Capstone Project: Netflix Data

Data visualization using Python, Matplotlib, and Seaborn

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Overview: Netflix Stock Data

- Capstone project part of Codecademy's Data Science Career Path
- Visualizations and code developed using these Python libraries:
    - A. *Matplotlib*
    - B. *Pandas*
    - C. *Seaborn*
- Data for Dow Jones Index and Netflix is from 2017
- For details, see appendix for code and visualizations

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What was the distribution of Netflix (NFLX) stock prices in 2017?
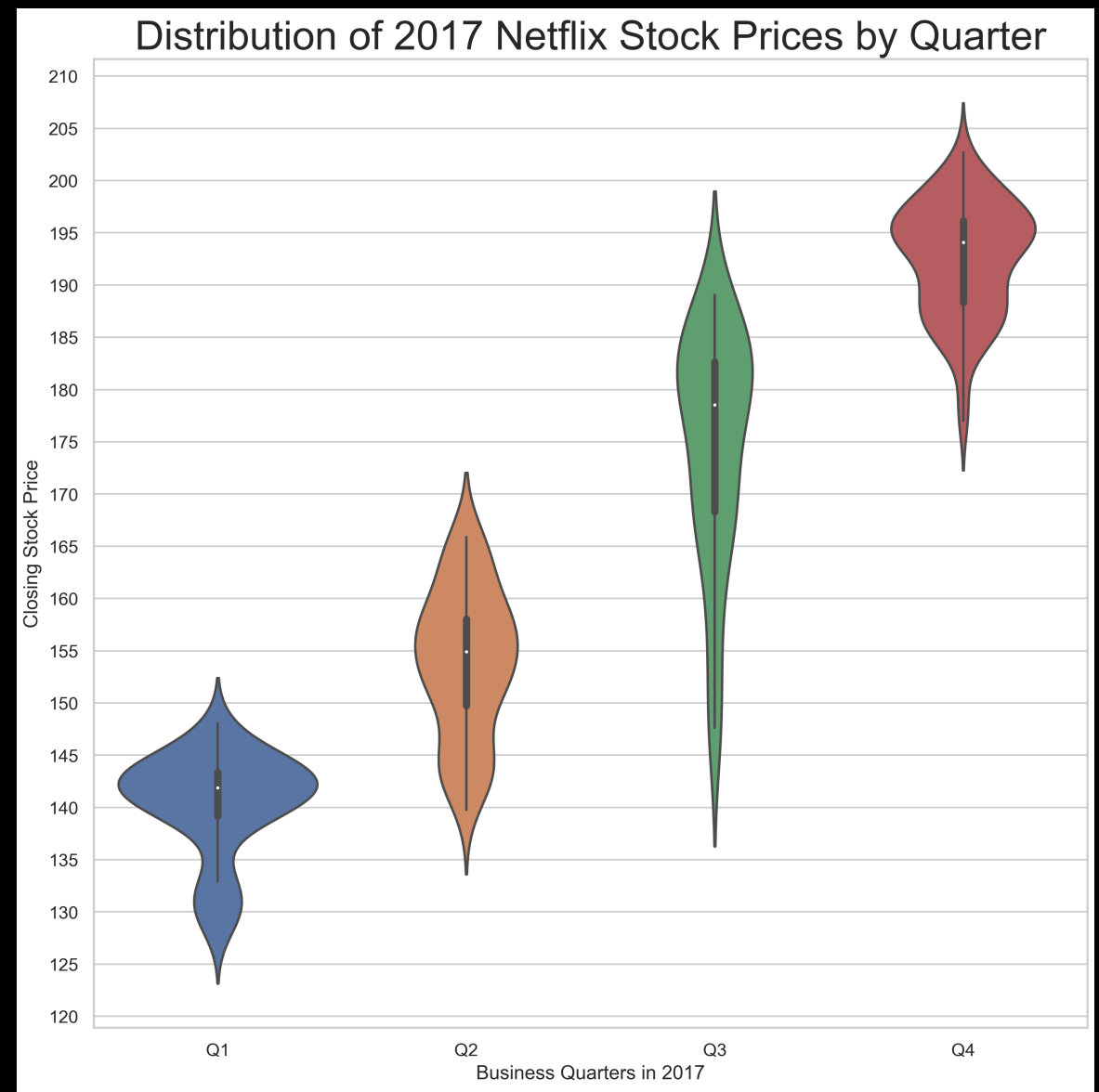
Takeaways:

1. Closing Price:
   - Minimum: $123
   - Maximum: $207
2. Q3 had largest range
3. Steady growth in 2017

Source: Yahoo Finance

Distribution of 2017 Netflix Stock Prices by Quarter

How did Netflix's earnings per share compare to estimates?

Takeaways:

1. Actual EPS met or beat estimates in 3 of 4 quarters

2. Underperformed estimates in Q3

NOTE: Yahoo Finance provided estimates for NFLX earnings per share.

2017: Netflix (NFLX) Earnings Per Share

NFLX Earnings Per Share

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NFLX Quarterly Revenue vs.Earnings in 2017

- NFLX revenues and earnings grew each quarter in 2017

Takeaways:

1. Netflix increased pricing in 2017.

   A. Subscribers streaming up to two devices now pay $10.99 per month. It was previously $9.99 per month.

   B. Subscribers streaming up to four devices now pay $13.99 per month. It was previously $11.99 per month.

2. Netflix saw its subscriber base continue to grow in 2017.

Source: https://investorplace.com/2017/10/netflix-price-increase-nflx/

NFLX Revenue vs. Earnings Quarterly
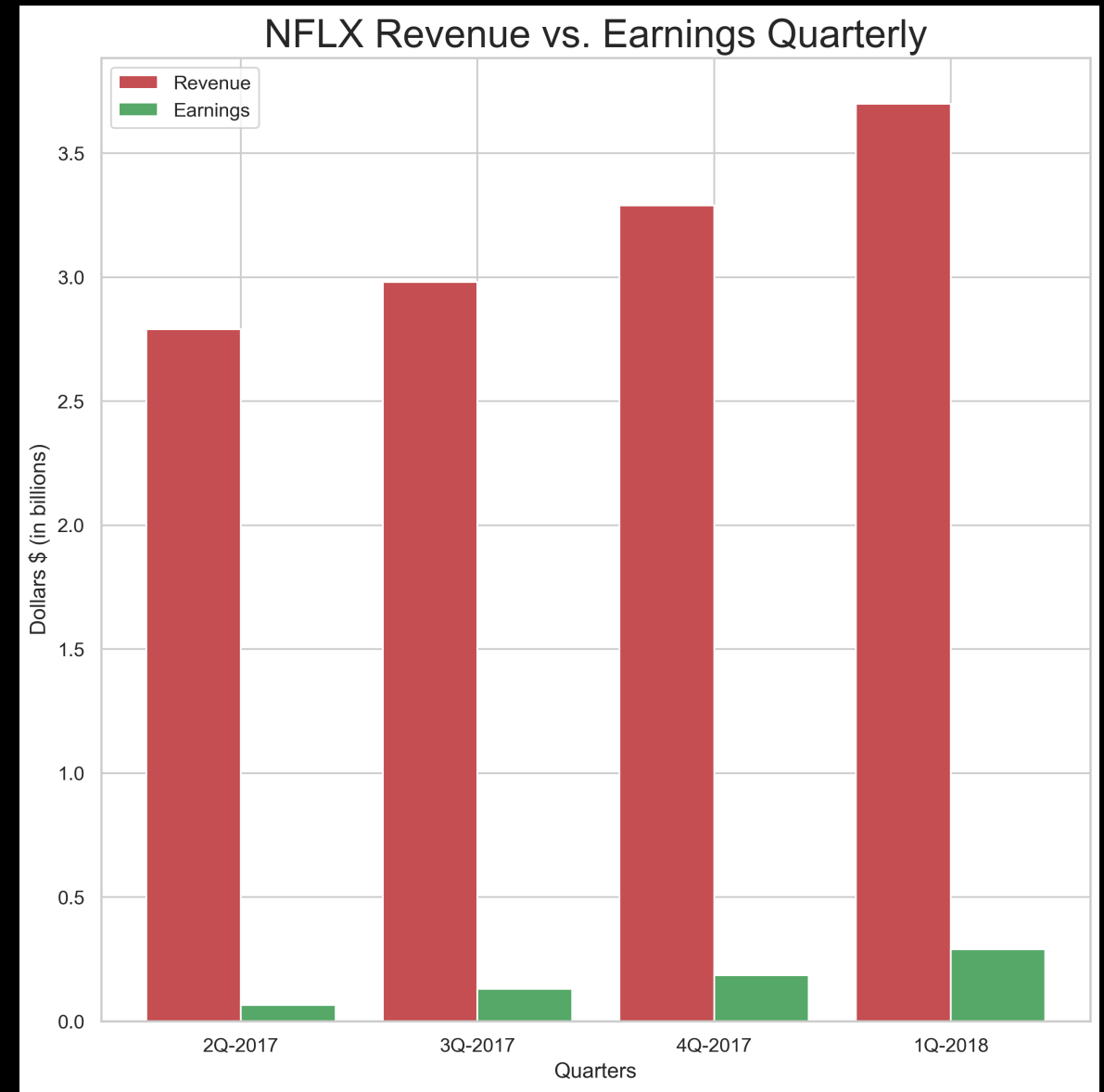
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2017 Comparison:
NFLX & DJIA

Takeaways:

1. Both NFLX and DJI rose in 2017.

2. NFLX had more volatility, with corrections in Q2-Q4.

3. NFLX is more volatile than the overall stock market

NOTE: Netflix is not one of the 30 DJI stock components.

2017 Comparison: Netflix (NFLX) and Dow Jones Industrial Average (DJIA)

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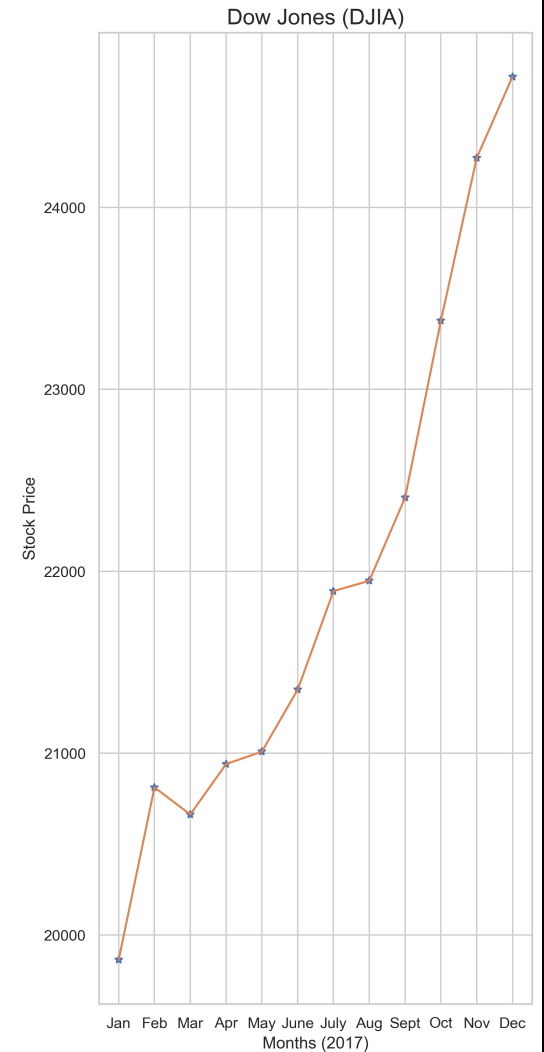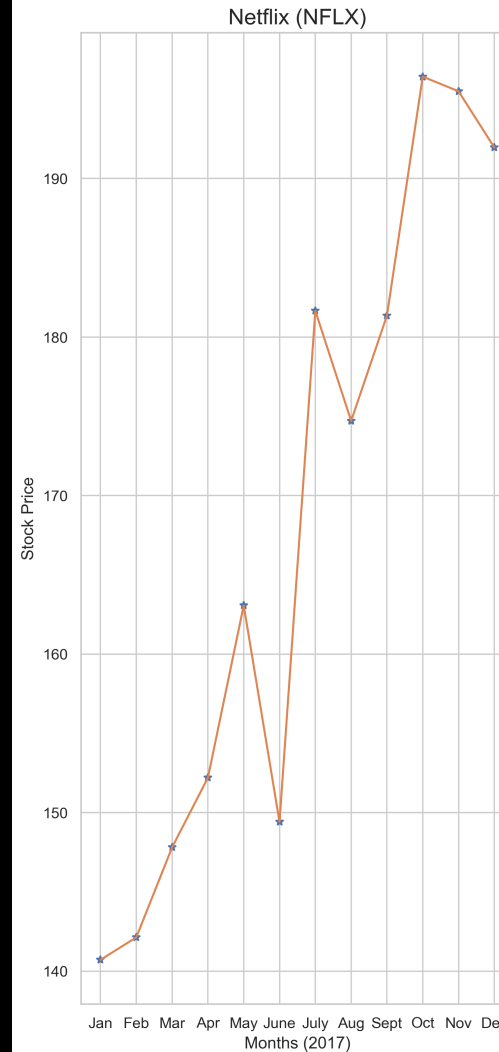
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My Role

- Import data from Yahoo
- Write Python code
- Use matplotlib and Seaborn to visualize data
- Develop this presentation and share insights

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Code: Violinplot of NFLX Stock Prices (By Quarter)

Details:

• Applied "whitegrid" to match with visualization

• Increased "yticks" for easier readability

• DPI = 300 (for better resolution)

```python
1   plt.figure(figsize=(11,11))
2   sns.set(style='whitegrid')
3   ax = sns.violinplot(data=netflix_stocks_quarterly, x="Quarter", y="Price")
4   ax.set_title("Distribution of 2017 Netflix Stock Prices (by Quarter)", fontsize=25)
5   ax.set(xlabel="Quarters (2017)")
6   ax.set(ylabel="Closing Stock Price")
7   ax.set_yticks(list(range(120, 215, 5)))
8   plt.savefig("distribution_of_2017_netflix_stock_by_quarter.png", dpi=300, \
9                   transparent = False, bbox_inches='tight')
10  plt.show()
```


Distribution of 2017 Netflix Stock Prices by Quarter

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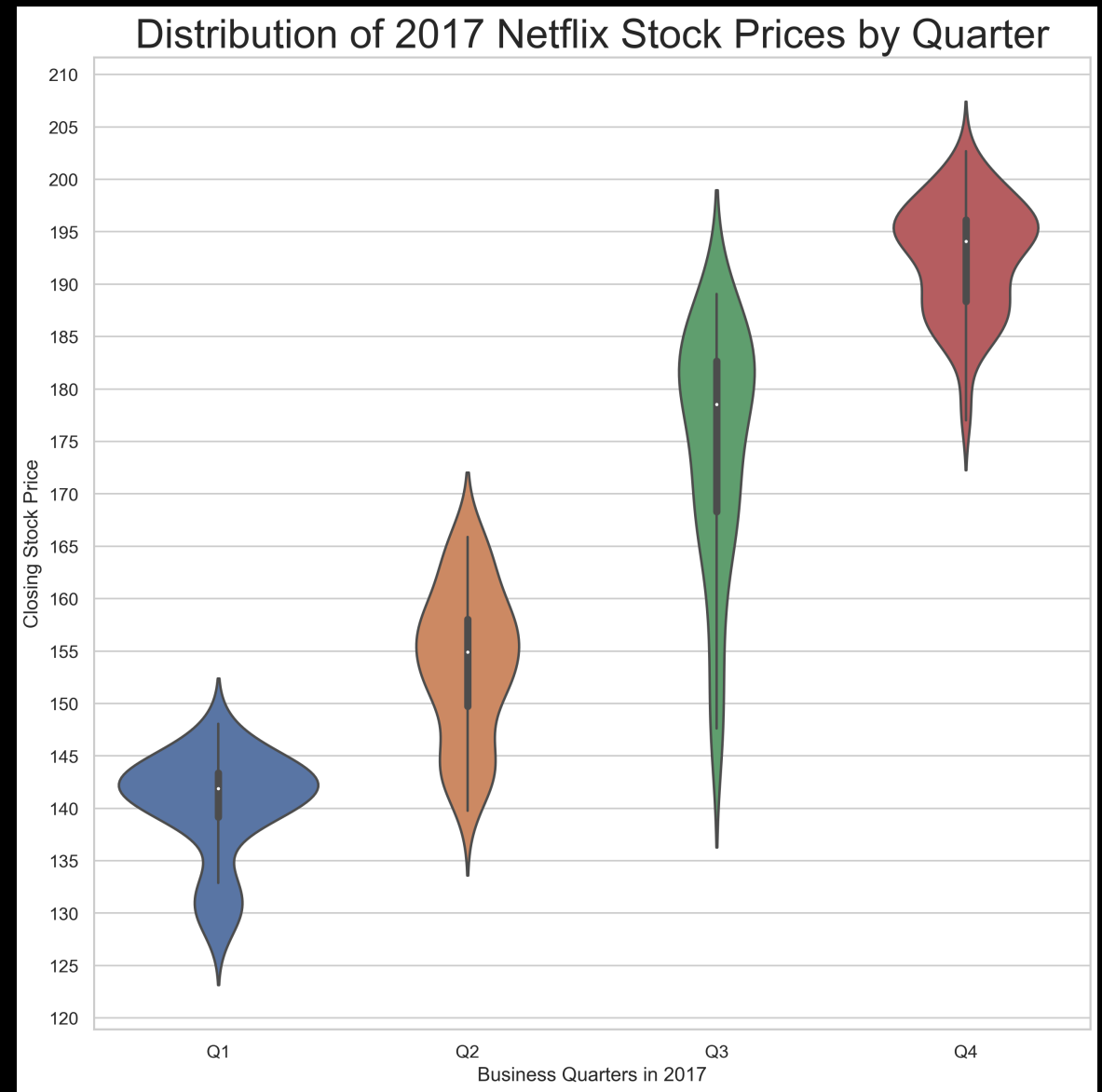
Code: Scatterplot for NFLX Earnings Per Share

Details:

- Manually moved legend to increase readability.

- Changed `figsize` to create square image export for slide.

- DPI = 300 (for better resolution)

```python
setupfig_eps = plt.figure(figsize=(7,7))
setupfig_eps.suptitle("2017: Netflix (NFLX) Earnings Per Share", fontsize=20)
x_positions = [1, 2, 3, 4]
chart_labels = ["1Q-2017","2Q-2017","3Q-2017","4Q-2017"]
earnings_actual =[.4, .15,.29,.41]
earnings_estimate = [.37,.15,.32,.41 ]

plt.scatter(x=x_positions, y=earnings_actual, color='red')
plt.scatter(x=x_positions, y=earnings_estimate, color='green', alpha=0.5)
plt.legend(["Actual","Estimate"], loc= "lower right")
plt.xticks(x_positions, chart_labels)
plt.xlabel("Quarter")
plt.ylabel("Earnings Per Share (in $)")
plt.title("NFLX Earnings Per Share")
plt.savefig("NFLX_earnings_per_share_2017.png", dpi=300, transparent = False, bbox_inches='tight')
plt.show()
```
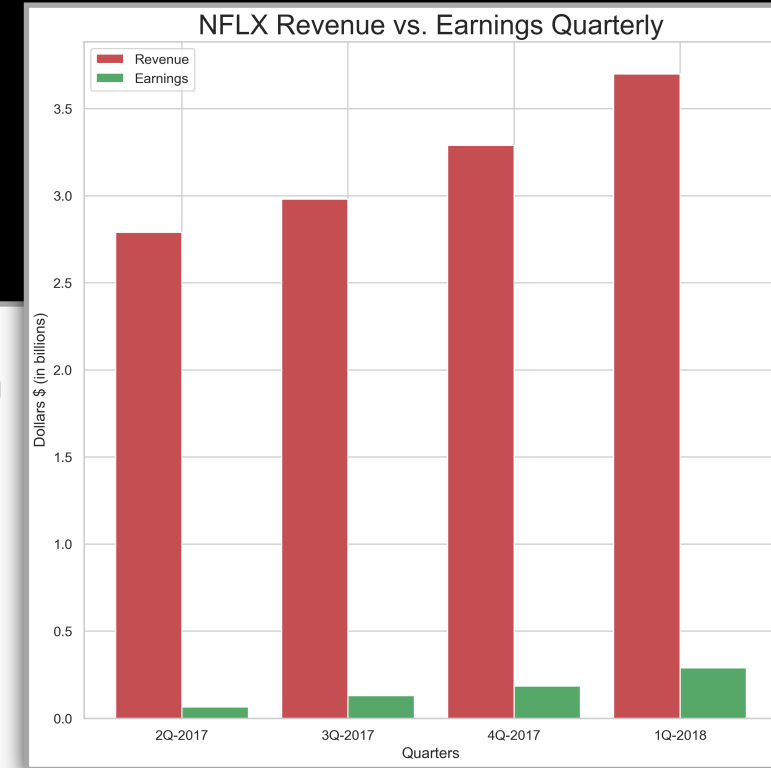
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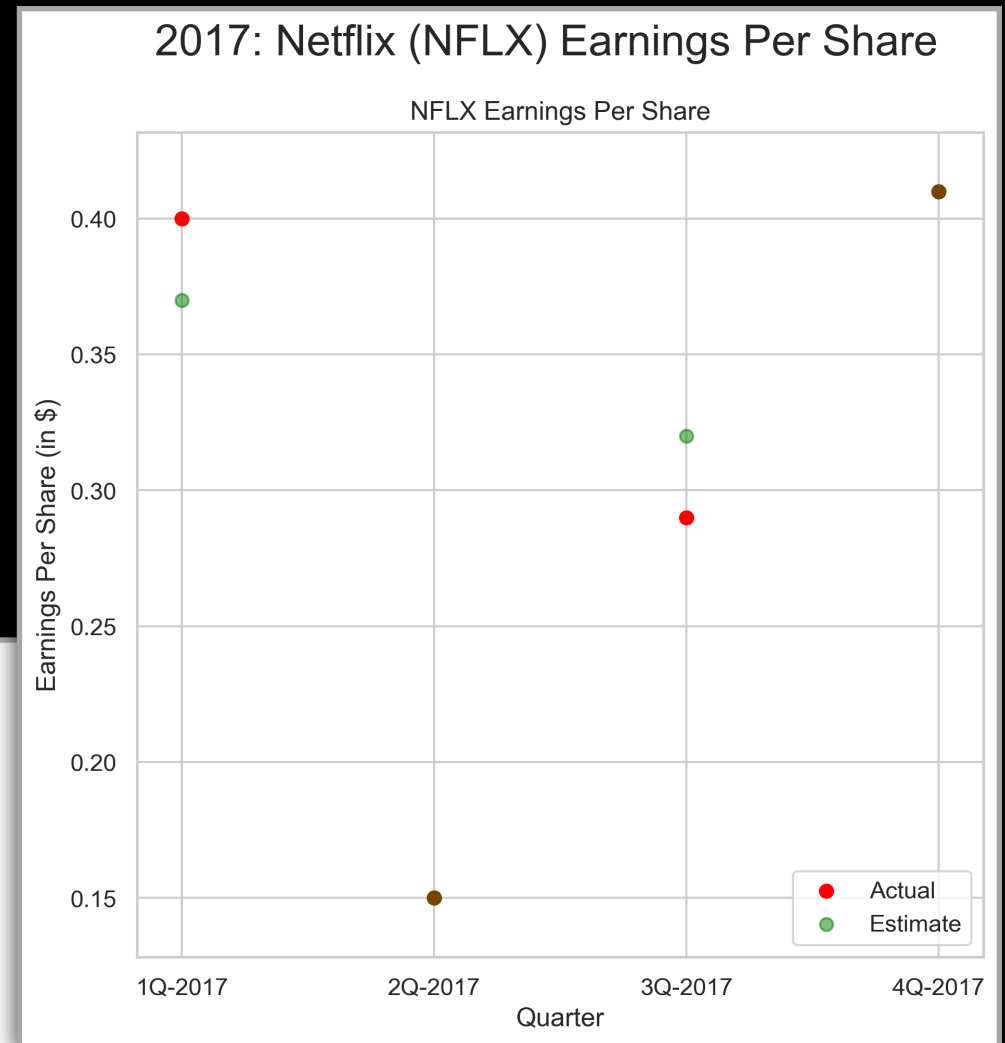
Code: Bar Chart for NFLX Quarterly Revenue vs.Earnings in 2017

Details:
- Increased title font size
- Changed `figsize` to create square image export for slide.
- DPI = 300 (for better resolution)
- Added labels for x-axis and y-axis

```python
1   # The metrics below are in billions of dollars
2   revenue_by_quarter = [2.79, 2.98,3.29,3.7]
3   earnings_by_quarter = [.0656,.12959,.18552,.29012]
4   quarter_labels = ["2Q-2017","3Q-2017","4Q-2017", "1Q-2018"]
5
6   # Revenue
7   n = 1   # This is our first dataset (out of 2)
8   t = 2 # Number of dataset
9   d = len(quarter_labels) # Number of sets of bars
10  w = 0.8 # Width of each bar
11  bars1_x = [t*element + w*n for element
12              in range(d)]
13
14  # Earnings
15  n = 2   # This is our second dataset (out of 2)
16  t = 2 # Number of dataset
17  d = len(quarter_labels) # Number of sets of bars
18  w = 0.8 # Width of each bar
19  bars2_x = [t*element + w*n for element
20              in range(d)]
21
22  middle_x = [ (a + b) / 2.0 for a, b in zip(bars1_x, bars2_x)]
23  labels = ["Revenue", "Earnings"]
24
25  plt.figure(figsize=(10,10))
26  ax = plt.subplot()
27  plt.bar(bars1_x, revenue_by_quarter, color='r')
28  plt.bar(bars2_x, earnings_by_quarter, color='g')
29  ax.set_title("NFLX Revenue vs. Earnings Quarterly", fontsize=22)
30  ax.set_xlabel("Quarters")
31  ax.set_ylabel("Dollars $ (in billions)")
32  plt.xticks(middle_x, quarter_labels)
33  plt.legend(labels)
34  plt.savefig('NFLX_Revenue_vs_Earnings_Quarterly_2017.png', \
35              dpi=300, transparent = False, bbox_inches='tight')
36  plt.show()
```
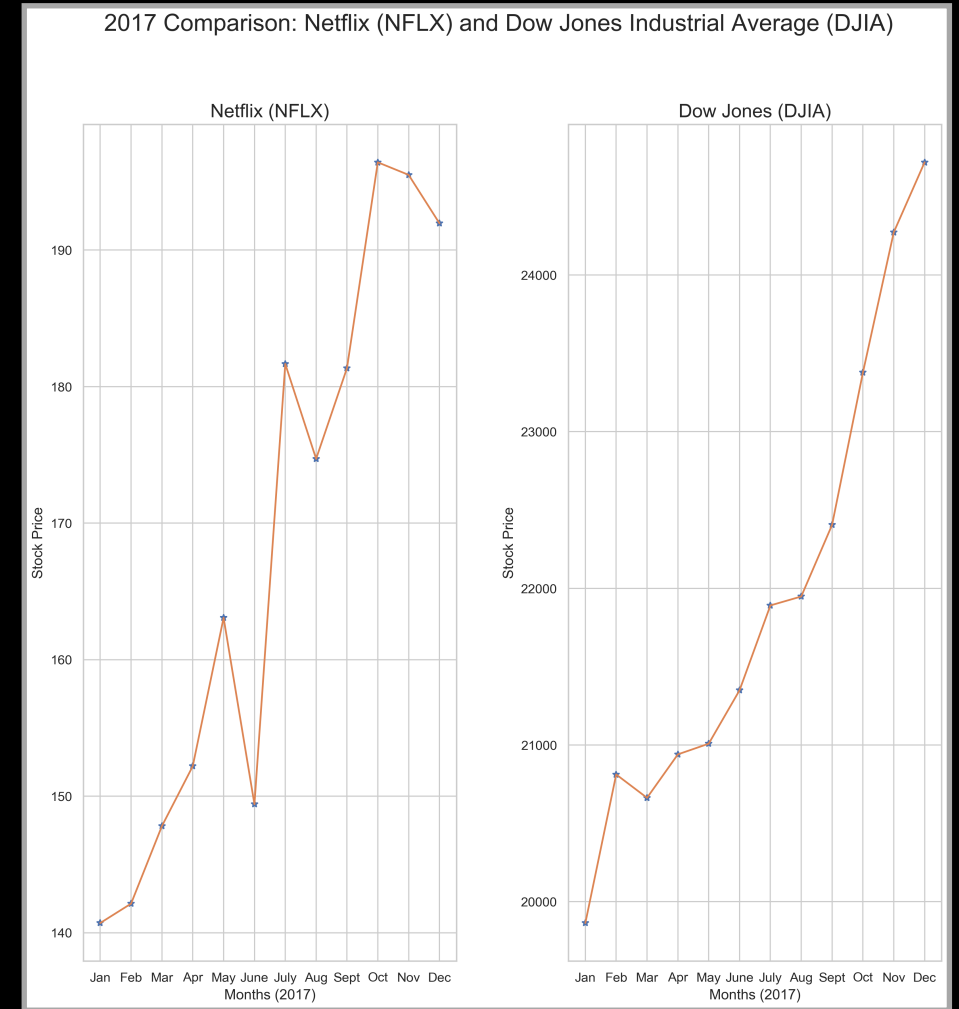
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```python
# Setup figure as a square image to fit in presentation
setupfig = plt.figure(figsize=(13,13))
# Add month names and apply a supertitle
months_labels = ['Jan', 'Feb', 'Mar', 'Apr', 'May', 'June', 'July', 'Aug', 'Sept', 'Oct', 'Nov', 'Dec']
setupfig.suptitle("2017 Comparison: Netflix (NFLX) and Dow Jones Industrial Average (DJIA)", fontsize=20)

# Left plot is Netflix
# ax1 = plt.subplot(total number rows, total number columns, index of subplot to modify)
ax1 = plt.subplot(1, 2, 1)
plt.plot(netflix_stocks["Date"], netflix_stocks["Price"], '*', \
         netflix_stocks["Date"], netflix_stocks["Price"], '-')
ax1.set_title("Netflix (NFLX)", fontsize=16)
ax1.set_xlabel("Months (2017)")
ax1.set_ylabel("Stock Price")
ax1.set_xticklabels(months_labels)

# Right plot is Dow Jones Industrial
# ax2 = plt.subplot(total number rows, total number columns, index of subplot to modify)
ax2 = plt.subplot(1, 2, 2)
plt.plot(dowjones_stocks["Date"], dowjones_stocks["Price"], '*', \
         dowjones_stocks["Date"], dowjones_stocks["Price"], '-')
ax2.set_title("Dow Jones (DJIA)", fontsize=16)
ax2.set_xlabel("Months (2017)")
ax2.set_ylabel("Stock Price")
ax2.set_xticklabels(months_labels)

plt.subplots_adjust(wspace=0.3)
plt.savefig('Netflix and Dow Jones Industrial - 2017.png', dpi=300, \
            transparent = False, bbox_inches='tight')
plt.show()
```

Details:
- Increased title font size
- Changed `figsize` to create square image export for slide.
- DPI = 300 (for better resolution)
- Used abbreviated month names
- Added labels for x-axis and y-axis

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Sources:

- https://github.com/Garkusha5/netflix-data

- https://investorplace.com/2017/10/netflix-price-increase-nflx/

- https://www.codecademy.com/paths/visualize-data-with-python/tracks/capstone-projects-dvp/modules/capstone-projects-dvp/informationals/capstone-project-netflix-data

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