Final Assignment

March 29, 2023

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

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

```
[4]: 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
```

0.1 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.

```
[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"), __
      overtical_spacing = .3)
         stock_data_specific = stock_data[stock_data.Date <= '2021--06-14']</pre>
         revenue_data_specific = revenue_data[revenue_data.Date <= '2021-04-30']</pre>
         fig.add_trace(go.Scatter(x=pd.to_datetime(stock_data_specific.Date,_
      oinfer_datetime_format=True), y=stock_data_specific.Close.astype("float"), u
      →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()
```

0.2 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.

```
[16]: Tesla = 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.

```
[17]: 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.

```
[18]: tesla_data.reset_index(inplace=True) tesla_data.head()
```

```
[18]:
                                                            Volume Dividends
             Date
                       Open
                                High
                                           Low
                                                   Close
     0 2010-06-29 1.266667 1.666667 1.169333
                                               1.592667
                                                         281494500
                                                                            0
                                                                            0
     1 2010-06-30 1.719333
                            2.028000 1.553333
                                                1.588667
                                                         257806500
     2 2010-07-01 1.666667
                                                                            0
                            1.728000 1.351333
                                                1.464000 123282000
     3 2010-07-02 1.533333
                            1.540000 1.247333
                                                                            0
                                                1.280000
                                                          77097000
     4 2010-07-06 1.333333 1.333333 1.055333
                                               1.074000 103003500
```

```
Stock Splits
0 0.0
1 0.0
2 0.0
3 0.0
4 0.0
```

0.3 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.

```
[19]: url = "https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/

□IBMDeveloperSkillsNetwork-PY0220EN-SkillsNetwork/labs/project/revenue.htm"

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

Parse the html data using beautiful_soup.

```
[20]: soup = BeautifulSoup(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

Below is the code to isolate the table, you will now need to loop through the rows and columns soup.find_all("tbody")[1]

If you want to use the read_html function the table is located at index 1

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

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

/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages/ipykernel_launcher.py:1: FutureWarning:

The default value of regex will change from True to False in a future version.

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

```
[23]: 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.

```
[24]: tesla_revenue.tail()
```

```
[24]:
           Date Revenue
      8
           2013
                    2013
      9
           2012
                     413
           2011
                     204
      10
      11
           2010
                     117
           2009
      12
                     112
```

0.4 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.

```
[11]: 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.

```
[12]: 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.

```
[13]: gme_data.reset_index(inplace=True) gme_data.head()
```

```
[13]:
              Date
                         Open
                                   High
                                               Low
                                                       Close
                                                                 Volume
                                                                         Dividends
      0 2002-02-13
                    1.620128
                               1.693350
                                         1.603296
                                                    1.691666
                                                               76216000
                                                                                0.0
      1 2002-02-14
                    1.712707
                               1.716074
                                         1.670626
                                                    1.683250
                                                               11021600
                                                                                0.0
```

```
2 2002-02-15 1.683250
                        1.687458 1.658001
                                            1.674834
                                                       8389600
                                                                      0.0
                                                                      0.0
3 2002-02-19 1.666418
                        1.666418 1.578047
                                            1.607504
                                                       7410400
4 2002-02-20 1.615920
                        1.662209 1.603295
                                            1.662209
                                                       6892800
                                                                      0.0
  Stock Splits
```

0 0.0 1 0.0 2 0.0 3 0.0 4 0.0

0.5 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/IBMDeveloperSkillsNetwork-PY0220EN-SkillsNetwork/labs/project/stock.html. Save the text of the response as a variable named html_data.

```
[6]: url = "https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/

GIBMDeveloperSkillsNetwork-PY0220EN-SkillsNetwork/labs/project/stock.html"

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

Parse the html data using beautiful_soup.

```
[7]: soup = BeautifulSoup(html_data)
```

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

Below is the code to isolate the table, you will now need to loop through the rows and columns soup.find_all("tbody")[1]

If you want to use the read_html function the table is located at index 1

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

for row in soup.find("tbody").find_all('tr'):
    col = row.find_all('td')
    date = col[0].text
    revenue = col[1].text
```

```
gme_revenue = gme_revenue.append({"Date":date, "Revenue":revenue},

ignore_index=True)

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

/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages/ipykernel_launcher.py:10: FutureWarning: The default value of regex will change from True to False in a future version.

Remove the CWD from sys.path while we load stuff.

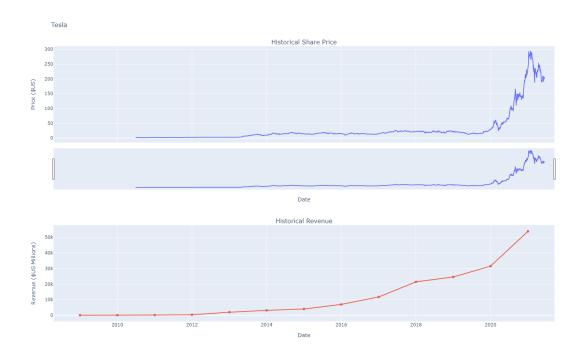
Display the last five rows of the gme_revenue dataframe using the tail function. Take a screenshot of the results.

```
[9]: gme_revenue.tail()
[9]:
         Date Revenue
         2009
                  8806
         2008
                  7094
     12
     13
         2007
                  5319
     14
         2006
                  3092
     15
         2005
                  1843
```

0.6 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.

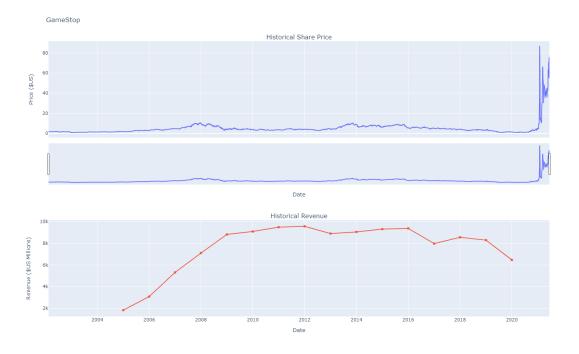
```
[25]: make_graph(tesla_data, tesla_revenue, 'Tesla')
```



0.7 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.

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



About the Authors:

Joseph Santarcangelo has a PhD in Electrical Engineering, his research focused on using machine learning, signal processing, and computer vision to determine how videos impact human cognition. Joseph has been working for IBM since he completed his PhD.

Azim Hirjani

0.8 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

##

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