

# Final Assignment

September 19, 2025

## 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. Use the version as per your python version.

```
[ ]: !pip install yfinance
      !pip install bs4
      !pip install nbformat
      !pip install --upgrade plotly
```

```
[ ]: 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
```

```
[ ]: import plotly.io as pio
      pio.renderers.default = "iframe"
```

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.

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

## 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.

```
[ ]: 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_rangeflider_visible=True)
    fig.show()
    from IPython.display import display, HTML
    fig_html = fig.to_html()
    display(HTML(fig_html))
```

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.

## 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`.

```
[ ]: import yfinance as yf
tesla = yf.Ticker("TSLA")
```

```
print(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.

```
[ ]: 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.

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

```
[ ]: ## 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`.

```
[ ]: import request
import panda as pd
from bs4 import BeautifulSoup
```

```
[ ]: 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 `BeautifulSoup` using parser i.e `html5lib` or `html.parser`.

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

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**.

Step-by-step instructions

Here are the step-by-step instructions:

1. Create an Empty DataFrame
2. Find the Relevant Table
3. Check for the Tesla Quarterly Revenue Table
4. Iterate Through Rows in the Table Body
5. Extract Data from Columns
6. Append Data to the DataFrame

[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

We are focusing on quarterly revenue in the lab.

```
[ ]: tesla_revenue = pd.DataFrame(columns=["date ", "revenue"])
```

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

```
[ ]: tesla_revenue["Revenue"] = tesla_revenue['Revenue'].str.  
    ↪replace(',', '\\$', "", regex=True)
```

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

```
[ ]: 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.

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

### 0.3 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`.

```
[ ]: import yfinance as yf  
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.

```
[ ]: 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.

```
[ ]: gme_data.reset_index(inplace=true)  
print(gme_data.head())
```

### 0.4 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_2`.

```
[ ]: import requests
import pandas as pd
from bs4 import BeautifulSoup
```

```
[ ]: url=https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/
↳IBMDeveloperSkillsNetwork-PY0220EN-SkillsNetwork/labs/project/stock.html
html_data_2 = request.get(url).text
```

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

```
[ ]: soup = beautiful_soup(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

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

```
[ ]: tables = pd.read_html(str(soup))
gme_revenue = table[1]
gme_revenue.columns = ["Date" , "Revenue"]
gme_revenue["Revenue"] = gme_revenue["Revenue"].replace(' [\s] ', '', regex=True)
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.
```

```
[ ]: print(gme_revenue.tail())
```

## 0.5 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

You just need to invoke the `make_graph` function with the required parameter to print the graph.

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

## 0.6 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

You just need to invoke the `make_graph` function with the required parameter to print the graph.

```
[ ]: 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.

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## 0.7 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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