Examining Possible Foot Traffic Pattern Shifts in NYC

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Abstract

The client who operates a local restaurant chain in NYC suspects that covid 19 pandemic conditions have drastically altered foot traffic volumes in some neighborhoods due to highly adapted rates of remote work option in the working population. Client wants to identify foot traffic trends emerged during pandemic conditions and monitor these trends as the covid 19 restrictions are gradually lifted and/or improved within the city.

Design

MTA (Metropolitan Transportation Authority) provides web hosted weekly data of volumes of entry and exits recorded at NYC subway station turnstiles in text format. This data was retrieved for years 2019, 2020, 2021 and 2022 into SQLite and manipulated using Pandas to initially identify candidate stations / areas which have been potentially less impacted by the drop in overall ridership. Visual data was provided using Matplotlib. Stations of interest then were examined by comparing year over year total ridership and median daily exit number drop ratios based on 2019 levels.

Data

The dataset consists of daily cumulative exit data recorded at each turnstile at a given time interval. A function was included in the study to mitigate the impact of counter resetting points at each turnstile as the exact switch over point to zero is not expressly available in the data set for the counters. Audited data was found to be less than 0.5% of the overall data and this data was included in the study as it is. However, duplicate rows of data were cleaned off the data set.

Algorithms

1. Base code out putting the top stations for a three week period provided by Metis in MTA Exercises was used to selectively take in much larger data for years 2019, 2020, 2021 and 2022.

2. Top 10 stations with highest number of exit data for each year were plotted as bar charts for initial exploration.

3. Top 10 stations with highest number of exit data for 2019, 2020 and 2021 were plotted as timeseries for initial exploration.

Tools
- SQLite for initial review and exporting data.
- NumPy and Pandas for data manipulation
- Matplotlib for plotting

Communication
- Project presentation slides