Impact of the Pandemic on Transportation in New York City

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Abstract

The goal of this project is to understand the ridership change before and after the Pandemic at New York to let NYC Department of Transportation adjust the public transportation plan. The data with Covid-19 daily counts of cases for New York provided by the Department of Health and Mental Hygiene (DOHMH) was used to see how the ridership change with the spread of covid. The ridership data from the Metropolitan Transit Agency (MTA) and the City of New York were analysis to see the influence of pandemic on the trend of ridership. The result show that even one and half year after the outbreak of covid last year the ridership of public transportation still has not returned back to the number before covid. However, the use of bridge and tunnel is similar to the number of pre pandemic.

Design

After the covid hit the New York, the city shut down and people start to work at home. People's commuting way changed a lot after the pandemic happened. Hence, the result from this project can help the NYC Department of Transportation have the better understanding of the influence of covid case on the ridership of public transportation. In the future, if there is a new variant of covid or new disease, they can somehow have a back up plan or adjust the transportation schedule to continue operating through the crisis.

Data

The MTA's weekly subway data contained the number of exists and entries for each turnstile with the four-hour interval. The data start from January of 2020 was used to see the trend of ridership pre-pandemic and post-pandemic. The daily counts of cases for New York was compared to see the relationship between the cases of covid and the flow of passengers in the public transportation.

Algorithms

- Data Cleaning- drop the duplicate data
- When the counter is reverse, adjust the reverse number
- Split the dataset into two time period
- Merge different dataset together and join based on datetime

Tools

- SqlAlchemy for reading data
- Numpy and Pandas for data cleaning and organizing
- Matplotlib and Seaborn for figures plotting

Communication