Gwitter Sentiment Analysis

-Ashika Rohit

Aim :

- To visually represent the sentiment of the tweets associated with a phrase by geographical regions using Raspberry Pi.
- My hope is that Political candidates, Brands can use this sentiment visualizer for making geo-aware policies and business decisions.

Why sentimental analysis using twitter ???

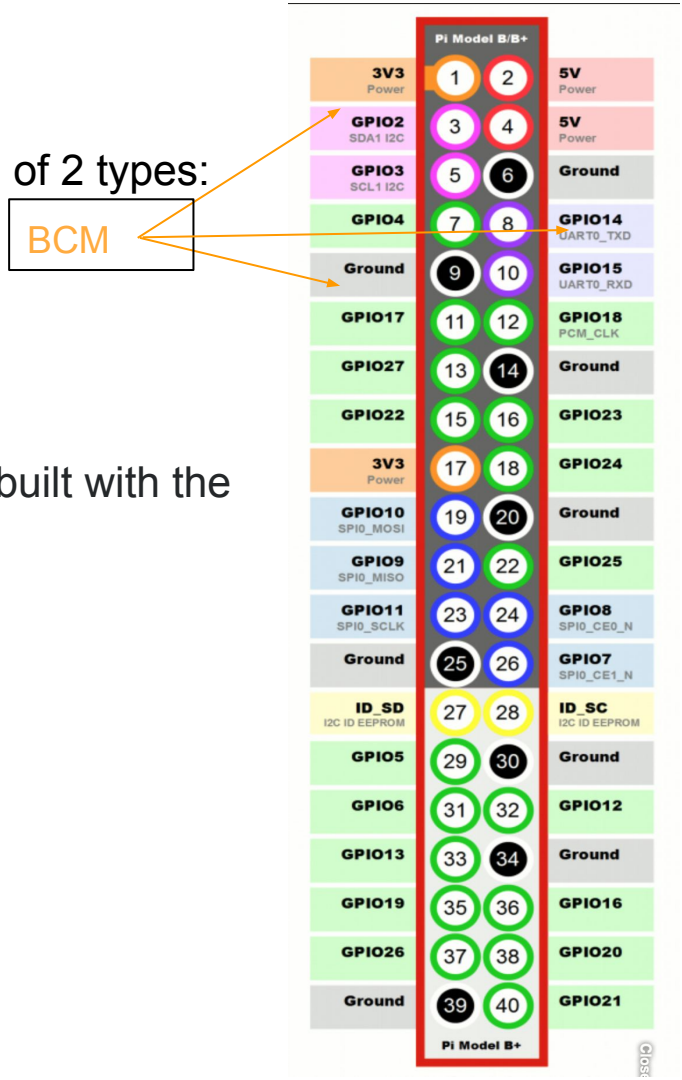
- 330 million + active monthly users, 500+ million tweets per day
- Message size restriction of 280 characters or less forces the users to stay focused.
- Sentiment analysis known as opinion mining allows us to quickly gauge the mood of the responses in the data.

Working of project :

- Implemented in Python using Raspberry Pi, Breadboard and LEDs.
- Takes a query or phrase from the user using GUI.
- Queries Twitter APIs based on a geo-code and radius for the regions using Tweepy.
- Calculates the sentiment of the tweets for the regions using Textblob.
- Lights up the (RGY) color leds for the cities appropriately depending on the sentiment.
- Displays a bar graph for the distribution of sentiments in the Desktop App

Characterization :

1. Figured out the nuances of the GPIO Pin Layouts which are of 2 types:
   a. BCM(***Broadcom SOC channel)*** pin layout
   b. Board pin layout



2. Identified few differences b/w wiringpi and pigpio
   a. WiringPi doesn't need to be run as root, but programs built with the RPi.GPIO module do need to be run as root.

   b. WiringPi supports analog reading and writing.

3. Raspberry Pi not ideally suitable for real time applications.

Discovery :

- Choose Python over C even though C provides faster execution of IO programs because:
  - Rich APIs are available for Twitter data and Sentiment Analysis.
  - Portability, as it can be run on many different systems.
- Installing Python packages in Raspberry pi are extremely slow because of its architecture(Arm)
- Sentiment score returned by TextBlob does not have a high accuracy.
- Only returns last 7 days worth of data as we are using Standard APIs.
- Ran into Rate Limit error from Twitter APIs during testing due to frequent querying.
- 2 methods for Filtering tweets by region
  - Using a search API with Geo Code.
  - Using filter api with Place code.
  - Went with search API with geocode as it fetches more results.

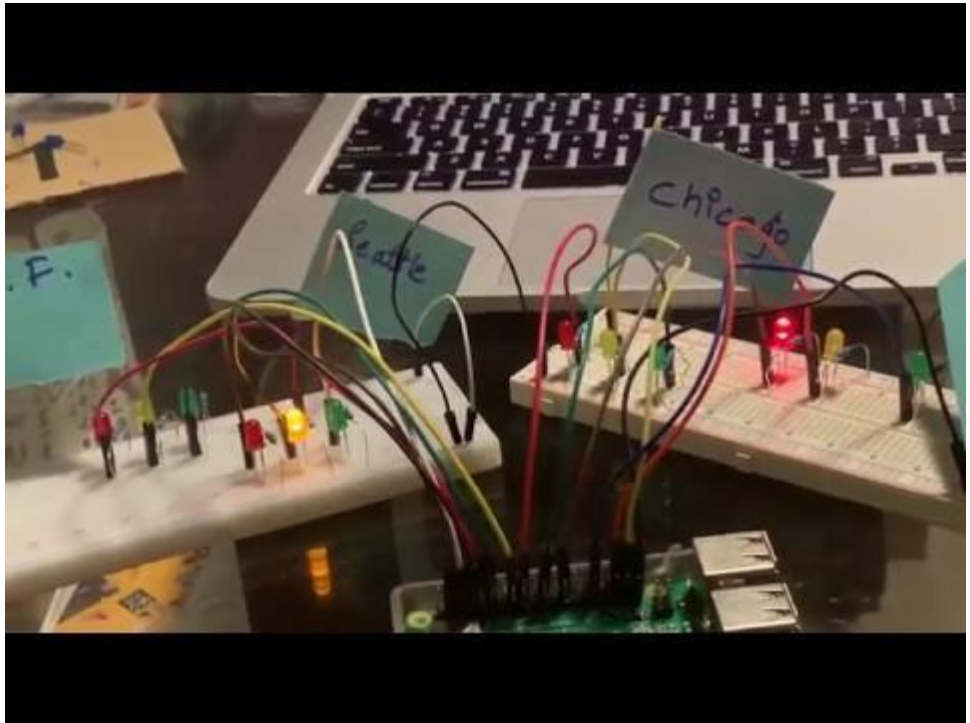
Challenges :

- Narrowing down to a single project from a huge list of potential Raspberry Pi project idea was challenging as we had to pick a project which is achievable in the time frame and with minimal cost.
- Diagnosing the component which has a problem was challenging.
- Tried out couple of bar graph APIs and a lot of trial and error with the input params to get a nice-looking Bar Graph in the desktop app.
- Navigating through numerous errors while Installing python related packages in Raspberry Pi.
- Troubleshooting unexpected behavior in Sentiment Analyzer caused by duplicate tweets.

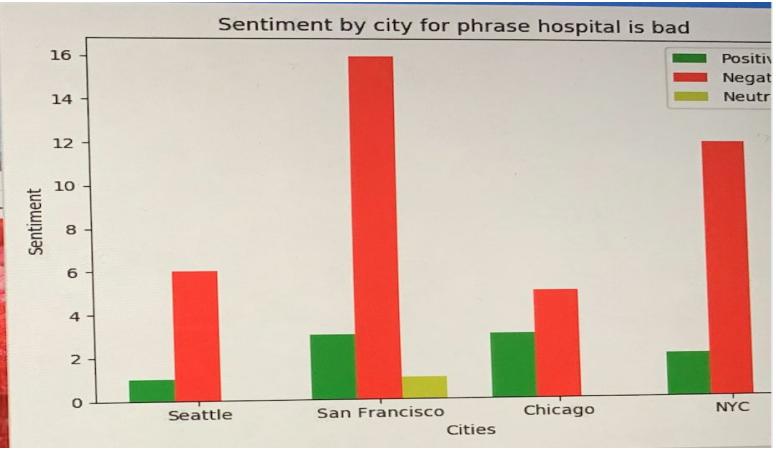
Future Work :

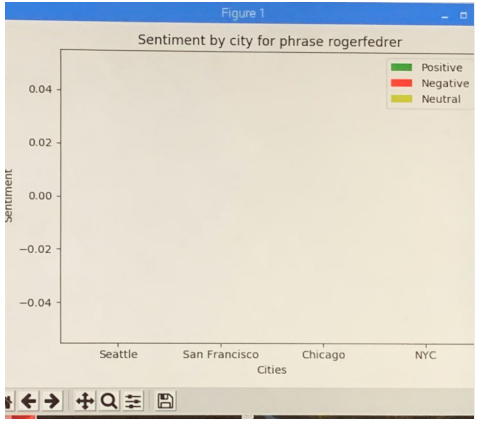
- Can be enhanced to make this a full-fledged political sentimental visualizer for all the 50 states for predicting election results.
- This tool can be enhanced for product companies to immediately take actions like responding to the negative tweets.
- Can use Facebook, Reddit APIs to do similar sentimental analysis.

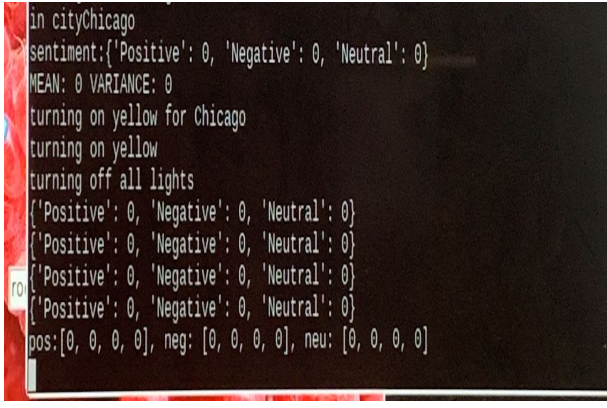
DEMO

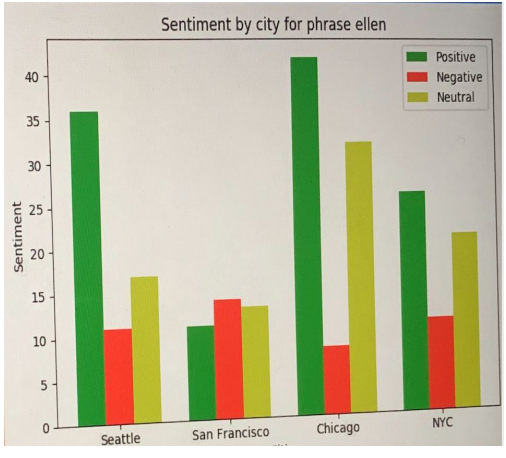


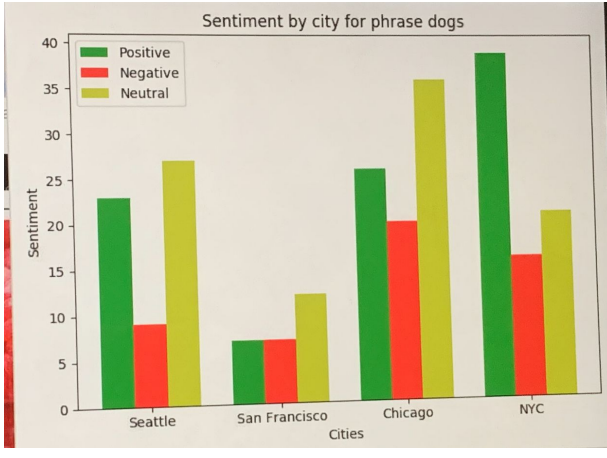
Graphs for different phrase:












THANK YOU