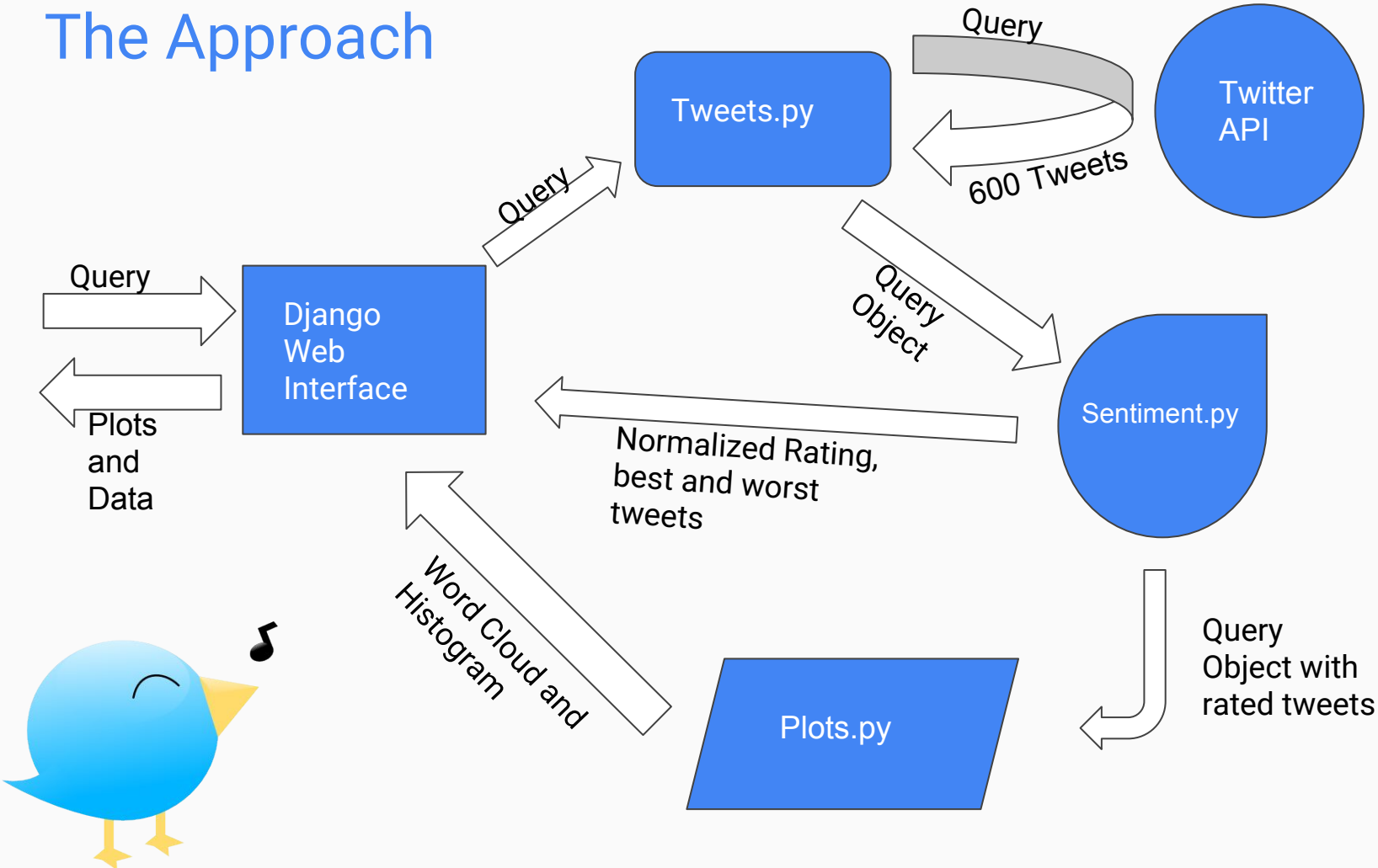
Little Bird: The Ask Anything Engine

Gabriel Levine, Maria Smith, and Graham Northrup

Goals

- Given a query, get tweets associated with that query
- Create a sentiment analysis tool that will determine the sentiment of each tweet pulled
- Put this all into a website that can be used to send queries and receive information

The Approach



Demo!

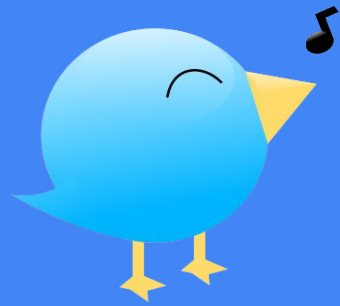
Little Bird Sentiment Analysis

General Language Method (NLTK Vader) augmented with Domain Specific Probabilities (Naive Bayesian Classifier)

General Language (NLTK Vader)

- Developed by Hutto, C.J. & Gilbert, E.E. (2014). VADER: A Parsimonious Rule-based Model for Sentiment Analysis of Social Media Text.
- Basic Lexical Method:
  - **Positive:** love, nice, good, great **Negative:** hurt, ugly, bad, worse
  - Supplemented for social media with acronyms and emoticons
- Incorporates Context-Awareness through Word-sense disambiguation:
  - **Negative**: “The contract looks good, but there’s a ***catch*”, Neutral**: “The fisherman sells his ***catch***”, **Positive**: “You better scoop him up quick, he’s a real ***catch***”
  - Relies on deeper lexical features like parts of speech

Domain Specific (Naive Bayesian)



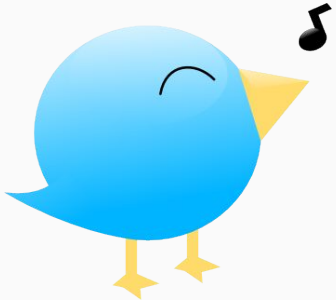
- P(label|features) = (P(label) * P(features|label)) / P(features)
- Too limited to work on text of tweet length, but can be used to extend general method by adding in P(label|feature) on tweet by tweet basis
- Captures usage specific to domain lexicon
    - Example: “portrays” has a positive valence for movies, but a neutral one in general language (as measured by our two methods)
- Method is easily extendable *given* tagged corpus

The Quirks of Sentiment Analysis

- Sentiment analysis tools are limited by amount of material
  - The length of a tweet reduces predictive power
- Sentiment analysis works on average, not so good on specific instances
  - Sometimes the best and worst tweet aren't actually that positive or negative
- How to generate intuitive ratings
- Sarcasm
  - Perhaps unsurprisingly, neither the human judges nor the machine learning techniques perform very well. [...] Our results suggest that lexical features alone are not sufficient for identifying sarcasm and that pragmatic and contextual features merit further study (González-Ibáñez, R. et al. "Identifying sarcasm in Twitter: a closer look")

The Twitter API

- Working with Twitter rate limits
  - Search API is limited to 180 requests per 15 minutes
    - Search API will return a maximum of 100 archived tweets per request
  - Stream API has no rate limit
    - Stream API collects tweets in real time
- Search vs Stream
- Collecting enough tweets for the sentiment analysis…



Future Capabilities

- Getting a Twitter API key that allows more than 100 tweets per connection
  - This would greatly downtime between the call and the return
- Making sure the query is actually the subject of each tweet being analyzed
- Working with time series tweets to see how opinions change over time


Thank You! Questions?