

Exploring the effect of COVID-19 on the stock market

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Motivation

- Define the core message or hypothesis of your project:

The COVID-19 pandemic has been a major contributing factor in the craziness that is the world in the last year, we wanted to explore in more specifics the relationship between how it might have affected the stock market

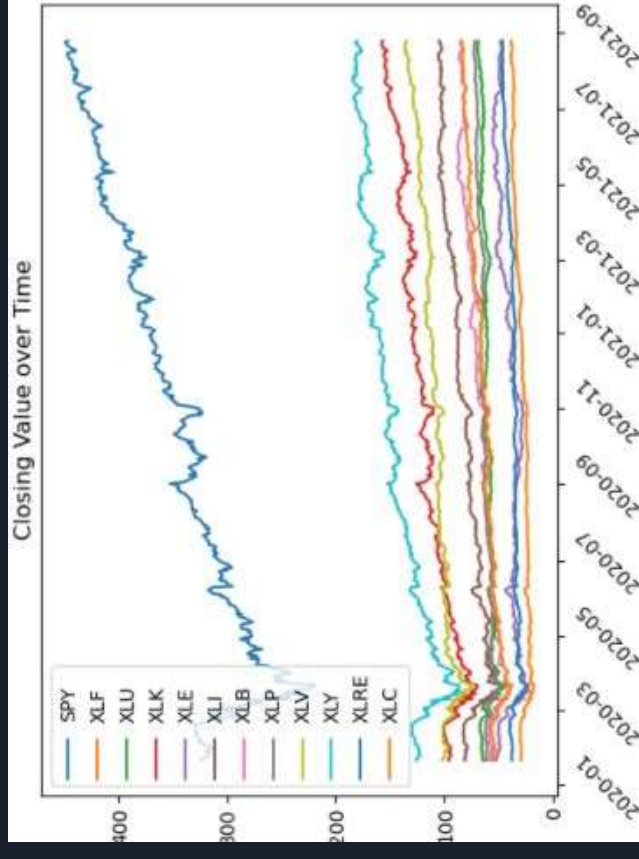
- Describe the type of questions you asked, and why
 1. How did S&P500 behavior differ before and during?
 2. How did the development of the Pandemic affect market trends?
 3. How were specific industries and businesses affected by Covid?



Overview

the questions you asked, describing what kinds of data you needed to answer them, and where you found it

- o Determined what data to use to best mimic the overall market and different sectors
 - Decided to focus on the S&P 500 and its sector funds
- o Data sources:
 - Yahoo!Finance API/Python module
 - [CDC COVID-19 public data](#) available
 - for download as a .csv





Data Cleanup & Exploration

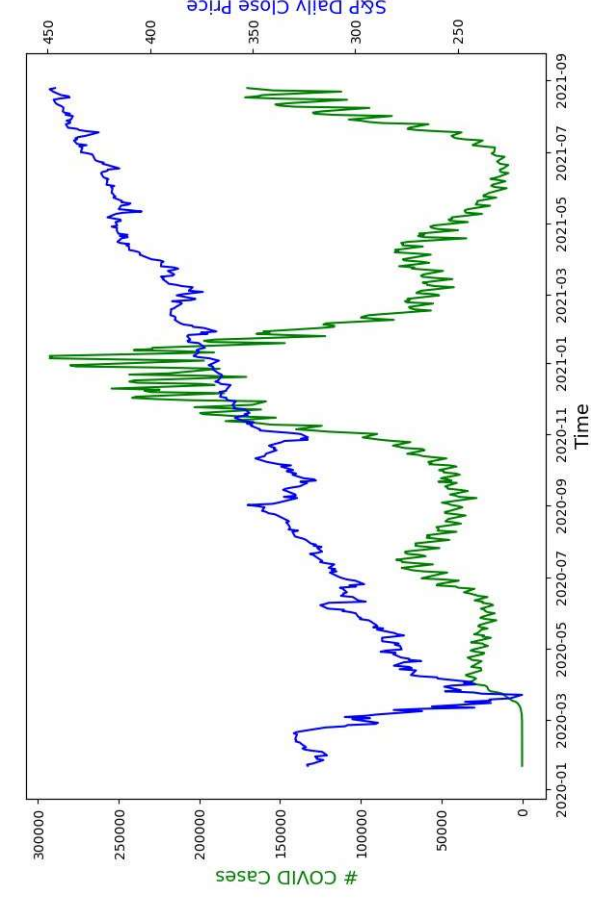
- o Describe the exploration and cleanup process
 - Was able to use `pd.read` to efficiently clean the `cdc.csv` file and create a DF with daily data reporting by each state. Then used `groupby` date & `sum` function to get daily data at the federal level
 - `Yfinance` module allows for easy import of historical data for specific tickers into pandas DF
- o Discuss insights you had while exploring the data that you didn't anticipate
- o Discuss any problems that arose after exploring the data, and how you resolved them



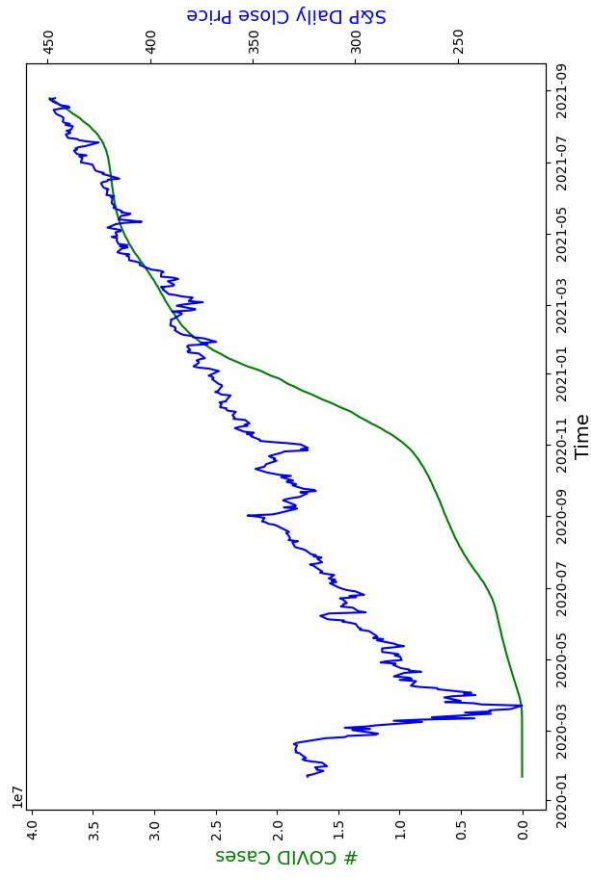
Analysis: Relationships between COVID & Stock Market throughout the pandemic

By: Diane

Covid cases and stock value over time



Covid cases and stock value over time





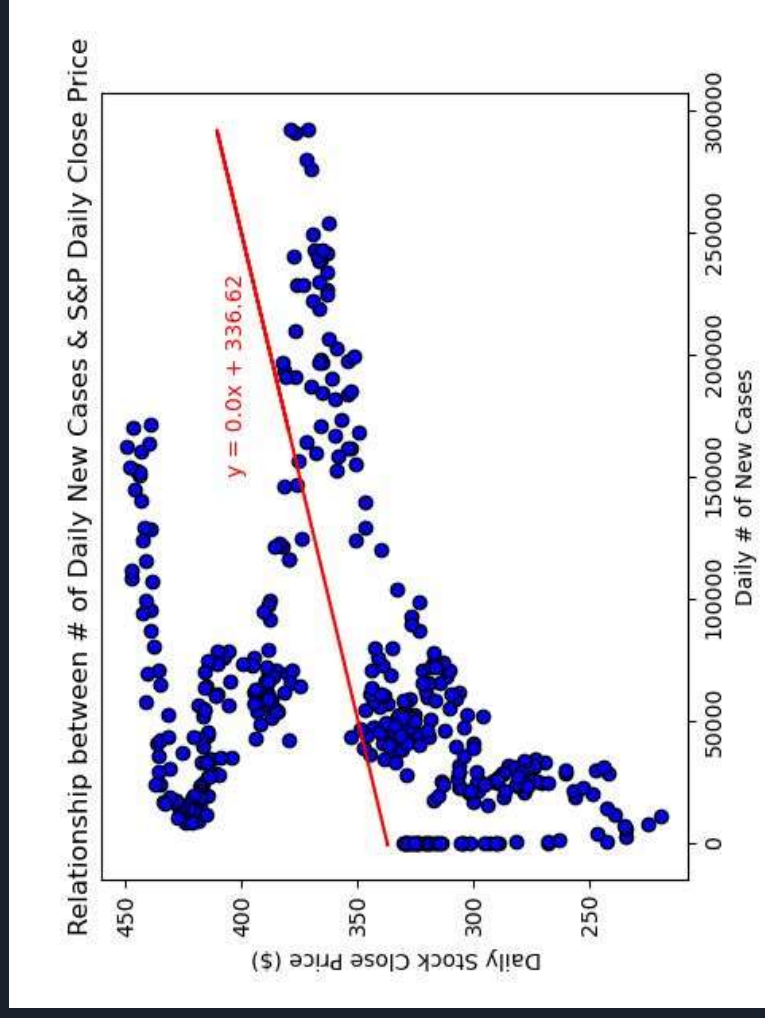
Analysis: Relationships between COVID & Stock Market throughout the pandemic

By: Diane

The correlation is 0.3

Appears still to be closely related to

Time passed





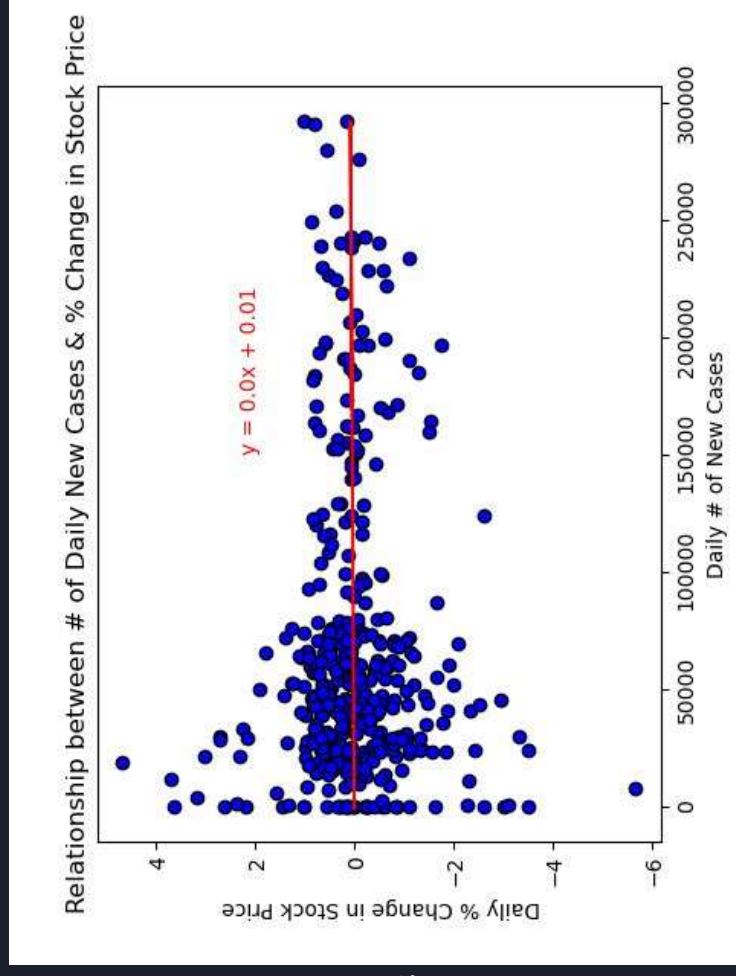
Analysis: Relationships between COVID & Stock Market throughout the pandemic

By: Diane

The correlation is 0.02

Visual trends:

- Larger increases & decreases
- When cases are lower
- Price is more stable while cases are higher

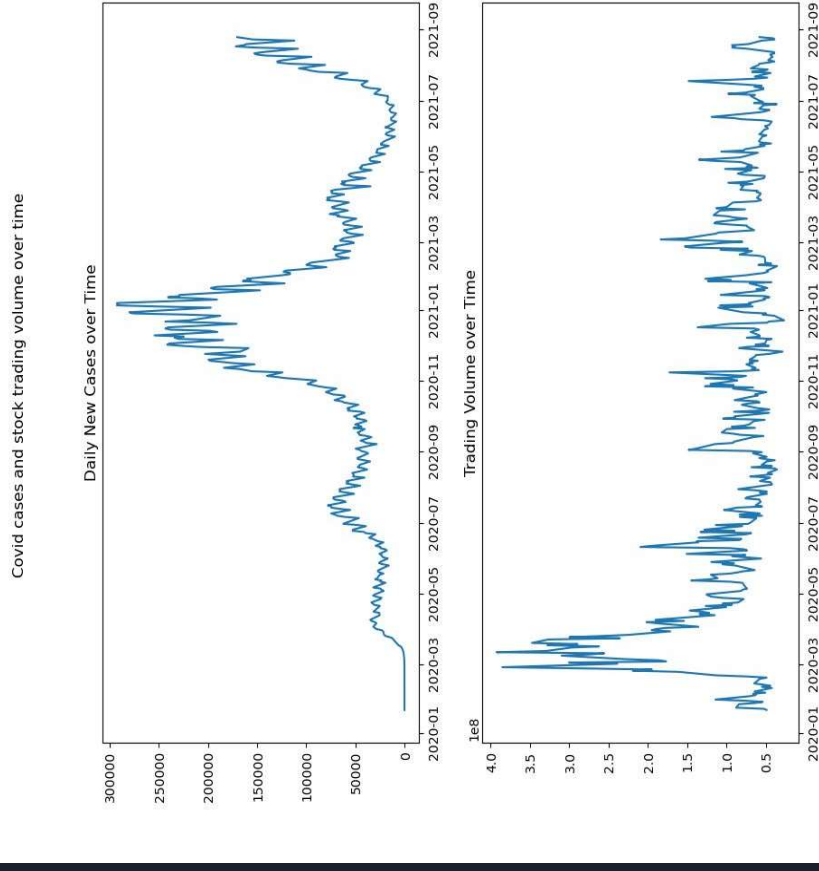
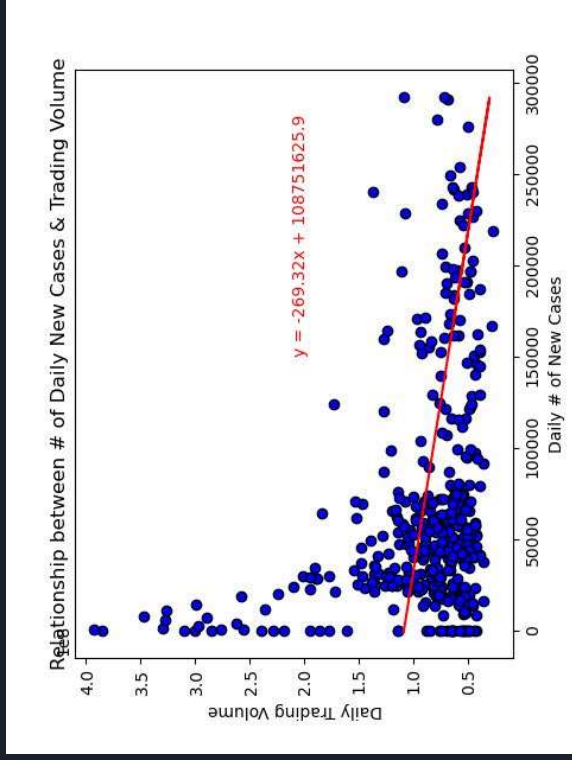




Analysis: Relationships between COVID & Stock Market throughout the pandemic

By: Diane

Do we see spikes in trading volume corresponding with changes in covid cases?





Analysis: Comparing the market pre- and post-pandemic start

By: Galen

S&P500 historical data for 2019 and 2020 was used to examine market general trends and how they were impacted by the pandemic.

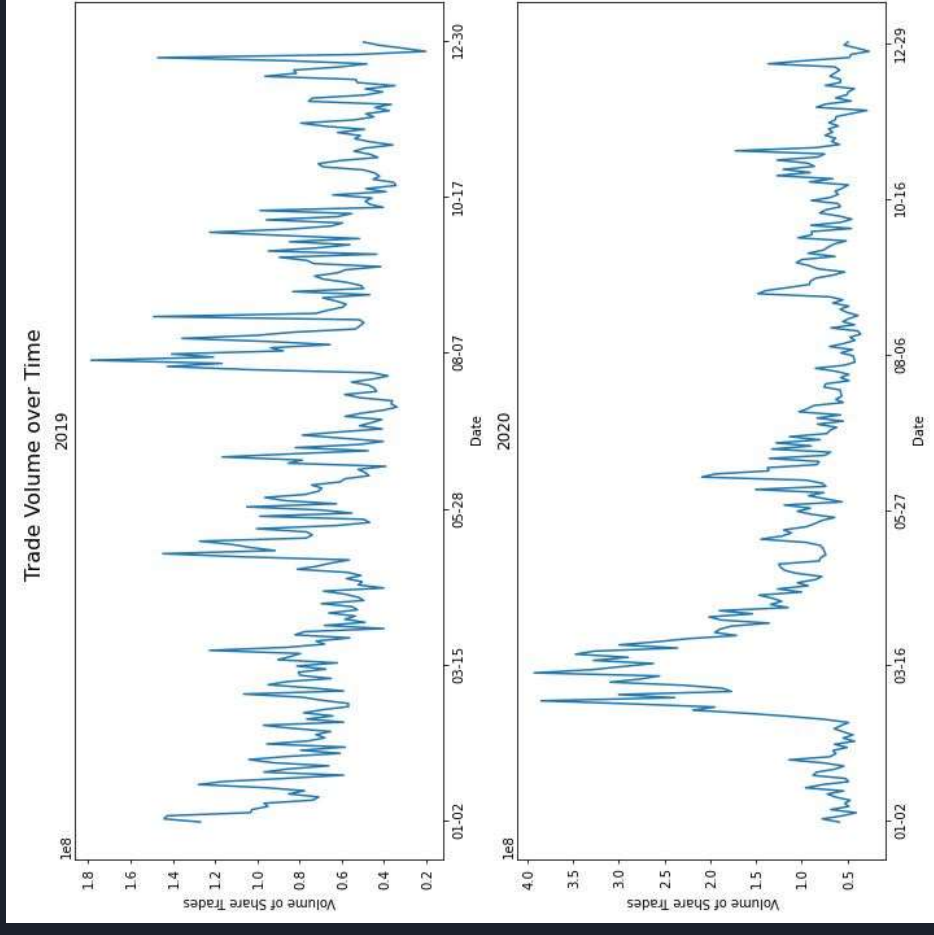
In particular, I looked at:

- Differences in trade volume over the course of the year for each year
- Daily stock price amplitude



Trade Volume Before and After

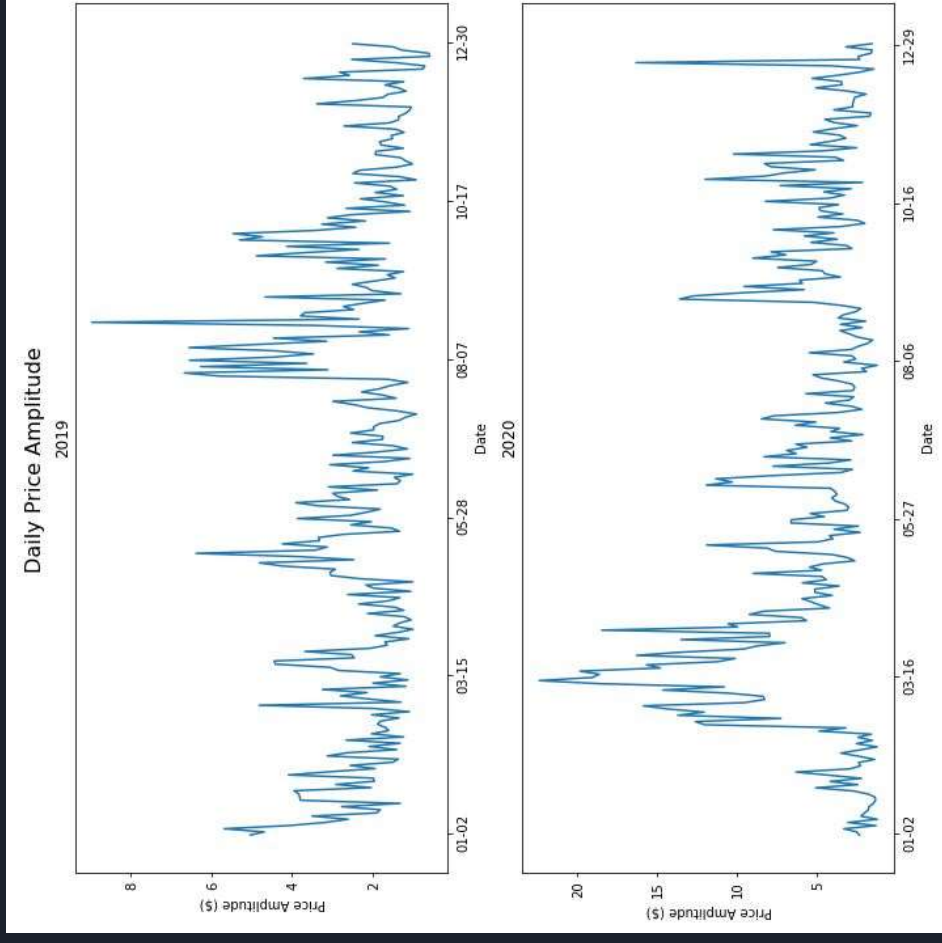
- Mean:
 - 2019: 7.009414e+07
 - 2020: 1.004460e+08
- Standard Deviation:
 - 2019: 2.599969e+07
 - 2020: 6.899600e+07





Price Amplitude Before and After

- Mean:
 - 2019: 2.417039
 - 2020: 5.471082
- Standard Deviation:
 - 2019: 1.295118
 - 2020: 4.000240
- Max:
 - 2019: 8.974515
 - 2020: 22.392258

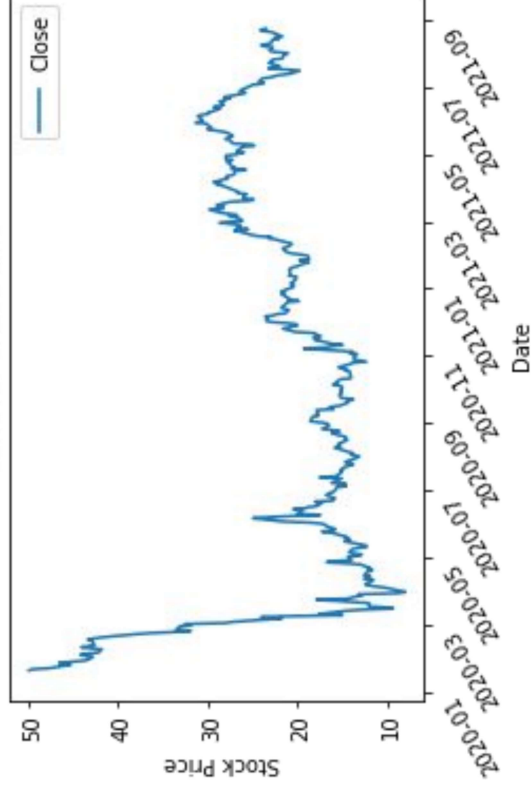




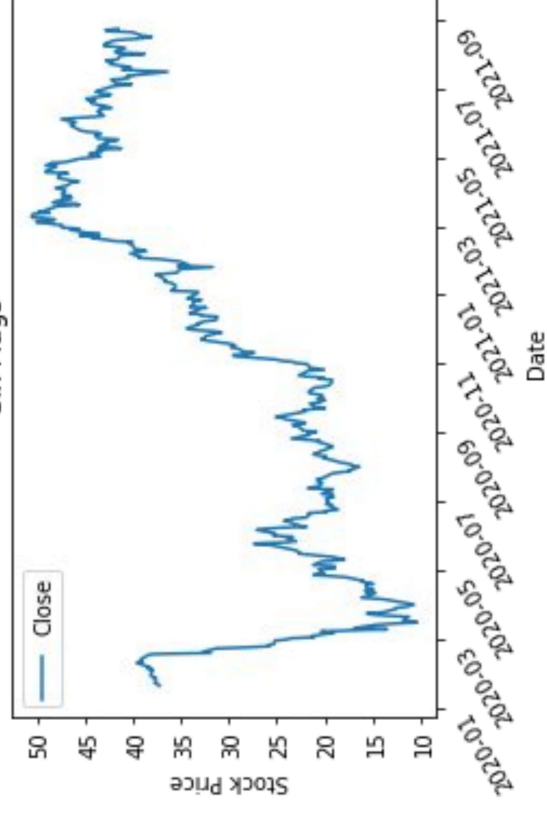
Questions

1. Is a pandemic always detrimental to the entire stock market?
2. How might one category of stocks be affected differently than another?
3. What are some examples of stocks that might get affected positively and some that might get affected negatively?

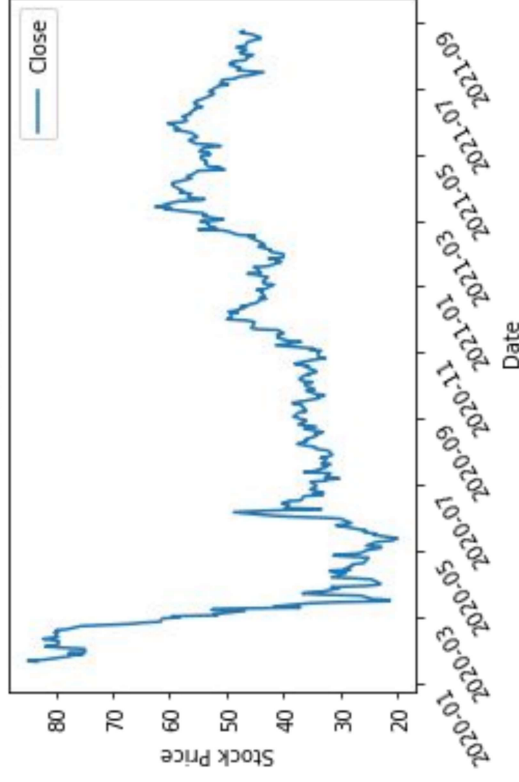
Carnival Cruise Line



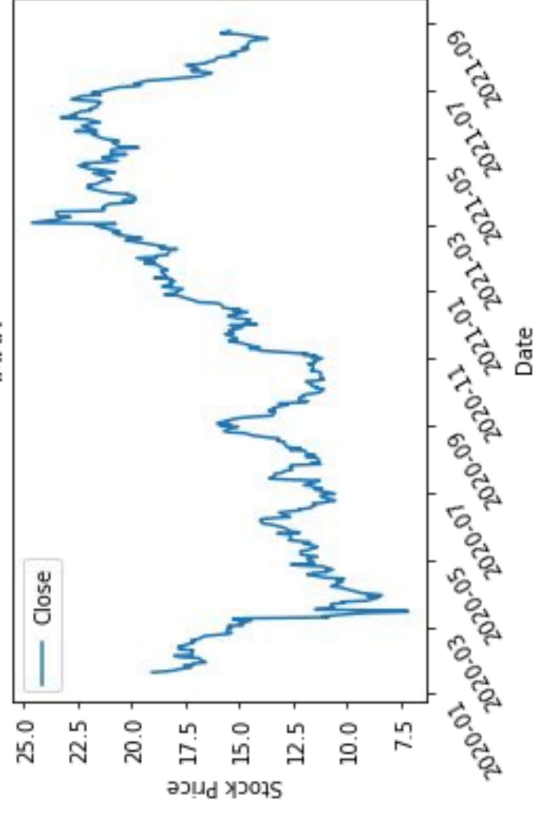
Six Flags



United Airlines



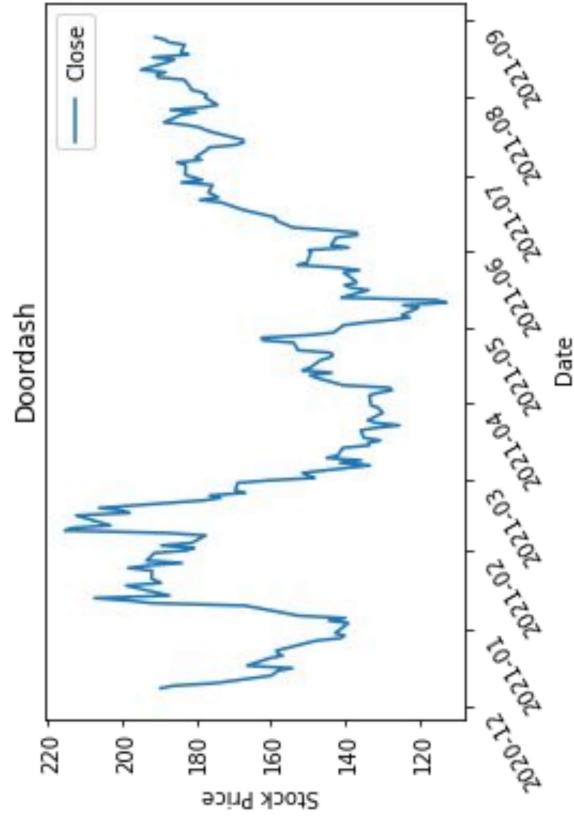
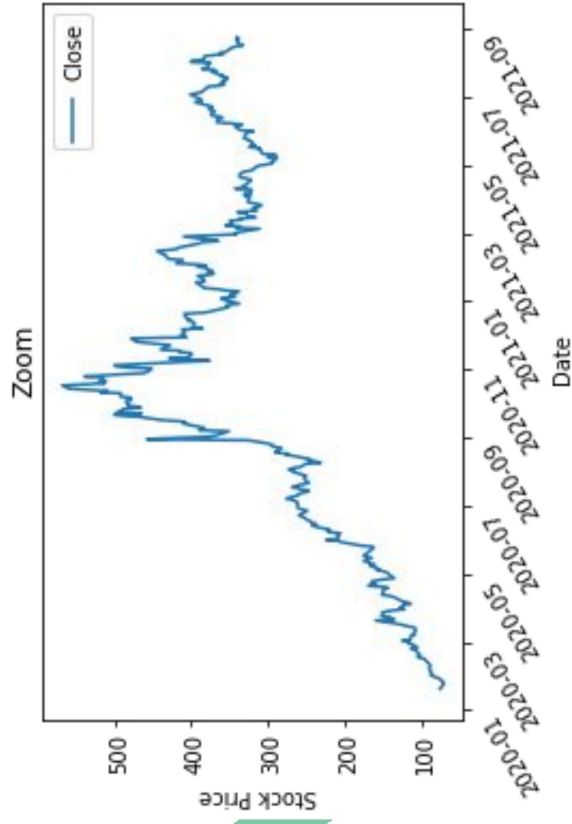
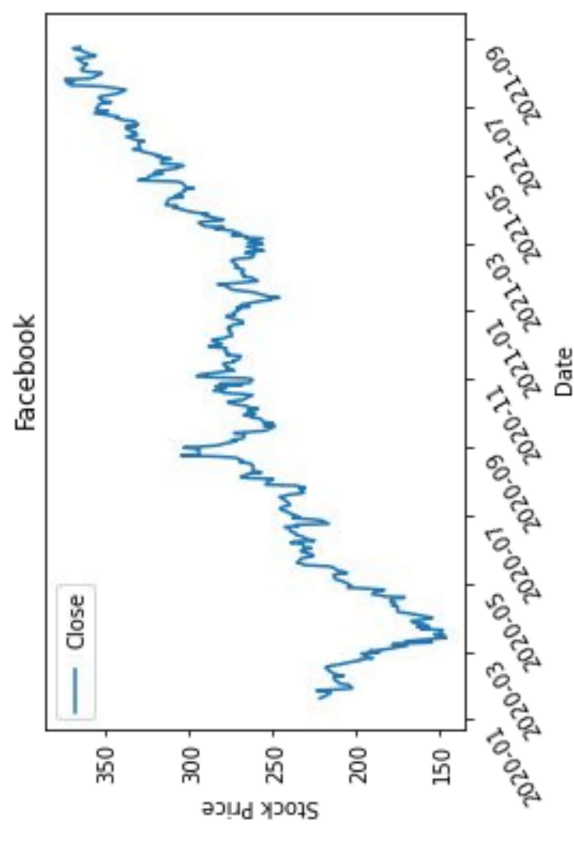
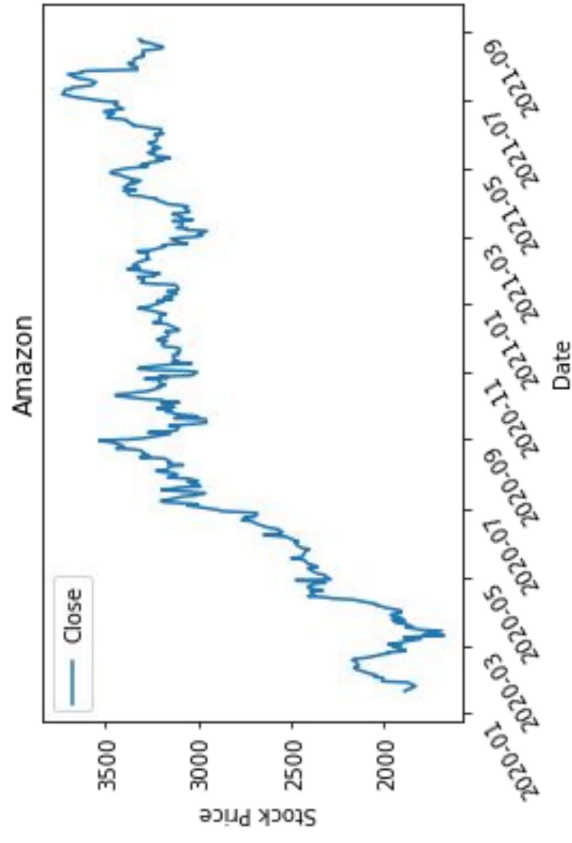
IMAX





More Questions

1. After seeing some examples of stocks that involve travel and human interaction, what trend did you notice?
2. Why do you think some of these stocks eventually rebounded beyond where they were before the crash, while others still remain low?
3. What kinds of factors might affect volatility during a pandemic?





Final Discussion:

Were we able to answer the questions to satisfaction? Did we find what we were expecting to find?

- Are we able to predict how market will react as cases are surging again?
- With so many additional factors affecting stock market behavior much more time would be required to do such a comprehensive analysis

General Inferences/Conclusions:

- High pandemic activity leads to price instability
- But ultimately a long-term buy and hold strategy would still make you a lot of money
- Has the market adjusted to COVID being the “new normal”? It would appear so.



Post Mortem

Discuss any difficulties that arose:

- Original scope had to change

What would we investigate if we had two more weeks?

- Effect of vaccines/vaccination rate on the stock market
- Incorporating information regarding government stimulus to the overall market and to individuals which may be propping up market
- Binning the data by week - may be easier to see trends at that level as opposed to daily