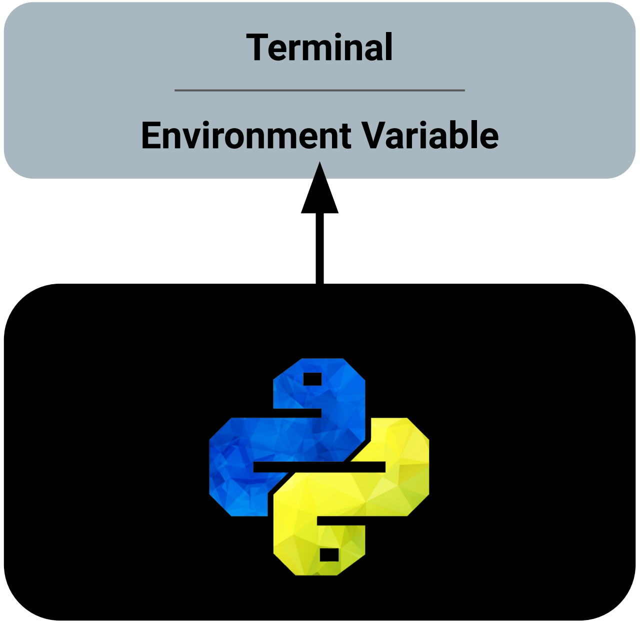


Environment Variables

An environment variable created in Python **cannot** be accessed by a terminal.

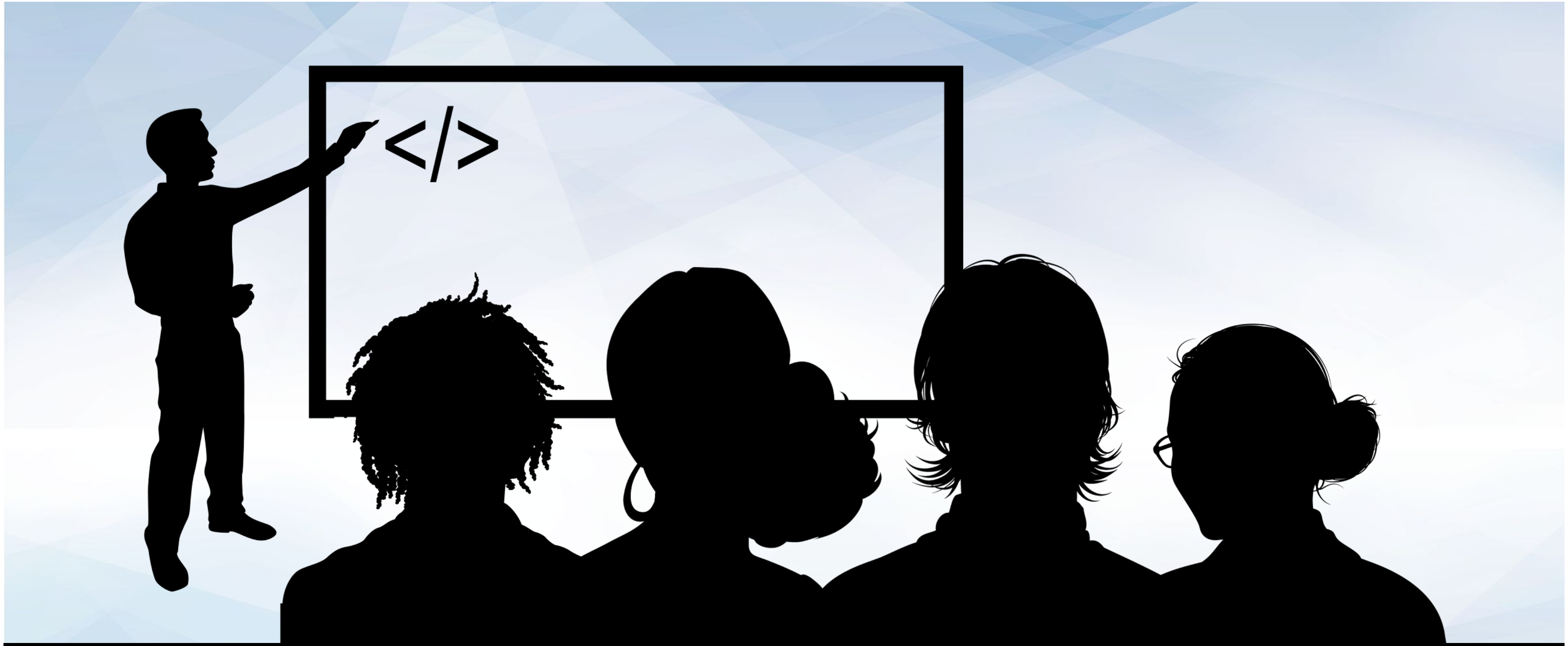


An environment variable created in a terminal **can** be accessed by Python.



Environment Variables

Because environment variables are at the **operating system level**, variables can be passed down from parent processes to child processes.



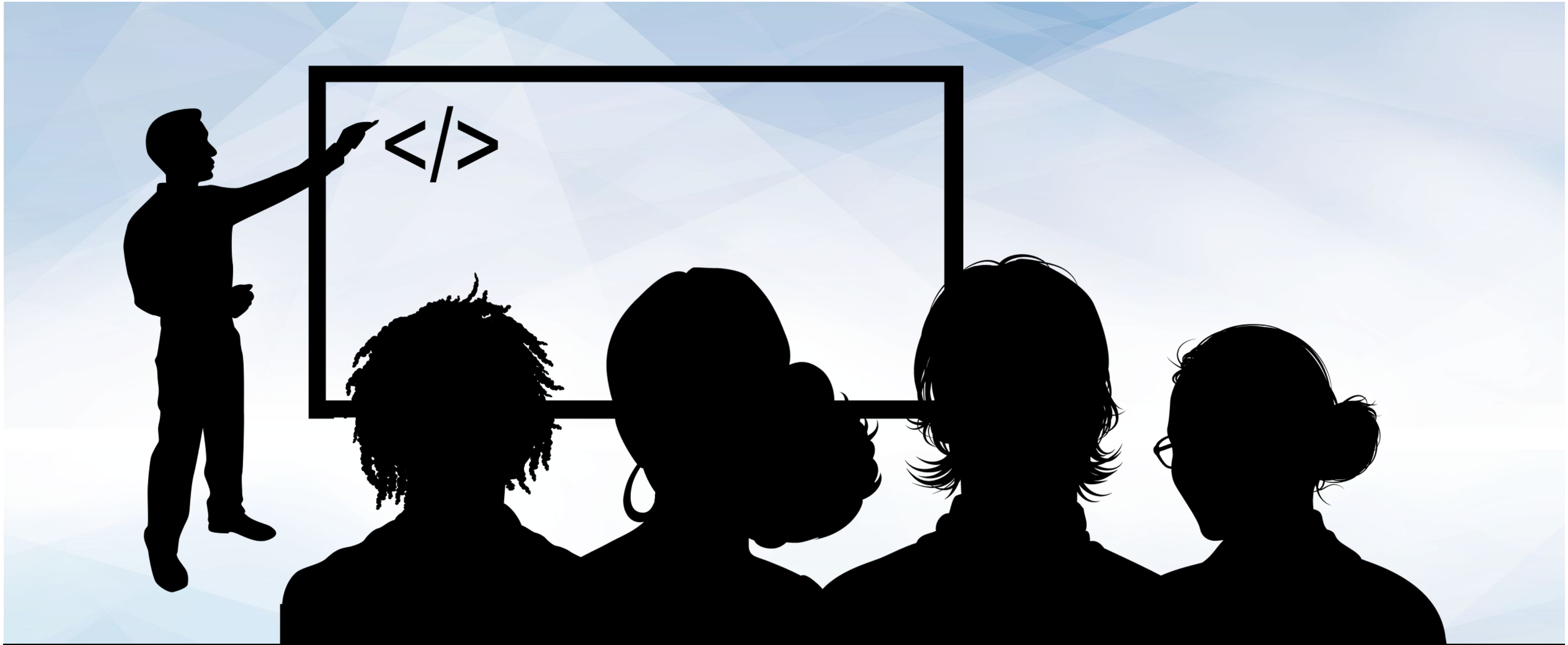
Instructor Demonstration

Creating Environment Variables

Calling Environment Variables

In order to make environment variables inheritable, they have to be exported and sourced.

```
Api_key = os.getenv()
```



Instructor Demonstration

Calling Environment Variables

Activity: Under Lock and Key

In this activity, you will create a Python code that retrieves the environment variable and passes the key with the request URL.
(Instructions sent via Slack.)

Suggested Time:
20 minutes

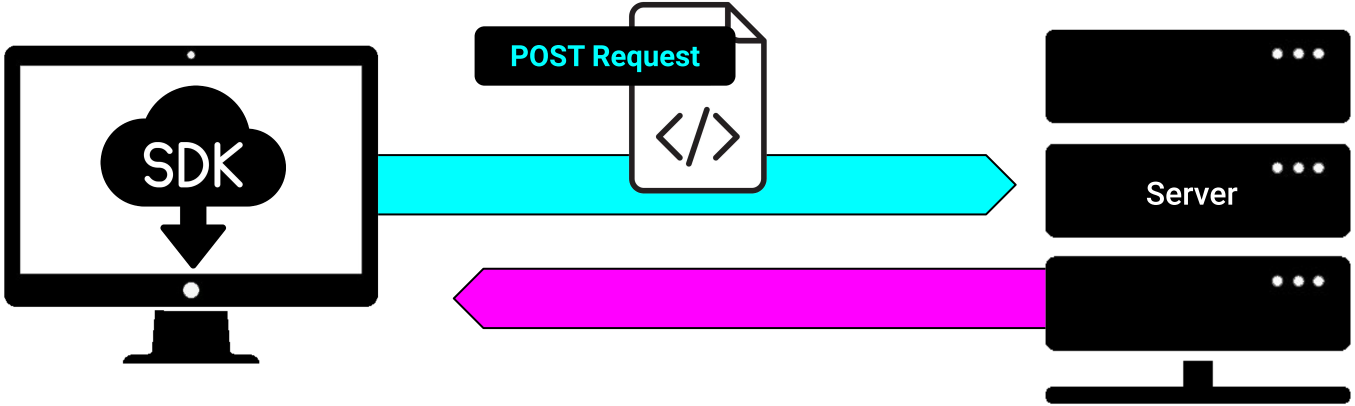
Time's Up! Let's Review.

Break

SDKs

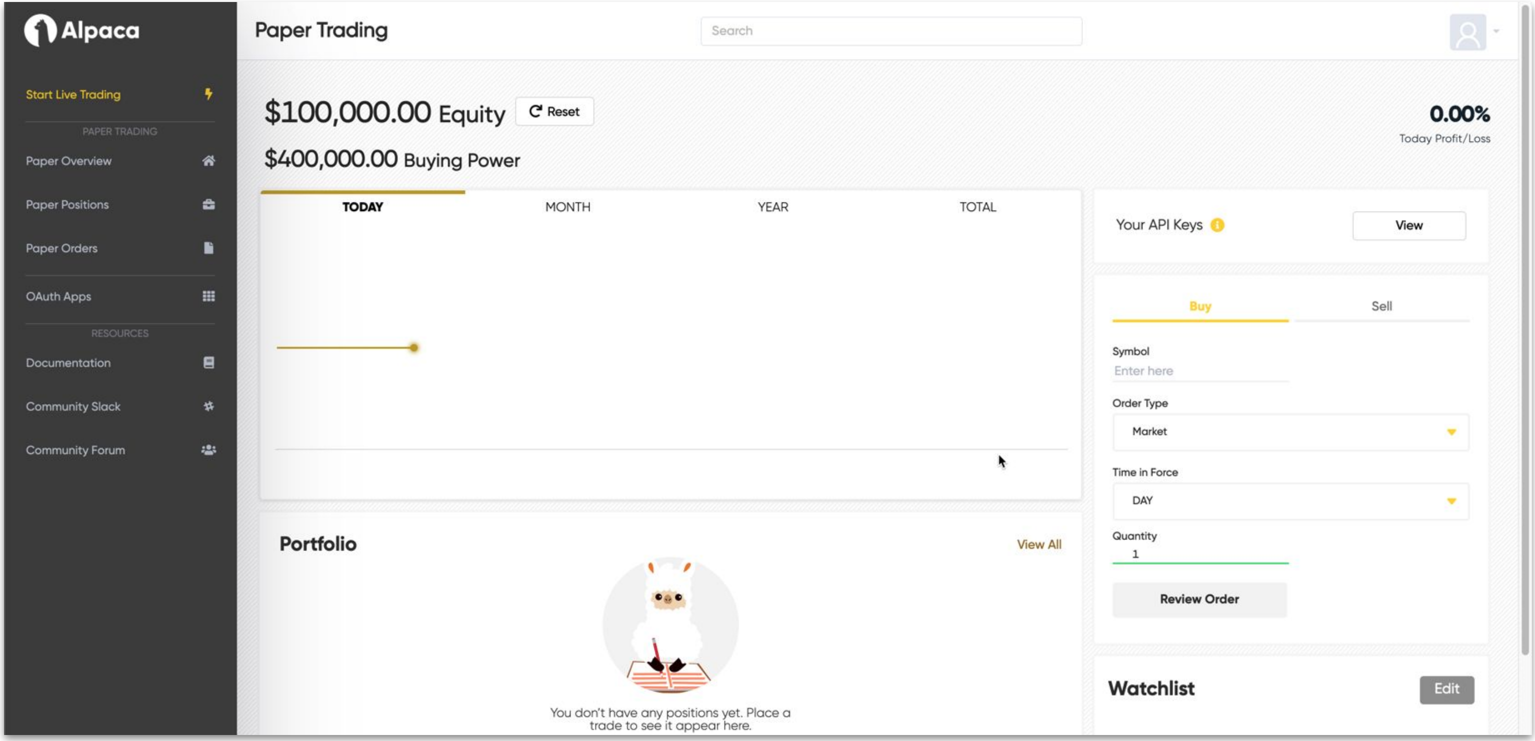
SDKs

SDKs work in the same fashion as the Python requests library: they provide functions to submit GET and POST API requests.



SDKs

Some companies, like Alpaca, offer Software Development Kits as a means to submit requests to their APIs.



$100,000.00 Equity

$400,000.00 Buying Power

0.00%
Today Profit/Loss

Symbol: Enter here

Order Type: Market

Time in Force: DAY

Quantity: 1

You don't have any positions yet. Place a trade to see it appear here.

SDKs

In addition to generic GET and POST functions, SDKs offer functions that are specific to their services/API. For example, the Quandl SDK lets you execute a function that returns historical stock prices.

```
# Using the Python requests library
requests.get("https://www.quandl.com/api/v3/datasets/WIKI/AMD?api_key=1A3")

# Using the Quandl SDK
quandl.get("WIKI/AMD", rows=5)
```

Introduction to Alpaca

What is Alpaca

Alpaca is a trading API that encapsulates banking, security, and regulatory complexity, allowing FinTech startups to build brokerage apps on top for free, and quickly.

As a FinTech professional, you can use Alpaca to fetch current stock market data free of charge from five different exchanges (IEX, NYSE National, NYSE Chicago, Nasdaq BX, and Nasdaq PSX).

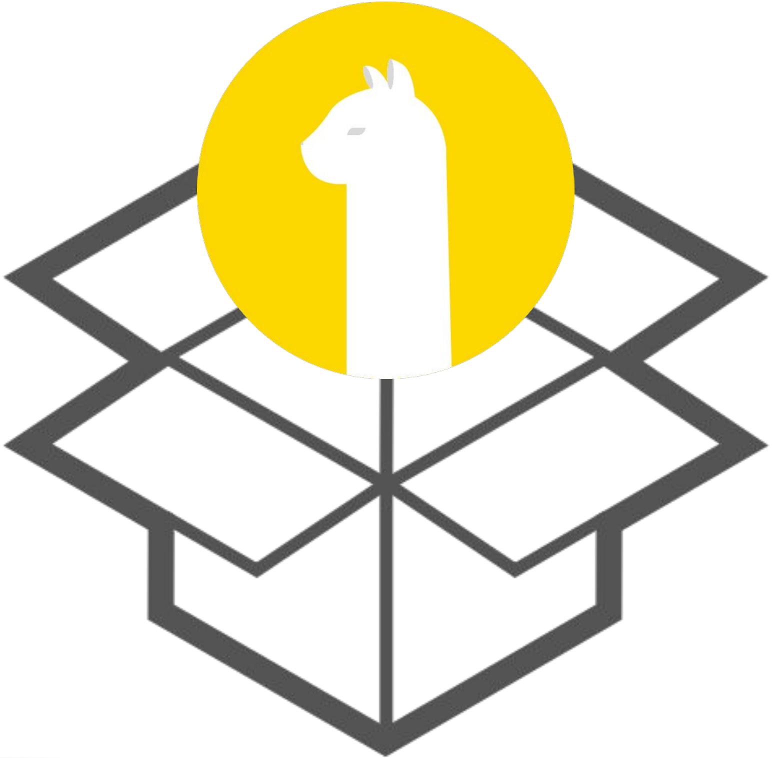
Installing Alpaca Python SDK

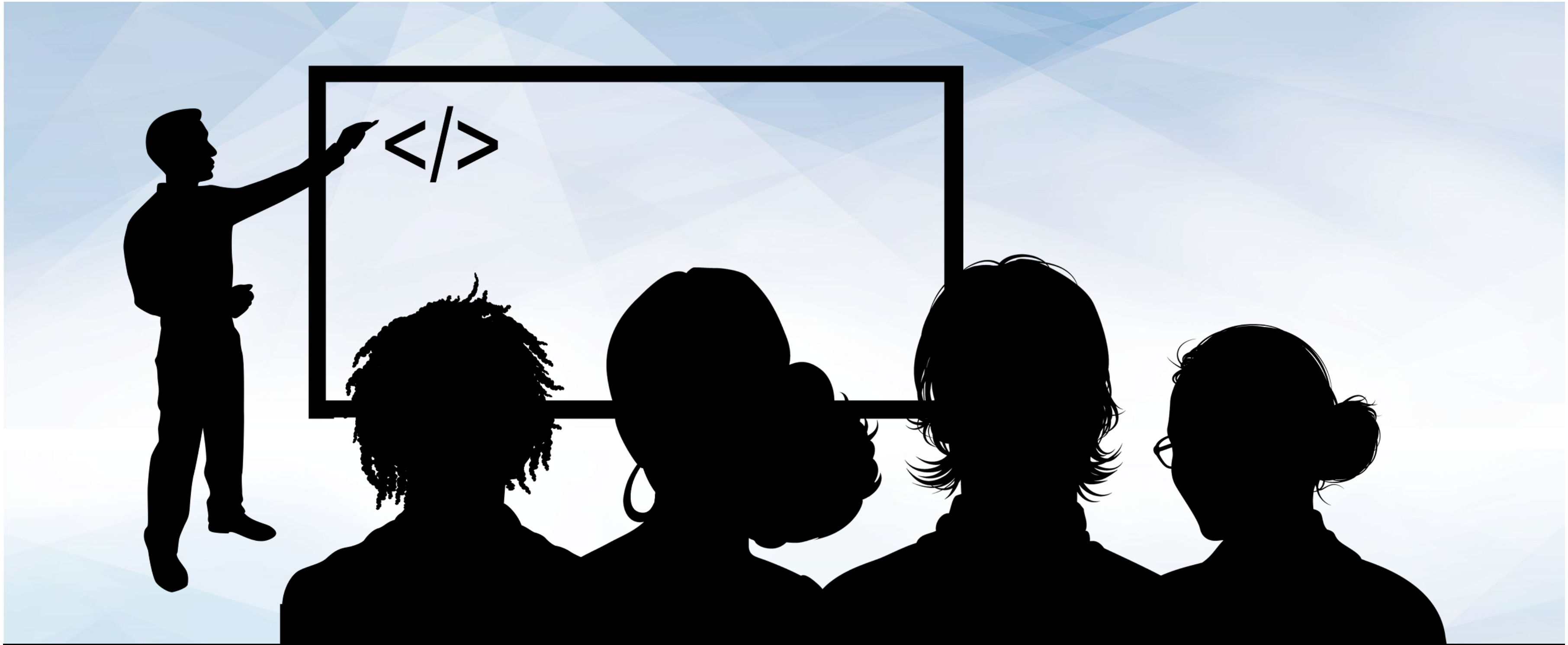
The Alpaca Python SDK can be downloaded using pip-install:

```
pip install alpaca-trade-api
```

You need to sign-up for Alpaca to create your Alpaca keys.

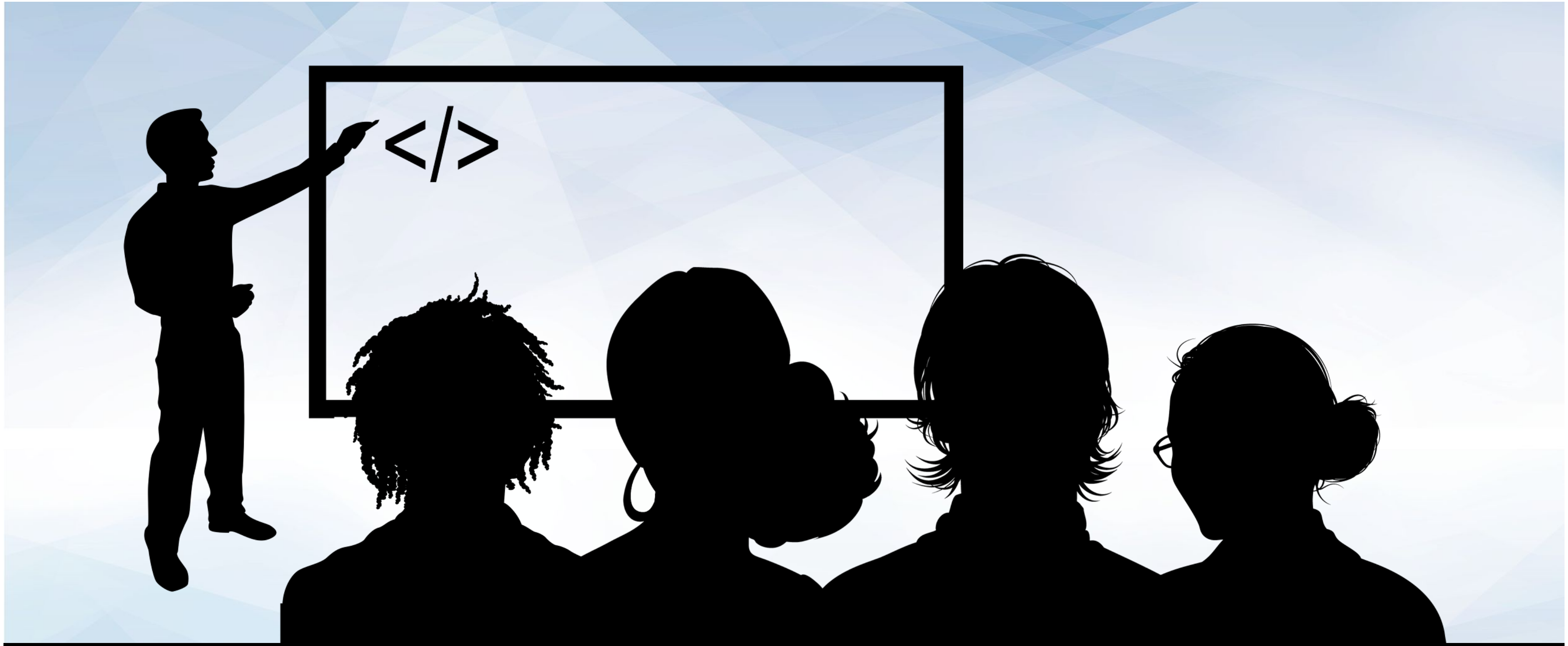
Remember, it's important to store your Alpaca keys in your `.env` file.





Instructor Demonstration

Creating Alpaca Keys



Instructor Demonstration

Alpaca Demo

Activity: Investment Value

In this activity, you will use the Alpaca SDK to calculate the present value of a stock portfolio.
(Instructions sent via Slack.)

Suggested Time:
20 minutes

Time’s Up! Let’s Review.

Questions?

The End