Final Assignment

February 15, 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.

Table of Contents

```
<ul>
    <li>Define a Function that Makes a Graph</li>
    <li>Question 1: Use yfinance to Extract Stock Data</li>
    <li>Question 2: Use Webscraping to Extract Tesla Revenue Data</li>
    <li>Question 3: Use yfinance to Extract Stock Data</li>
    <li>Question 4: Use Webscraping to Extract GME Revenue Data</li>
    <li>Question 5: Plot Tesla Stock Graph</li>
    <li>Question 6: Plot GameStop Stock Graph</li>
</ul>
```

Estimated Time Needed: 30 min

```
[1]: # !pip install yfinance
     # !mamba install bs4
     # !pip install nbformat
```

```
[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
```

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.

```
[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 <= '2021-04-30']
         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_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`.

```
[4]: tesla_stock = 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.

```
[23]: tesla_data = tesla_stock.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.

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

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`.

2

```
[7]: 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`.

```
[8]: soup = BeautifulSoup(html_data , 'html.parser')
```

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
```

```
[9]: soup1 = soup.find_all('table' , class_ = "historical_data_table table")
     data_tesla = soup1[1].find('tbody').find_all('tr')
     tesla_data = []
     for data_each_tesla in data_tesla:
         date = data_each_tesla.contents[1].text
         price = data_each_tesla.contents[3].text
         tesla_data.append([date , price])
     tesla_data

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

```
[9]:         Date Revenue
     49  2010-06-30     $28
     50  2010-03-31     $21
     51  2009-12-31
     52  2009-09-30     $46
     53  2009-06-30     $27
```

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

```
[10]: 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.
```
  """Entry point for launching an IPython kernel.
```

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

```
[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.

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

```
[12]:          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
```

1.1 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`.

```
[13]: gme = 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.

```
[14]: gme_data = gme.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.

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

```
[15]:                        Date      Open      High       Low     Close    Volume  \
      0 2002-02-13 00:00:00-05:00  1.620128  1.693350  1.603296  1.691666  76216000
      1 2002-02-14 00:00:00-05:00  1.712707  1.716074  1.670626  1.683250  11021600
      2 2002-02-15 00:00:00-05:00  1.683250  1.687458  1.658002  1.674834   8389600
      3 2002-02-19 00:00:00-05:00  1.666418  1.666418  1.578047  1.607504   7410400
      4 2002-02-20 00:00:00-05:00  1.615920  1.662210  1.603296  1.662210   6892800

         Dividends  Stock Splits
```

```
0        0.0          0.0
1        0.0          0.0
2        0.0          0.0
3        0.0          0.0
4        0.0          0.0
```

1.2 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`.

```
[16]: url_gme = "https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/
      ↪IBMDeveloperSkillsNetwork-PY0220EN-SkillsNetwork/labs/project/stock.html"
      html_data = requests.get(url_gme).text
```

Parse the html data using `beautiful_soup`.

```
[17]: soup = BeautifulSoup(html_data , 'html.parser')
```

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

```
[18]: table =soup.find_all('table')
      table_data =table[1].tbody.find_all('tr')
      table_data
      gme_data_frame = []
      for table_each in table_data:
          date = table_each.contents[1].text
          price = table_each.contents[3].text
          gme_data_frame.append([date , price])
      gme_df = pd.DataFrame(gme_data_frame , columns= ['Date' , 'Revenue'])
      gme_df['Revenue'] = gme_df['Revenue'].str.replace(',|\$',"")
      gme_df.dropna(inplace=True)
      gme_revenue = gme_df[gme_df['Revenue'] != '']
```

```
/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.

[19]: `gme_revenue.tail()`

[19]:
```
          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
```

1.3 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')`

Tesla

### Historical Share Price

Historical Revenue

1.4 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.

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

GameStop Plot
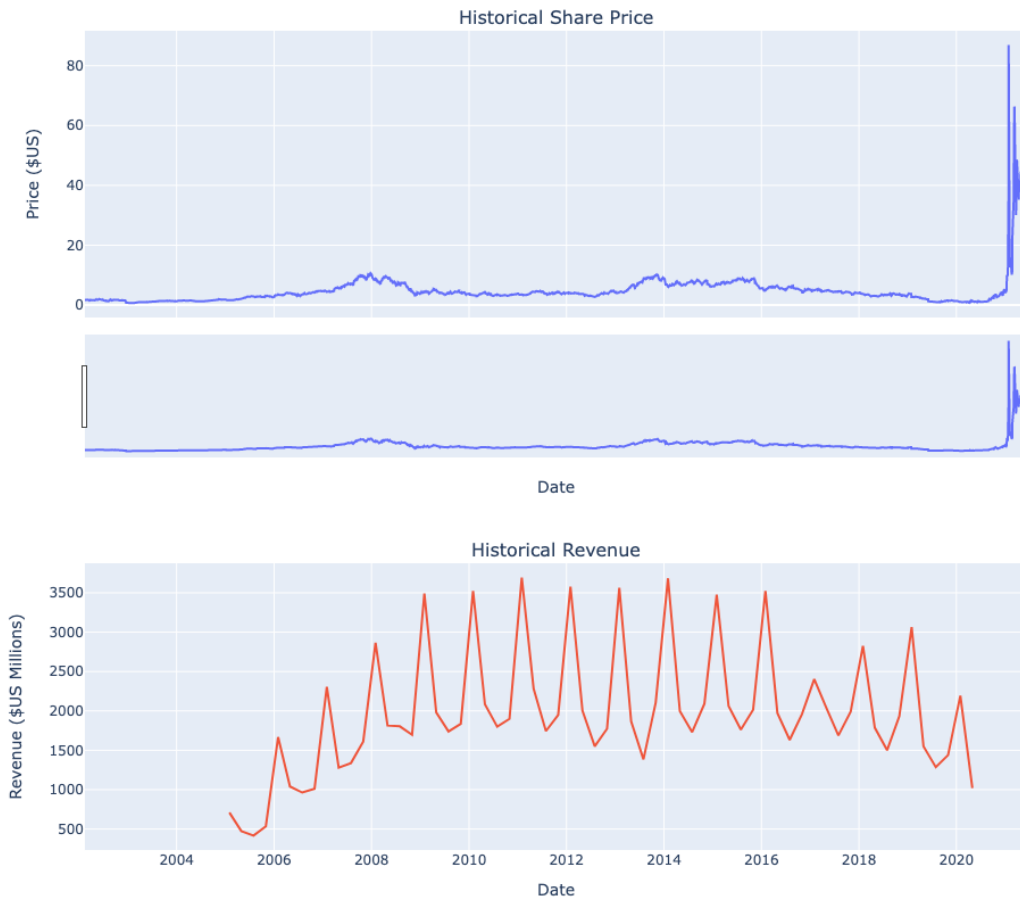
About the Authors:

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1.5 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

##