Finding the Perfect Captive Audience

Dayv Doberne

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Meet the ★ATRAINZ★

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- Timmy, Ryan, Ashton, Ignatio, and Neil
- NYC’s hottest new *a capella* group
- Performing in public to grow their social media following
- Dayv has been a loyal fan since early 2018

What are the busiest subway stations?

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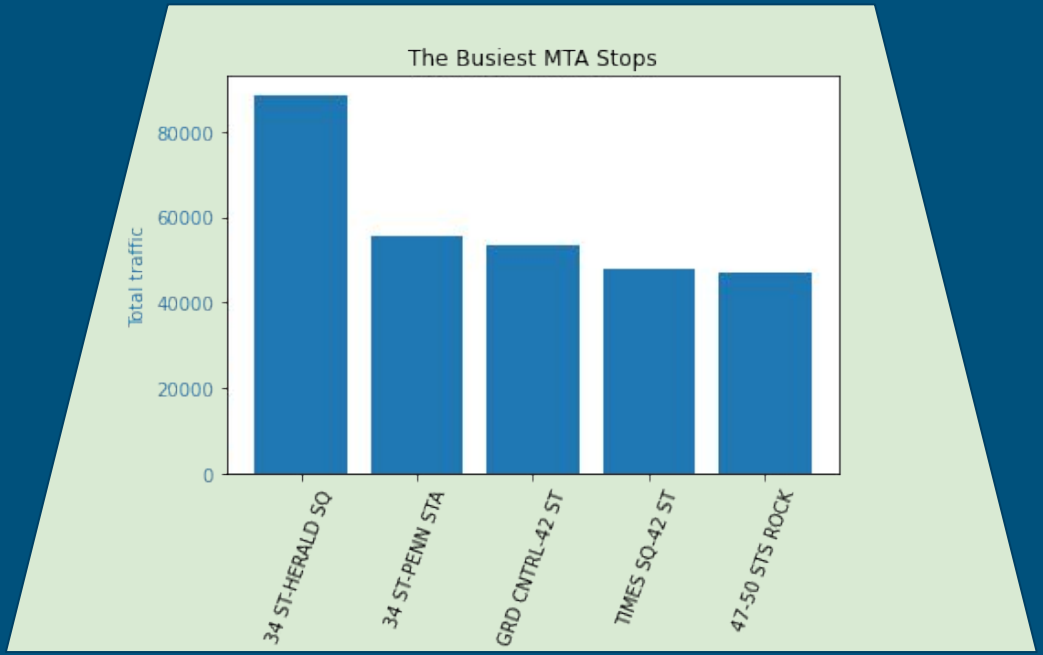

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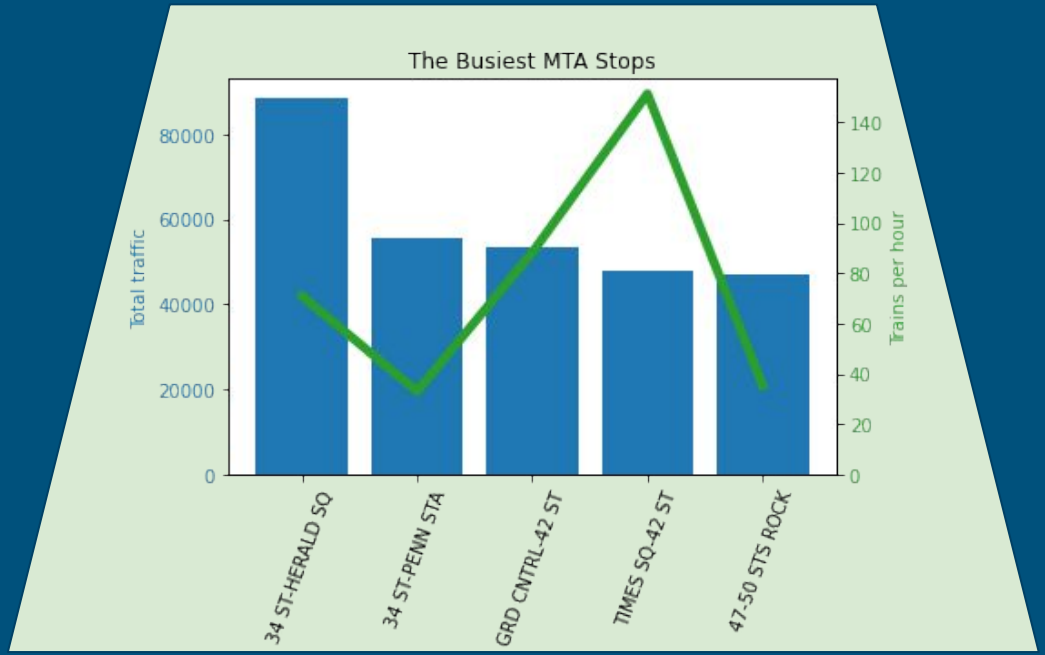

Reservations

- Traffic divided by many different lines – up to 12!
- Trains come every minute or even 30 seconds
- Not enough time for passengers to fully appreciate musical performance
- Most importantly – not enough time to post an Instagram story!

Time for a new plan

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- Lots of people = good
- Lots of trains = not so good
- Analyze data from 2019
- Search for trends where more people are waiting for longer

Methodology

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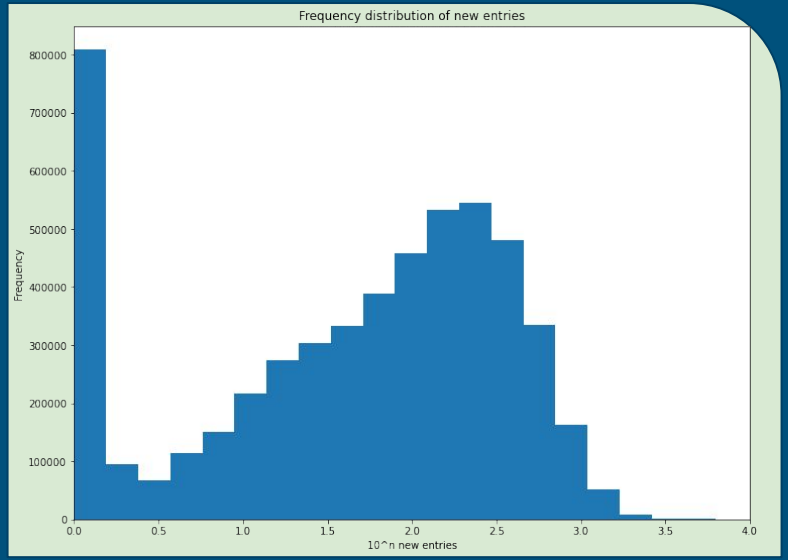
- Read in MTA data from March-August 2019
- Calculate total entries for each station during each timeframe
- Use the timestamp and station information to calculate the number of trains during each timeframe
- Divide number of passengers by number of trains to approximate the average number of people waiting

Methodology

- Used histogram to identify outliers
- Referenced train frequency table
- Wrote a method to take in datetime and station info, returning # of trains for that time period

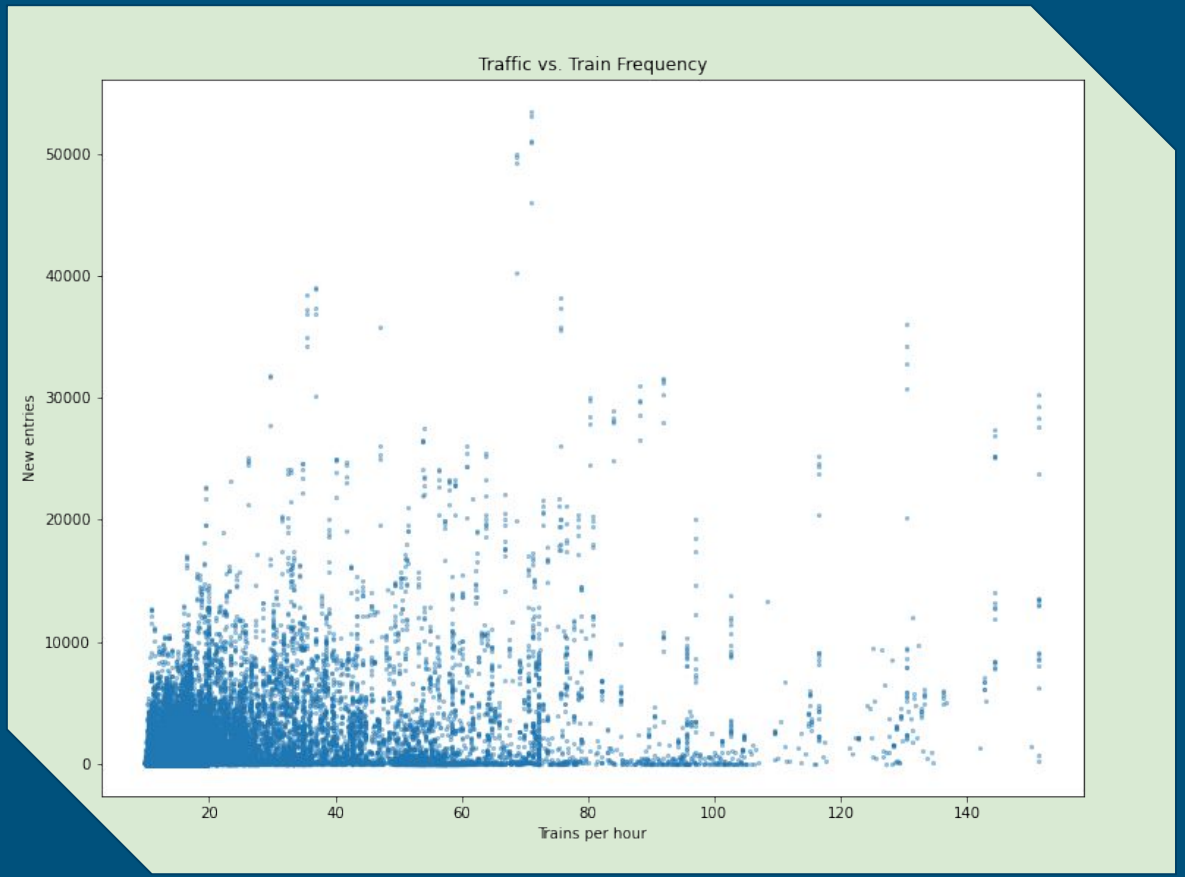



```
def trains_per_h_conv_better(date_and_line):
    dt_value = date_and_line[0]
    dt_ymd = [dt_value.year, dt_value.month,
    line = date_and_line[1]
    trains = 0
    time_rem = 240 * 60
    tv = (dt_value - datetime(dt_ymd[0], dt_y
    while time_rem > 0: # Will loop back if n
        if dt_value.weekday() > 4: # if weeke
            if tv > time_to_s(6, 30): # if af
                td = tv - time_to_s(6, 30)
                trains += calc_trains(min(td,
                if time_rem < td:
```

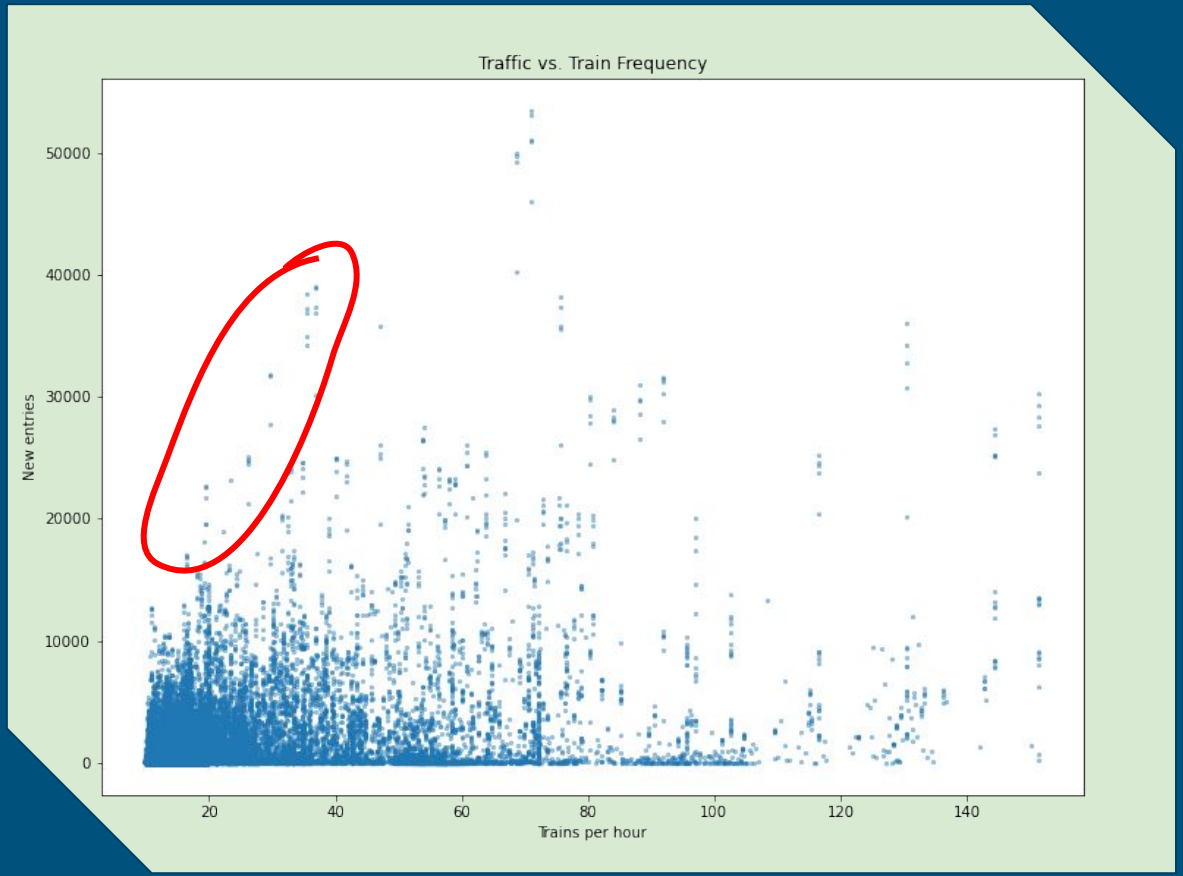
Period	1 [30] [2]	2 [31] [3]	3 [32] [4]	4 [33] [5]	5 [34] [6]	6 [35] [7]	7 [36] [8]
Rush hours	3	6-7	6-7	4-5	5-6	2-4	2-3
Middays	6	7-8	8-9	7-8	8-9	4	5
Evenings	10	8-12	12	10	10-12	10-12	5-8
Weekends	8-12	8-12	12	8-12	12	8-10	4-8
Late nights	20	20	20	20	20	20	20

Results

Results


Traffic vs. Train Frequency
New entries
50000
40000
30000
20000
10000
0
20
40
60
80
100
120
140
Trains per hour

Results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Recommendations

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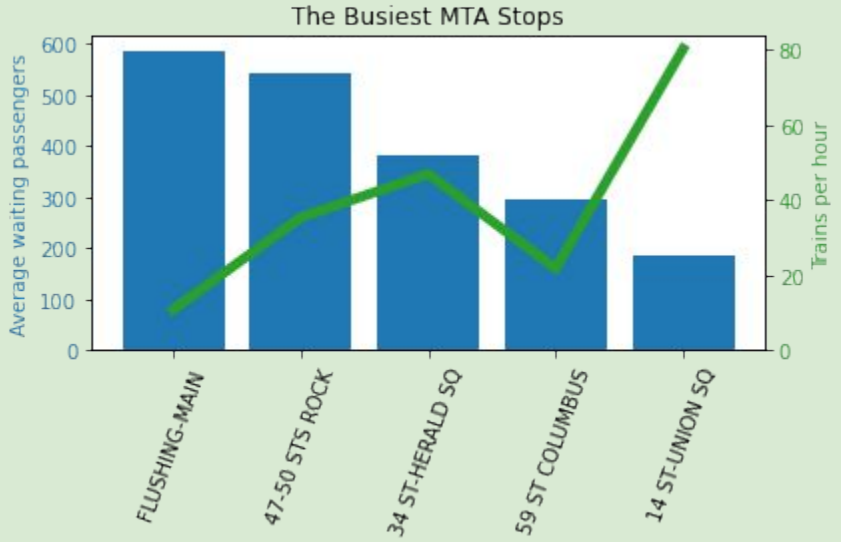

Recommendations

- Flushing-Main Street
  - Only serviced by the 7 line (10 trains per hour)
  - Highest average waiting passengers, 500+ during rush hour
  - Best times weekday early morning (before 8am)
- Rockefeller Center and Herald Square
  - Can average 10,000 passengers per hour during evening rush hour
  - 30-45 trains per hour
  - Still averages 380-540 passengers waiting on a weekly basis

Recommendations

- 59th St–Columbus Circle
  - Highest value for weekends at 7pm
  - Decreased train schedule on weekends, at 20 trains/hour
- Mets - Willets Point
  - Huge traffic immediately following New York Mets games
  - Kept showing up as outliers (but has a unique schedule to accommodate)
- ~~14th St–Union Square~~
  - ~~Huge amount of total traffic during rush hour~~
  - ~~Many lines means that trains are very frequent~~

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matplotlib