Top NYC Subway Stations for Rental Scooter Deployment

Andrew Wong

Project Goal

- Perform EDA on NYC MTA Turnstile data
- Produce results/findings that can benefit rental scooter companies (Bird, Lime, Lyft etc.)
  - Determine best stations to deploy scooters

Design

- Focus : Station Exit Data
- Higher exit traffic ➡ Higher potential for rental
- High traffic areas ↺↻ Recirculation of scooters
- ⬆ Revenue
- ⬆ Brand visibility

Data

- (Pre-Covid) 4/27/2019 to 7/26/2019 (91 days)
- Stations with highest average daily exits
- Top Stations per borough (Bronx, Brooklyn, Queens, Manhattan)

Data

- Exit counts updated every 4 hours, last count at 20:00
- Scooters collected for recharging starting at 21:00

Algorithms (Pandas)

- SCP daily exit count
  - max value - min value
  - dataframe sorted by DESC
  - found inexplicable increases

C008	R099	00-00-00	DEKALB AV	BDNQR	BMT	07/26/2019	00:00:00	REGULAR	0006897017	0008702864
C008	R099	00-00-00	DEKALB AV	BDNQR	BMT	07/26/2019	04:00:00	REGULAR	0006897017	0008702864
C008	R099	00-00-00	DEKALB AV	BDNQR	BMT	07/26/2019	08:00:00	REGULAR	2000093069	1850343553
C008	R099	00-00-00	DEKALB AV	BDNQR	BMT	07/26/2019	12:00:00	REGULAR	2000092817	1850343947
C008	R099	00-00-00	DEKALB AV	BDNQR	BMT	07/26/2019	16:00:00	REGULAR	2000092406	1850344366
C008	R099	00-00-00	DEKALB AV	BDNQR	BMT	07/26/2019	20:00:00	REGULAR	2000091967	1850344989

Algorithms (Pandas)


```
total_scp_exit.describe()
```

	EXITS_x	EXITS_y	exits_per_day
count	4.135410e+05	4.135410e+05	4.135410e+05
mean	3.615268e+07	3.610136e+07	5.132585e+04
std	2.013725e+08	2.012513e+08	7.086530e+06
min	0.000000e+00	0.000000e+00	0.000000e+00
25%	2.074170e+05	2.064270e+05	1.520000e+02
50%	1.422380e+06	1.420913e+06	4.610000e+02
75%	4.961140e+06	4.958675e+06	1.006000e+03
max	2.124127e+09	2.124125e+09	1.841642e+09
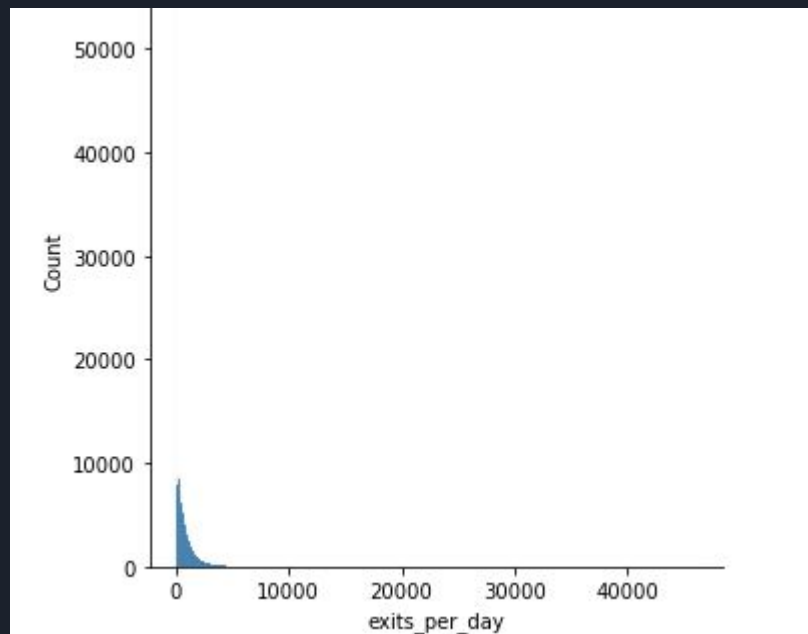
# Algorithms (Pandas)

```python
#Remove SCP exits_per_day values > 51325
total_scp_exit2 = total_scp_exit[(total_scp_exit.exits_per_day <51325)]
```

```python
#Find AVG EXITS per day per STATION.
avg_daily_exit = total_scp_exit2.groupby(['STATION','DATE','AREA'])[['exits_per_day']].sum()
```

```python
#Group by STATION and return the mean of daily exits
station_daily = avg_daily_exit.groupby(['STATION','AREA'])[['exits_per_day']].mean()
```

Results - All Manhattan

New York City Subway Diagram
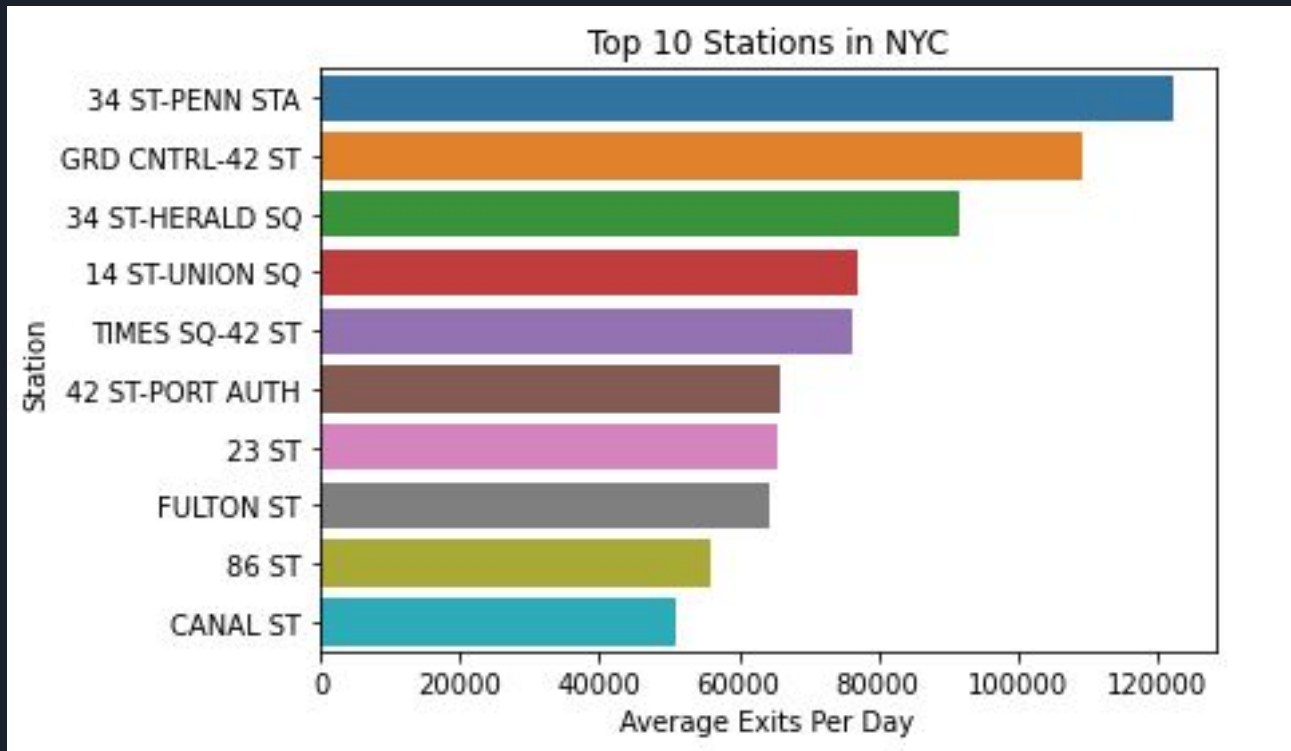
Results Considerations

- Manhattan is dense with stations
  - Less need for scooter rides
- Busiest areas ≠ best areas for scooters
    - Sidewalk/street conditions not ideal for placement, riding, safety
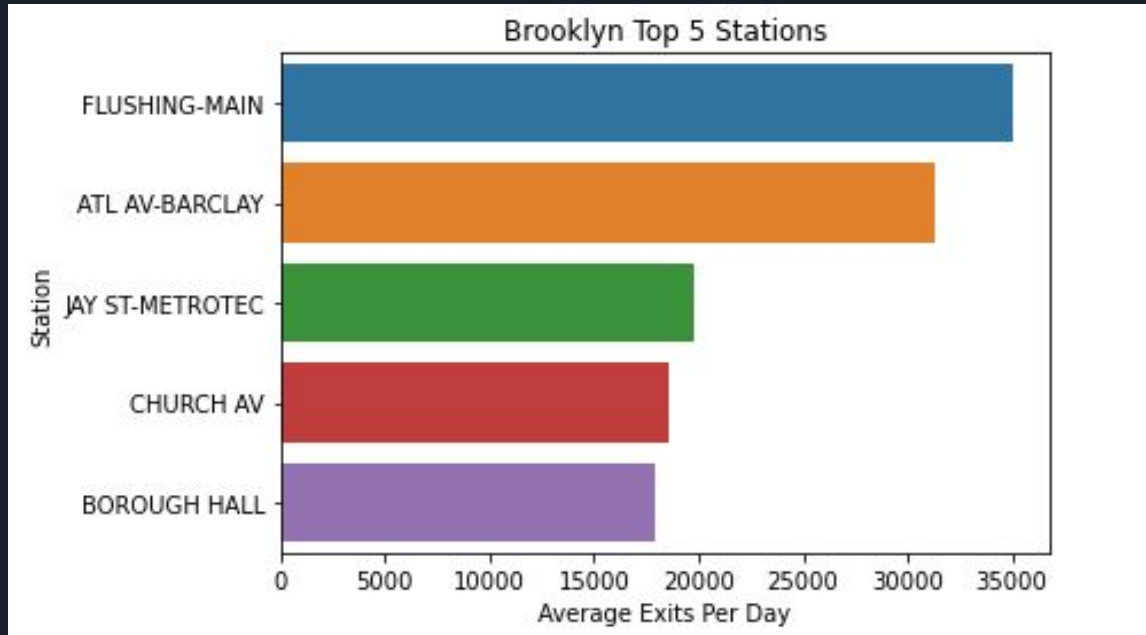
Algorithms cont.

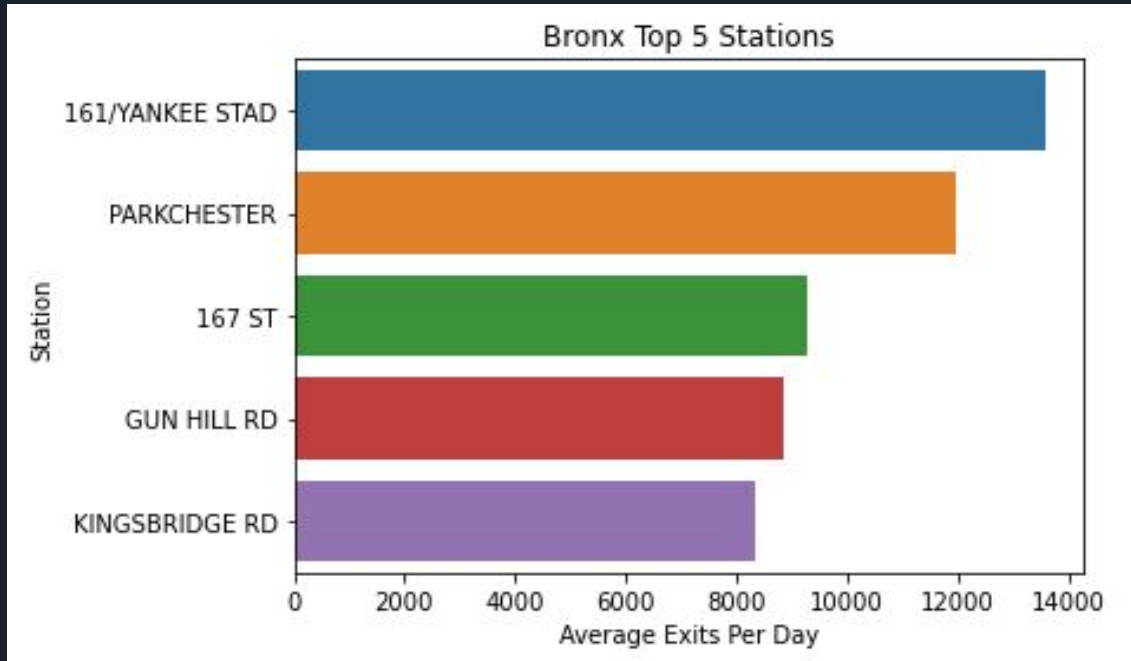## Finding TOP 5 Stations Per Borough

```python
#Masks for each borough of interest
brooklyn = (station_daily.AREA == 'BROOKLYN')
bronx = (station_daily.AREA == 'BRONX')
queens = (station_daily.AREA == 'QUEENS')
manhattan = (station_daily.AREA == 'MANHATTAN')
```
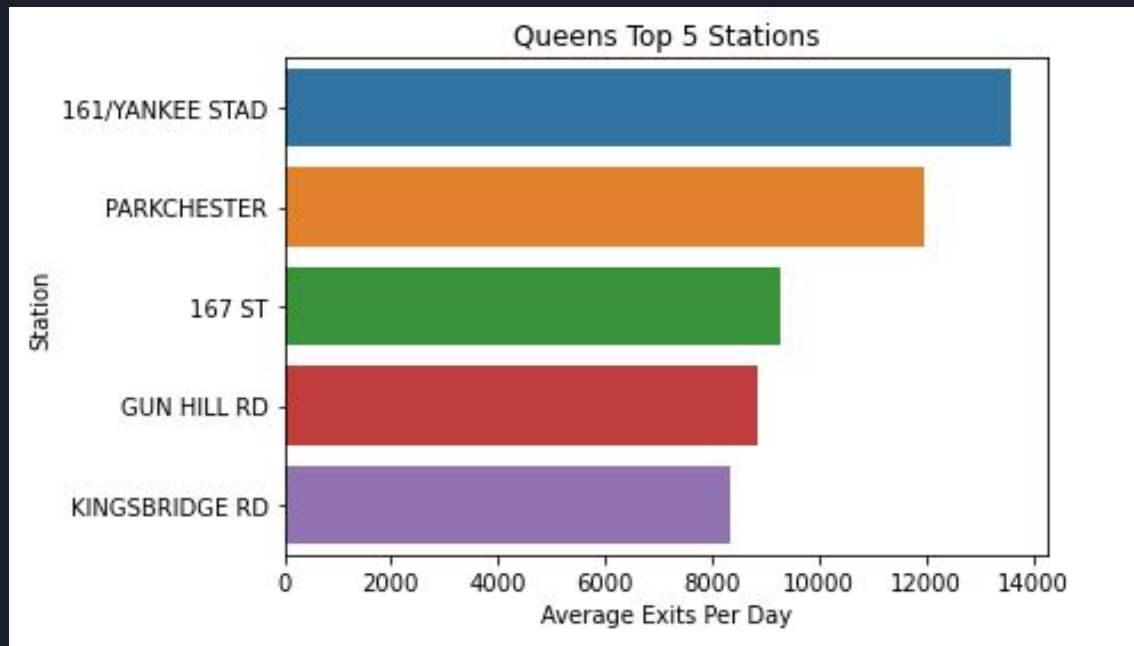
Results - Top 5 Stations Per Borough

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Tools

- SQL for data concatenation and filtering
- Pandas for data manipulation, analysis, cleaning
- Seaborn for plotting and visualization
- Python to download data, reading data using sqlalchemy engine