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**

In [1]:

```
!pip install yfinance
#!pip install pandas
#!pip install requests
!pip install bs4
#!pip install plotly
```

Requirement already satisfied: yfinance in /opt/conda/envs/Python-3.8-mai
n/lib/python3.8/site-packages (0.1.63)
Requirement already satisfied: requests>=2.20 in /opt/conda/envs/Python-3.
8-main/lib/python3.8/site-packages (from yfinance) (2.25.1)
Requirement already satisfied: numpy>=1.15 in /opt/conda/envs/Python-3.8-m
ain/lib/python3.8/site-packages (from yfinance) (1.19.2)
Requirement already satisfied: multitasking>=0.0.7 in /opt/conda/envs/Pyth
on-3.8-main/lib/python3.8/site-packages (from yfinance) (0.0.9)
Requirement already satisfied: lxml>=4.5.1 in /opt/conda/envs/Python-3.8-m
ain/lib/python3.8/site-packages (from yfinance) (4.6.3)
Requirement already satisfied: pandas>=0.24 in /opt/conda/envs/Python-3.8-
main/lib/python3.8/site-packages (from yfinance) (1.2.4)
Requirement already satisfied: python-dateutil>=2.7.3 in /opt/conda/envs/P
ython-3.8-main/lib/python3.8/site-packages (from pandas>=0.24->yfinance)
(2.8.1)
Requirement already satisfied: pytz>=2017.3 in /opt/conda/envs/Python-3.8-
main/lib/python3.8/site-packages (from pandas>=0.24->yfinance) (2021.1)
Requirement already satisfied: six>=1.5 in /opt/conda/envs/Python-3.8-mai
n/lib/python3.8/site-packages (from python-dateutil>=2.7.3->pandas>=0.24->
yfinance) (1.15.0)
Requirement already satisfied: certifi>=2017.4.17 in /opt/conda/envs/Pytho
n-3.8-main/lib/python3.8/site-packages (from requests>=2.20->yfinance) (20
21.5.30)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in /opt/conda/envs/Py
thon-3.8-main/lib/python3.8/site-packages (from requests>=2.20->yfinance)
(1.26.6)
Requirement already satisfied: idna<3,>=2.5 in /opt/conda/envs/Python-3.8-
main/lib/python3.8/site-packages (from requests>=2.20->yfinance) (2.8)
Requirement already satisfied: chardet<5,>=3.0.2 in /opt/conda/envs/Python
-3.8-main/lib/python3.8/site-packages (from requests>=2.20->yfinance) (3.
0.4)
Requirement already satisfied: bs4 in /opt/conda/envs/Python-3.8-main/lib/
python3.8/site-packages (0.0.1)
Requirement already satisfied: beautifulsoup4 in /opt/conda/envs/Python-3.
8-main/lib/python3.8/site-packages (from bs4) (4.9.3)
Requirement already satisfied: soupsieve>1.2 in /opt/conda/envs/Python-3.8
-main/lib/python3.8/site-packages (from beautifulsoup4->bs4) (2.2.1)

In [2]:

```
import yfinance as yf
import pandas as pd
import requests
from bs4 import BeautifulSoup as bs
import plotly.graph_objects as go
from plotly.subplots import make_subplots
```

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 [3]:

```python
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"), vertical_spacing = .3)
    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.astype("float"), name="Share Price"), row=1,
col=1)
    fig.add_trace(go.Scatter(x=pd.to_datetime(revenue_data_specific.Date, infer_datetim
e_format=True), y=revenue_data_specific.Revenue.astype("float"), name="Revenue"), row=2
, col=1)
    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()
```

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 [4]:

```python
tesla_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 [5]:

```python
tesla_data = tesla_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 [6]:

```
tesla_data.reset_index(inplace=True)
tesla_data.head(5)
```

Out[6]:

	Date	Open	High	Low	Close	Volume	Dividends	Stock Splits
0	2010-06-29	3.800	5.000	3.508	4.778	93831500	0	0.0
1	2010-06-30	5.158	6.084	4.660	4.766	85935500	0	0.0
2	2010-07-01	5.000	5.184	4.054	4.392	41094000	0	0.0
3	2010-07-02	4.600	4.620	3.742	3.840	25699000	0	0.0
4	2010-07-06	4.000	4.000	3.166	3.222	34334500	0	0.0

Question 2: Use Webscraping to Extract Tesla Revenue Data

Use the `requests` library to download the webpage
https://www.macrotrends.net/stocks/charts/TSLA/tesla/revenue
(https://www.macrotrends.net/stocks/charts/TSLA/tesla/revenue?
utm_medium=Exinfluencer&utm_source=Exinfluencer&utm_content=000026UJ&utm_term=10006555&utm_id:
SkillsNetwork-Channel-SkillsNetworkCoursesIBMDeveloperSkillsNetworkPY0220ENSkillsNetwork23455606-
2021-01-01). Save the text of the response as a variable named `html_data`.

In [7]:

```
url = "https://www.macrotrends.net/stocks/charts/TSLA/tesla/revenue?utm_medium=Exinflue
ncer&utm_source=Exinfluencer&utm_content=000026UJ&utm_term=10006555&utm_id=NA-SkillsNet
work-Channel-SkillsNetworkCoursesIBMDeveloperSkillsNetworkPY0220ENSkillsNetwork23455606
-2021-01-01"
html_data = requests.get(url).text
```

Parse the html data using `beautiful_soup`.

In [8]:

```
html_soup = bs(html_data)
```

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

Click here if you need help locating the table

In [9]:

```
tesla_revenue = pd.DataFrame(columns=["Date", "Revenue"])

for row in html_soup.find_all("tbody")[1].find_all("tr"):
    col = row.find_all("td")
    date = col[0].text
    quart = col[1].text

    tesla_revenue = tesla_revenue.append({"Date":date, "Revenue":quart}, ignore_index =
True)
```

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

In [10]:

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

```
<ipython-input-10-b8c4911c9b9e>:2: FutureWarning: The default value of reg
ex will change from True to False in a future version.
  tesla_revenue[replace_target] = tesla_revenue[replace_target].str.replac
e(',|\$',"")
```

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

In [11]:

```
tesla_revenue.dropna(inplace=True)

tesla_revenue = tesla_revenue[tesla_revenue[replace_target] != ""]
```

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

In [12]:

```
tesla_revenue.tail()
```

Out[12]:

	Date	Revenue
43	2010-09-30	31
44	2010-06-30	28
45	2010-03-31	21
47	2009-09-30	46
48	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 [13]:

```
gme_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 [14]:

```
gme_data = gme_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 [15]:

```
gme_data.reset_index(inplace=True)
gme_data.head()
```

Out[15]:

	Date	Open	High	Low	Close	Volume	Dividends	Stock Splits
0	2002-02-13	6.480513	6.773399	6.413183	6.766666	19054000	0.0	0.0
1	2002-02-14	6.850831	6.864296	6.682506	6.733003	2755400	0.0	0.0
2	2002-02-15	6.733001	6.749833	6.632006	6.699336	2097400	0.0	0.0
3	2002-02-19	6.665671	6.665671	6.312189	6.430017	1852600	0.0	0.0
4	2002-02-20	6.463681	6.648838	6.413183	6.648838	1723200	0.0	0.0

Question 4: Use Webscraping to Extract GME Revenue Data

Use the `requests` library to download the webpage https://www.macrotrends.net/stocks/charts/GME/gamestop/revenue (https://www.macrotrends.net/stocks/charts/GME/gamestop/revenue? utm_medium=Exinfluencer&utm_source=Exinfluencer&utm_content=000026UJ&utm_term=10006555&utm_id= SkillsNetwork-Channel-SkillsNetworkCoursesIBMDeveloperSkillsNetworkPY0220ENSkillsNetwork23455606- 2021-01-01). Save the text of the response as a variable named `html_data`.

In [16]:

```
url = "https://www.macrotrends.net/stocks/charts/GME/gamestop/revenue?utm_medium=Exinfl
uencer&utm_source=Exinfluencer&utm_content=000026UJ&utm_term=10006555&utm_id=NA-SkillsN
etwork-Channel-SkillsNetworkCoursesIBMDeveloperSkillsNetworkPY0220ENSkillsNetwork234556
06-2021-01-01"

html_data = requests.get(url).text
```

Parse the html data using `beautiful_soup` .

In [17]:

```
gmr_soup = bs(html_data, "html5lib")
```

Using `BeautifulSoup` or the `read_html` function extract the table with `GameStop Quarterly 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 using a method
similar to what you did in Question 2.

Click here if you need help locating the table

In [18]:

```
gme_revenue = pd.DataFrame(columns=["Date", "Revenue"])

for row in gmr_soup.find_all("tbody")[1].find_all("tr"):
    col = row.find_all("td")
    date = col[0].text
    quart = col[1].text

    gme_revenue = gme_revenue.append({"Date":date, "Revenue":quart}, ignore_index = Tru
e)

#Sanitise the returned data real quick
replace_target = "Revenue"
gme_revenue[replace_target] = gme_revenue[replace_target].str.replace(',|\$',"")

gme_revenue.dropna(inplace=True)
gme_revenue = gme_revenue[gme_revenue[replace_target] != ""]
```

```
<ipython-input-18-158a829b3e77>:12: FutureWarning: The default value of re
gex will change from True to False in a future version.
  gme_revenue[replace_target] = gme_revenue[replace_target].str.replace(',
|\$',"")
```

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

In [19]:

```
gme_revenue.tail()
```

Out[19]:

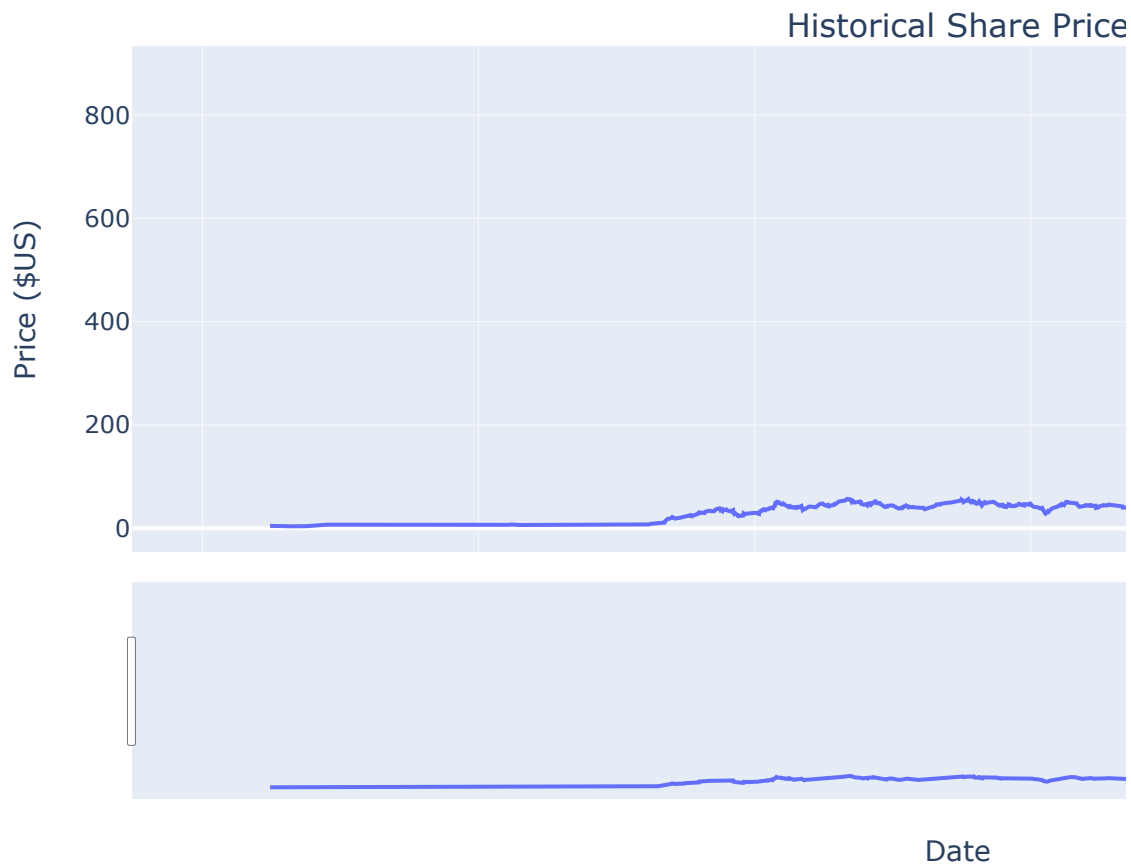|	Date	Revenue
62	2006-01-31	1667
63	2005-10-31	534
64	2005-07-31	416
65	2005-04-30	475
66	2005-01-31	709

Question 5: Plot Tesla Stock Graph

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

In [20]:

```
make_graph(tesla_data, tesla_revenue, 'Tesla')
```
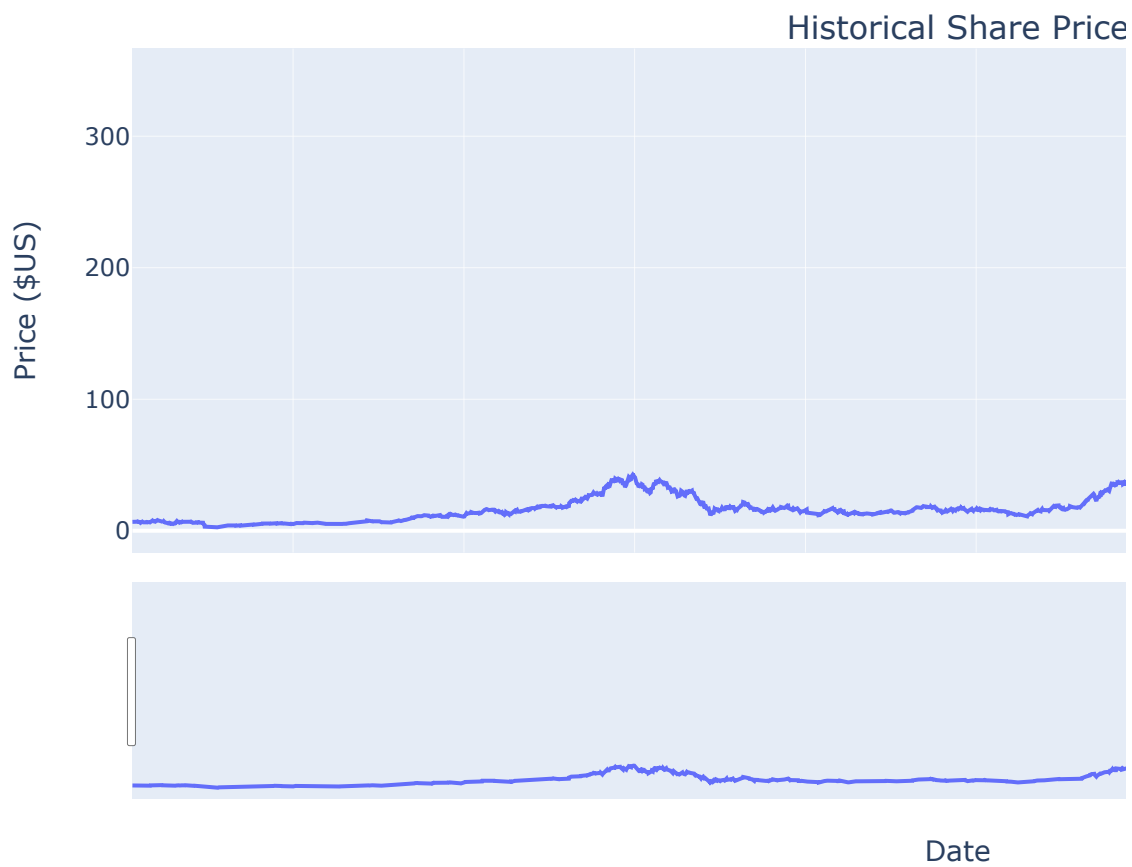
Tesla

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.

In [21]:

```
make_graph(gme_data, gme_revenue, 'GameStop')
```

GameStop

About the Authors:

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utm_medium=Exinfluencer&utm_source=Exinfluencer&utm_content=000026UJ&utm_term=10006555&utm_id:
SkillsNetwork-Channel-SkillsNetworkCoursesIBMDeveloperSkillsNetworkPY0220ENSkillsNetwork23455606-
2021-01-01) has a PhD in Electrical Engineering, his research focused on using machine learning, signal
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for IBM since he completed his PhD.

Azim Hirjani

Change Log

Date (YYYY-MM-DD)	Version	Changed By	Change Description
2020-11-10	1.1	Malika Singla	Deleted the Optional part
2020-08-27	1.0	Malika Singla	Added lab to GitLab