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.

[3]:
```
#!pip install yfinance==0.2.38
#!pip install pandas==2.2.2
#!pip install nbformat
```

[4]:
```
!pip install yfinance
!pip install bs4
!pip install nbformat
```

[4]:
```
Collecting yfinance
  Downloading yfinance-0.2.43-py2.py3-none-any.whl.metadata (11 kB)
Collecting pandas>=1.3.0 (from yfinance)
  Downloading pandas-2.2.2-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (19 kB)
Collecting numpy>=1.16.5 (from yfinance)
  Downloading numpy-2.1.1-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (60 kB)
2K     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 60.9/60.9 kB 8.6 MB/s eta 0:00:00
ent already satisfied: requests>=2.31 in /opt/conda/lib/python3.11/site-packages (from yfinance) (2.31.0)
Collecting multitasking>=0.0.7 (from yfinance)
  Downloading multitasking-0.0.11-py3-none-any.whl.metadata (5.5 kB)
Collecting lxml>=4.9.1 (from yfinance)
  Downloading lxml-5.3.0-cp311-cp311-manylinux_2_28_x86_64.whl.metadata (3.8 kB)
Requirement already satisfied: platformdirs>=2.0.0 in /opt/conda/lib/python3.11/site-packages (from yfinance) (4.2.1)
Requirement already satisfied: pytz>=2022.5 in /opt/conda/lib/python3.11/site-packages (from yfinance) (2024.1)
Collecting frozendict>=2.3.4 (from yfinance)
  Downloading frozendict-2.4.4-py311-none-any.whl.metadata (23 kB)
Collecting peewee>=3.16.2 (from yfinance)
  Downloading peewee-3.17.6.tar.gz (3.0 MB)
2K     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 3.0/3.0 MB 111.6 MB/s eta 0:00:00
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ents to build wheel ... ?25ldone
etadata (pyproject.toml) ... ?25ldone
ent already satisfied: beautifulsoup4>=4.11.1 in /opt/conda/lib/python3.11/site-packages (from yfinance) (4.12.3)
Collecting html5lib>=1.1 (from yfinance)
  Downloading html5lib-1.1-py2.py3-none-any.whl.metadata (16 kB)
Requirement already satisfied: soupsieve>1.2 in /opt/conda/lib/python3.11/site-packages (from beautifulsoup4>=4.11.1->yfinance) (2.5)
Requirement already satisfied: six>=1.9 in /opt/conda/lib/python3.11/site-packages (from html5lib>=1.1->yfinance) (1.16.0)
Requirement already satisfied: webencodings in /opt/conda/lib/python3.11/site-packages (from html5lib>=1.1->yfinance) (0.5.1)
Requirement already satisfied: python-dateutil>=2.8.2 in /opt/conda/lib/python3.11/site-packages (from pandas>=1.3.0->yfinance) (2.9.0)
Collecting tzdata>=2022.7 (from pandas>=1.3.0->yfinance)
  Downloading tzdata-2024.1-py2.py3-none-any.whl.metadata (1.4 kB)
Requirement already satisfied: charset-normalizer<4,>=2 in /opt/conda/lib/python3.11/site-packages (from requests>=2.31->yfinance) (3.3.2)
Requirement already satisfied: idna<4,>=2.5 in /opt/conda/lib/python3.11/site-packages (from requests>=2.31->yfinance) (3.7)
Requirement already satisfied: urllib3<3,>=1.21.1 in /opt/conda/lib/python3.11/site-packages (from requests>=2.31->yfinance) (2.2.1)
Requirement already satisfied: certifi>=2017.4.17 in /opt/conda/lib/python3.11/site-packages (from requests>=2.31->yfinance) (2024.6.2)
Downloading yfinance-0.2.43-py2.py3-none-any.whl (84 kB)
2K     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 84.6/84.6 kB 10.3 MB/s eta 0:00:00
l5lib-1.1-py2.py3-none-any.whl (112 kB)
2K     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 112.2/112.2 kB 14.9 MB/s eta 0:00:00
l-5.3.0-cp311-cp311-manylinux_2_28_x86_64.whl (5.0 MB)
2K     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 5.0/5.0 MB 61.8 MB/s eta 0:00:00:00:01
ultitasking-0.0.11-py3-none-any.whl (8.5 kB)
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anylinux_2_17_x86_64.manylinux2014_x86_64.whl (13.0 MB)
2K     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 13.0/13.0 MB 76.9 MB/s eta 0:00:00:00:0100:01
?25hDownloading tzdata-2024.1-py2.py3-none-any.whl (345 kB)
2K     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 345.4/345.4 kB 36.7 MB/s eta 0:00:00
l) ... ?25ldone
e=peewee-3.17.6-py3-none-any.whl size=138891 sha256=9d9d54b05a5f8e0a231c871f2b1f0ff2936c8e0e42ca71bc7ee0e8afbb9f7ed2
  Stored in directory: /home/jupyterlab/.cache/pip/wheels/1c/09/7e/9f659fde248ecdc1722a142c1d744271aad3914a0afc191058
Successfully built peewee
```

```
Installing collected packages: peewee, multitasking, tzdata, numpy, lxml, html5lib, frozendict, pandas, yfinance
Successfully installed frozendict-2.4.4 html5lib-1.1 lxml-5.3.0 multitasking-0.0.11 numpy-2.1.1 pandas-2.2.2 peewee-3.17.6 tzdata-2024.1
yfinance-0.2.43
Collecting bs4
  Downloading bs4-0.0.2-py2.py3-none-any.whl.metadata (411 bytes)
Requirement already satisfied: beautifulsoup4 in /opt/conda/lib/python3.11/site-packages (from bs4) (4.12.3)
Requirement already satisfied: soupsieve>1.2 in /opt/conda/lib/python3.11/site-packages (from beautifulsoup4->bs4) (2.5)
Downloading bs4-0.0.2-py2.py3-none-any.whl (1.2 kB)
Installing collected packages: bs4
Successfully installed bs4-0.0.2
Requirement already satisfied: nbformat in /opt/conda/lib/python3.11/site-packages (5.10.4)
Requirement already satisfied: fastjsonschema>=2.15 in /opt/conda/lib/python3.11/site-packages (from nbformat) (2.19.1)
Requirement already satisfied: jsonschema>=2.6 in /opt/conda/lib/python3.11/site-packages (from nbformat) (4.22.0)
Requirement already satisfied: jupyter-core!=5.0.*,>=4.12 in /opt/conda/lib/python3.11/site-packages (from nbformat) (5.7.2)
Requirement already satisfied: traitlets>=5.1 in /opt/conda/lib/python3.11/site-packages (from nbformat) (5.14.3)
Requirement already satisfied: attrs>=22.2.0 in /opt/conda/lib/python3.11/site-packages (from jsonschema>=2.6->nbformat) (23.2.0)
Requirement already satisfied: jsonschema-specifications>=2023.03.6 in /opt/conda/lib/python3.11/site-packages (from jsonschema>=2.6-
>nbformat) (2023.12.1)
Requirement already satisfied: referencing>=0.28.4 in /opt/conda/lib/python3.11/site-packages (from jsonschema>=2.6->nbformat) (0.35.1)
Requirement already satisfied: rpds-py>=0.7.1 in /opt/conda/lib/python3.11/site-packages (from jsonschema>=2.6->nbformat) (0.18.0)
Requirement already satisfied: platformdirs>=2.5 in /opt/conda/lib/python3.11/site-packages (from jupyter-core!=5.0.*,>=4.12->nbformat)
(4.2.1)
```

[5]:
```
!pip install pandas
!pip install requests
!pip install bs4
!pip install html5lib
!pip install lxml
!pip install plotly
```

[5]:
```
Requirement already satisfied: pandas in /opt/conda/lib/python3.11/site-packages (2.2.2)
Requirement already satisfied: numpy>=1.23.2 in /opt/conda/lib/python3.11/site-packages (from pandas) (2.1.1)
Requirement already satisfied: python-dateutil>=2.8.2 in /opt/conda/lib/python3.11/site-packages (from pandas) (2.9.0)
Requirement already satisfied: pytz>=2020.1 in /opt/conda/lib/python3.11/site-packages (from pandas) (2024.1)
Requirement already satisfied: tzdata>=2022.7 in /opt/conda/lib/python3.11/site-packages (from pandas) (2024.1)
Requirement already satisfied: six>=1.5 in /opt/conda/lib/python3.11/site-packages (from python-dateutil>=2.8.2->pandas) (1.16.0)
Requirement already satisfied: requests in /opt/conda/lib/python3.11/site-packages (2.31.0)
Requirement already satisfied: charset-normalizer<4,>=2 in /opt/conda/lib/python3.11/site-packages (from requests) (3.3.2)
Requirement already satisfied: idna<4,>=2.5 in /opt/conda/lib/python3.11/site-packages (from requests) (3.7)
Requirement already satisfied: urllib3<3,>=1.21.1 in /opt/conda/lib/python3.11/site-packages (from requests) (2.2.1)
Requirement already satisfied: certifi>=2017.4.17 in /opt/conda/lib/python3.11/site-packages (from requests) (2024.6.2)
Requirement already satisfied: bs4 in /opt/conda/lib/python3.11/site-packages (0.0.2)
Requirement already satisfied: beautifulsoup4 in /opt/conda/lib/python3.11/site-packages (from bs4) (4.12.3)
Requirement already satisfied: soupsieve>1.2 in /opt/conda/lib/python3.11/site-packages (from beautifulsoup4->bs4) (2.5)
Requirement already satisfied: html5lib in /opt/conda/lib/python3.11/site-packages (1.1)
Requirement already satisfied: six>=1.9 in /opt/conda/lib/python3.11/site-packages (from html5lib) (1.16.0)
Requirement already satisfied: webencodings in /opt/conda/lib/python3.11/site-packages (from html5lib) (0.5.1)
Requirement already satisfied: lxml in /opt/conda/lib/python3.11/site-packages (5.3.0)
Requirement already satisfied: plotly in /opt/conda/lib/python3.11/site-packages (5.22.0)
Requirement already satisfied: tenacity>=6.2.0 in /opt/conda/lib/python3.11/site-packages (from plotly) (8.4.1)
Requirement already satisfied: packaging in /opt/conda/lib/python3.11/site-packages (from plotly) (24.0)
```

[6]:
```
import pandas as pd
import requests
from bs4 import BeautifulSoup
```

[7]:
```
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
```

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.

[8]:
```
import warnings
# Ignore all warnings
warnings.filterwarnings("ignore", category=FutureWarning)
```

[]:
```
```

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
    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), y=stock_data_specific.Close.astype("float"), name="Share Price"), ro
    fig.add_trace(go.Scatter(x=pd.to_datetime(revenue_data_specific.Date), y=revenue_data_specific.Revenue.astype("float"), name="Revenue"),
    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()
```

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.**

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 = 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.

[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.

[7]:
```
Tesla_data.reset_index(inplace=True)
Tesla_data.head()
```

[7]:

	index	Date	Open	High	Low	Close	Volume	Dividends	Stock Splits
0	0	2010-06-29 00:00:00-04:00	1.266667	1.666667	1.169333	1.592667	281494500	0.0	0.0
1	1	2010-06-30 00:00:00-04:00	1.719333	2.028000	1.553333	1.588667	257806500	0.0	0.0
2	2	2010-07-01 00:00:00-04:00	1.666667	1.728000	1.351333	1.464000	123282000	0.0	0.0
3	3	2010-07-02 00:00:00-04:00	1.533333	1.540000	1.247333	1.280000	77097000	0.0	0.0
4	4	2010-07-06 00:00:00-04:00	1.333333	1.333333	1.055333	1.074000	103003500	0.0	0.0

Question 2: Use Webscraping to Extract Tesla Revenue Data

[6]:
```
!pip install pandas
!pip install requests
!pip install bs4
!pip install html5lib
!pip install lxml
!pip install plotly
```

[6]:
```
Requirement already satisfied: pandas in /opt/conda/lib/python3.11/site-packages (2.2.2)
Requirement already satisfied: numpy>=1.23.2 in /opt/conda/lib/python3.11/site-packages (from pandas) (2.1.1)
Requirement already satisfied: python-dateutil>=2.8.2 in /opt/conda/lib/python3.11/site-packages (from pandas) (2.9.0)
Requirement already satisfied: pytz>=2020.1 in /opt/conda/lib/python3.11/site-packages (from pandas) (2024.1)
Requirement already satisfied: tzdata>=2022.7 in /opt/conda/lib/python3.11/site-packages (from pandas) (2024.1)
Requirement already satisfied: six>=1.5 in /opt/conda/lib/python3.11/site-packages (from python-dateutil>=2.8.2->pandas) (1.16.0)
Requirement already satisfied: requests in /opt/conda/lib/python3.11/site-packages (2.31.0)
Requirement already satisfied: charset-normalizer<4,>=2 in /opt/conda/lib/python3.11/site-packages (from requests) (3.3.2)
Requirement already satisfied: idna<4,>=2.5 in /opt/conda/lib/python3.11/site-packages (from requests) (3.7)
Requirement already satisfied: urllib3<3,>=1.21.1 in /opt/conda/lib/python3.11/site-packages (from requests) (2.2.1)
Requirement already satisfied: certifi>=2017.4.17 in /opt/conda/lib/python3.11/site-packages (from requests) (2024.6.2)
Requirement already satisfied: bs4 in /opt/conda/lib/python3.11/site-packages (0.0.2)
Requirement already satisfied: beautifulsoup4 in /opt/conda/lib/python3.11/site-packages (from bs4) (4.12.3)
Requirement already satisfied: soupsieve>1.2 in /opt/conda/lib/python3.11/site-packages (from beautifulsoup4->bs4) (2.5)
Requirement already satisfied: html5lib in /opt/conda/lib/python3.11/site-packages (1.1)
Requirement already satisfied: six>=1.9 in /opt/conda/lib/python3.11/site-packages (from html5lib) (1.16.0)
Requirement already satisfied: webencodings in /opt/conda/lib/python3.11/site-packages (from html5lib) (0.5.1)
Requirement already satisfied: lxml in /opt/conda/lib/python3.11/site-packages (5.3.0)
Requirement already satisfied: plotly in /opt/conda/lib/python3.11/site-packages (5.22.0)
Requirement already satisfied: tenacity>=6.2.0 in /opt/conda/lib/python3.11/site-packages (from plotly) (8.4.1)
Requirement already satisfied: packaging in /opt/conda/lib/python3.11/site-packages (from plotly) (24.0)
```

[7]:
```
import pandas as pd
import requests
from bs4 import BeautifulSoup
```

[9]:
```
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
```

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`.

```
url=" https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBMDeveloperSkillsNetwork-PY0220EN-SkillsNetwork/labs/project/revenu
```

#Parse the html data using `beautiful_soup` using parser i.e `html5lib` or `html.parser`. Make sure to use the `html_data` with the content parameter as follow `html_data.content` .

```
response = requests.get(url)
```

```
html_data = response.text
```

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`.

```
soup = BeautifulSoup(html_data, 'html5lib')
```

```
tables = pd.read_html(str(soup))
```

```
tesla_revenue = tables[0]
```

```
tesla_revenue.columns = ["Date", "Revenue"]
```

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

```
tesla_revenue.dropna(inplace=True)
```

```
tesla_revenue = tesla_revenue[tesla_revenue["Revenue"] != ""]
```

```
print(tesla_revenue.tail())
```

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

▸ Step-by-step instructions

▸ Click here if you need help locating the table

```

```

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

```

```

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

Question 3: Use yfinance to Extract Stock Data

```
#Question 3: Use yfinance to Extract Stock Data
Using theTicker 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.
```

```
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.
```

```
game_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
```

```
game_data.reset_index(inplace=True)
```

```
game_data.head()
```

	Date	Open	High	Low	Close	Volume	Dividends	Stock Splits
0	2002-02-13 00:00:00-05:00	1.620128	1.693350	1.603296	1.691666	76216000	0.0	0.0
1	2002-02-14 00:00:00-05:00	1.712707	1.716074	1.670626	1.683250	11021600	0.0	0.0
2	2002-02-15 00:00:00-05:00	1.683250	1.687458	1.658002	1.674834	8389600	0.0	0.0
3	2002-02-19 00:00:00-05:00	1.666418	1.666418	1.578047	1.607504	7410400	0.0	0.0
4	2002-02-20 00:00:00-05:00	1.615920	1.662210	1.603296	1.662210	6892800	0.0	0.0

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`.

```

```

```
!pip install requests
!pip install beautifulsoup4
!pip install pandas
```

```
Requirement already satisfied: requests in /opt/conda/lib/python3.11/site-packages (2.31.0)
Requirement already satisfied: charset-normalizer<4,>=2 in /opt/conda/lib/python3.11/site-packages (from requests) (3.3.2)
Requirement already satisfied: idna<4,>=2.5 in /opt/conda/lib/python3.11/site-packages (from requests) (3.7)
Requirement already satisfied: urllib3<3,>=1.21.1 in /opt/conda/lib/python3.11/site-packages (from requests) (2.2.1)
Requirement already satisfied: certifi>=2017.4.17 in /opt/conda/lib/python3.11/site-packages (from requests) (2024.6.2)
Requirement already satisfied: beautifulsoup4 in /opt/conda/lib/python3.11/site-packages (4.12.3)
Requirement already satisfied: soupsieve>1.2 in /opt/conda/lib/python3.11/site-packages (from beautifulsoup4) (2.5)
Requirement already satisfied: pandas in /opt/conda/lib/python3.11/site-packages (2.2.2)
Requirement already satisfied: numpy>=1.23.2 in /opt/conda/lib/python3.11/site-packages (from pandas) (2.1.1)
Requirement already satisfied: python-dateutil>=2.8.2 in /opt/conda/lib/python3.11/site-packages (from pandas) (2.9.0)
Requirement already satisfied: pytz>=2020.1 in /opt/conda/lib/python3.11/site-packages (from pandas) (2024.1)
Requirement already satisfied: tzdata>=2022.7 in /opt/conda/lib/python3.11/site-packages (from pandas) (2024.1)
Requirement already satisfied: six>=1.5 in /opt/conda/lib/python3.11/site-packages (from python-dateutil>=2.8.2->pandas) (1.16.0)
```

```
import requests
from bs4 import BeautifulSoup
import pandas as pd
```

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

```
url=" https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBMDeveloperSkillsNetwork-PY0220EN-SkillsNetwork/labs/project/stock.
```

```
html_data_2=requests.get(url).text
```

```
soup = BeautifulSoup(html_data_2, 'html5lib')
```

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.

```
read_html_pandas_html_game_Revenue = pd.read_html(url)
```

```
read_html_pandas_game_Revenue=pd.read_html(url)
```

```
game_Revenue.columns = ["Data","Revenue"]
```

```
read_html_pandas_data=pd.read_html(str(soup))
```

```
game_Revenue = read_html_pandas_data[0]
```

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

```
print(game_Revenue.tail())
```

Out

```
    GameStop Annual Revenue (Millions of US $)  \
11                                       2009
12                                       2008
13                                       2007
14                                       2006
15                                       2005

   GameStop Annual Revenue (Millions of US $).1
11                                       $8,806
12                                       $7,094
13                                       $5,319
14                                       $3,092
15                                       $1,843
```

Note: Use the method similar to what you did in question 2.

▸ Click here if you need help locating the table

```
```

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

```
```

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

```
```

```
!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
```

41]:

```
Collecting yfinance==0.1.67
  Downloading yfinance-0.1.67-py2.py3-none-any.whl.metadata (10 kB)
Requirement already satisfied: pandas>=0.24 in /opt/conda/lib/python3.11/site-packages (from yfinance==0.1.67) (2.2.2)
Requirement already satisfied: numpy>=1.15 in /opt/conda/lib/python3.11/site-packages (from yfinance==0.1.67) (2.1.1)
Requirement already satisfied: requests>=2.20 in /opt/conda/lib/python3.11/site-packages (from yfinance==0.1.67) (2.31.0)
Requirement already satisfied: multitasking>=0.0.7 in /opt/conda/lib/python3.11/site-packages (from yfinance==0.1.67) (0.0.11)
Requirement already satisfied: lxml>=4.5.1 in /opt/conda/lib/python3.11/site-packages (from yfinance==0.1.67) (5.3.0)
Requirement already satisfied: python-dateutil>=2.8.2 in /opt/conda/lib/python3.11/site-packages (from pandas>=0.24->yfinance==0.1.67)
(2.9.0)
Requirement already satisfied: pytz>=2020.1 in /opt/conda/lib/python3.11/site-packages (from pandas>=0.24->yfinance==0.1.67) (2024.1)
Requirement already satisfied: tzdata>=2022.7 in /opt/conda/lib/python3.11/site-packages (from pandas>=0.24->yfinance==0.1.67) (2024.1)
Requirement already satisfied: charset-normalizer<4,>=2 in /opt/conda/lib/python3.11/site-packages (from requests>=2.20->yfinance==0.1.67)
(3.3.2)
Requirement already satisfied: idna<4,>=2.5 in /opt/conda/lib/python3.11/site-packages (from requests>=2.20->yfinance==0.1.67) (3.7)
Requirement already satisfied: urllib3<3,>=1.21.1 in /opt/conda/lib/python3.11/site-packages (from requests>=2.20->yfinance==0.1.67) (2.2.1)
Requirement already satisfied: certifi>=2017.4.17 in /opt/conda/lib/python3.11/site-packages (from requests>=2.20->yfinance==0.1.67)
(2024.6.2)
Requirement already satisfied: six>=1.5 in /opt/conda/lib/python3.11/site-packages (from python-dateutil>=2.8.2->pandas>=0.24-
>yfinance==0.1.67) (1.16.0)
Downloading yfinance-0.1.67-py2.py3-none-any.whl (25 kB)
Installing collected packages: yfinance
  Attempting uninstall: yfinance
    Found existing installation: yfinance 0.2.43
    Uninstalling yfinance-0.2.43:
      Successfully uninstalled yfinance-0.2.43
Successfully installed yfinance-0.1.67

Looking for: ['bs4==4.10.0']

?25l2K0G[+] 0.0s
2K1A2K0G[+] 0.1s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  13.7kB /  38.0MB @ 242.4kB/s  0.1s
conda-forge/noarch   ━━━━━━━━━━╸━━━━━━━━━━━━━━   0.0 B /  ??.?MB @  ??.?MB/s  0.1s2K1A2K1A2K0G[+] 0.2s
conda-forge/linux-64 ━╸━━━━━━━━━━━━━━━━━━━━━━━━   4.8MB /  38.0MB @  30.4MB/s  0.2s
conda-forge/noarch   ━━━╸━━━━━━━━━━━━━━━━━━━━━━   3.6MB /  16.4MB @  21.2MB/s  0.2s2K1A2K1A2K0G[+] 0.3s
conda-forge/linux-64 ━━━━╸━━━━━━━━━━━━━━━━━━━━━   9.3MB /  38.0MB @  35.5MB/s  0.3s
conda-forge/noarch   ━━━━━━━━╸━━━━━━━━━━━━━━━━   8.0MB /  16.4MB @  29.3MB/s  0.3s2K1A2K1A2K0G[+] 0.4s
conda-forge/linux-64 ━━━━━━╸━━━━━━━━━━━━━━━━━━  13.3MB /  38.0MB @  36.4MB/s  0.4s
conda-forge/noarch   ━━━━━━━━━━━╸━━━━━━━━━━━━━  12.1MB /  16.4MB @  32.1MB/s  0.4s2K1A2K1A2K0G[+] 0.5s
conda-forge/linux-64 ━━━━━━━━╸━━━━━━━━━━━━━━━━  18.1MB /  38.0MB @  38.6MB/s  0.5s
conda-forge/noarch   ━━━━━━━━━━━━━━━━━━━━━━╸━━  14.4MB /  16.4MB @  33.6MB/s  0.5s2K1A2K1A2K0Gconda-forge/noarch
16.4MB @  34.8MB/s  0.5s
[+] 0.6s
conda-forge/linux-64 ━━━━━━━━━━━━╸━━━━━━━━━━━━  22.9MB /  38.0MB @  38.8MB/s  0.6s2K1A2K0G[+] 0.7s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━╸━━━━━━━━  31.3MB /  38.0MB @  45.2MB/s  0.7s2K1A2K0G[+] 0.8s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  0.8s2K1A2K0G[+] 0.9s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  0.9s2K1A2K0G[+] 1.0s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  1.0s2K1A2K0G[+] 1.1s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  1.1s2K1A2K0G[+] 1.2s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  1.2s2K1A2K0G[+] 1.3s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  1.3s2K1A2K0G[+] 1.4s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  1.4s2K1A2K0G[+] 1.5s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  1.5s2K1A2K0G[+] 1.6s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  1.6s2K1A2K0G[+] 1.7s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  1.7s2K1A2K0G[+] 1.8s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  1.8s2K1A2K0G[+] 1.9s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  1.9s2K1A2K0G[+] 2.0s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  2.0s2K1A2K0G[+] 2.1s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  2.1s2K1A2K0G[+] 2.2s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  2.2s2K1A2K0G[+] 2.3s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  2.3s2K1A2K0G[+] 2.4s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  2.4s2K1A2K0G[+] 2.5s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  2.5s2K1A2K0G[+] 2.6s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  2.6s2K1A2K0G[+] 2.7s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  2.7s2K1A2K0G[+] 2.8s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  2.8s2K1A2K0G[+] 2.9s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  2.9s2K1A2K0G[+] 3.0s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  3.0s2K1A2K0G[+] 3.1s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  3.1s2K1A2K0G[+] 3.2s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  3.2s2K1A2K0G[+] 3.3s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  3.3s2K1A2K0G[+] 3.4s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  3.4s2K1A2K0G[+] 3.5s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  3.5s2K1A2K0G[+] 3.6s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  3.6s2K1A2K0G[+] 3.7s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  3.7s2K1A2K0G[+] 3.8s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  3.8s2K1A2K0G[+] 3.9s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  3.9s2K1A2K0G[+] 4.0s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  4.0s2K1A2K0G[+] 4.1s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  4.1s2K1A2K0G[+] 4.2s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  4.2s2K1A2K0G[+] 4.3s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  4.3s2K1A2K0G[+] 4.4s
conda-forge/linux-64 ━━━━━━━━━━━━━━━━━━━━━━━━━━  36.0MB /  38.0MB @  48.4MB/s  4.4s2K1A2K0G[+] 4.5s
```

```
conda-forge/linux-64 ──────────────────────────── ──  36.0MB /  38.0MB @  48.4MB/s  4.5s2K1A2KOG[+] 4.6s
conda-forge/linux-64 ──────────────────────────── ──  36.0MB /  38.0MB @  48.4MB/s  4.6s2K1A2KOG[+] 4.7s
conda-forge/linux-64 ──────────────────────────── ──  36.0MB /  38.0MB @  48.4MB/s  4.7s2K1A2KOG[+] 4.8s
conda-forge/linux-64 ──────────────────────────── ──  36.0MB /  38.0MB @  48.4MB/s  4.8s2K1A2KOG[+] 4.9s
conda-forge/linux-64 ──────────────────────────── ──  36.0MB /  38.0MB @  48.4MB/s  4.9s2K1A2KOG[+] 5.0s
conda-forge/linux-64 ──────────────────────────── ──  36.0MB /  38.0MB @  48.4MB/s  5.0s2K1A2KOG[+] 5.1s
conda-forge/linux-64 ──────────────────────────── ──  36.0MB /  38.0MB @  48.4MB/s  5.1s2K1A2KOG[+] 5.2s
conda-forge/linux-64 ──────────────────────────── ──  36.0MB /  38.0MB @  48.4MB/s  5.2s2K1A2KOG[+] 5.3s
conda-forge/linux-64 ──────────────────────────── ──  36.0MB /  38.0MB @  48.4MB/s  5.3s2K1A2KOG[+] 5.4s
conda-forge/linux-64 ──────────────────────────── ──  36.0MB /  38.0MB @  48.4MB/s  5.4s2K1A2KOG[+] 5.5s
conda-forge/linux-64 ──────────────────────────── ──  36.0MB /  38.0MB @  48.4MB/s  5.5s2K1A2KOG[+] 5.6s
conda-forge/linux-64 ──────────────────────────── ──  36.0MB /  38.0MB @  48.4MB/s  5.6s2K1A2KOG[+] 5.7s
conda-forge/linux-64 ──────────────────────────── ──  36.0MB /  38.0MB @  48.4MB/s  5.7s2K1A2KOG[+] 5.8s
conda-forge/linux-64 ──────────────────────────── ──  36.0MB /  38.0MB @  48.4MB/s  5.8s2K1A2KOGconda-forge/linux-64
38.0MB @  49.8MB/s  5.9s
?25h
Pinned packages:
  - python 3.11.*
  - python 3.11.*


Transaction

  Prefix: /opt/conda

  Updating specs:

   - bs4==4.10.0
   - ca-certificates
   - certifi
   - openssl


  Package               Version  Build         Channel          Size
──────────────────────────────────────────────────────────────────────
  Install:
──────────────────────────────────────────────────────────────────────

  + bs4                  4.10.0  hd8ed1ab_0    conda-forge       4kB
  + libgcc               14.1.0  h77fa898_1    conda-forge     846kB

  Upgrade:
──────────────────────────────────────────────────────────────────────

  - certifi            2024.6.2  pyhd8ed1ab_0  conda-forge     161kB
  + certifi           2024.8.30  pyhd8ed1ab_0  conda-forge     164kB
  - ca-certificates    2024.6.2  hbcca054_0    conda-forge     156kB
  + ca-certificates   2024.8.30  hbcca054_0    conda-forge     159kB
  - libgomp              13.2.0  h77fa898_6    conda-forge     420kB
  + libgomp              14.1.0  h77fa898_1    conda-forge     460kB
  - libgcc-ng            13.2.0  h77fa898_6    conda-forge     778kB
  + libgcc-ng            14.1.0  h69a702a_1    conda-forge      52kB
  - openssl               3.3.1  h4ab18f5_0    conda-forge       3MB
  + openssl               3.3.2  hb9d3cd8_0    conda-forge       3MB

  Downgrade:
──────────────────────────────────────────────────────────────────────

  - beautifulsoup4       4.12.3  pyha770c72_0  conda-forge     118kB
  + beautifulsoup4       4.10.0  pyha770c72_0  conda-forge      79kB

  Summary:

  Install: 2 packages
  Upgrade: 5 packages
  Downgrade: 1 packages

  Total download: 5MB

──────────────────────────────────────────────────────────────────────


?25l2KOG[+] 0.0s
Downloading  (3) - ──────────────────────────   0.0 B beautifulsoup4             0.0s
Extracting       ──────────────────────────        0                            0.0s2K1A2K1A2KOGcertifi
163.8kB @   2.5MB/s  0.1s
bs4                                              4.3kB @  53.0kB/s  0.1s
[+] 0.1s
Downloading  (5) ──────────────────────── ─ 168.1kB beautifulsoup4             0.1s
Extracting   (2) ──── ──────────────────── ──       0 bs4                        0.0s2K1A2K1A2KOGbeautifulsoup4
79.2kB @ 782.8kB/s  0.1s
ca-certificates                                159.0kB @ 894.6kB/s  0.2s
libgcc-ng                                       52.2kB @ 293.0kB/s  0.1s
[+] 0.2s
Downloading  (3) ──────── ──────────────────   1.7MB libgcc                     0.3s
```

```
Extracting   (5) ━━━━ ━━━━━━━━━━━━━━━━━━━━ ━━       0 bs4                          0.2s2K1A2K1A2Kp
460.2kB @   1.8MB/s  0.2s
openssl                                        2.9MB @  11.1MB/s  0.2s
[+] 0.3s
Downloading       ━━━━━━━━━━━━━━━━━━━━━━━━━   4.7MB                              0.3s
Extracting   (6) ━━━━ ━━━━━━━━━━━━━━━━━━━━       2 beautifulsoup4               0.2s2K1A2K1A2KOG[+] 0.4s
Downloading       ━━━━━━━━━━━━━━━━━━━━━━━━━   4.7MB                              0.3s
Extracting   (4) ━━━━━━━━━ ━━━━━━━━━━━━━━━       4 libgcc                       0.3s2K1A2K1A2KOG[+] 0.5s
Downloading       ━━━━━━━━━━━━━━━━━━━━━━━━━   4.7MB                              0.3s
Extracting   (3) ━━━━━━━━━━━━ ━━━━━━━━━━━━       5 libgcc                       0.4s2K1A2K1A2KOG[+] 0.6s
Downloading       ━━━━━━━━━━━━━━━━━━━━━━━━━   4.7MB                              0.3s
Extracting        ━━━━━━━━━━━━━━━━━━━━━━━━━       8                              0.5s2K1A2K1A2KOGission denied:
'/opt/conda/lib/python3.11/site-packages/certifi-2024.6.2.dist-info/INSTALLER' -> '/opt/conda/lib/python3.11/site-packages/certifi-
2024.6.2.dist-info/INSTALLER.c~'
()


[Errno 13] Permission denied: '/opt/conda/lib/python3.11/site-packages/certifi-2024.6.2.dist-info/INSTALLER' ->
'/opt/conda/lib/python3.11/site-packages/certifi-2024.6.2.dist-info/INSTALLER.c~'
()
```

42]:
```
import pandas as pd
import requests
from bs4 import BeautifulSoup
```

43]:
```
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
```

44]:
```
!pip install pandas
!pip install requests
!pip install bs4
!pip install html5lib
!pip install lxml
!pip install plotly
```

44]:
```
Requirement already satisfied: pandas in /opt/conda/lib/python3.11/site-packages (2.2.2)
Requirement already satisfied: numpy>=1.23.2 in /opt/conda/lib/python3.11/site-packages (from pandas) (2.1.1)
Requirement already satisfied: python-dateutil>=2.8.2 in /opt/conda/lib/python3.11/site-packages (from pandas) (2.9.0)
Requirement already satisfied: pytz>=2020.1 in /opt/conda/lib/python3.11/site-packages (from pandas) (2024.1)
Requirement already satisfied: tzdata>=2022.7 in /opt/conda/lib/python3.11/site-packages (from pandas) (2024.1)
Requirement already satisfied: six>=1.5 in /opt/conda/lib/python3.11/site-packages (from python-dateutil>=2.8.2->pandas) (1.16.0)
Requirement already satisfied: requests in /opt/conda/lib/python3.11/site-packages (2.31.0)
Requirement already satisfied: charset-normalizer<4,>=2 in /opt/conda/lib/python3.11/site-packages (from requests) (3.3.2)
Requirement already satisfied: idna<4,>=2.5 in /opt/conda/lib/python3.11/site-packages (from requests) (3.7)
Requirement already satisfied: urllib3<3,>=1.21.1 in /opt/conda/lib/python3.11/site-packages (from requests) (2.2.1)
Requirement already satisfied: certifi>=2017.4.17 in /opt/conda/lib/python3.11/site-packages (from requests) (2024.6.2)
Requirement already satisfied: bs4 in /opt/conda/lib/python3.11/site-packages (0.0.2)
Requirement already satisfied: beautifulsoup4 in /opt/conda/lib/python3.11/site-packages (from bs4) (4.12.3)
Requirement already satisfied: soupsieve>1.2 in /opt/conda/lib/python3.11/site-packages (from beautifulsoup4->bs4) (2.5)
Requirement already satisfied: html5lib in /opt/conda/lib/python3.11/site-packages (1.1)
Requirement already satisfied: six>=1.9 in /opt/conda/lib/python3.11/site-packages (from html5lib) (1.16.0)
Requirement already satisfied: webencodings in /opt/conda/lib/python3.11/site-packages (from html5lib) (0.5.1)
Requirement already satisfied: lxml in /opt/conda/lib/python3.11/site-packages (5.3.0)
Requirement already satisfied: plotly in /opt/conda/lib/python3.11/site-packages (5.22.0)
Requirement already satisfied: tenacity>=6.2.0 in /opt/conda/lib/python3.11/site-packages (from plotly) (8.4.1)
Requirement already satisfied: packaging in /opt/conda/lib/python3.11/site-packages (from plotly) (24.0)
```

39]:
```
import warnings
# Ignore all warnings
warnings.filterwarnings("ignore", category=FutureWarning)
```

45]:
```
import plotly.graph_objects as go
from plotly.subplots import make_subplots
```

46]:
```
import yfinance as yf
```

48]:
```
!pip install matplotlib
```

48]:
```
Requirement already satisfied: matplotlib in /opt/conda/lib/python3.11/site-packages (3.9.2)
Requirement already satisfied: contourpy>=1.0.1 in /opt/conda/lib/python3.11/site-packages (from matplotlib) (1.3.0)
Requirement already satisfied: cycler>=0.10 in /opt/conda/lib/python3.11/site-packages (from matplotlib) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in /opt/conda/lib/python3.11/site-packages (from matplotlib) (4.53.1)
Requirement already satisfied: kiwisolver>=1.3.1 in /opt/conda/lib/python3.11/site-packages (from matplotlib) (1.4.7)
Requirement already satisfied: numpy>=1.23 in /opt/conda/lib/python3.11/site-packages (from matplotlib) (2.1.1)
Requirement already satisfied: packaging>=20.0 in /opt/conda/lib/python3.11/site-packages (from matplotlib) (24.0)
Requirement already satisfied: pillow>=8 in /opt/conda/lib/python3.11/site-packages (from matplotlib) (10.4.0)
Requirement already satisfied: pyparsing>=2.3.1 in /opt/conda/lib/python3.11/site-packages (from matplotlib) (3.1.4)
```

```
Requirement already satisfied: python-dateutil>=2.7 in /opt/conda/lib/python3.11/site-packages (from matplotlib) (2.9.0)
Requirement already satisfied: six>=1.5 in /opt/conda/lib/python3.11/site-packages (from python-dateutil>=2.7->matplotlib) (1.16.0)
```

51]:
```
import matplotlib.pyplot as plt
```

52]:
```
def make_graph(data, title):
    plt.figure(figsize=(10, 5))
    plt.plot(data['Date'], data['Close'], label='Close Price')
    plt.title(title)
    plt.xlabel('Date')
    plt.ylabel('Close Price (USD)')
    plt.legend()
    plt.grid(True)
    plt.show()
```

53]:
```
ticker = 'TSLA'
```

54]:
```
tesla = yf.Ticker('TSLA')
```

55]:
```
tesla_data=tesla.history(period='max')
```

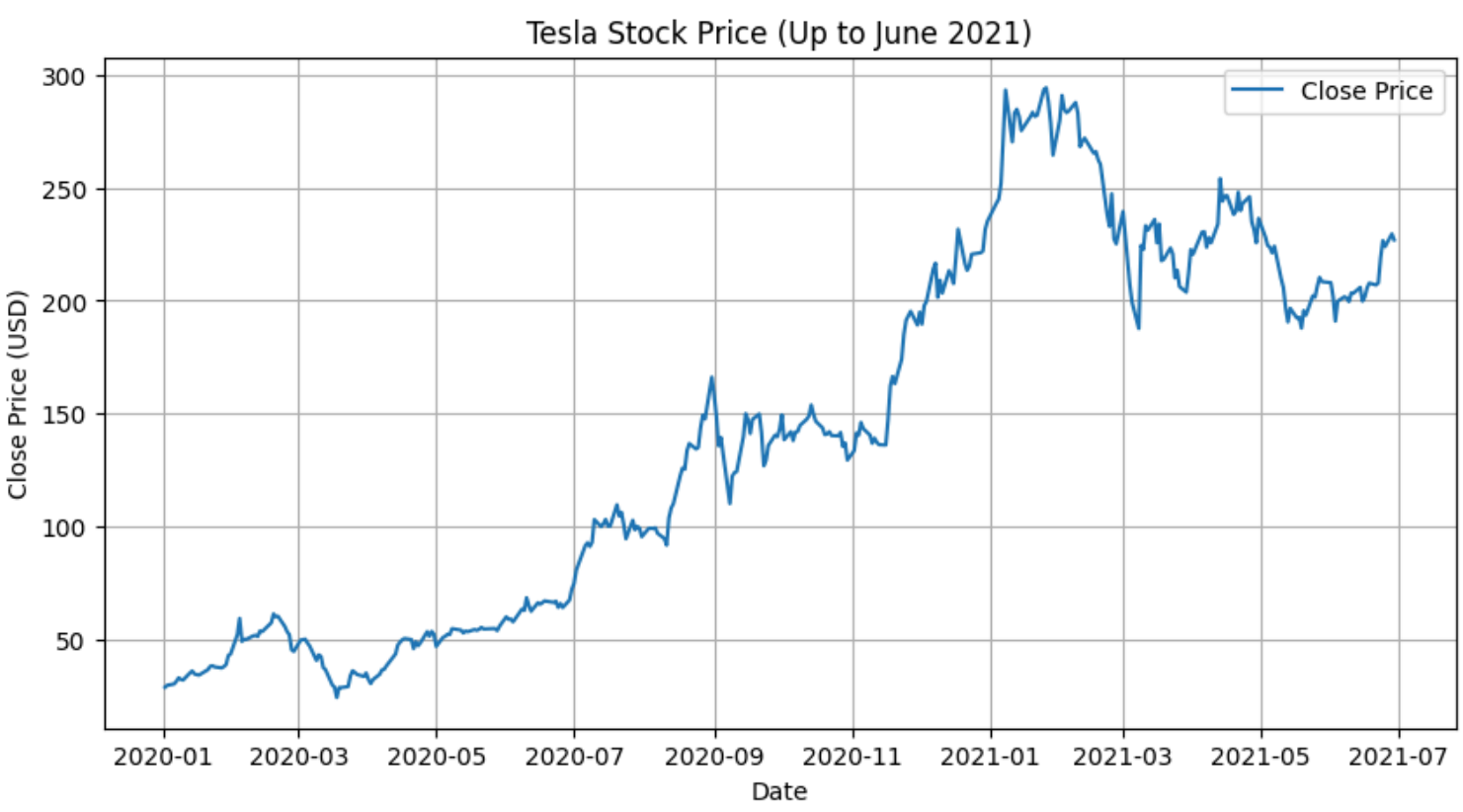
56]:
```
tesla_data = yf.download(ticker, start='2020-01-01', end='2021-06-30')
```

56]:
```
[**********100%**********]  1 of 1 completed
```

57]:
```
tesla_data.reset_index(inplace=True)
```

58]:
```
 make_graph(tesla_data, 'Tesla Stock Price (Up to June 2021)')
```

58]:



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

1]:
```
!pip install yfinance
!pip install bs4
!pip install nbformat
```

1]:
```
Collecting yfinance
  Downloading yfinance-0.2.43-py2.py3-none-any.whl.metadata (11 kB)
Collecting pandas>=1.3.0 (from yfinance)
  Downloading pandas-2.2.2-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (19 kB)
Collecting numpy>=1.16.5 (from yfinance)
  Downloading numpy-2.1.1-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (60 kB)
2K     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 60.9/60.9 kB 6.6 MB/s eta 0:00:00
ent already satisfied: requests>=2.31 in /opt/conda/lib/python3.11/site-packages (from yfinance) (2.31.0)
```

```
Collecting multitasking>=0.0.7 (from yfinance)
  Downloading multitasking-0.0.11-py3-none-any.whl.metadata (5.5 kB)
Collecting lxml>=4.9.1 (from yfinance)
  Downloading lxml-5.3.0-cp311-cp311-manylinux_2_28_x86_64.whl.metadata (3.8 kB)
Requirement already satisfied: platformdirs>=2.0.0 in /opt/conda/lib/python3.11/site-packages (from yfinance) (4.2.1)
Requirement already satisfied: pytz>=2022.5 in /opt/conda/lib/python3.11/site-packages (from yfinance) (2024.1)
Collecting frozendict>=2.3.4 (from yfinance)
  Downloading frozendict-2.4.4-py311-none-any.whl.metadata (23 kB)
Collecting peewee>=3.16.2 (from yfinance)
  Downloading peewee-3.17.6.tar.gz (3.0 MB)
2K     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 3.0/3.0 MB 114.7 MB/s eta 0:00:00
?25h  Installing build dependencies ... ?25ldone
ents to build wheel ... ?25ldone
etadata (pyproject.toml) ... ?25ldone
ent already satisfied: beautifulsoup4>=4.11.1 in /opt/conda/lib/python3.11/site-packages (from yfinance) (4.12.3)
Collecting html5lib>=1.1 (from yfinance)
  Downloading html5lib-1.1-py2.py3-none-any.whl.metadata (16 kB)
Requirement already satisfied: soupsieve>1.2 in /opt/conda/lib/python3.11/site-packages (from beautifulsoup4>=4.11.1->yfinance) (2.5)
Requirement already satisfied: six>=1.9 in /opt/conda/lib/python3.11/site-packages (from html5lib>=1.1->yfinance) (1.16.0)
Requirement already satisfied: webencodings in /opt/conda/lib/python3.11/site-packages (from html5lib>=1.1->yfinance) (0.5.1)
Requirement already satisfied: python-dateutil>=2.8.2 in /opt/conda/lib/python3.11/site-packages (from pandas>=1.3.0->yfinance) (2.9.0)
Collecting tzdata>=2022.7 (from pandas>=1.3.0->yfinance)
  Downloading tzdata-2024.1-py2.py3-none-any.whl.metadata (1.4 kB)
Requirement already satisfied: charset-normalizer<4,>=2 in /opt/conda/lib/python3.11/site-packages (from requests>=2.31->yfinance) (3.3.2)
Requirement already satisfied: idna<4,>=2.5 in /opt/conda/lib/python3.11/site-packages (from requests>=2.31->yfinance) (3.7)
Requirement already satisfied: urllib3<3,>=1.21.1 in /opt/conda/lib/python3.11/site-packages (from requests>=2.31->yfinance) (2.2.1)
Requirement already satisfied: certifi>=2017.4.17 in /opt/conda/lib/python3.11/site-packages (from requests>=2.31->yfinance) (2024.6.2)
Downloading yfinance-0.2.43-py2.py3-none-any.whl (84 kB)
2K     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 84.6/84.6 kB 8.3 MB/s eta 0:00:00
l5lib-1.1-py2.py3-none-any.whl (112 kB)
2K     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 112.2/112.2 kB 13.9 MB/s eta 0:00:00
l-5.3.0-cp311-cp311-manylinux_2_28_x86_64.whl (5.0 MB)
2K     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 5.0/5.0 MB 120.0 MB/s eta 0:00:0000:01
ultitasking-0.0.11-py3-none-any.whl (8.5 kB)
Downloading numpy-2.1.1-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (16.3 MB)
2K     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 16.3/16.3 MB 107.4 MB/s eta 0:00:0000:0100:01
anylinux_2_17_x86_64.manylinux2014_x86_64.whl (13.0 MB)
2K     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 13.0/13.0 MB 130.1 MB/s eta 0:00:0000:010:01
?25hDownloading tzdata-2024.1-py2.py3-none-any.whl (345 kB)
2K     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 345.4/345.4 kB 35.8 MB/s eta 0:00:00
l) ... ?25ldone
e=peewee-3.17.6-py3-none-any.whl size=138891 sha256=4891345df2c482cc9b32de4024611fe0854afd87e5f817c99a9264ff7e3f4df1
  Stored in directory: /home/jupyterlab/.cache/pip/wheels/1c/09/7e/9f659fde248ecdc1722a142c1d744271aad3914a0afc191058
Successfully built peewee
Installing collected packages: peewee, multitasking, tzdata, numpy, lxml, html5lib, frozendict, pandas, yfinance
Successfully installed frozendict-2.4.4 html5lib-1.1 lxml-5.3.0 multitasking-0.0.11 numpy-2.1.1 pandas-2.2.2 peewee-3.17.6 tzdata-2024.1
yfinance-0.2.43
Collecting bs4
  Downloading bs4-0.0.2-py2.py3-none-any.whl.metadata (411 bytes)
Requirement already satisfied: beautifulsoup4 in /opt/conda/lib/python3.11/site-packages (from bs4) (4.12.3)
Requirement already satisfied: soupsieve>1.2 in /opt/conda/lib/python3.11/site-packages (from beautifulsoup4->bs4) (2.5)
Downloading bs4-0.0.2-py2.py3-none-any.whl (1.2 kB)
Installing collected packages: bs4
Successfully installed bs4-0.0.2
Requirement already satisfied: nbformat in /opt/conda/lib/python3.11/site-packages (5.10.4)
Requirement already satisfied: fastjsonschema>=2.15 in /opt/conda/lib/python3.11/site-packages (from nbformat) (2.19.1)
Requirement already satisfied: jsonschema>=2.6 in /opt/conda/lib/python3.11/site-packages (from nbformat) (4.22.0)
Requirement already satisfied: jupyter-core!=5.0.*,>=4.12 in /opt/conda/lib/python3.11/site-packages (from nbformat) (5.7.2)
Requirement already satisfied: traitlets>=5.1 in /opt/conda/lib/python3.11/site-packages (from nbformat) (5.14.3)
Requirement already satisfied: attrs>=22.2.0 in /opt/conda/lib/python3.11/site-packages (from jsonschema>=2.6->nbformat) (23.2.0)
Requirement already satisfied: jsonschema-specifications>=2023.03.6 in /opt/conda/lib/python3.11/site-packages (from jsonschema>=2.6-
>nbformat) (2023.12.1)
Requirement already satisfied: referencing>=0.28.4 in /opt/conda/lib/python3.11/site-packages (from jsonschema>=2.6->nbformat) (0.35.1)
Requirement already satisfied: rpds-py>=0.7.1 in /opt/conda/lib/python3.11/site-packages (from jsonschema>=2.6->nbformat) (0.18.0)
Requirement already satisfied: platformdirs>=2.5 in /opt/conda/lib/python3.11/site-packages (from jupyter-core!=5.0.*,>=4.12->nbformat)
(4.2.1)
```

[2]:
```
!pip install pandas
!pip install requests
!pip install bs4
!pip install html5lib
!pip install lxml
!pip install plotly
```

[2]:
```
Requirement already satisfied: pandas in /opt/conda/lib/python3.11/site-packages (2.2.2)
Requirement already satisfied: numpy>=1.23.2 in /opt/conda/lib/python3.11/site-packages (from pandas) (2.1.1)
Requirement already satisfied: python-dateutil>=2.8.2 in /opt/conda/lib/python3.11/site-packages (from pandas) (2.9.0)
Requirement already satisfied: pytz>=2020.1 in /opt/conda/lib/python3.11/site-packages (from pandas) (2024.1)
Requirement already satisfied: tzdata>=2022.7 in /opt/conda/lib/python3.11/site-packages (from pandas) (2024.1)
Requirement already satisfied: six>=1.5 in /opt/conda/lib/python3.11/site-packages (from python-dateutil>=2.8.2->pandas) (1.16.0)
Requirement already satisfied: requests in /opt/conda/lib/python3.11/site-packages (2.31.0)
Requirement already satisfied: charset-normalizer<4,>=2 in /opt/conda/lib/python3.11/site-packages (from requests) (3.3.2)
Requirement already satisfied: idna<4,>=2.5 in /opt/conda/lib/python3.11/site-packages (from requests) (3.7)
Requirement already satisfied: urllib3<3,>=1.21.1 in /opt/conda/lib/python3.11/site-packages (from requests) (2.2.1)
```

```
Requirement already satisfied: certifi>=2017.4.17 in /opt/conda/lib/python3.11/site-packages (from requests) (2024.6.2)
Requirement already satisfied: bs4 in /opt/conda/lib/python3.11/site-packages (0.0.2)
Requirement already satisfied: beautifulsoup4 in /opt/conda/lib/python3.11/site-packages (from bs4) (4.12.3)
Requirement already satisfied: soupsieve>1.2 in /opt/conda/lib/python3.11/site-packages (from beautifulsoup4->bs4) (2.5)
Requirement already satisfied: html5lib in /opt/conda/lib/python3.11/site-packages (1.1)
Requirement already satisfied: six>=1.9 in /opt/conda/lib/python3.11/site-packages (from html5lib) (1.16.0)
Requirement already satisfied: webencodings in /opt/conda/lib/python3.11/site-packages (from html5lib) (0.5.1)
Requirement already satisfied: lxml in /opt/conda/lib/python3.11/site-packages (5.3.0)
Requirement already satisfied: plotly in /opt/conda/lib/python3.11/site-packages (5.22.0)
Requirement already satisfied: tenacity>=6.2.0 in /opt/conda/lib/python3.11/site-packages (from plotly) (8.4.1)
Requirement already satisfied: packaging in /opt/conda/lib/python3.11/site-packages (from plotly) (24.0)
```

[3]:
```
import plotly.graph_objects as go
from plotly.subplots import make_subplots
```

[4]:
```
!pip install matplotlib
```

[4]:
```
Collecting matplotlib
  Downloading matplotlib-3.9.2-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (11 kB)
Collecting contourpy>=1.0.1 (from matplotlib)
  Downloading contourpy-1.3.0-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (5.4 kB)
Collecting cycler>=0.10 (from matplotlib)
  Downloading cycler-0.12.1-py3-none-any.whl.metadata (3.8 kB)
Collecting fonttools>=4.22.0 (from matplotlib)
  Downloading fonttools-4.53.1-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (162 kB)
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 matplotlib)
  Downloading kiwisolver-1.4.7-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (6.3 kB)
Requirement already satisfied: numpy>=1.23 in /opt/conda/lib/python3.11/site-packages (from matplotlib) (2.1.1)
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Collecting pillow>=8 (from matplotlib)
  Downloading pillow-10.4.0-cp311-cp311-manylinux_2_28_x86_64.whl.metadata (9.2 kB)
Collecting pyparsing>=2.3.1 (from matplotlib)
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atplotlib
Successfully installed contourpy-1.3.0 cycler-0.12.1 fonttools-4.53.1 kiwisolver-1.4.7 matplotlib-3.9.2 pillow-10.4.0 pyparsing-3.1.4
```

[6]:
```
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
```

[8]:
```
!pip install matplotlib
```

[8]:
```
Requirement already satisfied: matplotlib in /opt/conda/lib/python3.11/site-packages (3.9.2)
Requirement already satisfied: contourpy>=1.0.1 in /opt/conda/lib/python3.11/site-packages (from matplotlib) (1.3.0)
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Requirement already satisfied: fonttools>=4.22.0 in /opt/conda/lib/python3.11/site-packages (from matplotlib) (4.53.1)
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Requirement already satisfied: pyparsing>=2.3.1 in /opt/conda/lib/python3.11/site-packages (from matplotlib) (3.1.4)
Requirement already satisfied: python-dateutil>=2.7 in /opt/conda/lib/python3.11/site-packages (from matplotlib) (2.9.0)
Requirement already satisfied: six>=1.5 in /opt/conda/lib/python3.11/site-packages (from python-dateutil>=2.7->matplotlib) (1.16.0)
```

[7]:
```
import warnings
# Ignore all warnings
warnings.filterwarnings("ignore", category=FutureWarning)
```

[9]:
```
import plotly.graph_objects as go
from plotly.subplots import make_subplots
```

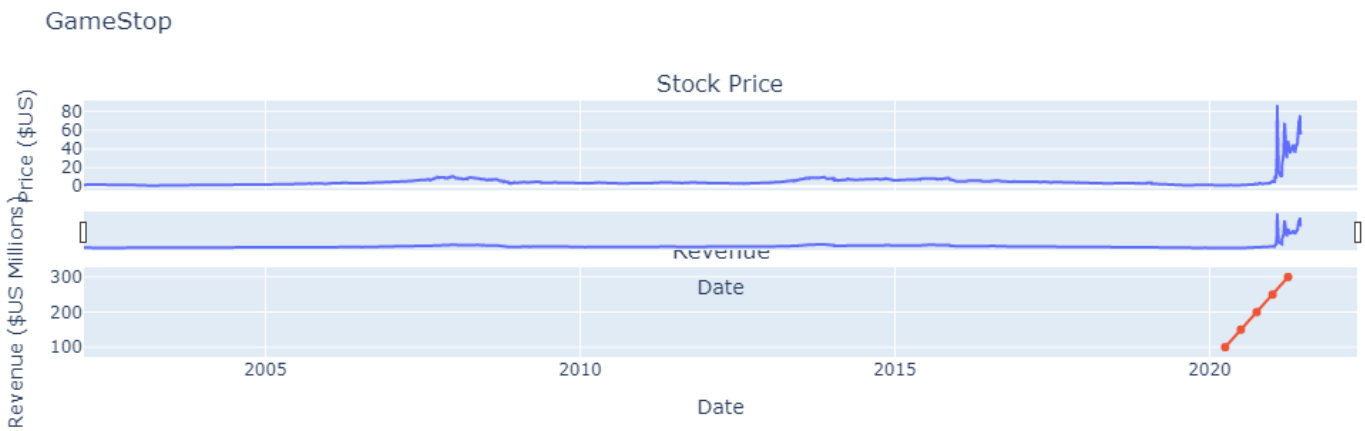
[25]:
```
gme_data = pd.DataFrame({'Date': pd.date_range(start='2020-01-01', end='2021-06-30', freq='M'),  'Close': [4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
```

```
26]: gme_revenue = pd.DataFrame({'Date': pd.date_range(start='2020-01-01', end='2021-06-30', freq='Q'),'Revenue': [100, 150, 200, 250, 300, 350]})
```

```
38]: def make_graph(stock_data, revenue_data, stock):
    fig = make_subplots(rows=2, cols=1, shared_xaxes=True, subplot_titles=("Stock Price", "Revenue"), vertical_spacing=0.3)

    stock_data_specific = stock_data[stock_data.Date <= '2021-06-14']
    revenue_data_specific = revenue_data[revenue_data.Date <= '2021-06-14']

    fig.add_trace(go.Scatter(x=pd.to_datetime(stock_data_specific.Date), y=stock_data_specific.Close, name="Stock Price"), row=1, col=1)
    fig.add_trace(go.Scatter(x=pd.to_datetime(revenue_data_specific.Date), y=revenue_data_specific.Revenue.astype(float), name="Revenue"), ro

    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()
```

```
40]: make_graph(gme_data, gme_revenue, 'GameStop')
```

40]:



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.