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.

Table of Contents

Estimated Time Needed: **30 min**

In [1]:
```
!pip install yfinance==0.1.67
#!pip install pandas==1.3.3
#!pip install requests==2.26.0
!mamba install bs4==4.10.0 -y
#!pip install plotly==5.3.1
```

```
Collecting yfinance==0.1.67
  Downloading yfinance-0.1.67-py2.py3-none-any.whl (25 kB)
Requirement already satisfied: numpy>=1.15 in /opt/conda/envs/Python-3.8-mai
n/lib/python3.8/site-packages (from yfinance==0.1.67) (1.19.2)
Requirement already satisfied: pandas>=0.24 in /opt/conda/envs/Python-3.8-mai
n/lib/python3.8/site-packages (from yfinance==0.1.67) (1.2.4)
Requirement already satisfied: requests>=2.20 in /opt/conda/envs/Python-3.8-m
ain/lib/python3.8/site-packages (from yfinance==0.1.67) (2.25.1)
Requirement already satisfied: lxml>=4.5.1 in /opt/conda/envs/Python-3.8-mai
n/lib/python3.8/site-packages (from yfinance==0.1.67) (4.6.3)
Collecting multitasking>=0.0.7
  Downloading multitasking-0.0.10.tar.gz (8.2 kB)
Requirement already satisfied: python-dateutil>=2.7.3 in /opt/conda/envs/Pyth
on-3.8-main/lib/python3.8/site-packages (from pandas>=0.24->yfinance==0.1.67)
(2.8.1)
Requirement already satisfied: pytz>=2017.3 in /opt/conda/envs/Python-3.8-mai
n/lib/python3.8/site-packages (from pandas>=0.24->yfinance==0.1.67) (2021.1)
Requirement already satisfied: six>=1.5 in /opt/conda/envs/Python-3.8-main/li
b/python3.8/site-packages (from python-dateutil>=2.7.3->pandas>=0.24->yfinanc
e==0.1.67) (1.15.0)
Requirement already satisfied: certifi>=2017.4.17 in /opt/conda/envs/Python-
3.8-main/lib/python3.8/site-packages (from requests>=2.20->yfinance==0.1.67)
(2021.10.8)
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==0.1.67)
(3.0.4)
Requirement already satisfied: idna<3,>=2.5 in /opt/conda/envs/Python-3.8-mai
n/lib/python3.8/site-packages (from requests>=2.20->yfinance==0.1.67) (2.8)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in /opt/conda/envs/Pytho
n-3.8-main/lib/python3.8/site-packages (from requests>=2.20->yfinance==0.1.6
7) (1.26.6)
Building wheels for collected packages: multitasking
  Building wheel for multitasking (setup.py) ... done
  Created wheel for multitasking: filename=multitasking-0.0.10-py3-none-any.w
hl size=8487 sha256=70655a632839a978ae81718afd16ee000631f7e8dd713e8756453712c
e0b3c15
  Stored in directory: /tmp/wsuser/.cache/pip/wheels/21/c9/66/b41c847de65c798
5db52ec21d59996841598b8b0e93f2b9500
Successfully built multitasking
Installing collected packages: multitasking, yfinance
Successfully installed multitasking-0.0.10 yfinance-0.1.67
/usr/bin/sh: mamba: command not found
```

In [2]:
```
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
```

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]:
```
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 <= '2021-06-30']
    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_datetime_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]:
```
tesla = yf.Ticker("TSLA")
tesla_info = tesla.info
```

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]:
```
tesla_data = tesla.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()
#tesla_data
```

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=NA-SkillsNetwork-Channel-SkillsNetworkCoursesIBMDeveloperSkillsNetworkPY0220ENSkillsNetwork23455606-2021-01-01). Save the text of the response as a variable named `html_data`.

In [7]:
```
import pandas as pd
import requests
from bs4 import BeautifulSoup
url = "https://www.macrotrends.net/stocks/charts/TSLA/tesla/revenue"
html_data = requests.get(url).text
#html_data
```

Parse the html data using `beautiful_soup`.

In [8]:
```
beautiful_soup = BeautifulSoup(html_data,'html5lib')
#beautiful_soup
```

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.read_html(url)
tesla_revenue = tesla_revenue[1]
tesla_revenue= tesla_revenue.rename(columns={'Tesla Quarterly Revenue(Millions of US $)':'Date', 'Tesla Quarterly Revenue(Millions of US $).1':'Revenue'})
#tesla_revenue
```

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

In [10]:
```
tesla_revenue["Revenue"] = tesla_revenue['Revenue'].str.replace(',|\$',"")
```

```
/tmp/wsuser/ipykernel_206/349343550.py:1: FutureWarning: The default value of
regex will change from True to False in a future version.
  tesla_revenue["Revenue"] = tesla_revenue['Revenue'].str.replace(',|\$',"")
```

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['Revenue'] != ""]
```

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
44	2010-09-30	31
45	2010-06-30	28
46	2010-03-31	21
48	2009-09-30	46
49	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]:
```
import yfinance as yf
import pandas as pd
import requests
from bs4 import BeautifulSoup
GameStop = 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 = GameStop.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	6.480512	6.773398	6.413182	6.766665	19054000	0.0	0.0
1	2002-02-14	6.850830	6.864296	6.682505	6.733002	2755400	0.0	0.0
2	2002-02-15	6.733003	6.749835	6.632008	6.699338	2097400	0.0	0.0
3	2002-02-19	6.665671	6.665671	6.312188	6.430016	1852600	0.0	0.0
4	2002-02-20	6.463683	6.648840	6.413185	6.648840	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=NA-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"
html_data = requests.get(url).text
```

Parse the html data using `beautiful_soup`.

In [17]:
```
beautiful_soup = BeautifulSoup(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.read_html(url)
gme_revenue = gme_revenue[1]
gme_revenue= gme_revenue.rename(columns={'GameStop Quarterly Revenue(Millions
 of US $)':'Date', 'GameStop Quarterly Revenue(Millions of US $).1':'Revenue'
})
gme_revenue["Revenue"] = gme_revenue['Revenue'].str.replace(',|\$',"")
gme_revenue.head()
```

```
/tmp/wsuser/ipykernel_206/2594000764.py:4: FutureWarning: The default value o
f regex will change from True to False in a future version.
  gme_revenue["Revenue"] = gme_revenue['Revenue'].str.replace(',|\$',"")
```

Out[18]:

	Date	Revenue
0	2021-10-31	1297
1	2021-07-31	1183
2	2021-04-30	1277
3	2021-01-31	2122
4	2020-10-31	1005

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()
```

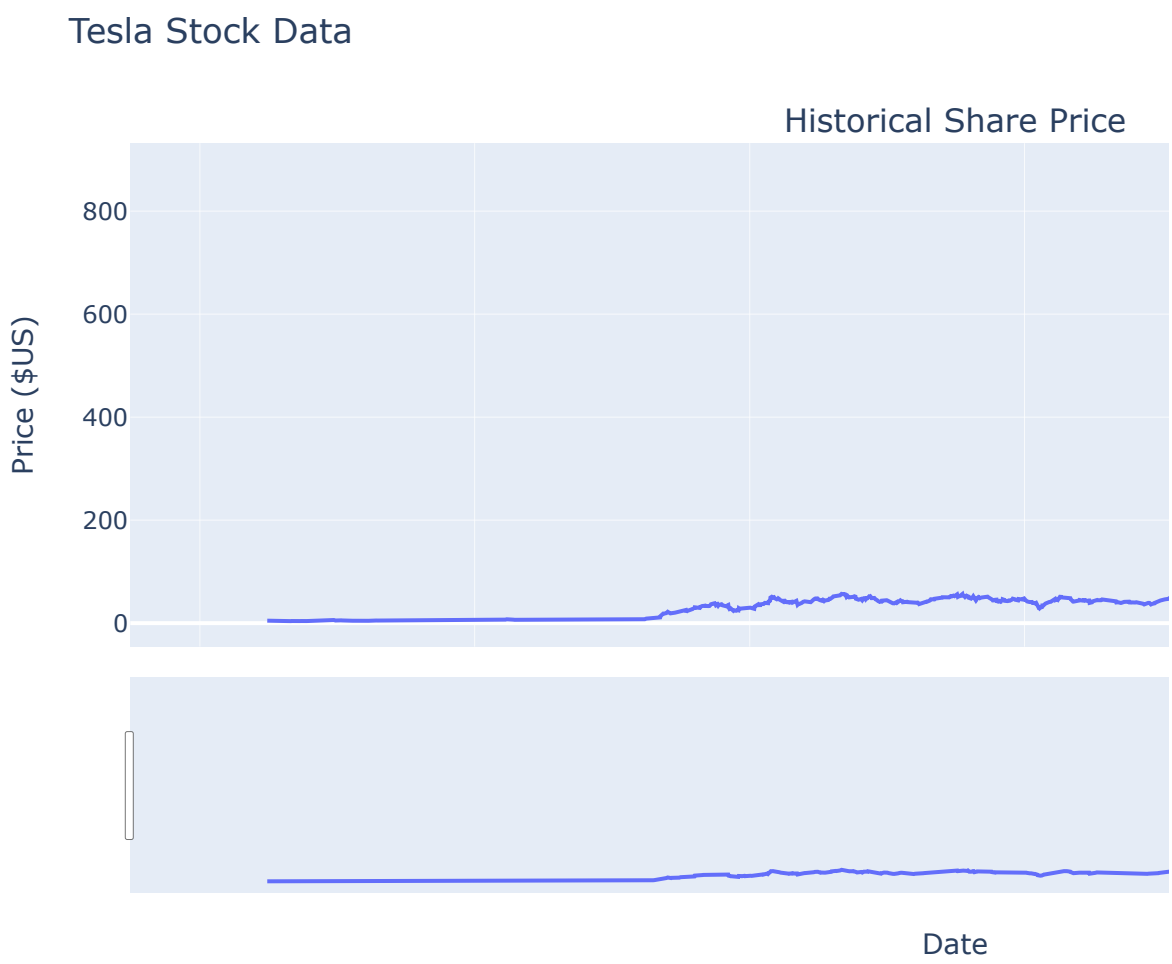
Out[19]:

	Date	Revenue
63	2006-01-31	1667
64	2005-10-31	534
65	2005-07-31	416
66	2005-04-30	475
67	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.

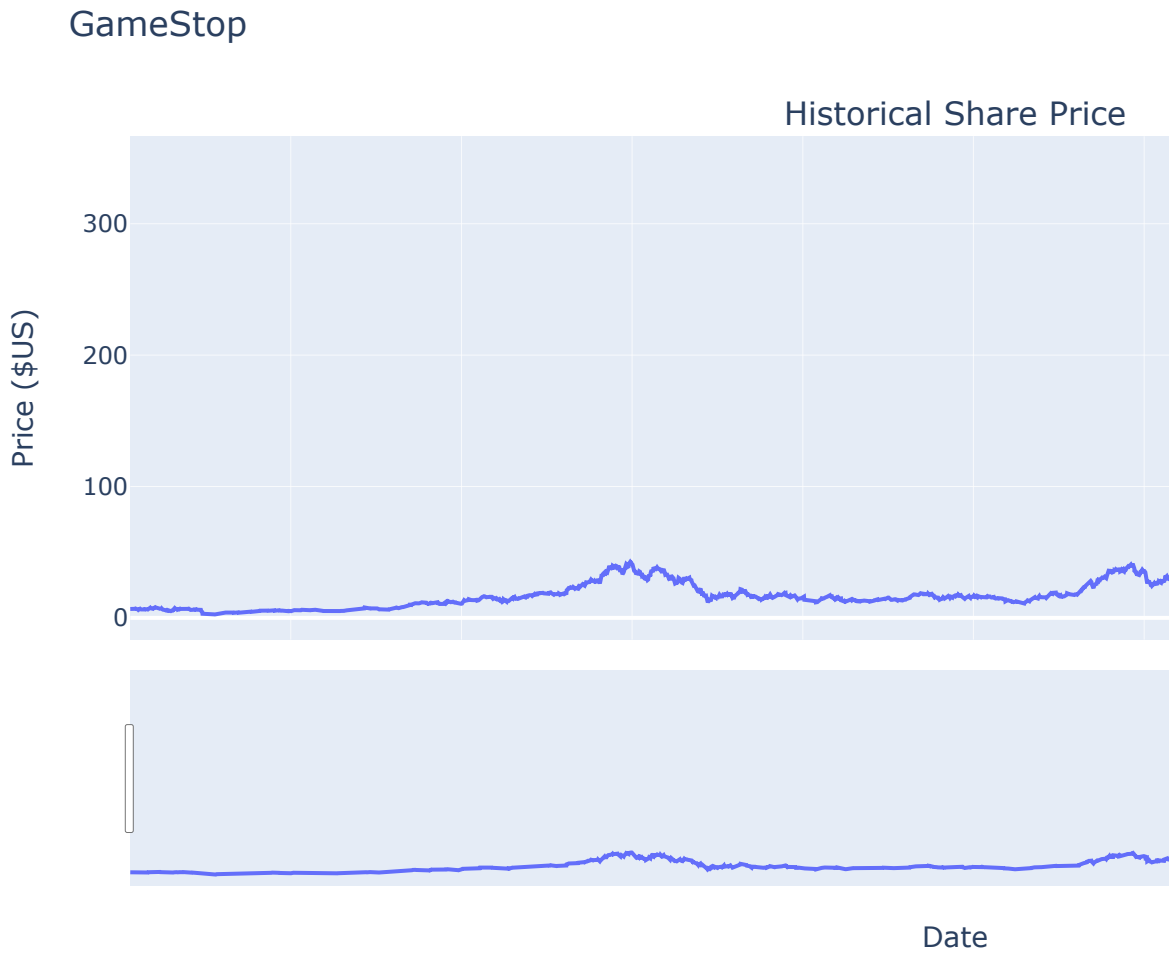
In [20]:
```
make_graph(tesla_data, tesla_revenue, 'Tesla Stock Data')
```



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')
```



About the Authors:

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Azim Hiriani

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