



# WEATHER PATTERNS AND SUBWAY RIDERSHIP IN NEW YORK CITY

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# INTRODUCTION

Growing concern of climate change

Goal: Figure out if poor weather conditions have an impact on subway ridership



# MTA TURNSTILE DATA

C/A	UNIT	SCP	STATION	LINENAME	DIVISION	DATE	TIME	DESC	ENTRIES	EXITS
A002	R051	02-00-00	59 ST	NQR456W	BMT	12/18/2021	03:00:00	REGULAR	7672966	2645023
A002	R051	02-00-00	59 ST	NQR456W	BMT	12/18/2021	07:00:00	REGULAR	7672969	2645040
A002	R051	02-00-00	59 ST	NQR456W	BMT	12/18/2021	11:00:00	REGULAR	7672991	2645127
A002	R051	02-00-00	59 ST	NQR456W	BMT	12/18/2021	15:00:00	REGULAR	7673037	2645193
A002	R051	02-00-00	59 ST	NQR456W	BMT	12/18/2021	19:00:00	REGULAR	7673097	2645270

# NEW YORK CITY WEATHER DATA

name	datetime	temp	feelslike	precip	precipprob	preciptype	snow	snowdepth	windspeed	cloudcover	icon
new york city	2021-01-01T00:00:00	36	31.8	0			0	0	5	10.5	clear-night
new york city	2021-01-01T01:00:00	35.3	35.3	0			0	0	2.9	10.5	clear-night
new york city	2021-01-01T02:00:00	35.2	30.7	0			0	0	5.2	10.5	clear-night
new york city	2021-01-01T03:00:00	35	30.7	0			0	0	4.9	10.5	clear-night
new york city	2021-01-01T04:00:00	34.5	29.1	0			0	0	6.1	10.5	clear-night

# TOOLS



# DATA AGGREGATION

Main DataFrame (except foot\_traffic column)

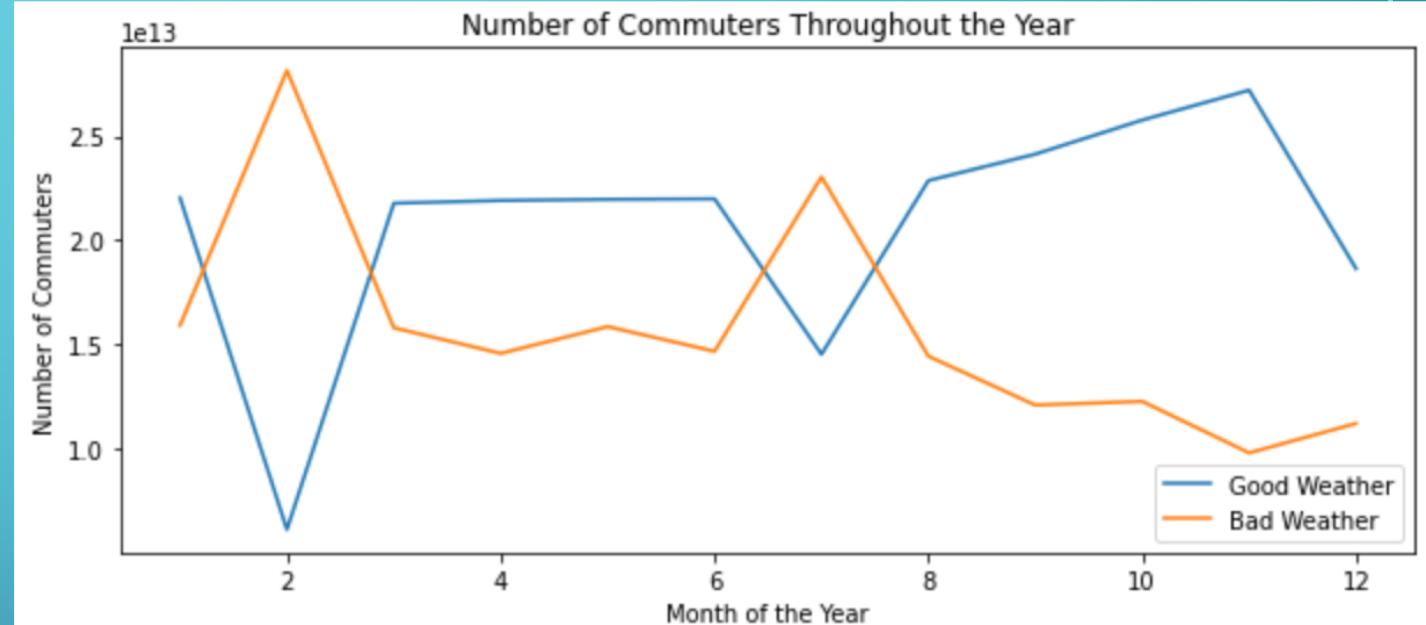
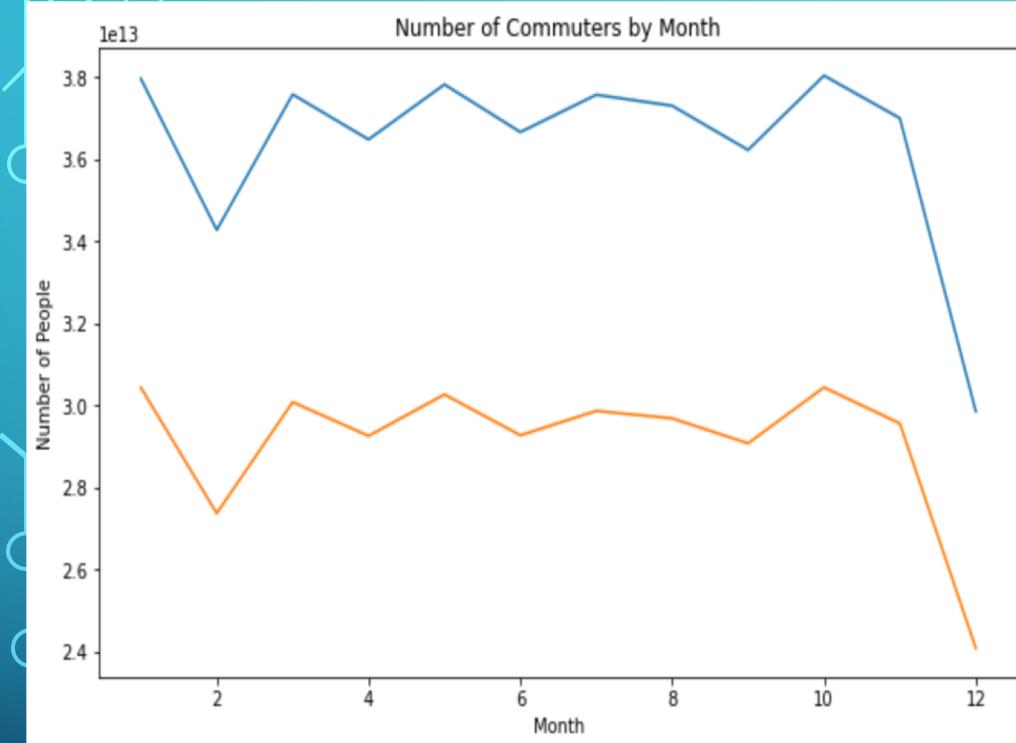
	STATION	DATE	weather_type	day_of_week	temp	ENTRIES	EXITS	precip	snow	snowdepth	total_precip	foot_traffic
1434	1 AV	2021-01-05	good	1	38.762041	2777608478	2797264170	0.0	0.0	0.13	0.0	5574872648

## Examples of Data Manipulation

STATION	Jan Entry Diff	Feb Entry Diff	Mar Entry Diff	Apr Entry Diff	May Entry Diff	Jun Entry Diff
0 1 AV	-5.690432e-07	-2.935554e-07	-1.179316e-05	-1.154793e-07	2.678564e-06	-1.201209e-07

STATION	ENTRIES	EXITS	foot_traffic
65 42 ST-PORT AUTH	16170531553198	13378551819488	29549083372686

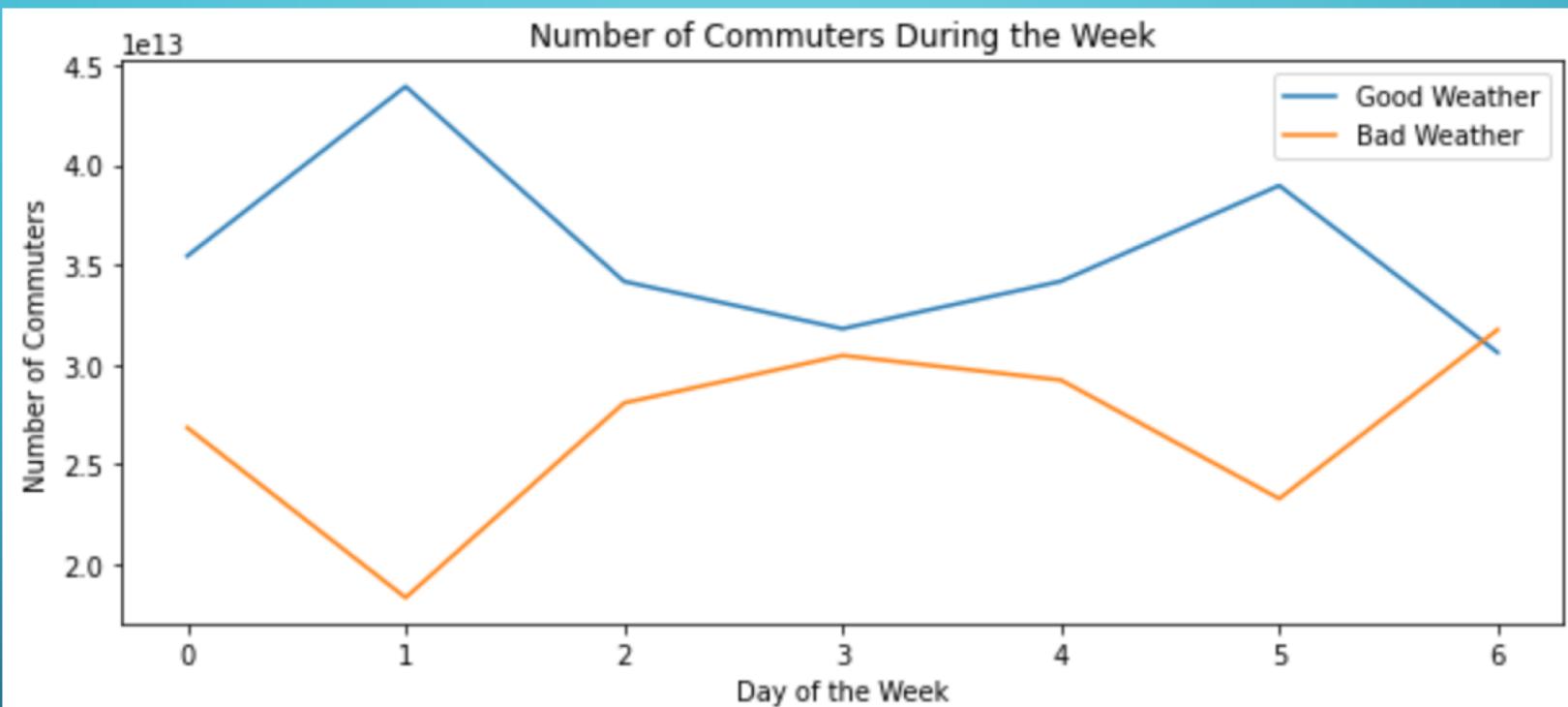
# RESULTS



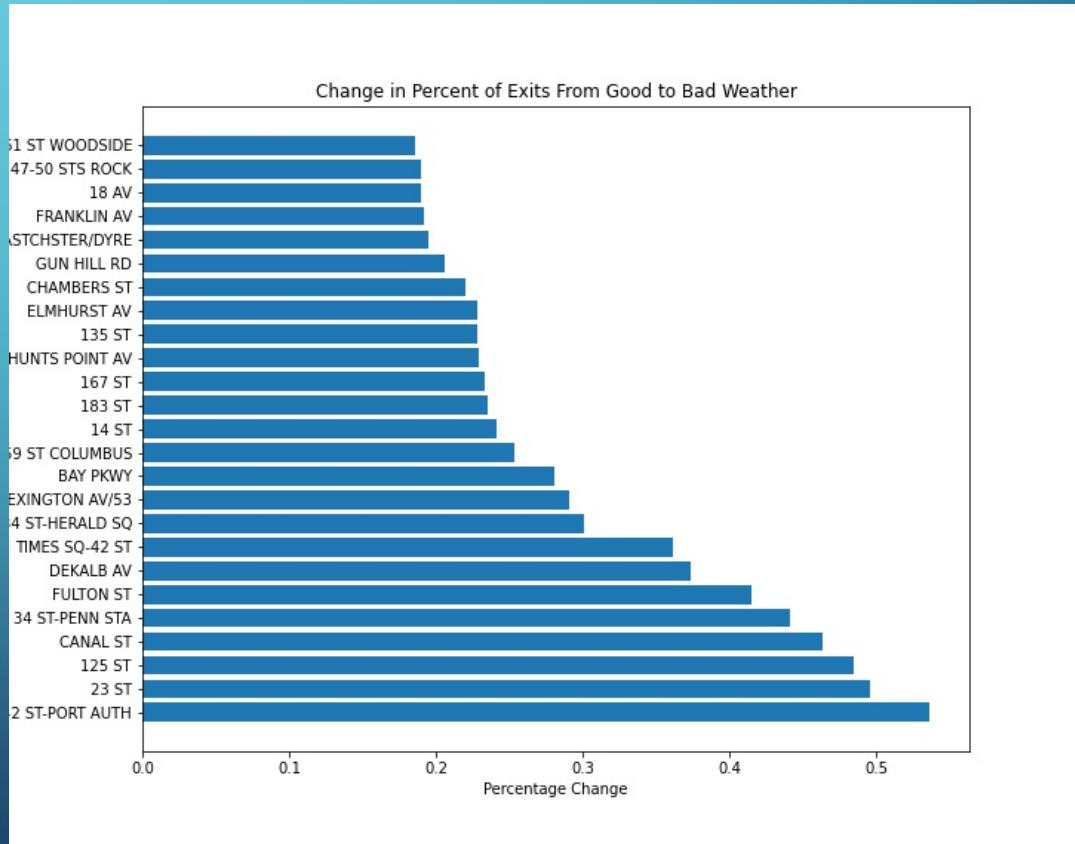
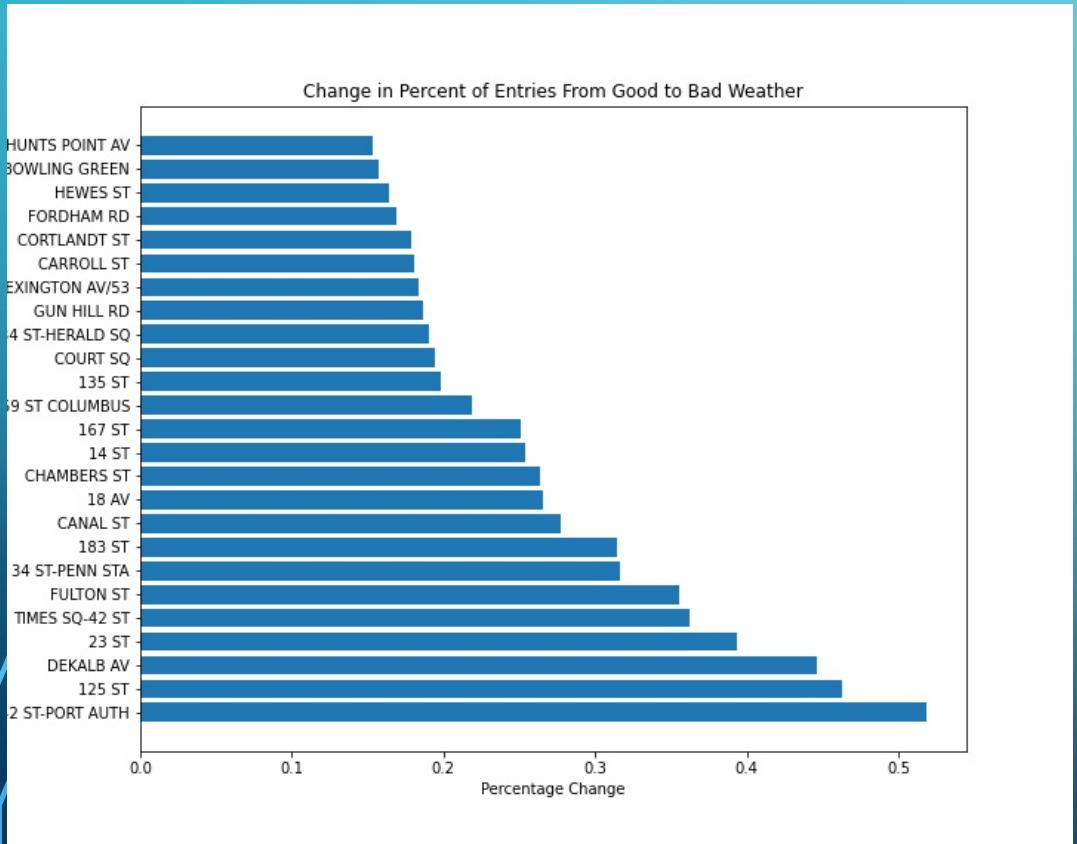
2	bad	8235
	good	1791
		9026

7	bad	6790
	good	4290
		11080

# RESULTS

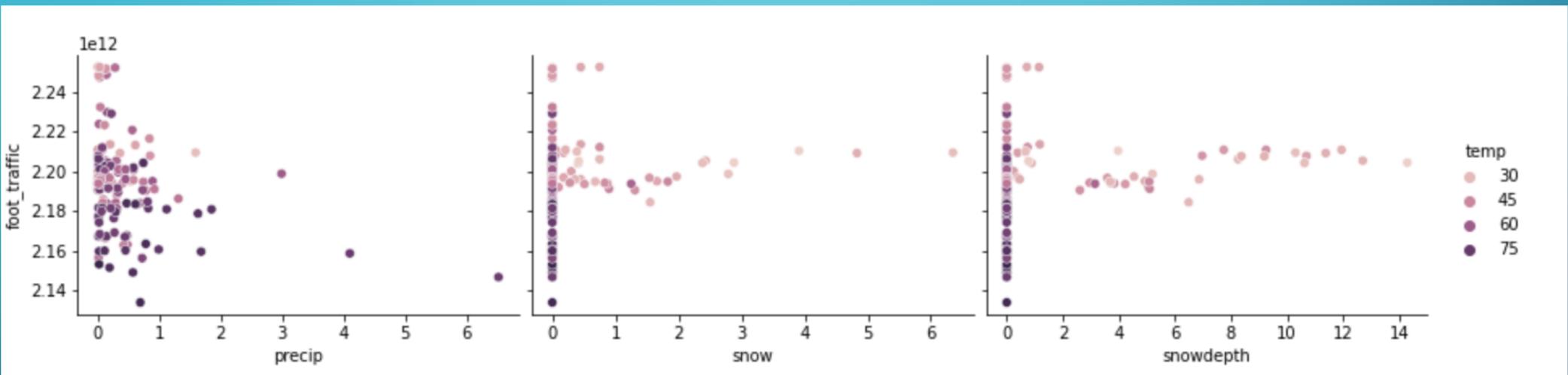


# RESULTS



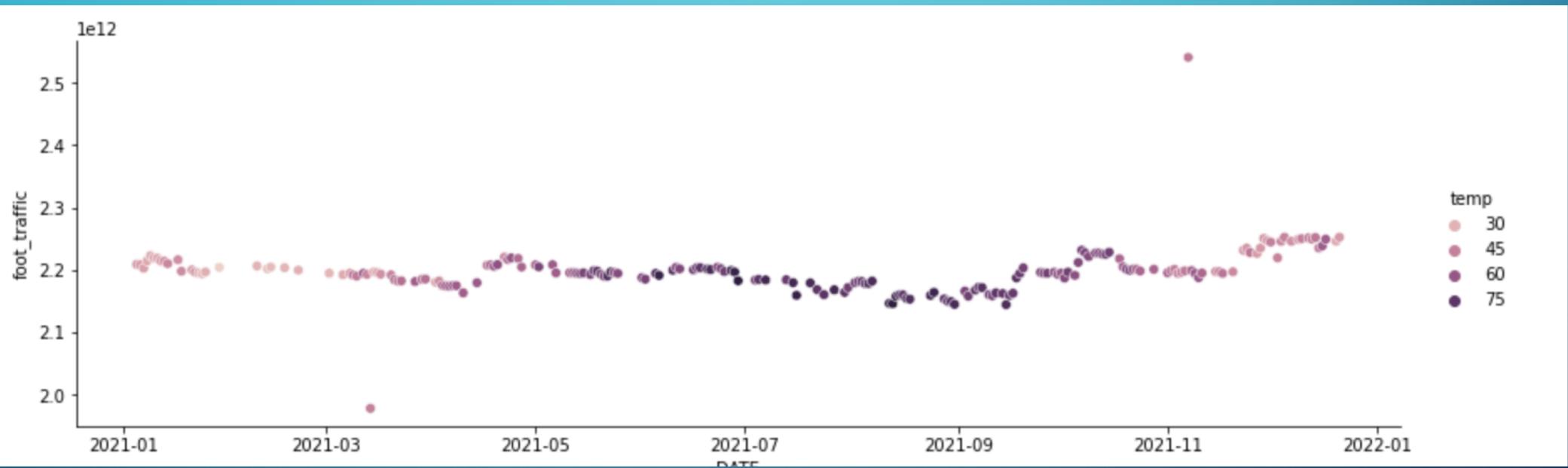
# RESULTS

## Commuter Patterns During Bad Weather

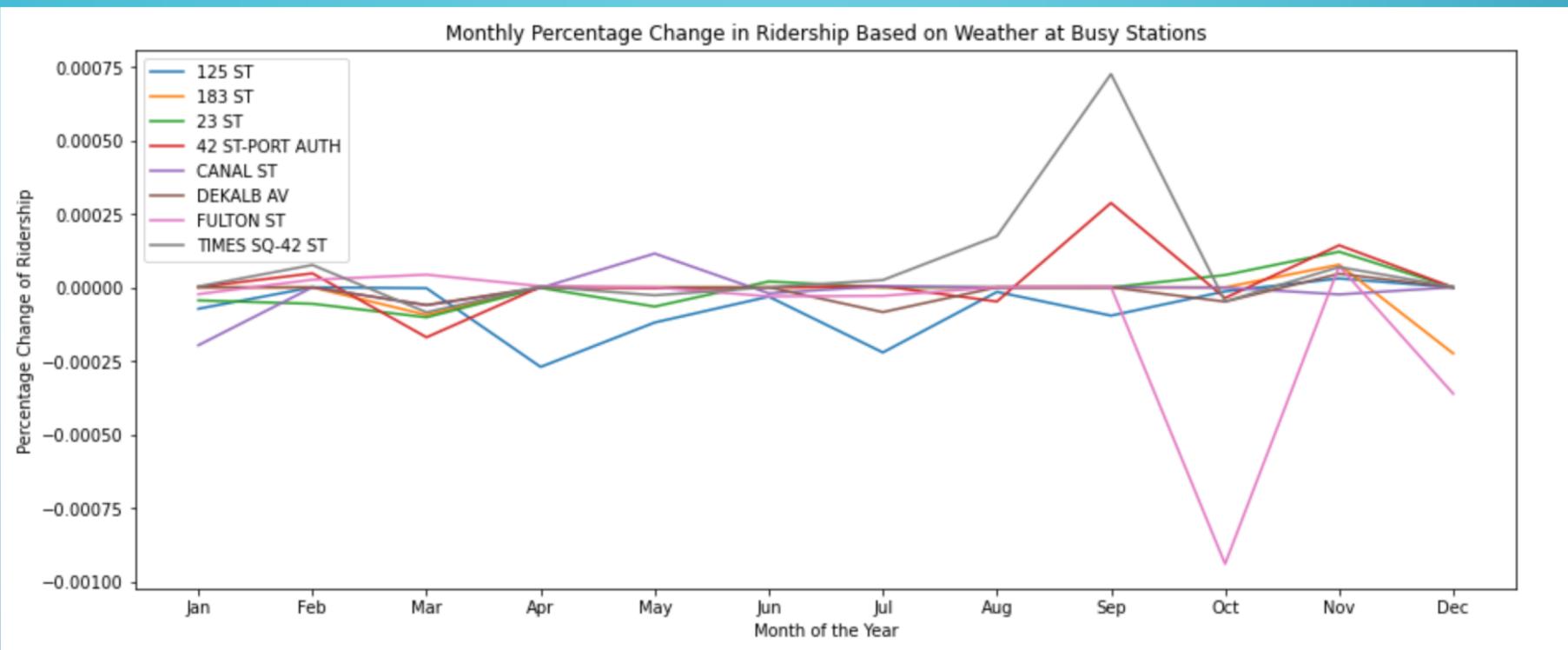


# RESULTS

## Commuter Patterns During Good Weather



# RESULTS



# CONCLUSIONS

- Impact of poor weather is very small, other factors may cause bigger changes in ridership
- Data from before 2020 or in the future may have more information

# FUTURE WORK

- Look at subway ridership in different cities and the weather patterns unique to that area
- Research if there's a difference between the weather today and weather from the past