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Neptune Code:T1VISF

Team: 4

Project : FOREX Trading System

Task: **Data Aquisition from Open source Finance Data API.**

API used: Quandl and Twitter API.

1. **Quandl:Financial Data API**

What is Quandl used for?

The world's most powerful data lives on **Quandl**.The premier source for financial, economic, and alternative datasets, serving investment professionals. **Quandl's** platform is used by over 400,000 people, including analysts from the world's top **hedge funds, asset managers** and **investment banks**.

Feature of Quandl: Simple, Powerful And Free

Your Choice of Data is very important when it comes traiding in **Stock** market.

Who are Quandl?



Founded in 2013, Quandl has become a respected data provider. They now boast over 250,000 users from individuals to large hedge funds and investment banks. **Quandl provides a wide ranging dataset across two main categories:**

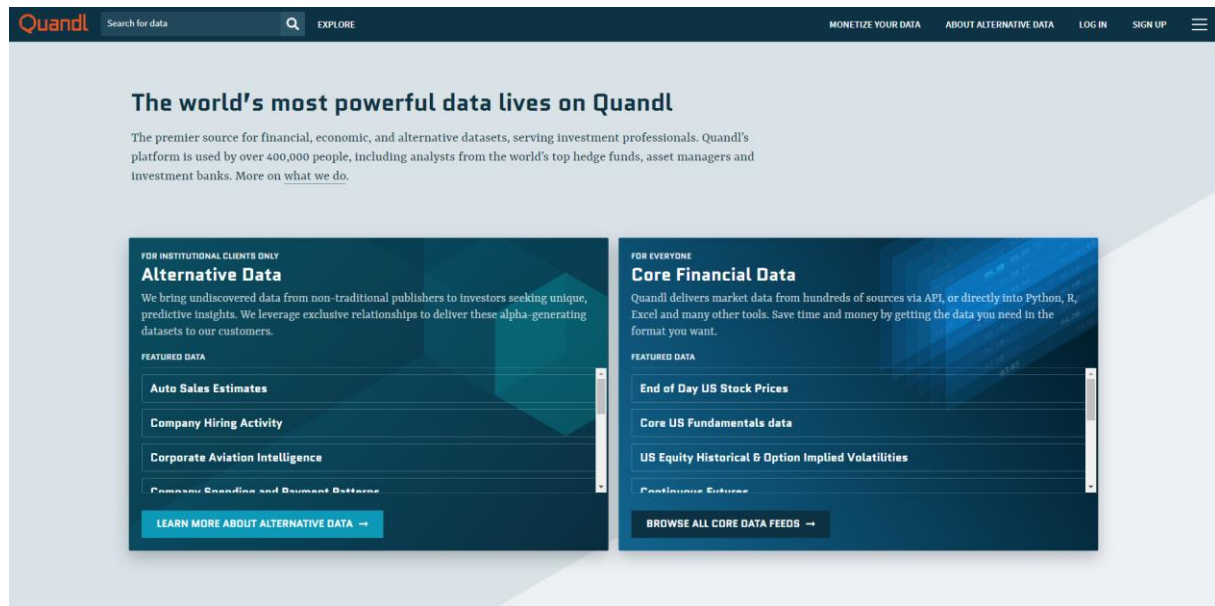
- **Core Financial Data:** coverage of securities and market data across all asset classes.
- **Alternative Data:** a vast collection of data sources from outside of the normal or regulatory data companies or markets.

Quandl is an aggregated marketplace for financial, economic and other related APIs. Quandl aggregates APIs from third-party marketplaces as services for users to purchase whatever APIs they want to use.

How Quandl helps you invest & trade?

Quandl provides a wide range of data and importantly a lot of flexibility in how you consume that data. Client libraries for data access in Ruby, R, Excel and **Python** are available, as well as an open and well documented API that can be integrated with any language of your choice.

How Quandl's Excel and Python clients can be used to obtain data?



Step 1: Quandl Signup:

- First step is to signup here:

The image shows the 'Create your account' page on the Quandl website. On the left is a sidebar with the Quandl logo and text explaining why to sign up (free account, API access, data download) and why information is needed (personalization). The main content area has a 'SIGN UP' / 'LOG IN' header. Below is the 'Create your account' form, labeled 'STEP 1 OF 3'. It includes input fields for 'FIRST NAME' and 'LAST NAME'. A section titled 'CHOOSE YOUR PURPOSE FOR USING QUANDL:' contains three radio button options: 'Business' (for a business to access data for a specific, defined use), 'Academic' (data to be used in an academic environment), and 'Personal' (data for personal use only). A 'NEXT' button is at the bottom right.

- Enter your email address
- Select a reason for using the data
- Select the purpose of using Quandl.

[SIGN UP](#) [LOG IN](#)

STEP 1 OF 3

Create your account

FIRST NAME

Derghisa

LAST NAME

Mahajan

CHOOSE YOUR PURPOSE FOR USING QUANDL:

☒ Business

For a business to access data for a specific, defined use.

☐ Academic

Data to be used in an academic environment.

☐ Personal

Data for personal use only.

NEXT

- SIGN UP

LOG IN

×

Why sign up?

Create a free account on Quandl so you can:

 - Access our API, libraries, and tools
 - Download free data and premium sample data in any format
 - Access our export and visualization tools
 - View relevant information about pricing and licensing for our premium data feeds

Premium data on Quandl can be purchased via a la carte subscriptions. Pay only for what you need. There is no fee to use the platform or Quandl's open data feeds.

Why do we need this information from you?

There are over 500 data products available on Quandl. Understanding how you plan to use Quandl - as a business, an academic, or an individual - helps us personalize your experience by displaying relevant data feeds, functionality, and documentation.

STEP 2 OF 3

Create your account

NAME OF COLLEGE OR UNIVERSITY

ELITE

HOW WILL YOU BE USING THIS DATA *

As a student

←PREVIOUS

SCHOOL EMAIL ADDRESS

quandlexample@gmail.com

NEXT →

- Enter a secure password
- Press 'Create Account'

Why sign up?

Create a free account on Quandl so you can:

- Access our API, libraries, and tools
- Download free data and premium sample data in any format
- Access our expert and visualization tools
- View relevant information about pricing and licensing for our premium data feeds

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[SIGN UP](#) [LOG IN](#)

Create your account

STEP 3 OF 3

CREATE A PASSWORD

.....

[PREVIOUS](#)

CONFIRM YOUR PASSWORD

.....

☐ I have agreed to the [terms of service](#) and [privacy policy](#)

[CREATE ACCOUNT](#)

- You will receive an email verification that you must select to activate the account.

After login we can access all data free and paid. Below is the Dashboard of Quandl:

Quandl Dashboard:

[EXPLORE](#)

[MONETIZE YOUR DATA](#)

Your account was successfully confirmed.

Welcome to your new home page.
From here you can view your subscriptions and browse data of interest.

NEW PRODUCTS

Nasdaq Last Sale Plus

Comprehensive, affordable access to all Nasdaq U.S. market last sale data and consolidated volumes. NLS Plus includes all trade data from The Nasdaq, FINRA/Nasdaq TRF, Nasdaq BX and Nasdaq PSX.

[NEW](#) [PREMIUM](#) [NO SAMPLE DATA](#)

PUBLISHED BY NASDAQ

Nasdaq Global Index Data Service

Consolidated data feed for ~45,000 Nasdaq indexes, as well as exchange-traded products (ETPs) valuation data and third-party partner data.

[NEW](#) [PREMIUM](#) [NO SAMPLE DATA](#)

PUBLISHED BY NASDAQ

Nasdaq Data-On-Demand

Nasdaq Data-On-Demand provides easy and flexible access to high quality and reliable historical Level 1 data for Nasdaq-, NYSE-, NYSE American, OTCBB, OTC and other regional-listed securities.

[NEW](#) [PREMIUM](#) [NO SAMPLE DATA](#)

Alternative Data

Explore our curated catalog of institutional-only data products.

[REQUEST ACCESS](#) [LEARN MORE](#)

Your Organization

You don't currently belong to an organization on Quandl. Learn more about team collaboration and data sharing features.

[LEARN MORE](#)

Your Data Subscriptions

You are not currently subscribed to any data feeds. Your subscriptions will appear here when available.

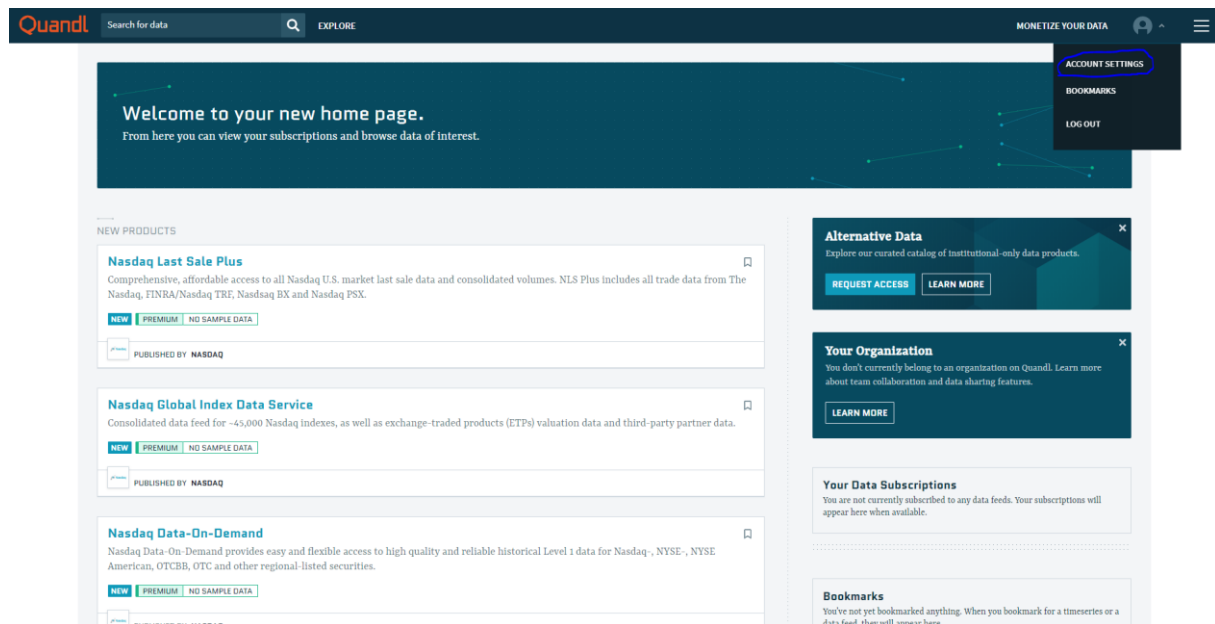
Quandl APIs:

After logging to Quandl the first step in that process is to **Generate the appropriate API key.**

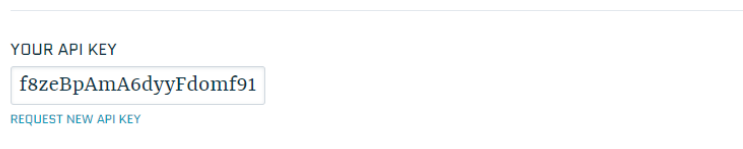
Quandl API Key:

To work with a **Quandl APIs** you must first ensure that you have a **Quandl API client key**. **API Client key** is used when you want to **access data from Quandl**. Go to the Account Settings page in your Quandl account:

Select Account Settings in the top right corner. (Marked in a blue circle).



API key which is a long string of random characters is displayed.



Further I am going to use 2 methods to gather data:

1. Excel API

2. Python API


Quandl makes data acquisition easy. There are many methods and ways to gather data using quandl. I am focusing on Python and Excel methods to gather data efficiently.

Excel API:

Quandl provides an excellent Excel Add-on which automatically integrates with any supported version of Windows Excel. Currently supported Excel versions are 2010, 2013 & 2016.

Quandl Excel Add-On Configuration: Pulling all data into Excel


The add on is available at <https://www.quandl.com/tools/excel>. To install run the downloaded installer file and follow the instructions. After installation the next time you open Excel you will be asked permission to install the Excel customisation:



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Work with all of your Quandl databases, harmonized across hundreds of publishers, directly in Excel.

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WORKS WITH WINDOWS EXCEL VERSIONS 2013, 2016 AND 2019

All Quandl Data, Directly from Excel

Pull a Quandl dataset into Excel in minutes with the Excel Add-In. No programming skills required. Just a few clicks through our custom formula builder and you're back to work.


Download this Add-In and install.



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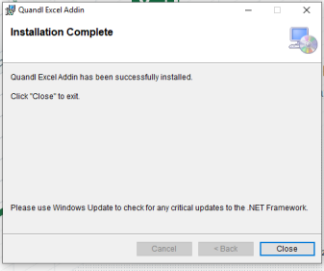
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INSTALL THE FREE ADD-IN

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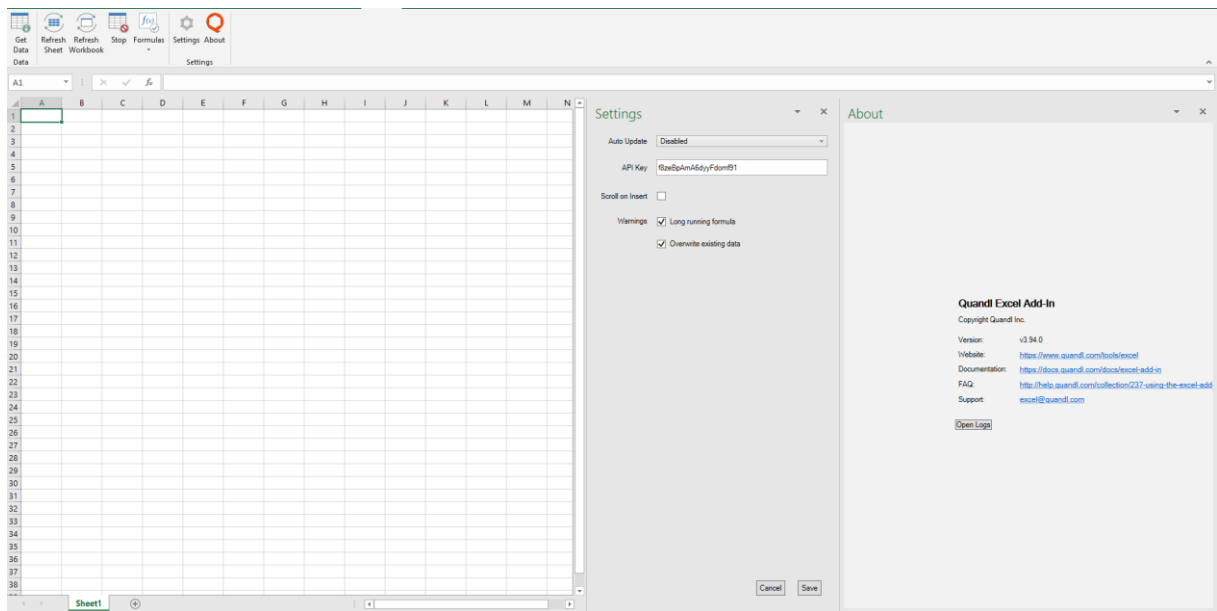
WORKS WITH WINDOWS EXCEL VERSIONS 2013, 2016 AND 2019



All Quandl Data, Directly from Excel

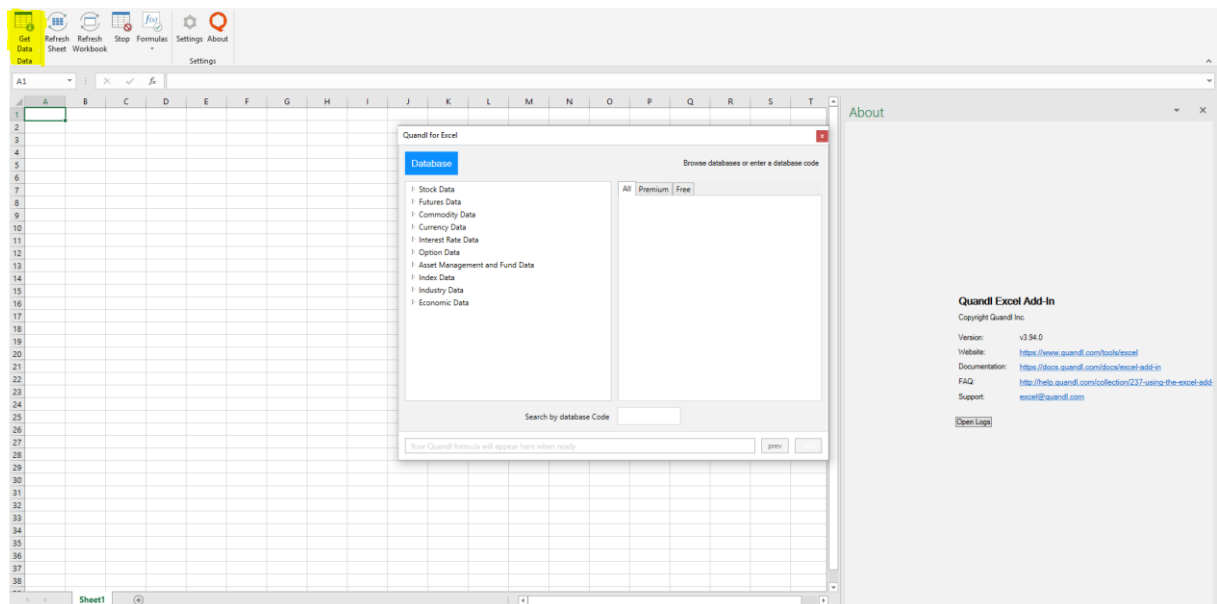
Pull a Quandl dataset into Excel in minutes with the Excel Add-In. No programming skills required. Just a few clicks through our custom formula builder and you're back to work.

Now Open Excel a new blank worksheet and you should see a **‘Quandl’** menu item in Excel. Select this menu item and enter the **API Key** to complete the configuration:



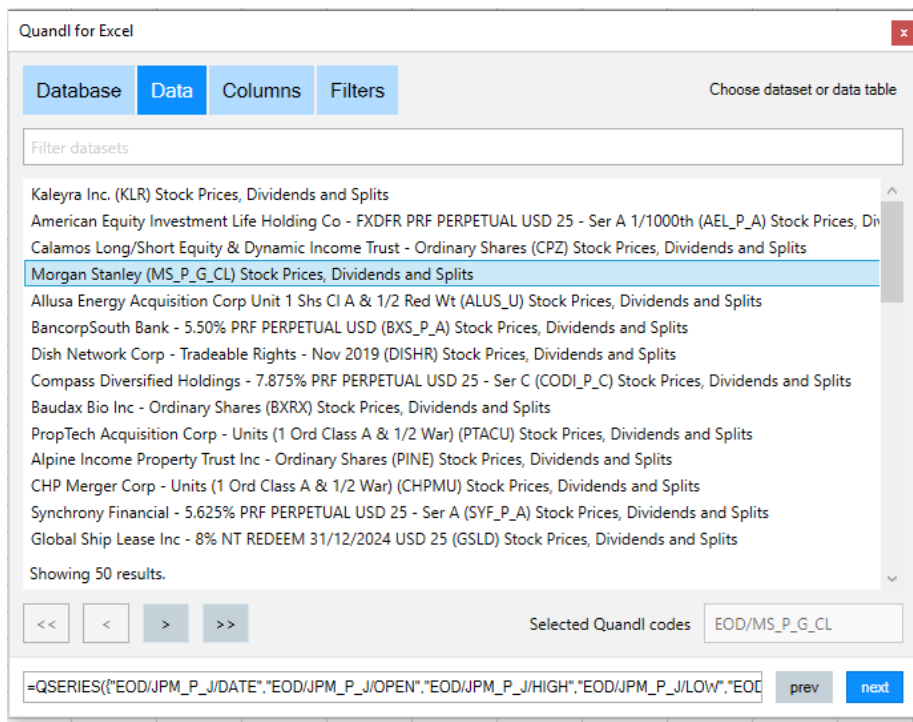
Using the Formula Builder to obtain historic data

1. Open the Quandl Formula Builder within Excel:

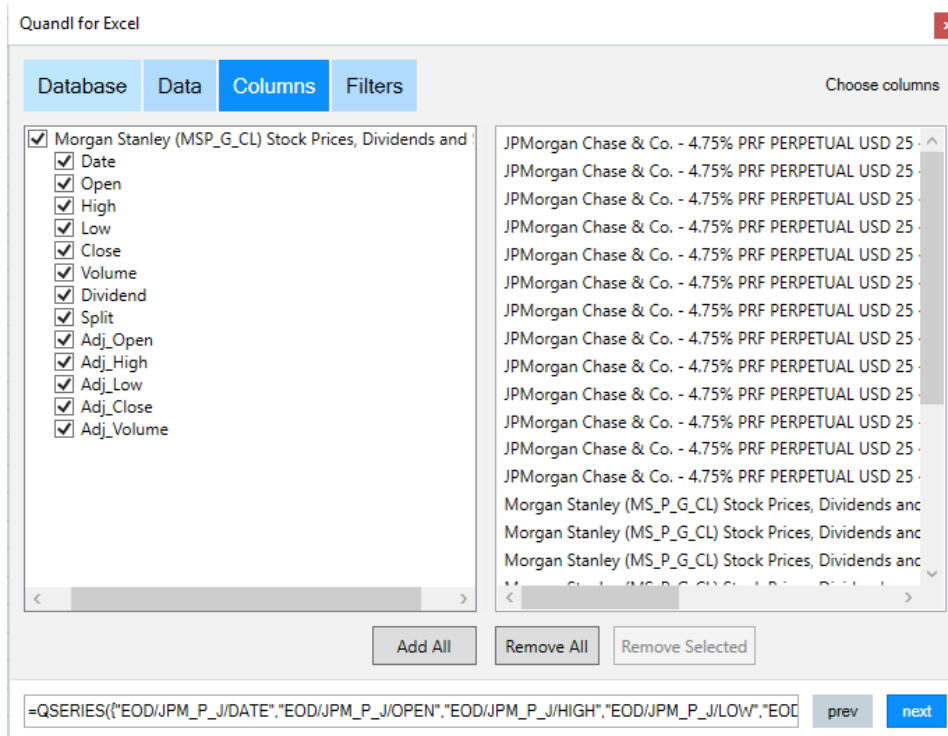


Click on Get Data. Now you can choose any of the data from Quandl. And import it for use.

2. Select a data set to download: I choose **JP Morgan data**
3. Choose the data points for the time series you want to download:



4. Click Next: Then choose the data points for the time series you want to download:



5. In the next tab you have the option to filter the data to be downloaded. You can choose the date range to pull data for, the frequency of the series (Daily/Weekly/Monthly etc) and sort or limit the data returned to your needs.

Quandl for Excel

Database Data Columns **Filters** Customize time series data

Date Filters

Date Range Type All Historical

Data Manipulation

Frequency None (default)

Transformation None (default)

Results

Sort Default

Limit

=QSERIES(("EOD/JPM_P_J/DATE","EOD/JPM_P_J/OPEN","EOD/JPM_P_J/HIGH","EOD/JPM_P_J/LOW","EOD

prev next

6. Finally we confirm the data to be downloaded and where to place it in our Excel file.

Quandl for Excel

Database Data Columns Filters **Placement** Choose where to place the data

Choose how you would like to insert your formula. There are two main ways to insert your formula.

- Select the formula from the formula wizard below and copy it into your document.
- Select the cell you wish to insert your formula in and click the 'Insert' button below.

Currently Selected Cell:

Sheet1!\$A\$1

☒ Include headers

☒ Include dates

☐ Show dates across columns

=QSERIES(("EOD/JPM_P_J/DATE","EOD/JPM_P_J/OPEN","EOD/JPM_P_J/HIGH","EOD/JPM_P_J/LOW","EOD

prev insert

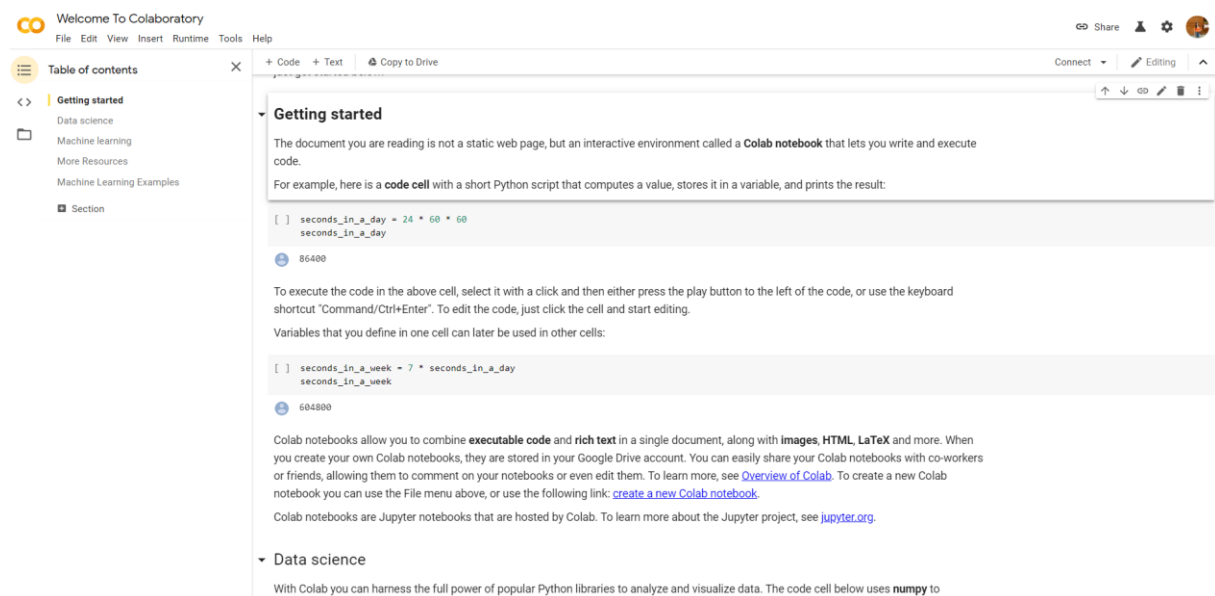
7. Data will be available in the Excel sheet. At any time you can refresh the data using the built in tools.
-

2. Python API:

The second approach for data integration we will look at is via the **python** client provided by Quandl.

Setting up your python environment:

For python I am using colab notebook to gather data from Quandl.



- API that is chosen for this task is provided by <https://www.quandl.com/>
- Specifically, the data related to stock prices, dividends and splits API - <https://www.quandl.com/databases/WIKIP>
- As I mentioned in the above signing task. This API is freely available upon signing up.
- The API key required for the extraction of data is **qPPFXCRW6twydcQXVB2i**

Here is the link of my work in Python:

I have gathered data from into the csv file.

<https://colab.research.google.com/drive/1sc3MGyuhCdbFrD9Xi9bqOuO0mzc2zE4->

Steps:

1.Importing Usefull python libraries

```
!pip install https://github.com/matplotlib/mpl_finance/archive/master.zip
!pip install mpl-finance
import pandas as pd
from pandas import Series
import numpy as np
import requests
import csv
import matplotlib.pyplot as plt
import warnings
from matplotlib import dates
import matplotlib as mlp
from mpl_finance import candlestick_ohlc
%matplotlib inline
```

2. Choose web API

API Selected:

Chosen API for data acquisition provided by <https://www.quandl.com/>. Specifically, the data related to stock prices, dividends and splits API - <https://www.quandl.com/databases/WIKIP>

Quandl API is freely available upon signing up.

The API key required for the extraction of data is f8zeBpAmA6dyyFdomf91

```
[ ] #Task 2: Retrieve data from the chosen API
#Function to request data from the url provided using the 'companies' argument and the global variable 'apikey'
def get_raw_data(companies):
    url = "https://www.quandl.com/api/v3/datatables/WIKI/PRICES.csv?ticker="+companies["Alphabet"]+"&api_key="+apikey
    get_response = requests.get(url) #Requests to get data from url
    if get_response.status_code != 200: #Retrieval Error Response
        print("Unable to retrieve data",get_response.status_code)
    else:
        print("Data Retrieved & Status Code:",get_response.status_code)
        data = csv.reader(get_response.text.strip().split('\n')) #Splits the data on the basis of newline and stores the result
        return data
```

3. Collected raw data, and Storing it in a File

```
apikey = "f8zeBpAmA6dyyFdomf91" #API KEY retrieved on Signup
```

```
Data Retrieved & Status Code: 200
Raw File Saved
```

4. Load and Represent the data using Pandas DataFrame.

	ticker	date	open	high	low	close	volume	ex-dividend	split_ratio	adj_open	adj_high	adj_low	adj_close	adj_volume
0	GOOG	2018-03-27	1063.00	1064.84	996.92	1005.10	3029471.0	0.0	1.0	1063.00	1064.84	996.92	1005.10	3029471.0
1	GOOG	2018-03-26	1046.00	1055.63	1008.40	1053.21	2558385.0	0.0	1.0	1046.00	1055.63	1008.40	1053.21	2558385.0
2	GOOG	2018-03-23	1047.03	1063.36	1021.22	1021.57	2113497.0	0.0	1.0	1047.03	1063.36	1021.22	1021.57	2113497.0
3	GOOG	2018-03-22	1081.88	1082.90	1045.91	1049.08	2580374.0	0.0	1.0	1081.88	1082.90	1045.91	1049.08	2580374.0
4	GOOG	2018-03-21	1092.74	1106.30	1085.15	1090.88	1640709.0	0.0	1.0	1092.74	1106.30	1085.15	1090.88	1640709.0
...
995	GOOG	2014-04-11	532.55	540.00	526.53	530.60	3914100.0	0.0	1.0	532.55	540.00	526.53	530.60	3914100.0
996	GOOG	2014-04-10	565.00	565.00	539.90	540.95	4025800.0	0.0	1.0	565.00	565.00	539.90	540.95	4025800.0
997	GOOG	2014-04-09	559.62	565.37	552.95	564.14	3321700.0	0.0	1.0	559.62	565.37	552.95	564.14	3321700.0
998	GOOG	2014-04-08	542.60	555.00	541.61	554.90	3142600.0	0.0	1.0	542.60	555.00	541.61	554.90	3142600.0
999	GOOG	2014-04-07	540.74	548.48	527.15	538.15	4389600.0	0.0	1.0	540.74	548.48	527.15	538.15	4389600.0

1000 rows × 14 columns

5. Converting date field to DateTime

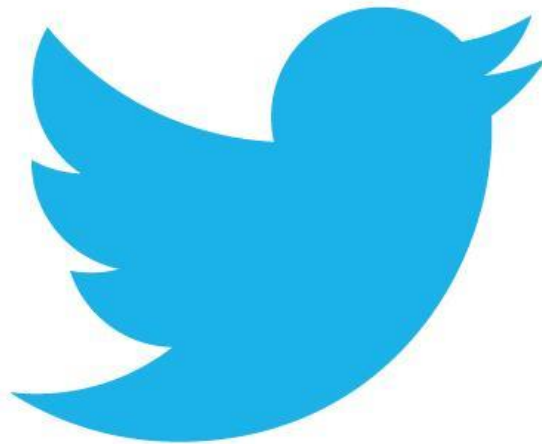
	Company	date	open	high	low	close	volume	adj_close	Year
0	GOOG	2018-03-27	1063.00	1064.84	996.92	1005.10	3029471.0	1005.10	2018
1	GOOG	2018-03-26	1046.00	1055.63	1008.40	1053.21	2558385.0	1053.21	2018
2	GOOG	2018-03-23	1047.03	1063.36	1021.22	1021.57	2113497.0	1021.57	2018
3	GOOG	2018-03-22	1081.88	1082.90	1045.91	1049.08	2580374.0	1049.08	2018
4	GOOG	2018-03-21	1092.74	1106.30	1085.15	1090.88	1640709.0	1090.88	2018

Final Thoughts or conclusion for Quandl API:

After performing these operations I have a good understanding of the service offered by Quandl. The company continues to grow its access to datasets, particularly alternative data,

that can support your trading and investing. The gathered data from Quandl is now ready for **Analysis and Visualisation**.

2. Twitter API:



With **Twitter's API** platform, you'll find endpoints to unlock the data from Tweets, so you can build great experiences and solutions for your customers. These endpoints enable you to manage your Tweets, publish and curate Tweets, filter and search for Tweet topics or trends, and much more.

In order to get data from Twitter you need to register for App.

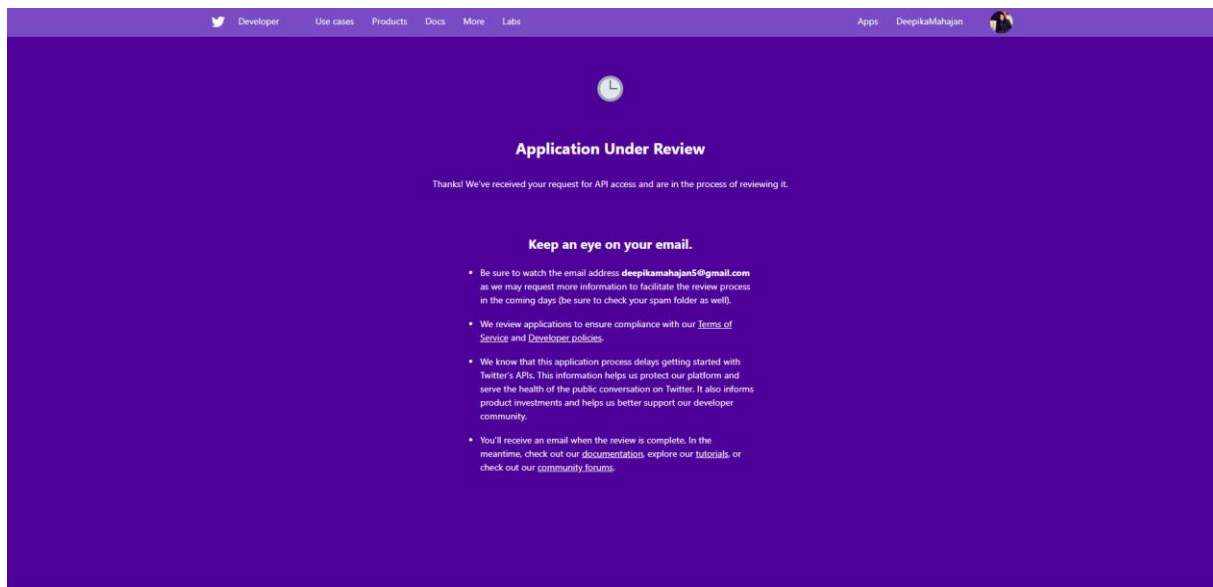
Register Your App

Step1: The first step is the registration of your app.

Step2: In particular, you need to point your browser to <http://apps.twitter.com>, log-in to Twitter (if you're not already logged in) and register a new application.

Step3: You can now choose a name and a description for your app.

Step4: You will receive a *consumer key* and a *consumer secret*: these are application settings that should always be kept private. For me this step is pending. Twitter is showing me this result. There is no response from them so far.



Step5: After getting the key, from the configuration page of your app, you can also require an access token and an access token secret. Similarly to the consumer keys, these strings must also be kept private: they provide the application access to Twitter on behalf of your account.

Accessing the Data with Twitter API:

Tweepy is one of the most interesting and straightforward to use.

Just because I could not get access to the Twitter App account. I am demonstrating sample code to explain the next steps for data gathering.

```
#Install twitter API
!pip install tweepy==3.3.0

Requirement already satisfied: tweepy==3.3.0 in /usr/local/lib/python3.6/dist-packages (3.3.0)
Requirement already satisfied: requests>=2.4.3 in /usr/local/lib/python3.6/dist-packages (from tweepy==3.3.0) (2.21.0)
Requirement already satisfied: requests-oauthlib>=0.4.1 in /usr/local/lib/python3.6/dist-packages (from tweepy==3.3.0) (1.3.0)
Requirement already satisfied: six>=1.7.3 in /usr/local/lib/python3.6/dist-packages (from tweepy==3.3.0) (1.12.0)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.6/dist-packages (from requests>=2.4.3->tweepy==3.3.0) (2019.11.28)
Requirement already satisfied: idna<2.9,>=2.5 in /usr/local/lib/python3.6/dist-packages (from requests>=2.4.3->tweepy==3.3.0) (2.8)
Requirement already satisfied: urllib3<1.25,>=1.21.1 in /usr/local/lib/python3.6/dist-packages (from requests>=2.4.3->tweepy==3.3.0) (1.24.3)
Requirement already satisfied: chardet<3.1.0,>=3.0.2 in /usr/local/lib/python3.6/dist-packages (from requests>=2.4.3->tweepy==3.3.0) (3.0.4)
Requirement already satisfied: oauthlib>=3.0.0 in /usr/local/lib/python3.6/dist-packages (from requests-oauthlib>=0.4.1->tweepy==3.3.0) (3.1.0)

[2] #In order to authorise the app to access Twitter on our behalf, we need to use the OAuth interface:
#I am writing dummy code just to demonstrate How Twitter API works
import tweepy
from tweepy import OAuthHandler

consumer_key = 'YOUR-CONSUMER-KEY'
consumer_secret = 'YOUR-CONSUMER-SECRET'
access_token = 'YOUR-ACCESS-TOKEN'
access_secret = 'YOUR-ACCESS-SECRET'

auth = OAuthHandler(consumer_key, consumer_secret)
auth.set_access_token(access_token, access_secret)

api = tweepy.API(auth)
```

<https://colab.research.google.com/drive/1SAdFio-j6YZ3CMcfKZD5MIZFSaPOno3>

In case of Streaming data we use : `StreamListener()` to customise the way we process the incoming data. A working example that gathers all the new tweets with the #python hashtag:

```
[9] #For Stream Data
from tweepy import Stream
from tweepy.streaming import StreamListener

class MyListener(StreamListener):

    def on_data(self, data):
        try:
            with open('python.json', 'a') as f:
                f.write(data)
            return True
        except BaseException as e:
            print("Error on_data: %s" % str(e))
            return True

    def on_error(self, status):
        print(status)
        return True

twitter_stream = Stream(auth, MyListener())
twitter_stream.filter(track=['#python'])
```

Sources and References:

<https://towardsdatascience.com/best-5-free-stock-market-apis-in-2019-ad91dddec984>

<https://docs.quandl.com/>

<https://www.geeksforgeeks.org/coding-the-financial-market/>

<https://decodingmarkets.com/>

