Capstone Project: Netflix Data

Visualization using Python and Jupyter Notebook

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Introduction

Netflix Stock Profile

- The following is a stock profile (series of studies, visualizations, and analyses that dive into different aspects a publicly traded company's data) of Netflix, completed as part of Codecademy's Data-Science path.
- The analysis and visualizations are based on Netflix and Dow Jones data from 2017.This presentation utilizes the following Python libraries:
  - - Pandas
  - - Matplotlib
  - - Seaborn Code and visualizations prepped using jupyter notebook.

Topics Covered

Stock Health

- Distribution of Netflix stock prices throughout 2017 , broken down quarterly

ESP Review

- Review of estimated versus actual earnings per share, broken down quarterly

Revenue vs Earnings

- Review of Netflix' influx of revenue and subsequent losses or profits throughout the fiscal year.

Stock versus Market

- Comparing Netflix' stock growth against the Dow Jones index

Format

Visualization

- Visualization(s) of the underlying data.

Findings

- Assertions and conclusions reached based on the aforementioned visualizations.

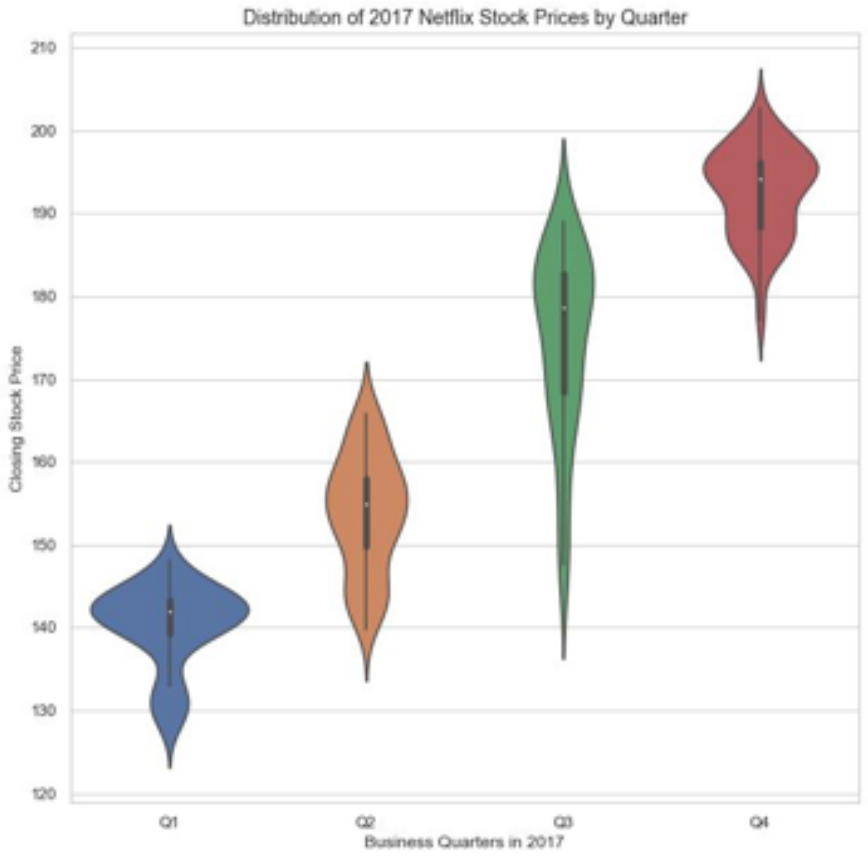
Code Review

- A section that would certainly be absent in a presentation of financial health (i.e. to non-tech users), Code Review includes any relevant notes for the purposes of fact-checking and optimization.

Stock Profile

Stock Health

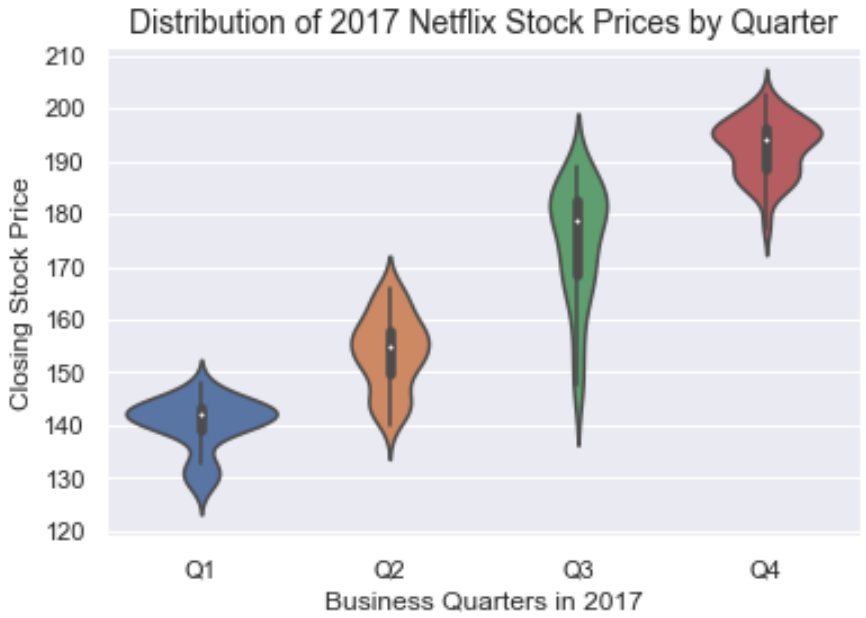
- Mostly steady growth throughout the year, as indicated by:
  - Each Quarter occupying higher position (relative to CSP)
  - Most quarters occupying a relatively equal spread from lowest to highest stock value
- Stock's Closing Price mostly sat between $130 and $200, with extremes at:
  - Lowest: $127.48
  - Highest : $202.67
- While most quarters were relatively steady, Q3 saw the greatest degree of volatility, indicated by:
  - Wide distribution of Closing Stock Prices



Stock Health

- Main changes
  - Applying darkgrid to better tie later quarters to CSP
  - Upping the number of y-ticks for additional granularity

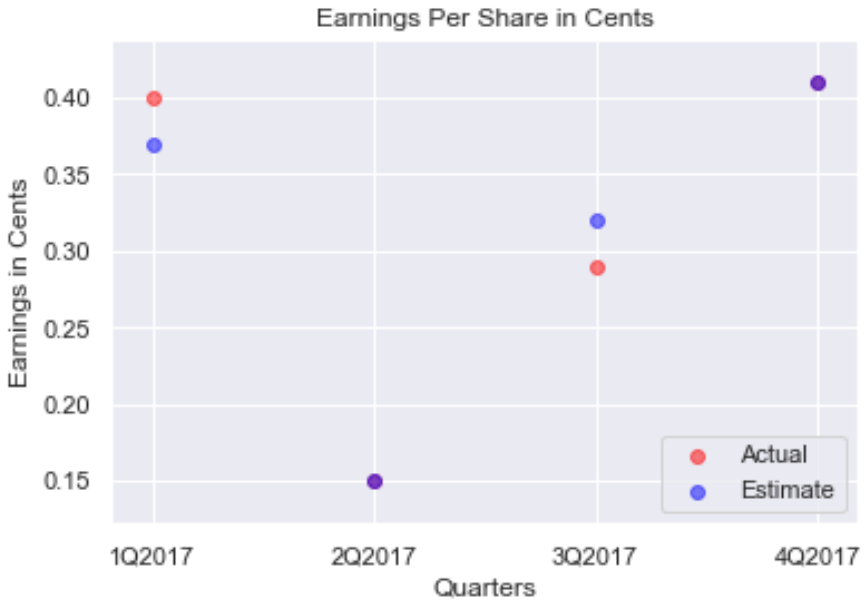
```
sns.set(style="darkgrid") ax =
sns.violinplot(data=netflix_stocks_quarterly,
x=netflix_stocks_quarterly["Quarter"],
y=netflix_stocks_quarterly["Price"] )
ax.set_title("Distribution of 2017 Netflix Stock Prices
by Quarter", fontsize=14) ax.set_xlabel("Business
Quarters in 2017") ax.set_ylabel("Closing Stock Price")
ax.set_yticks(list(range(120, 220, 10))) plt.show()
```



EPS Review

EPS ,as predicted by Yahoo, was accurate in 2/4 quarters (indicated with purple dot):

- - Q2 - Q4
- Netflix EPS outperformed estimates in Q1, but underperformed in Q3.



EPS
Review Code

Main Changes:

- - Plotting a grid in conjunction with two scatter plots
- - Taking the axes position and utilizing that position as a reference point to make the plot 20% narrower.
- - This is done to accommodate a legend outside of the plot itself (while retaining that legend within the figure itself)
- - Placing the legend outside of the plot for readability, by passing in the bbox_to_anchor keyword.

```
chart_labels = ["1Q2017","2Q2017","3Q2017","4Q2017"]
earnings_actual =[.4, .15,.29,.41] earnings_estimate =
[.37,.15,.32,.41 ] ax = plt.subplot()
plt.scatter(x_positions,earnings_actual,color='red',alpha=0
.5)
plt.scatter(x_positions,earnings_estimate,color='blue',alp
ha=0.5) plt.legend(["Actual","Estimate"],loc=4)
plt.xticks(x_positions, chart_labels) ax.set_title("Earnings
Per Share in Cents") ax.set_xlabel("Quarters")
ax.set_ylabel("Earnings in Cents") plt.show()
```

Revenue vs Earnings

Both revenue and earnings saw a consistent upward trend throughout the fiscal year:

Start:

- Revenue: 2.79 (billion)
- Earnings: 0.065 (billion)

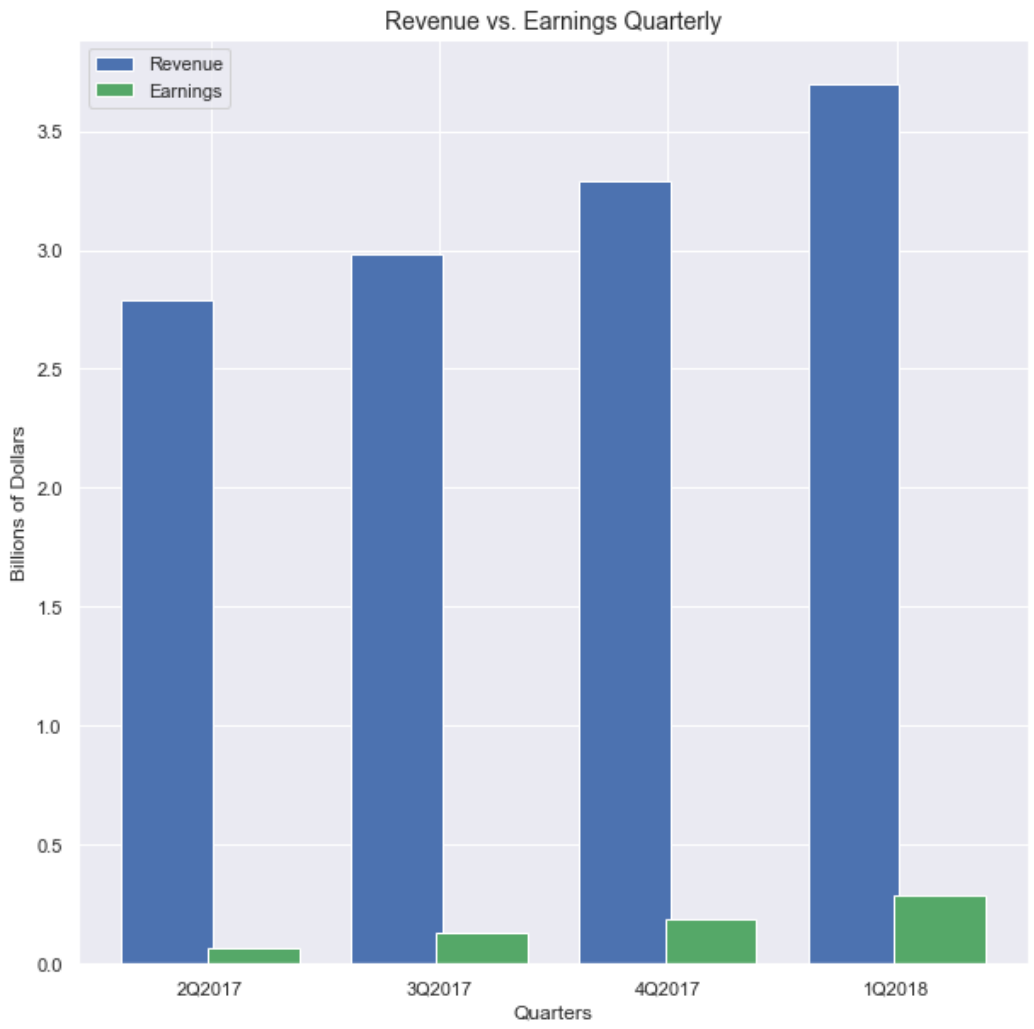
End:

- Revenue: 3.7 (billion)
- Earnings: 0.29 (billion)

The ratio of earnings against revenue also increased:

- Q1: 2.3%
- Q2: 4.3%
- Q3: 5.6%
- Q4: 7.8%

Meaning: Netflix increased their footprint while making themselves ultimately leaner and more profitable.



Revenue vs Earnings code

Main changes:

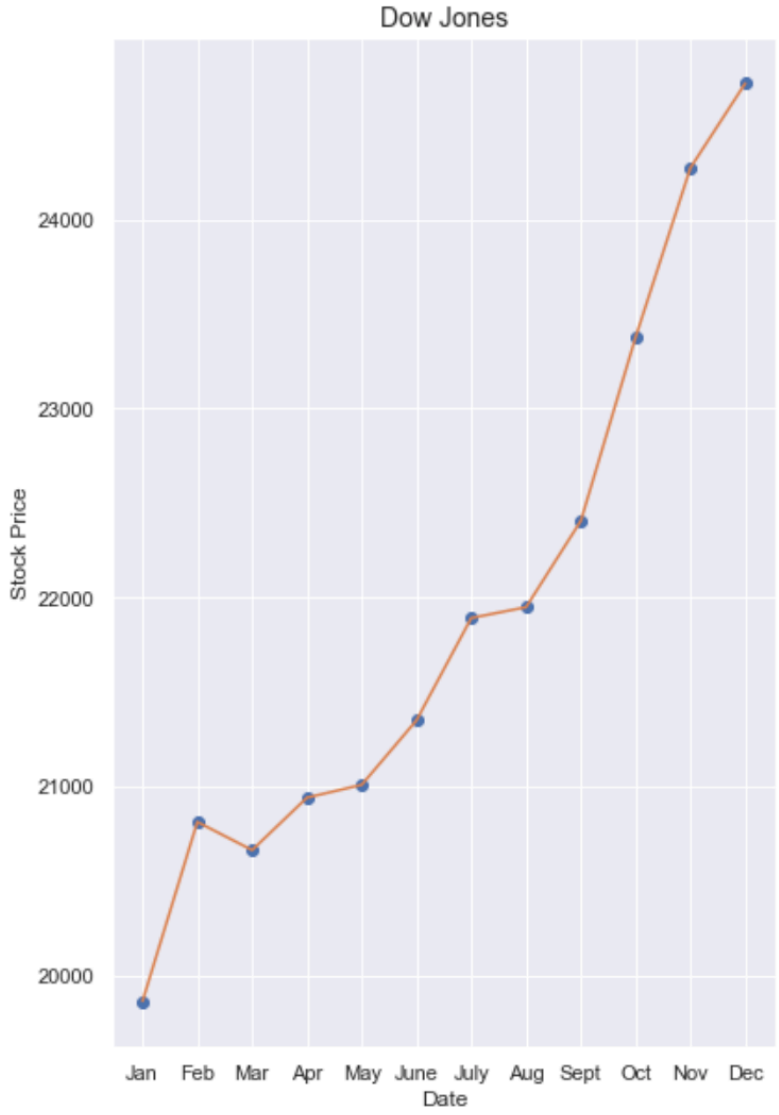
- Retained darkgrid to easily compare
- datasets against metrics
- Changed earnings (i.e profit) color to green to highlight profit to company.

Code used to determine ratio between revenue and earnings for each quarte

```
# The metrics below are in billions of dollars
revenue_by_quarter = [2.79, 2.98,3.29,3.7]
earnings_by_quarter = [.0656,.12959,.18552,.29012]
quarter_labels = ["2Q2017","3Q2017","4Q2017", "1Q2018"]

# Revenue
n = 1  # This is our first dataset (out of 2)
t = 2 # Number of dataset
d = len(quarter_labels) # Number of sets of bars
w = .75 # Width of each bar
bars1_x = [t*element + w*n for element
             in range(d)]



# Earnings
n = 2  # This is our second dataset (out of 2)
t = 2 # Number of dataset
d = len(quarter_labels) # Number of sets of bars
w = .75 # Width of each bar
bars2_x = [t*element + w*n for element
             in range(d)]




middle_x = [ (a + b) / 2.0 for a, b in zip(bars1_x, bars2_x)]
labels = ["Revenue", "Earnings"]
```

```
ratios = []
for i in range(len(revenue_by_quarter)):
    ratios.append(earnings_by_quarter[i] / revenue_by_quarter[i] * 100)
print(ratios)
print("{:.2f}%".format(sum(ratios) / len(ratios)))
```

How did Netflix do relative to the Dow Jones Index?



Stocks vs DJIA

Overall , both Netflix stock value and the Dow Jones rose throughout 2017.

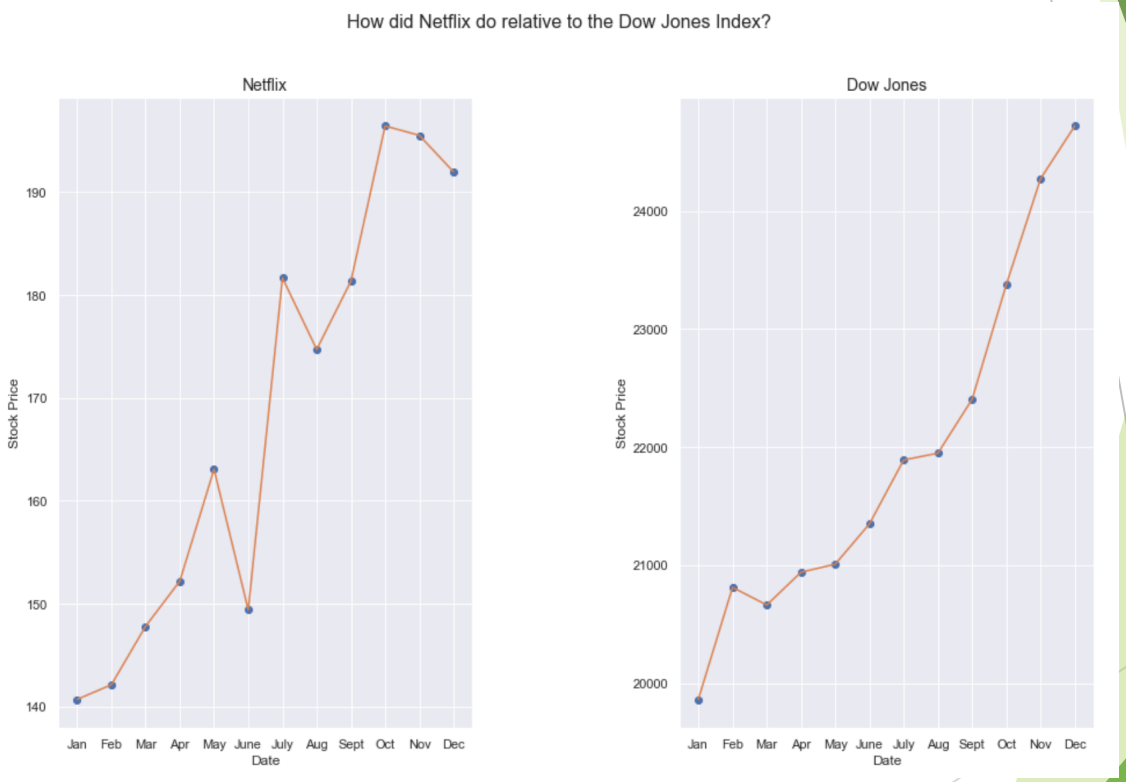
However, Netflix stock was far more volatile, seeing downturns in Q2, Q3, and Q4.

- In comparison, the Dow Jones only saw a brief downturn in Q1.

This means:

- Netflix stock overall was more volatile than the general stock market.
- The stock's volatility was likely not caused by the market.

Netflix accounts for less than 1% of the Dow Jones stock price, suggesting it has little material impact on the overall stock market.



Stocks vs DJIA Code

Main changes:

- - Replaced the yyyy-mm-dd dates from the underlying data set and utilizing a list of month names (abbreviated) and the set_xticklabels method for immediate readability.
- - Passing in overlapping datasets with different linestyles in each plt.plot() call to generate a line with points at each month to highlight price points at regular intervals.

```
compfig = plt.figure(figsize=(16,10))
# Making the figure more readable with month names and applying a supertitle
month_names = ['Jan', 'Feb', 'Mar', 'Apr', 'May', 'June', 'July', 'Aug', 'Sept', 'Oct', 'Nov', 'De
c']
compfig.suptitle("How did Netflix do relative to the Dow Jones Index?", fontsize=16)

# Left plot Netflix
ax1 = plt.subplot(1, 2, 1)
plt.plot(netflix_stocks["Date"], netflix_stocks["Price"], 'o', netflix_stocks["Date"], netflix_sto
cks["Price"], '-')
ax1.set_title("Netflix", fontsize=14)
ax1.set_xlabel("Date")
ax1.set_ylabel("Stock Price")
ax1.set_xticklabels(month_names)

# Right plot Dow Jones
ax2 = plt.subplot(1, 2, 2)
plt.plot(dowjones_stocks["Date"], dowjones_stocks["Price"], 'o', dowjones_stocks["Date"], dowjones
_stocks["Price"], '-')
ax2.set_title("Dow Jones", fontsize=14)
ax2.set_xlabel("Date")
ax2.set_ylabel("Stock Price")
ax2.set_xticklabels(month_names)

plt.subplots_adjust(wspace=0.5)
```

```
print("Checking how the stocks of netflix and the dow jones index compare")
print("Jan 2017\nNetflix: {:.2f} vs. Dow Jones: {:.2f}".format(netflix_stocks[netflix_stocks["Dat
e"] == '2017-01-01']["Price"][0], dowjones_stocks[dowjones_stocks["Date"] == '2017-01-01']["Pric
e"][0]))
print("Ratio of {:.4f}".format(netflix_stocks[netflix_stocks["Date"] == '2017-01-01']["Price"][0]
/ dowjones_stocks[dowjones_stocks["Date"] == '2017-01-01']["Price"][0]))
```