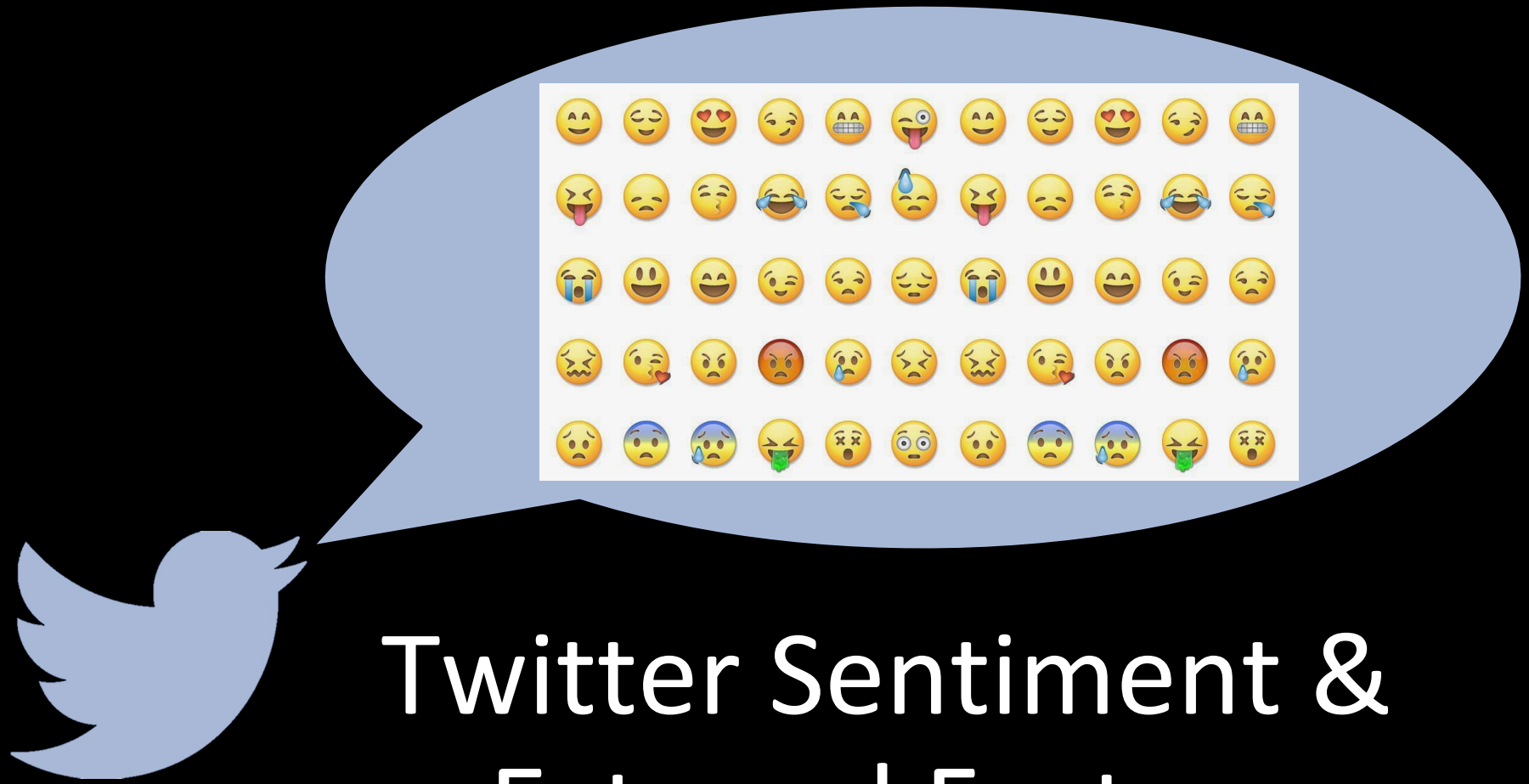


Twitter Sentiment & External Factors

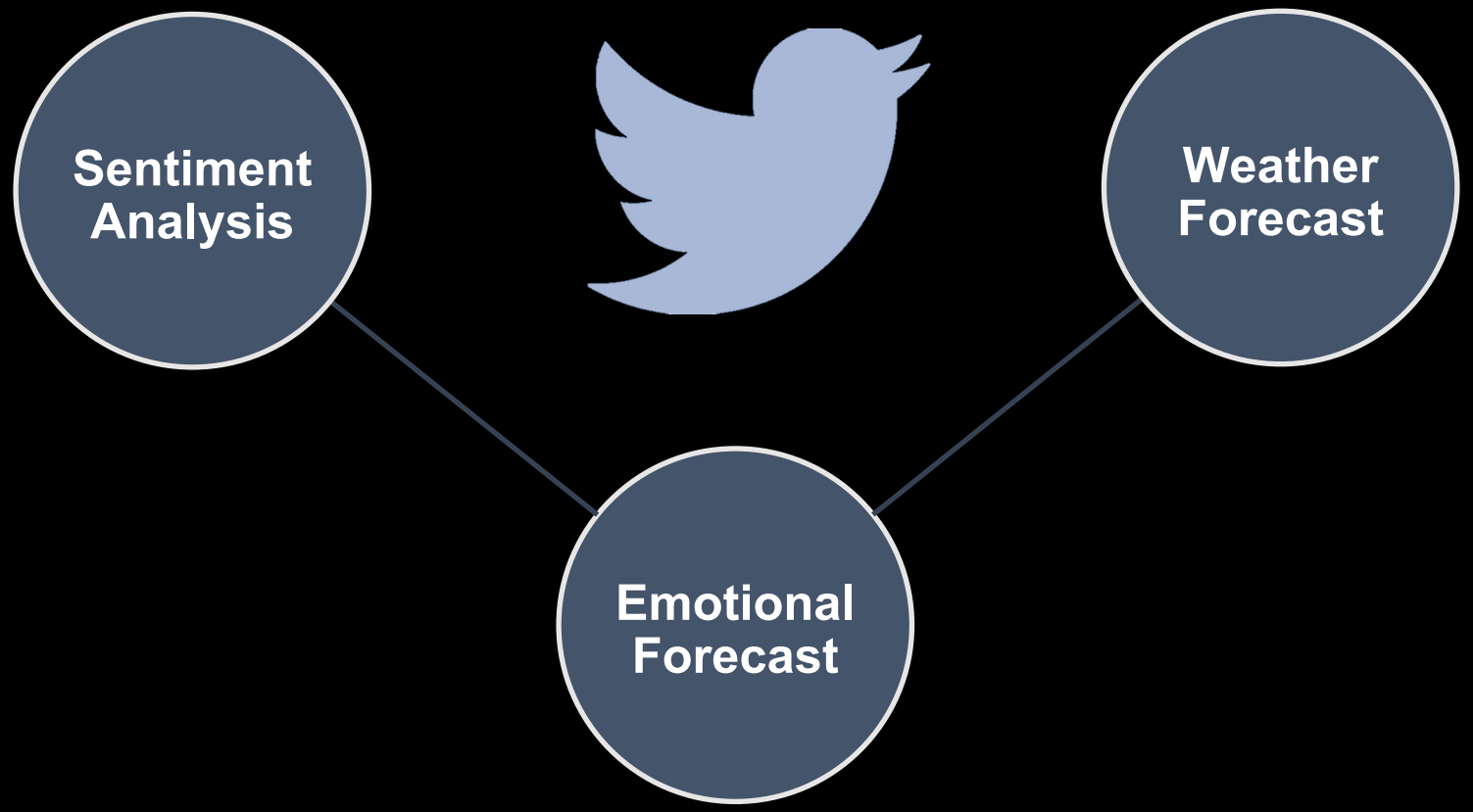
Projects in Data Science: Python

Zach Bogart, Josh Feldman, Joe Gamse, Ramy Jaber, Pit Kauffmann

INTRO

What external factors influence how people tweet?

Eg can we create a weekly ‘emotion forecast’ for Twitter based on the weather forecast?



DATA

TWEETS

- Use tweepy streamer to stream tweets from specified locations – running on Google Cloud
- ~200k total tweets from 3 cities
- 18500-word list with sentiment scores between -1 and 1

WEATHER

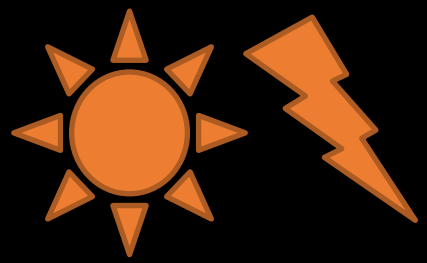
- Get weather data for specific weather stations from NOAA (ftp.ncdc.noaa.gov), corresponding with specified locations for Tweets
- Includes temperature, wind speed, cloud coverage, precipitation

METHODOLOGY

TWEETS – Stream in for each location

SENTIMENT SCORE – calculate sentiment of each tweet using wordlist

WEATHER – add weather data for each tweet from closest weather station



TRAIN – train model on weather/tweet data using Random Forest, Extra Trees and Bagging Classifiers

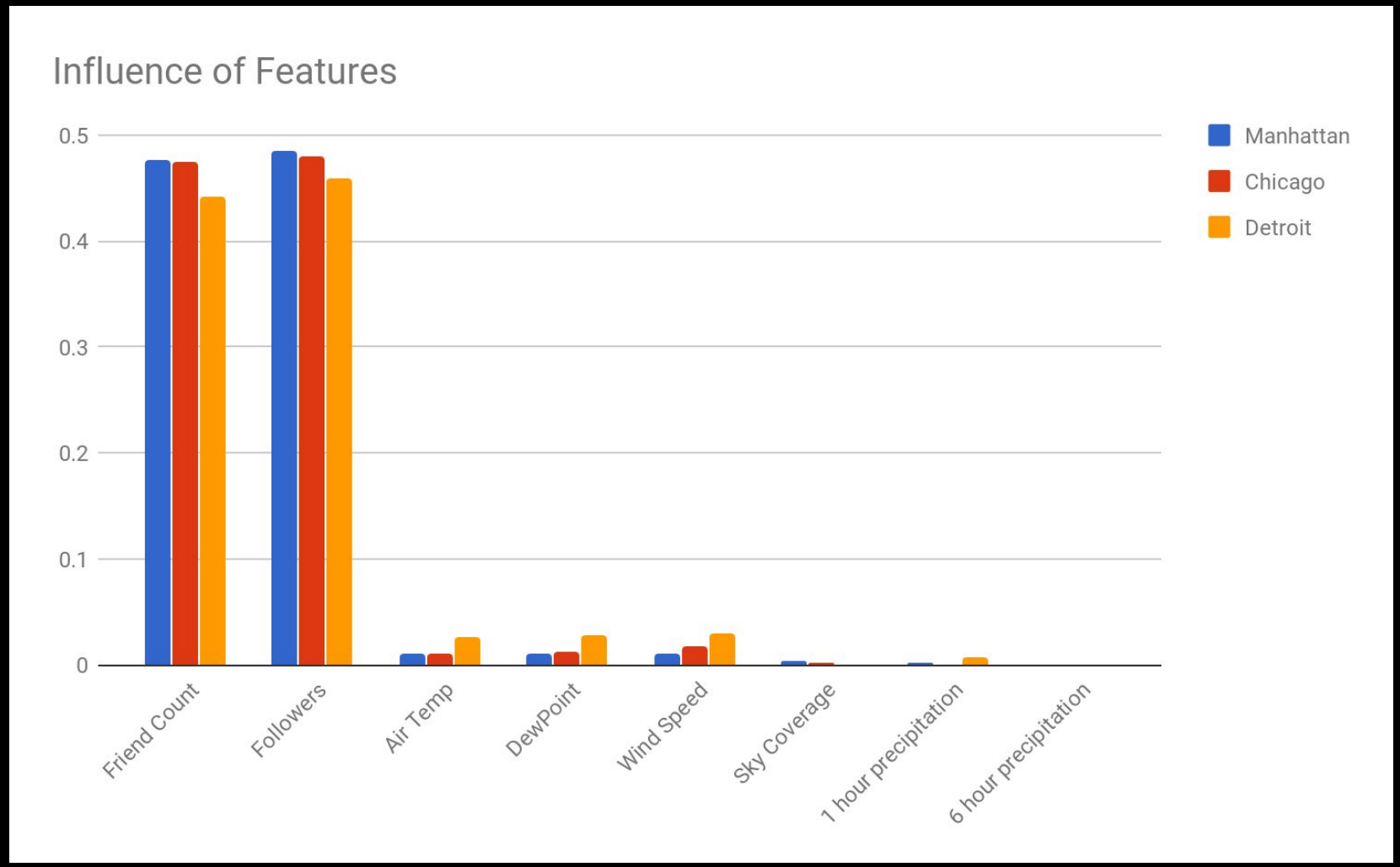
PREDICT – use forecast weather data to predict change in sentiment by location

PRELIMINARY RESULTS

Goal: Classify each tweet as either positive, negative, or neutral sentiment

Test Accuracy		Training Accuracy	
Manhattan	~85K	0.845	0.425
Chicago	~65K	0.818	0.4
Detroit	~12K	0.815	0.405

PRELIMINARY RESULTS (cont'd)



PRELIMINARY RESULTS (cont'd)

Confusion Matrixes (Manhattan - testing on 25% of tweets)

ALL FACTORS	Predictions				
Actual		**Neutral**	**Positive**	**Negative**	
	Neutral	1987	1966	1540	**5493**
	Positive	1715	4129	2607	**8451**
	Negative	1493	2977	2978	**7448**
		5195	**9072**	**7125**	

WEATHER ONLY	Predictions				
Actual		**Neutral**	**Positive**	**Negative**	
	Neutral	0	5171	388	**5559**
	Positive	0	7919	608	**8527**
	Negative	0	6782	524	**7306**
		0	**19872**	**1520**	

CONCLUSION & NEXT STEPS

- Collect tweets for even more locations and across a longer time period
- Run each classifier with more parameters to find the best fit
- Run more classifiers: K-means, Support Vector Machines, K-nearest neighbours, Naive Bayes
- Make sentiment analysis more granular & precise
- How do other factors, such as crime rates, sports events, etc. affect overall sentiment?

QUESTIONS?