UCLA DataFest Challenge 2020
Team: Summer-19
Team Members: Kelly Chen (kelljchen@gmail.com), Kevin Hahn (kevinhahn@ucla.edu), Jason Chhay (jwchhay@ucla.edu), Michelle Lee (michellegl22@g.ucla.edu), Newton Peng (newt.peng@gmail.com)
Dataset: The data is from the U.S. Dept. of Labor from 1991 to present

Question: How has unemployment been affected by COVID-19 in comparison to the 2008 recession?
Race Unemployment:
Data included information on six groups--White, Black, Asian, American Indian/Alaskan Native, Hawaiian/Pacific Islander, and N/A. Analysis consisted of determining percent change in unemployment per group, proportion represented of total unemployment, and overall change in number unemployed.

All groups had higher percent changes in unemployment in the first two months of the COVID-19 recession compared to the 2008 Great Recession. Asians and Hawaiian/Pacific Islanders experienced the greatest percent change in unemployment from March to April 2020 at 153.24% and 181.96% respectively. With the exception of the American Indian/Alaskan group, all other race groups experienced percent increases in unemployment at rates over four times those unemployment changes in 2008.

Gender Unemployment:
A time-series graph made with the dygraph library in R made it easier to visualize changes in unemployment by gender, identify points of interest, and calculate percent increases in unemployment. Unlike in 2008, women experienced higher rates of unemployment in the first two months of the COVID-19 recession, with a 115% increase in unemployment from March to April 2020 compared to 11.2% from December 2007 to January 2008. In comparison, men experienced a 21% increase, which is comparable with increases in unemployment in 2008 (23% increase from December 2007 to January 2008). Presently, women are more impacted by unemployment than their male counterparts.

Age Unemployment:
We created interactive stream charts to analyze how unemployment differs by age between today's economic state and the 2008 recession.
In these charts, we have displayed the total reported monthly unemployment counts by age group, and we classified the data into 5 age groups: < 22, 23-34, 35-44, 45-59, and > 60
- **2008 Recession:** Number unemployed was steady for the first 10 months of 2008 before rapidly increasing.
- **2019-Present:** Immediate spike in unemployment across all age groups when COVID-19 was declared a national pandemic in mid-March.

Both graphs are similar. Most notable is that the unemployment count of late middle aged (45-59) and of young people (23-34) **each** outnumber that of early middle aged people. This 35-44 age group is usually where people are well-settled in their careers, so it's probably easier to retain their position or quickly find a new job before filing for unemployment than the other age groups.

Industry Unemployment:
20 industries were in the dataset. Using the dygraph library in R, we created an interactive visualization of the top three industries in the unemployment population: manufacturing, construction, and administrative and support, waste management, and remediation services.

Construction and administrative and support industries follow similar fluctuations for both the coronavirus and 2008 recession, but both experience a sharp dip in April 2020. This suggests that amidst the coronavirus pandemic, workers in other industries filed for unemployment at much higher rates. Not many workers in manufacturing are represented in the total unemployed population in 2020, but were highly represented for the 2008 recession, due to the "growing trade deficit in manufacturing products" and "the massive output collapse" of the Great Recession, according to the Economic Policy Institute.

Conclusion: Coronavirus expedited the timeline of unemployment due to businesses deemed as essential vs nonessential and shelter-in place orders, whereas the increase in unemployment in the 2008 recession was much more gradual. Also, higher proportions of unemployment may be industry-specific, and people most vulnerable to being unemployed in 2020 are females and young and late-middle-age people.