# Python Project for Data Science

April 15, 2025

[38]:

```
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
```

[39]:

```
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()
```

## 0.1 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.**

[53]:

```
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.**

[54]:

```
tesla_data = Tesla.history(period = "max")
```

[55]:

```
tesla_data.reset_index(inplace = True)
tesla_data.head()
```

[55]:

```
                       Date      Open      High       Low     Close  \
0 2010-06-29 00:00:00-04:00  1.266667  1.666667  1.169333  1.592667
1 2010-06-30 00:00:00-04:00  1.719333  2.028000  1.553333  1.588667
2 2010-07-01 00:00:00-04:00  1.666667  1.728000  1.351333  1.464000
3 2010-07-02 00:00:00-04:00  1.533333  1.540000  1.247333  1.280000
4 2010-07-06 00:00:00-04:00  1.333333  1.333333  1.055333  1.074000

      Volume  Dividends  Stock Splits
0  281494500        0.0           0.0
1  257806500        0.0           0.0
2  123282000        0.0           0.0
3   77097000        0.0           0.0
4  103003500        0.0           0.0
```

### 0.2 Question 2: Use Webscraping to Extract Tesla Revenue Data

[64]:

```
url = "https://www.macrotrends.net/stocks/charts/TSLA/tesla/revenue"
headers = {"User-Agent": "Mozilla/5.0 (Windows NT 10.0; Win64; x64)"}
response = requests.get(url, headers=headers)
```

[66]:

```
soup = BeautifulSoup(response.text, "html.parser")

print(soup.find_all('title'))
```

```
[<title>Tesla Revenue 2010-2024 | TSLA | MacroTrends</title>]
```

[78]:

```
tesla_revenue = []
for table in soup.find_all('table'):
    header = table.find('th')
    if header and 'Tesla Quarterly Revenue' in header.text:
        rows = table.find_all('tr')
        for row in rows:
            cols = row.find_all('td')
            if len(cols) >= 2:
                date = cols[0].text.strip()
                revenue = cols[1].text.strip().replace('$', '').replace(',', '')
                if revenue != '':
                    tesla_revenue.append({"Date": date, "Revenue": revenue})

tesla_revenue_df = pd.DataFrame(tesla_revenue)
```

[82]:

```
tesla_revenue_df = pd.DataFrame(tesla_revenue)
print(tesla_revenue_df.tail())
```

```
          Date Revenue
57  2010-09-30      31
58  2010-06-30      28
59  2010-03-31      21
60  2009-09-30      46
61  2009-06-30      27
```

## 0.3 Question 3: Use yfinance to Extract Stock Data

```
[83]: GameStop = yf.Ticker("GME")
```

```
[84]: gme_data = GameStop.history(period = 'max')
```

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

```
[85]:                        Date      Open      High       Low     Close    Volume  \
      0 2002-02-13 00:00:00-05:00  1.620128  1.693350  1.603296  1.691667  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  1.683251  1.687459  1.658002  1.674835   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
```

## 0.4 Question 4: Use Webscraping to Extract GME Revenue Data

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

```
[126]: soup = BeautifulSoup(html_data,"html5lib")
```

```
[127]: tables = pd.read_html(url, match="GameStop Quarterly Revenue", flavor='bs4')
       gme_revenue = tables[0]
```

```
[128]: gme_revenue = gme_revenue.rename(columns={'GameStop Quarterly Revenue (Millions␣
        ↪of US $)': 'Date','GameStop Quarterly Revenue (Millions of US $).1':␣
        ↪'Revenue'})
```

```
[129]: gme_revenue["Revenue"] = gme_revenue["Revenue"].str.replace(",", "").str.
        ↪replace("$", "")
```

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

[130]:
```
print(gme_revenue.tail())
```

```
          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
```

## 0.5 Question 5 - Tesla Stock and Revenue Dashboard

[134]:
```
print(type(tesla_revenue))
```

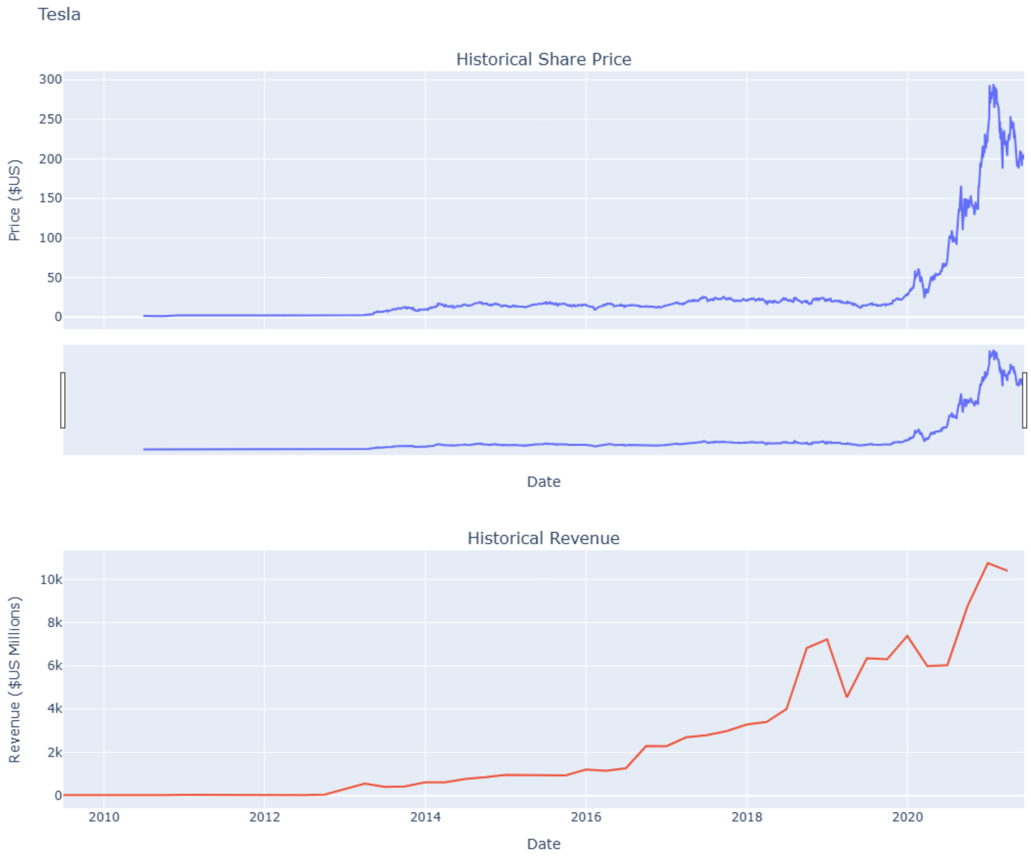
```
<class 'list'>
```

[138]:
```
tesla_revenue = pd.DataFrame(tesla_revenue, columns=['Date', 'Revenue'])
```

[139]:
```
# Clean up revenue column
tesla_revenue["Revenue"] = tesla_revenue["Revenue"].str.replace(",", "").str.
 ↪replace("$", "")
tesla_revenue.dropna(inplace=True)
```

[140]:
```
make_graph(tesla_data, tesla_revenue, 'Tesla')
```

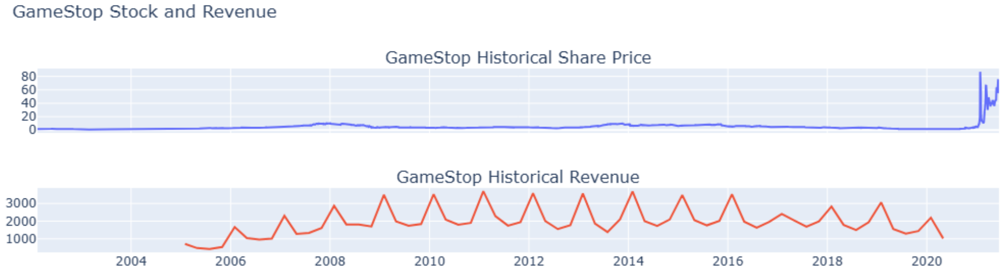
```
C:\Users\Istiak\AppData\Local\Temp\ipykernel_12156\2068038883.py:5: UserWarning:

The argument 'infer_datetime_format' is deprecated and will be removed in a
future version. A strict version of it is now the default, see
https://pandas.pydata.org/pdeps/0004-consistent-to-datetime-parsing.html. You
can safely remove this argument.

C:\Users\Istiak\AppData\Local\Temp\ipykernel_12156\2068038883.py:6: UserWarning:

The argument 'infer_datetime_format' is deprecated and will be removed in a
future version. A strict version of it is now the default, see
https://pandas.pydata.org/pdeps/0004-consistent-to-datetime-parsing.html. You
can safely remove this argument.
```



## 0.6 Question 6 - GameStop Stock and Revenue Dashboard

[144]:

```python
make_graph(gme_data, gme_revenue, 'GameStop')
```



[ ]:

```
```