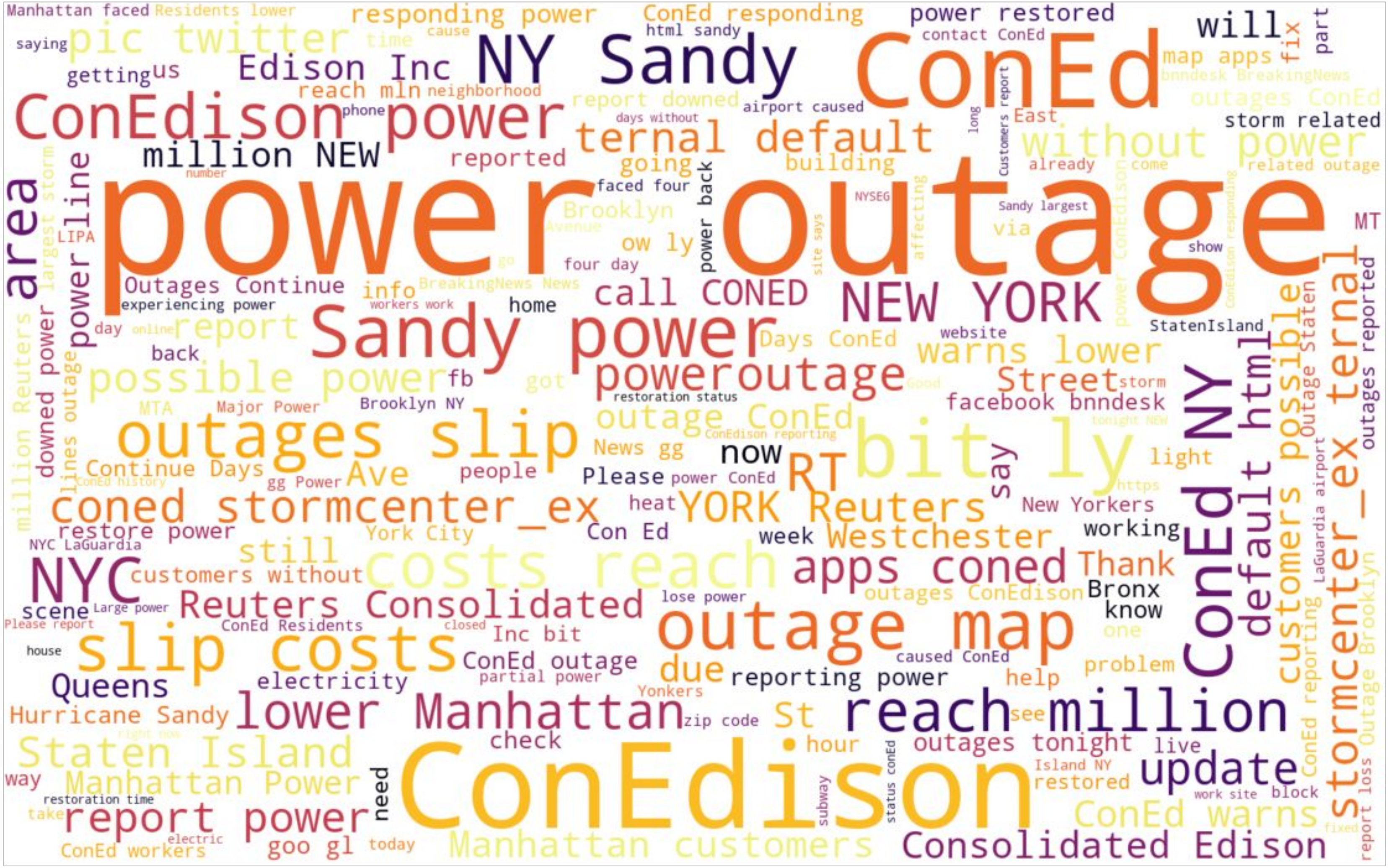
Tweet-Based Identification of Power Outages

Kevin Crystal, Ixchel Fragoso, John Ohakim


power outage
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Westchester
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neighborhood
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faced four
power back
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StatenIsland
website
restoration status
Brooklyn NY
Major Power
MTA
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lines outage
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NYC LaGuardia
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partial power
Yonkers
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Island NY
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work site
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LaGuardia airport
Outage Staten
ConEd reporting
Outage Brooklyn
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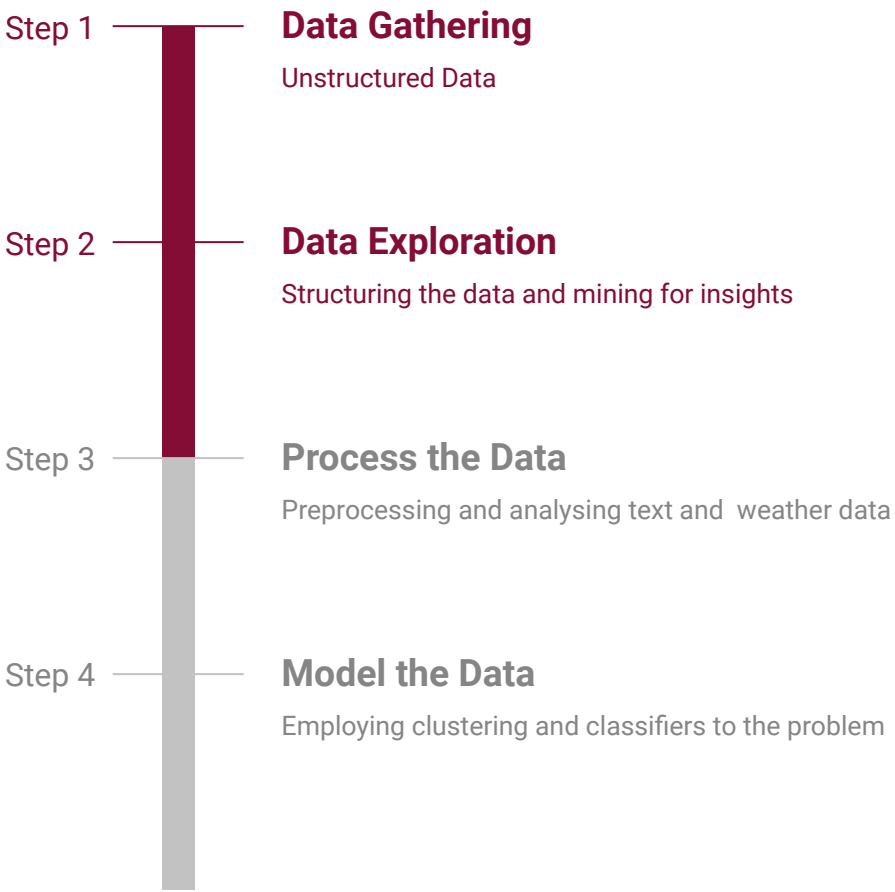
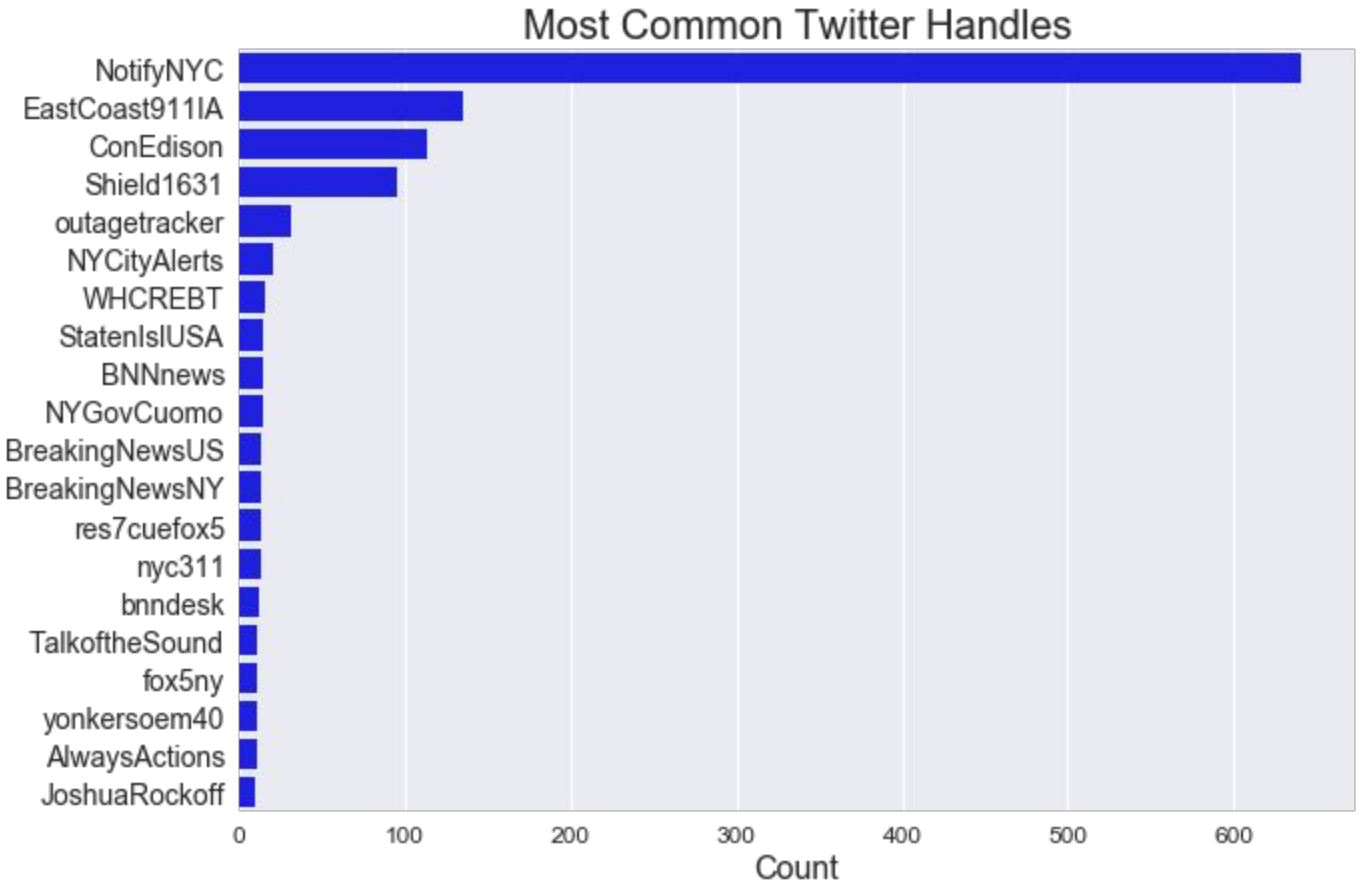
Workflow


Step 1
Data Gathering
Unstructured Data
Step 2
Data Exploration
Structuring the data and mining for insights
Step 3
Process the Data
Preprocessing and analysing text and weather data
Step 4
Model the Data
Employing clustering and classifiers to the problem

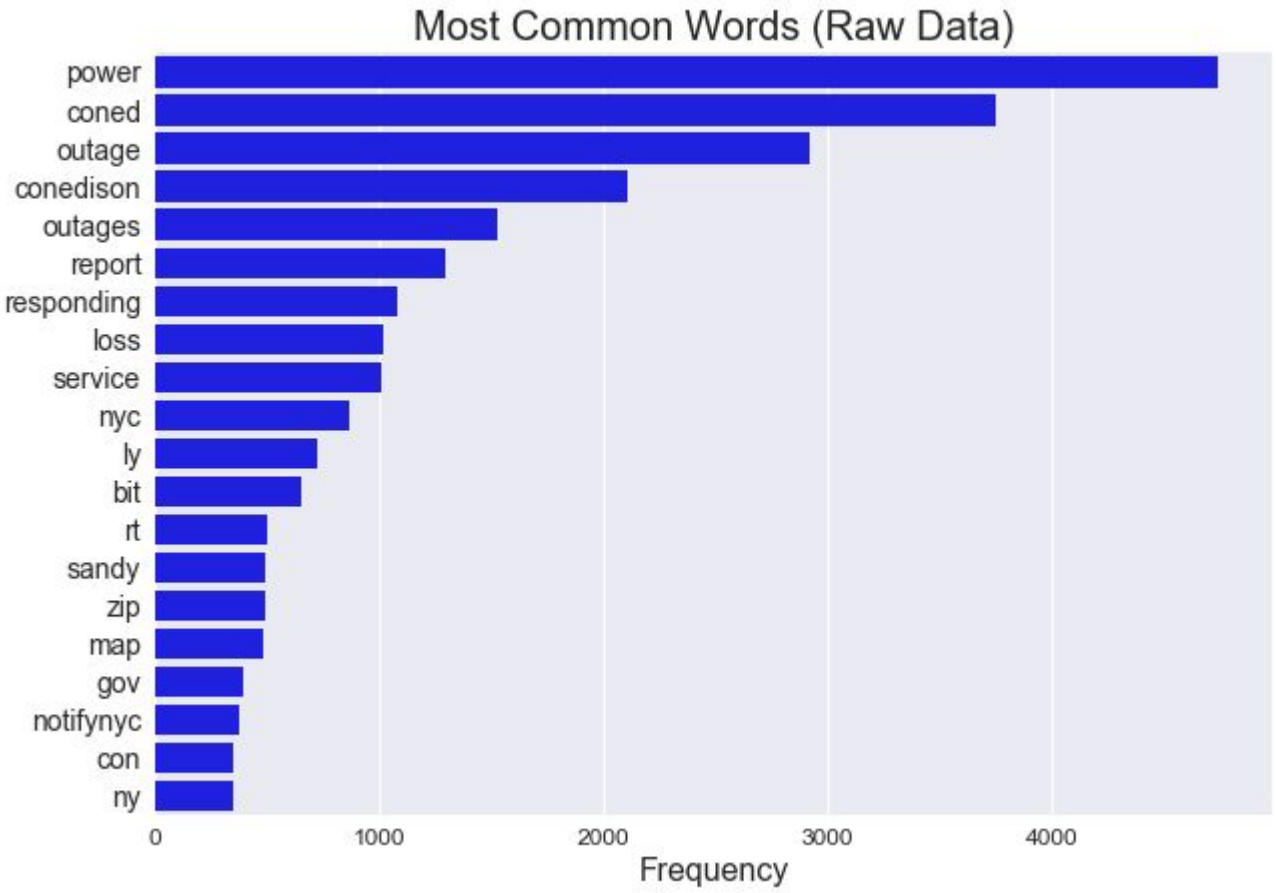
Data Gathering

Challenges			Successes
1 **Access**	✗	✓	**Method**
2 **Cost**	✗	✓	**Historical Data:** - Tweets - Weather Data
3 **Time**	✗	✓	**NYC Open Data**

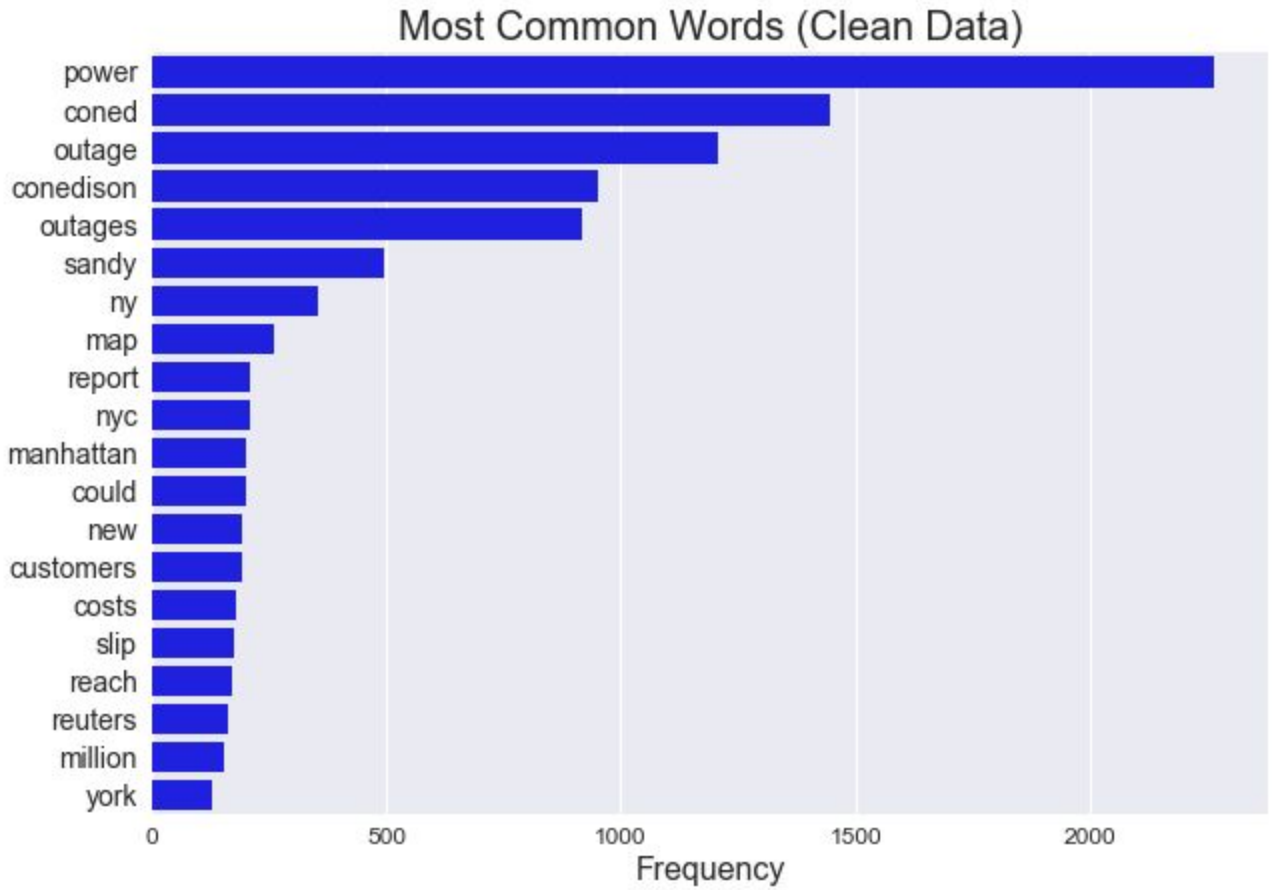
Data Exploration



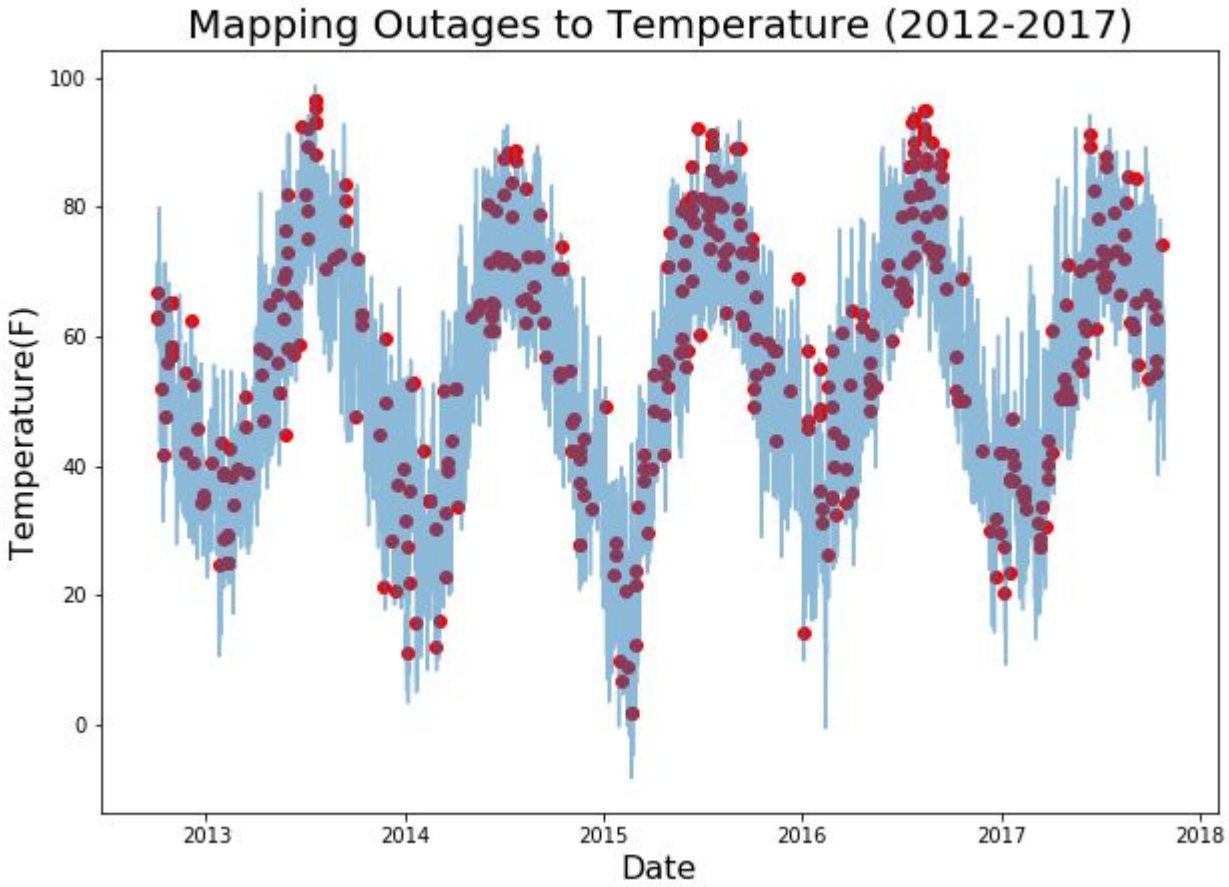
Data Exploration



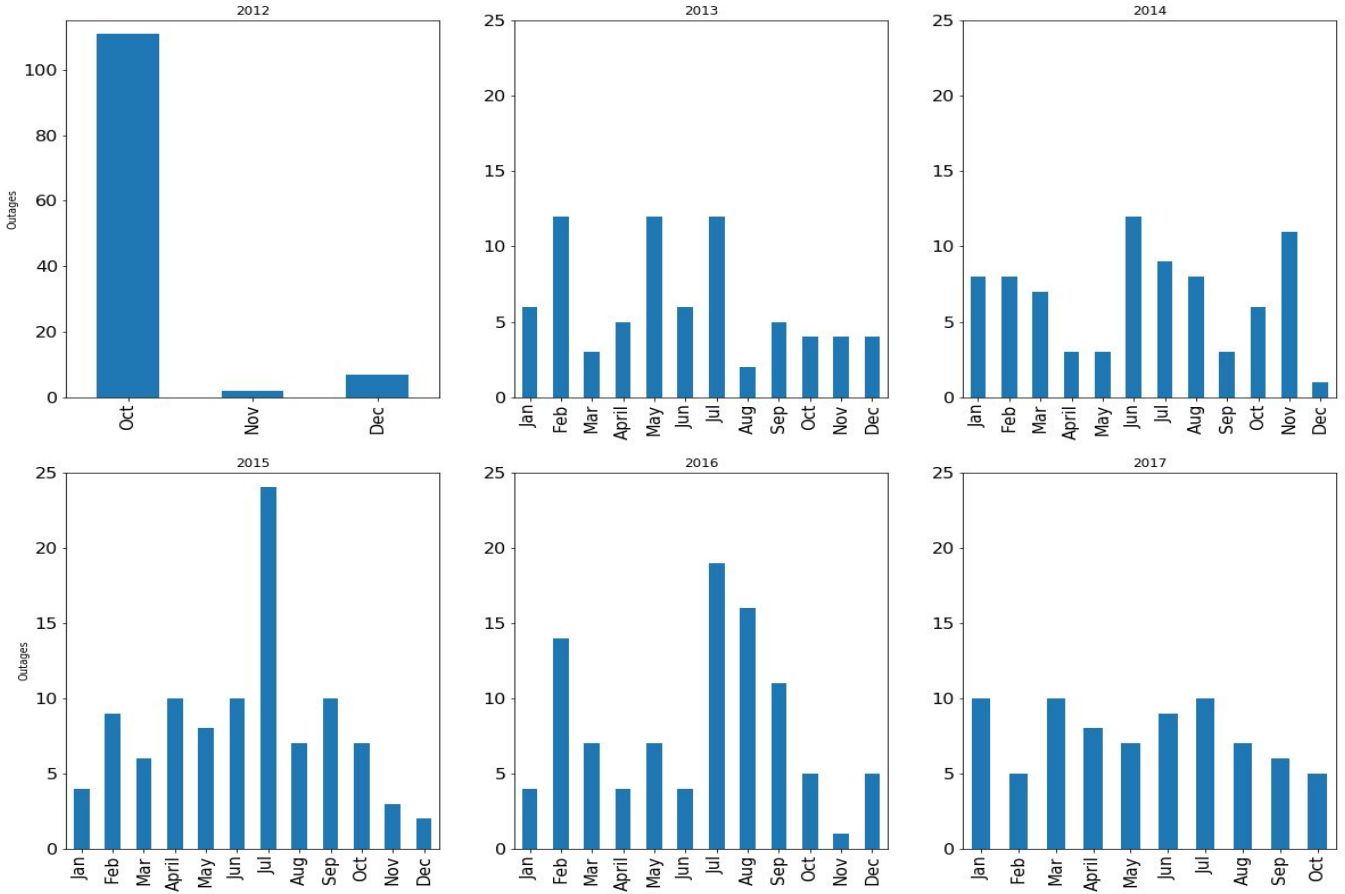
Data Exploration



Data Exploration



Number of Outages (2012-2017)



Clustering

- K-Means
- DBSCAN

- Any insights in the tweets?
- Any prominent patterns?

- 4 Clusters
- Very similar vocabulary
- Multiple clusters, depending on the data
- Over 2000 as noise

Classification

- Logistic Regression
- SVC

- Less than 1% positive class
- Class Weights
- Decision threshold

- Poor performance based on Recall
- Sharp tradeoffs
- Moderate tradeoffs
- Extensive search

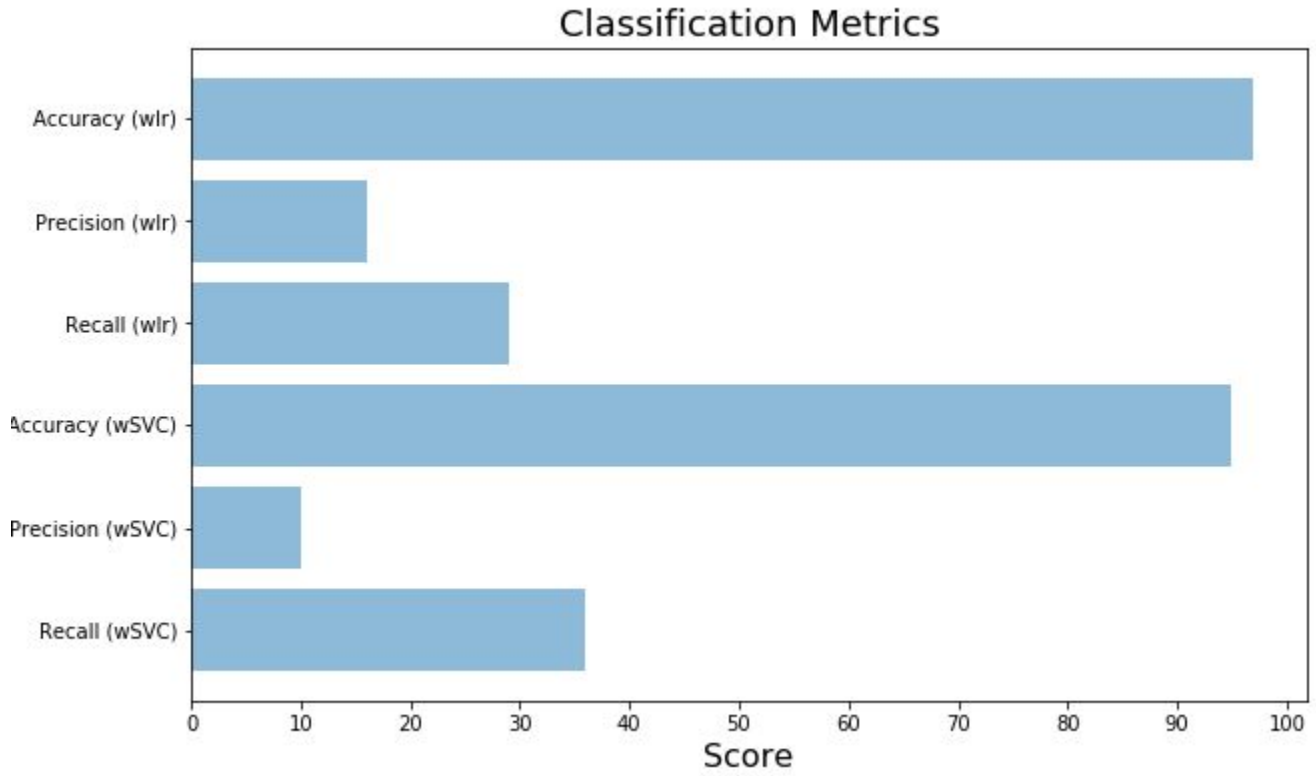
PCA

- Reduced Dimensions

- Weather a good predictor of outages
- Clumsy to employ all features

- No insights yet
- *Apriori*, no significant changes

Model Evaluation



Concluding Remarks

01	**Model**	• Employ other classification algorithms • Predict using weather data • Map outages to locations
02	**Evaluation**	• Identify other evaluation metrics • Imbalanced class problem
03	**Deployment**	• Capture new tweets • Model that predicts in real time