**Overview**

1. Use statistical and mathematical methods to analyze the COVID-19 spreading pattern in the past one year. 2. Use machine learning methods to make reasonable prediction of COVID-19 spreading in the future one year.

**Introduction**

Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus. Most people infected with the virus will experience mild to moderate respiratory illness and recover without requiring special treatment. However, some will become seriously ill and require medical attention. Older people and those with underlying medical conditions like cardiovascular disease, diabetes, chronic respiratory disease, or cancer are more likely to develop serious illness. Anyone can get sick with COVID-19 and become seriously ill or die at any age. The COVID-19 pandemic is a formidable global public health challenge. Since the initial emergence of a novel coronavirus in late 2019, the spread of SARS-CoV-2 has been unrelenting, impacting nearly every aspect of society worldwide. The pandemic has required a substantial response by public health authorities at all levels. Predicting the trend of COVID-19 is a possible method to prevent the new spreading of COVID-19 pandemic. Analysis the pattern of COVID-19 in the past two years in the U.S. could help make the prediction of COVID-19 in the future.

In United States of America, from 3 January 2020 to 5 November 2021, there have been 45,968,940 confirmed cases of COVID-19 with 744,398 deaths. Different statistical methods will be used in this project to analyze the spreading situation of COVID-19 in the U.S. Machine learning methods will also be included in this project to make the reasonable prediction of COVID-19 spreading situation in the future one year. Mathematical methods and coding will be used for this project.