CSC343 Phase 4 Discussion
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In the present project, we investigated the impact of the pandemic on the U.S. in various aspects, including responding policies and stock markets, using the under-pandemic database. We also tried exploring the potential correlation between cases, deaths, and demographic factors of the States.

To see how the states implemented policies in response to the pandemic, we first picked some U.S. states according to the in-state situation of the pandemic. We defined three types: states in severe situations, states that are recovering, states with mild situations. As Q1-Queries 1, 2, 3 shows, most states that had closed k-12 schools enforced this policy in March, showing that the children's lives are most valued. We found that the states that were in severe situations generally closed non-essential businesses earlier than other types of states, yet most did not enforce quarantine mandates (Q1-Queries 1). Two of the states that were recovering since June did enforce a quarantine in June (Q1-Queries 2). We also found that more "mild" states, in terms of percentage, enforced mask mandates earlier than the other two types of states (Q1-Queries 3). The correlation between the states' situation and their responding policies is not clear. We expect to have more information to analyze further. For example, the state-wide political leanings could influence the time of policy enforcement, and the demographic factors may be more powerful in predicting the severity of state-wide pandemic situations.

To examine whether the population and poverty level correlate with the coronavirus cases, we studied deeply into poverty rate, population density, daily positive cases, and daily death cases for each state. We divided states into three categories according to the percentage of people whose income in the past 12 months is below the poverty level in each state. A state has a low, moderate, or high poverty rate if the percentage of people below the poverty level is less than 10%, between 10% and 15%, or above 15%. We found that the daily average of positive cases and death cases increase as the poverty rate increases (see Q2-Queries 2.1, 2.2, 2.3). By grouping the states into two categories, states with low population density and states with high population density, We found that the population and coronavirus cases also have a positive correlation (see Q2-Queries 4.1, 4.2). We concluded that the population and poverty level are both positively correlated with the number of cases. According to Q2-Queries 5.1, 5.2, the states with low population density and low poverty rate have no more than 500 positive cases and 10 death cases daily from March to September. In contrast, the states that have a high population density and a high poverty rate experienced more than 2500 positive cases and 30 death cases daily in the same period.

To investigate how the outbreak of the COVID-19 pandemic has impacted the United States stock market, we closely examined the most commonly followed equity indices, S&P 500 Index, Dow Jones Industrial Average, and Nasdaq Composite. In March 2020, the average stock prices for the three indices had fallen dramatically as COVID-19 quickly spread around the states (see Q3-Queries 1.1,1.2). The stock prices encountered large decreases starting on March 9 compared with stock prices for three indices on February 3 (see Q3-Queries 2.1, 2.2, 2.3). According to additional information, the S&P 500 triggered level 1 market-wide circuit breakers during the opening hour on March 9, 12, 16, and 18 based on drops of 7% from the previous close, which in agreement with the Q3-Query 2.1 result that the stock prices for S&P 500 index dropped 14%, 21%, 24%, and 27% respectively. Since the stock market is an excellent economic indicator for the United States economy, it reflects how well the companies are doing. Thus, the stock market crash in March 2020 can devastate overall economic growth and negatively affect the nation's GDP. At present, the United States economy seems not only affected by the stock market but also affected most by the increase in the unemployment rate. The COVID-19 pandemic has had a significant effect on unemployment in every state in the US, and we focused on investigating the unemployment rate of the four major states, Washington, Michigan, New York, and California. The states had a relatively high unemployment rate in April with 16.4%, 16.3%, 24%, 15.3% unemployment rate for California, Washington, Michigan, and New York respectively (see Q3-Queries 3.1, 3.2, 3.3,3.4). According to Q3-Query 4, the average unemployment rate across all states has experienced a steady increase starting from April as the COVID-19 outbreak out of control.