



this peer to peer assignment made by Ghada Ahmed

Extracting and Visualizing Stock Data

Description

Extracting essential data from a dataset and displaying it is a necessary part of data science; therefore individuals can make correct decisions based on the data. In this assignment, you will extract some stock data, you will then display this data in a graph.

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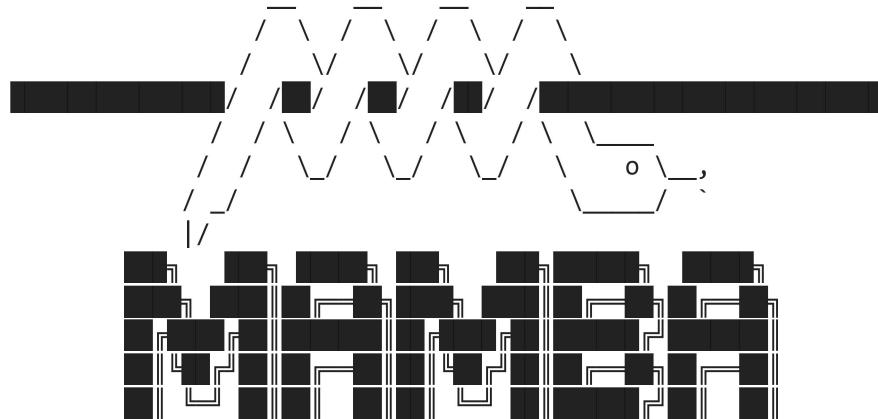
Estimated Time Needed: **30 min**

***Note*:-** If you are working Locally using anaconda, please uncomment the following code and execute it.

```
In [1]: #!pip install yfinance==0.2.38  
#!pip install pandas==2.2.2  
#!pip install nbformat
```

```
In [2]: !pip install yfinance==0.1.67  
!mamba install bs4==4.10.0 -y  
!pip install nbformat==4.2.0
```

```
Collecting yfinance==0.1.67
  Downloading yfinance-0.1.67-py2.py3-none-any.whl (25 kB)
Requirement already satisfied: pandas>=0.24 in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from yfinance==0.1.67) (1.3.5)
Requirement already satisfied: numpy>=1.15 in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from yfinance==0.1.67) (1.21.6)
Requirement already satisfied: requests>=2.20 in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from yfinance==0.1.67) (2.29.0)
Collecting multitasking>=0.0.7 (from yfinance==0.1.67)
  Downloading multitasking-0.0.11-py3-none-any.whl (8.5 kB)
Requirement already satisfied: lxml>=4.5.1 in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from yfinance==0.1.67) (4.9.2)
Requirement already satisfied: python-dateutil>=2.7.3 in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from pandas>=0.24->yfinance==0.1.67) (2.8.2)
Requirement already satisfied: pytz>=2017.3 in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from pandas>=0.24->yfinance==0.1.67) (2023.3)
Requirement already satisfied: charset-normalizer<4,>=2 in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from requests>=2.20->yfinance==0.1.67) (3.1.0)
Requirement already satisfied: idna<4,>=2.5 in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from requests>=2.20->yfinance==0.1.67) (3.4)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from requests>=2.20->yfinance==0.1.67) (1.26.15)
Requirement already satisfied: certifi>=2017.4.17 in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from requests>=2.20->yfinance==0.1.67) (2023.5.7)
Requirement already satisfied: six>=1.5 in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from python-dateutil>=2.7.3->pandas>=0.24->yfinance==0.1.67) (1.16.0)
Installing collected packages: multitasking, yfinance
Successfully installed multitasking-0.0.11 yfinance-0.1.67
```



□ □□ □□□ □□□□ □ □

mamba (1.4.2) supported by @QuantStack

GitHub: <https://github.com/mamba-org/mamba>
Twitter: <https://twitter.com/QuantStack>



Looking for: ['bs4==4.10.0']

```
[+] 0.0s
[+] 0.1s
pkgs/main/linux-64 ━━━━━━━━ 0.0 B / ???.?MB @ ???.?MB/s 0.1s
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@ 4.0MB/s 1.9s
```

Pinned packages:

- python 3.7.*

Transaction

Prefix: /home/jupyterlab/conda/envs/python

Updating specs:

- bs4==4.10.0
- ca-certificates
- certifi
- openssl

Package	Version	Build	Channel	Size
Install:				

+ bs4	4.10.0	hd3eb1b0_0	pkgs/main/noarch	10kB
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Upgrade:

- ca-certificates	2023.5.7	hbcca054_0	conda-forge	
+ ca-certificates	2024.3.11	h06a4308_0	pkgs/main/linux-64	130kB

```
- openssl          1.1.1t h0b41bf4_0    conda-forge  
+ openssl          1.1.1w h7f8727e_0    pkgs/main/linux-64      4MB
```

Downgrade:

```
- beautifulsoup4   4.11.1 pyha770c72_0  conda-forge  
+ beautifulsoup4   4.10.0 pyh06a4308_0  pkgs/main/noarch     87kB
```

Summary:

Install: 1 packages

Upgrade: 2 packages

Downgrade: 1 packages

Total download: 4MB

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Downloading ━━━━━━━━ 0.0 B           0.0s  
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bs4           10.2kB @ 64.0kB/s 0.2s  
beautifulsoup4 86.6kB @ 511.6kB/s 0.2s  
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Downloading and Extracting Packages

Preparing transaction: done

Verifying transaction: done

Executing transaction: done

Collecting nbformat==4.2.0

 Downloading nbformat-4.2.0-py2.py3-none-any.whl (153 kB)

 153.3/153.3 kB 24.1 MB/s eta 0:00:00

Requirement already satisfied: ipython-genutils in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from nbformat==4.2.0) (0.2.0)

Requirement already satisfied: jsonschema!=2.5.0,>=2.4 in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from nbformat==4.2.0) (4.17.3)

Requirement already satisfied: jupyter-core in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from nbformat==4.2.0) (4.12.0)

Requirement already satisfied: traitlets>=4.1 in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from nbformat==4.2.0) (5.9.0)

Requirement already satisfied: attrs>=17.4.0 in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from jsonschema!=2.5.0,>=2.4->nbformat==4.2.0) (23.1.0)

Requirement already satisfied: importlib-metadata in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (f

```
rom jsonschema!=2.5.0,>=2.4->nbformat==4.2.0) (4.11.4)
Requirement already satisfied: importlib-resources>=1.4.0 in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from jsonschema!=2.5.0,>=2.4->nbformat==4.2.0) (5.12.0)
Requirement already satisfied: pkgutil-resolve-name>=1.3.10 in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from jsonschema!=2.5.0,>=2.4->nbformat==4.2.0) (1.3.10)
Requirement already satisfied: pyrsistent!=0.17.0,!0.17.1,!0.17.2,>=0.14.0 in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from jsonschema!=2.5.0,>=2.4->nbformat==4.2.0) (0.19.3)
Requirement already satisfied: typing-extensions in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from jsonschema!=2.5.0,>=2.4->nbformat==4.2.0) (4.5.0)
Requirement already satisfied: zipp>=3.1.0 in /home/jupyterlab/conda/envs/python/lib/python3.7/site-packages (from importlib-resources>=1.4.0->jsonschema!=2.5.0,>=2.4->nbformat==4.2.0) (3.15.0)
Installing collected packages: nbformat
  Attempting uninstall: nbformat
    Found existing installation: nbformat 5.8.0
    Uninstalling nbformat-5.8.0:
      Successfully uninstalled nbformat-5.8.0
ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behavior is the source of the following dependency conflicts.
jupyter-server 1.24.0 requires nbformat>=5.2.0, but you have nbformat 4.2.0 which is incompatible.
nbclient 0.7.4 requires nbformat>=5.1, but you have nbformat 4.2.0 which is incompatible.
nbconvert 7.4.0 requires nbformat>=5.1, but you have nbformat 4.2.0 which is incompatible.
Successfully installed nbformat-4.2.0
```

```
In [3]: import yfinance as yf
import pandas as pd
import requests
from bs4 import BeautifulSoup
import plotly.graph_objects as go
from plotly.subplots import make_subplots
```

In Python, you can ignore warnings using the `warnings` module. You can use the `filterwarnings` function to filter or ignore specific warning messages or categories.

```
In [4]: import warnings
# Ignore all warnings
warnings.filterwarnings("ignore", category=FutureWarning)
```

Define Graphing Function

In this section, we define the function `make_graph`. You don't have to know how the function works, you should only care about the inputs. It takes a dataframe with stock data (dataframe must contain Date and Close columns), a dataframe with revenue data (dataframe must contain Date and Revenue columns), and the name of the stock.

```
In [5]: def make_graph(stock_data, revenue_data, stock):
    fig = make_subplots(rows=2, cols=1, shared_xaxes=True, subplot_titles=("Historical Share Price", "Historical Revenue"))
    stock_data_specific = stock_data[stock_data.Date <= '2021-06-14']
    revenue_data_specific = revenue_data[revenue_data.Date <= '2021-04-30']
    fig.add_trace(go.Scatter(x=pd.to_datetime(stock_data_specific.Date, infer_datetime_format=True), y=stock_data_specific.Close, name="Share Price"))
    fig.add_trace(go.Scatter(x=pd.to_datetime(revenue_data_specific.Date, infer_datetime_format=True), y=revenue_data_specific.Revenue, name="Revenue"))
    fig.update_xaxes(title_text="Date", row=1, col=1)
    fig.update_xaxes(title_text="Date", row=2, col=1)
    fig.update_yaxes(title_text="Price ($US)", row=1, col=1)
    fig.update_yaxes(title_text="Revenue ($US Millions)", row=2, col=1)
    fig.update_layout(showlegend=False,
                      height=900,
                      title=stock,
                      xaxis_rangeslider_visible=True)
    fig.show()
```

Use the `make_graph` function that we've already defined. You'll need to invoke it in questions 5 and 6 to display the graphs and create the dashboard.

Note: You don't need to redefine the function for plotting graphs anywhere else in this notebook; just use the existing function.

Question 1: Use yfinance to Extract Stock Data

Using the `Ticker` function enter the ticker symbol of the stock we want to extract data on to create a ticker object. The stock is Tesla and its ticker symbol is `TSLA`.

```
In [6]: ticker = yf.Ticker('TSLA')
```

Using the ticker object and the function `history` extract stock information and save it in a dataframe named `tesla_data`. Set the `period` parameter to `"max"` so we get information for the maximum amount of time.

```
In [7]: #tesla_data = pd.DataFrame(ticker.history(period='max'))
tesla_data = ticker.history(period='max')
```

Reset the index using the `reset_index(inplace=True)` function on the `tesla_data` DataFrame and display the first five rows of the `tesla_data` dataframe using the `head` function. Take a screenshot of the results and code from the beginning of Question 1 to the results below.

```
In [8]: tesla_data.reset_index(inplace=True)
```

```
In [30]: tesla_data.head(5)
```

```
Out[30]:
```

	Date	Open	High	Low	Close	Volume	Dividends	Stock Splits
0	2010-06-29	1.266667	1.666667	1.169333	1.592667	281494500	0	0.0
1	2010-06-30	1.719333	2.028000	1.553333	1.588667	257806500	0	0.0
2	2010-07-01	1.666667	1.728000	1.351333	1.464000	123282000	0	0.0
3	2010-07-02	1.533333	1.540000	1.247333	1.280000	77097000	0	0.0
4	2010-07-06	1.333333	1.333333	1.055333	1.074000	103003500	0	0.0

Question 2: Use Webscraping to Extract Tesla Revenue Data

Use the `requests` library to download the webpage <https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBMDeveloperSkillsNetwork-PY0220EN-SkillsNetwork/labs/project/revenue.htm> Save the text of the response as a variable named `html_data`.

```
In [9]: html_data = requests.get('https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBMDeveloperSkillsNetwork-PY0220EN-SkillsNetwork/labs/project/revenue.htm')
```

Parse the html data using `beautiful_soup` using parser i.e `html5lib` or `html.parser`.

```
In [11]: soup = BeautifulSoup(html_data, 'html.parser')
# soup = BeautifulSoup(html_data, 'html5lib')
```

Using `BeautifulSoup` or the `read_html` function extract the table with `Tesla Revenue` and store it into a dataframe named `tesla_revenue`. The dataframe should have columns `Date` and `Revenue`.

```
In [12]: tesla_revenue = pd.DataFrame()
```

- ▶ Step-by-step instructions
- ▶ Click here if you need help locating the table

```
In [13]: # 4. Iterate Through Rows in the Table Body
for row in soup.find_all("tbody")[1].find_all("tr"):
    cols = row.find_all("td")

    # 5. Extract Data from Columns
    period = cols[0].text
    Revenue = cols[1].text

    # 6. Append Data to the DataFrame
    tesla_revenue = tesla_revenue.append({'Date': period, 'Revenue': Revenue}, ignore_index=True)
```

Execute the following line to remove the comma and dollar sign from the `Revenue` column.

```
In [14]: tesla_revenue["Revenue"] = tesla_revenue['Revenue'].str.replace(',', '$', '')
```

Execute the following lines to remove all null or empty strings in the Revenue column.

```
In [15]: tesla_revenue.dropna(inplace=True)

tesla_revenue = tesla_revenue[tesla_revenue['Revenue'] != ""]

# reset the type to integer
tesla_revenue['Revenue'] = tesla_revenue['Revenue'].astype(int)
```

Display the last 5 rows of the `tesla_revenue` dataframe using the `tail` function. Take a screenshot of the results.

```
In [32]: tesla_revenue.tail(5)
```

Out[32]:

	Date	Revenue
48	2010-09-30	31
49	2010-06-30	28
50	2010-03-31	21
52	2009-09-30	46
53	2009-06-30	27

Question 3: Use yfinance to Extract Stock Data

Using the `Ticker` function enter the ticker symbol of the stock we want to extract data on to create a ticker object. The stock is GameStop and its ticker symbol is `GME`.

In [17]: `ticker = yf.Ticker('GME')`

Using the ticker object and the function `history` extract stock information and save it in a dataframe named `gme_data`. Set the `period` parameter to `"max"` so we get information for the maximum amount of time.

In [18]: `gme_data = pd.DataFrame(ticker.history(period='max'))`

Reset the index using the `reset_index(inplace=True)` function on the `gme_data` DataFrame and display the first five rows of the `gme_data` dataframe using the `head` function. Take a screenshot of the results and code from the beginning of Question 3 to the results below.

In [19]: `gme_data.reset_index(inplace=True)`

In [34]: `gme_data.head(5)`

Out[34]:

	Date	Open	High	Low	Close	Volume	Dividends	Stock Splits
0	2002-02-13	1.620128	1.693350	1.603296	1.691666	76216000	0.0	0.0
1	2002-02-14	1.712707	1.716074	1.670626	1.683250	11021600	0.0	0.0
2	2002-02-15	1.683251	1.687459	1.658002	1.674834	8389600	0.0	0.0
3	2002-02-19	1.666418	1.666418	1.578048	1.607504	7410400	0.0	0.0
4	2002-02-20	1.615920	1.662210	1.603296	1.662210	6892800	0.0	0.0

Question 4: Use Webscraping to Extract GME Revenue Data

Use the `requests` library to download the webpage <https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBMDriverSkillsNetwork-PY0220EN-SkillsNetwork/labs/project/stock.html>. Save the text of the response as a variable named `html_data_2`.

In [20]: `html_data_2 = requests.get('https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBMDriverSkillsNetw`

Parse the html data using `beautiful_soup` using parser i.e `html5lib` or `html.parser`.

In [21]: `soup = BeautifulSoup(html_data_2, 'html.parser')`

Using `BeautifulSoup` or the `read_html` function extract the table with `GameStop Revenue` and store it into a dataframe named `gme_revenue`. The dataframe should have columns `Date` and `Revenue`. Make sure the comma and dollar sign is removed from the `Revenue` column.

Note: Use the method similar to what you did in question 2.

► Click here if you need help locating the table

In [22]: `gme_revenue = pd.DataFrame()`

```
In [23]:
```

```
'''  
body = soup.find_all('tbody')[1]  
print(body.prettify())  
'''  
  
for row in soup.find_all('tbody')[1].find_all('tr'):  
    col = row.find_all('td')  
    D = col[0].text  
    R = col[1].text  
    gme_revenue = gme_revenue.append({'Date':D,'Revenue':R},ignore_index=True)
```

```
In [24]:
```

```
gme_revenue["Revenue"] = gme_revenue['Revenue'].str.replace(',|\$',"")
```

```
In [25]:
```

```
gme_revenue.dropna(inplace=True)  
  
# there is no null values---> gme_revenue['Revenue'].isna().sum()  
gme_revenue = gme_revenue[gme_revenue['Revenue'] != ""]  
  
gme_revenue['Revenue'] = gme_revenue['Revenue'].astype(int)
```

Display the last five rows of the `gme_revenue` dataframe using the `tail` function. Take a screenshot of the results.

```
In [35]:
```

```
gme_revenue.tail(5)
```

```
Out[35]:
```

	Date	Revenue
57	2006-01-31	1667
58	2005-10-31	534
59	2005-07-31	416
60	2005-04-30	475
61	2005-01-31	709

Question 5: Plot Tesla Stock Graph

Use the `make_graph` function to graph the Tesla Stock Data, also provide a title for the graph. Note the graph will only show data upto June 2021.

► Hint

```
In [27]: make_graph(tesla_data, tesla_revenue, 'Tesla')
```


Question 6: Plot GameStop Stock Graph

Use the `make_graph` function to graph the GameStop Stock Data, also provide a title for the graph. The structure to call the `make_graph` function is `make_graph(gme_data, gme_revenue, 'GameStop')`. Note the graph will only show data upto June 2021.

► Hint

```
In [28]: make_graph(gme_data, gme_revenue, 'GameStop')
```


About the Authors:

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Change Log

Date (YYYY-MM-DD)	Version	Changed By	Change Description
2022-02-28	1.2	Lakshmi Holla	Changed the URL of GameStop
2020-11-10	1.1	Malika Singla	Deleted the Optional part
2020-08-27	1.0	Malika Singla	Added lab to GitLab