Sentiment Analysis with NLP on Twitter Data

Acknowledgment

Abstract

There is a vast amount of data available on the web for internet users as a result of the development and evolution of web technology, and a lot of data is also generated. The Internet has evolved into a platform for online education, idea sharing, and exchange social networking platforms, such as Facebook, Twitter, and Google+ are quickly becoming more popular since they enable users to engage in discussion, exchange ideas, and other forms of discourse with other communities, or send messages over the globe.

Numerous studies have been conducted in the area of sentiment analysis of data on Twitter. The main topic of this study is sentiment analysis on Twitter data that is useful in analyzing the information in the unstructured tweets that express opinions, either positive or negative, and diverse views.

Introduction

Nowadays, the age of the Internet has modified the manner people express their perspectives, and opinions. It is now particularly finished through blog posts, online forums, product evaluation websites, social media, etc. Nowadays, tens of thousands and thousands of humans are the usage of social network websites like Facebook, Twitter, Google Plus, etc. to express their emotions, opinion, and proportion perspectives approximately their daily lives. Through the net communities, we get an interactive media wherein customers tell and impact others through forums.

Social media is producing a huge quantity of sentiment wealthy information within side the shape of tweets, famous updates, blog posts, comments, reviews, etc. Moreover, social media provides a possibility for groups by giving a platform to connect with their clients for advertising. People mostly depend upon person-generated content material online to a great extent for selection making. The quantity of content material generated through customers is simply too vast for a regular person to analyze. So there's a want to automate this, numerous sentiment evaluation strategies are extensively used.

Sentiment evaluation (SA)tells person whether or not the information about the product is great or now no longer earlier than they purchase it.Marketers and companies use this evaluation information to recognize about their services or products in the sort of manner that it may be presented as per the person‟s requirements.Facts have an goal thing but,there are a few other textual contents which specific subjective characteristics. These contents are particularly opinions, sentiments, appraisals, attitudes, and emotions, which shape the middle of Sentiment Analysis(SA). It gives many difficult possibilities to broaden new applications, particularly because of the massive increase of available information on line sets like blogs and social networks.

Basic Concepts

Sentiment analysis can be defined as a process that automates mining of attitudes, opinions, views and emotions from text, speech, tweets and database sources through Natural Language Processing (NLP).It can help any organization to find people's opinions of their company and products. Sentiment analysis involves classifying opinions in text into categories like "positive" or "negative" or "neutral". It's also referred as subjectivity analysis, opinion mining, and appraisal extraction.

As an example, let's check out some tweets mentioning @Salesforce and see how they would be tagged by a sentiment analysis model:

"The more I use @salesforce the more I dislike it. It's slow and full of bugs. There are elements of the UI that look like they haven't been updated since 2006. Current frustration: app exchange pages won't stop refreshing every 10 seconds" --> This first tweet would be tagged as "`Negative`".

"That's what I love about @salesforce. That it's about relationships and about caring about people and it's not only about business and money. Thanks for caring about #TrailblazerCommunity" --> In contrast, this tweet would be classified as "`Positive`".

"Coming Home: #Dreamforce Returns to San Francisco for 20th Anniversary. @Salesforce" --> Lastly, this tweet would be tagged as "`Neutral`" as it doesn't contain an opinion or polarity.

Analyze Feedback on Twitter

Listening to customers is key for detecting insights on how you can improve your product or service. Although there are multiple sources of feedback, such as surveys or public reviews, Twitter offers raw, unfiltered feedback on what your audience thinks about your offering.

By analyzing how people talk about your brand on Twitter, you can understand whether they like a new feature you just launched. You can also get a sense if your pricing is clear for your target audience. You can also see what aspects of your offering are the most liked and disliked to make business decisions (e.g. customers loving the simplicity of the user interface but hate how slow customer support is).

Problem Statement

Given a message, classify whether the message is of positive, negative, or neutral sentiment. For messages conveying both a positive and negative sentiment, whichever is the stronger sentiment should be chosen.

Requirement Specifications:

In this project, we try to implement a Twitter sentiment analysis model that helps to overcome the challenges of identifying the sentiments of the tweets.Twitter has become the default way to share a bad customer experience and express frustrations whenever something goes wrong while using a product or service. This is why companies monitor how users mention their brand on Twitter to detect any issues early on.

By implementing a sentiment analysis model that analyzes incoming mentions in real-time, you can automatically be alerted about sudden spikes of negative mentions. Most times, this is caused is an ongoing situation that needs to be addressed asap (e.g. an app not working because of server outages or a really bad experience with a customer support representative). The necessary details regarding the datasets are:

- **`target:`** the polarity of the tweet (positive or negative)
- **`ids:`** Unique id of the tweet
- **`Date:`** the date of the tweet
- **`flag:`** It refers to the query. If no such query exists then it is NO QUERY.
- **`user:`** It refers to the name of the user that tweeted
- **`text:`** It refers to the text of the tweet

The datasets that we are using is the Live datasets which consists of 1000 tweets for that an specific KEYWORD that have been extracted using the Twitter API.

Project Analysis:

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Proposal:

Our proposed work focuses on a method to analyse sentiment using Twitter data. The developed method is based on three important parts that are Data Extraction from the Twitter API using Tweepy Library, pre-processing the extracted data using Text-Blob Library for processing textual data. The same library was used to calculate the sentiments of the given tweets.

Methodology:

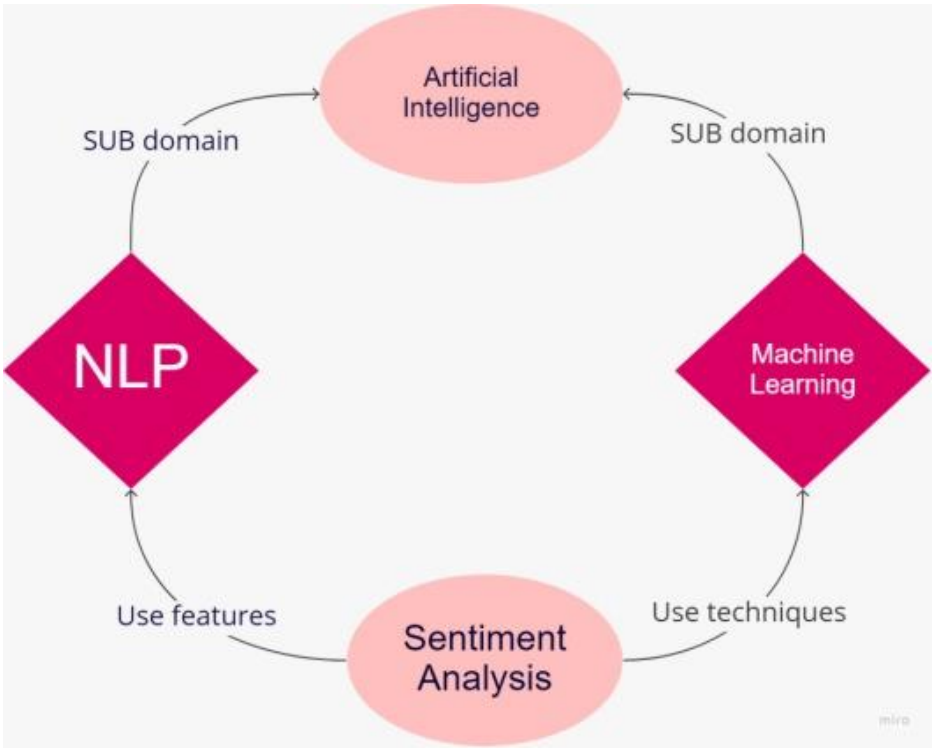
Algorithm 1: All authentication Keys to access Twitter API to connect as Oath handler or jump server/revers proxy server

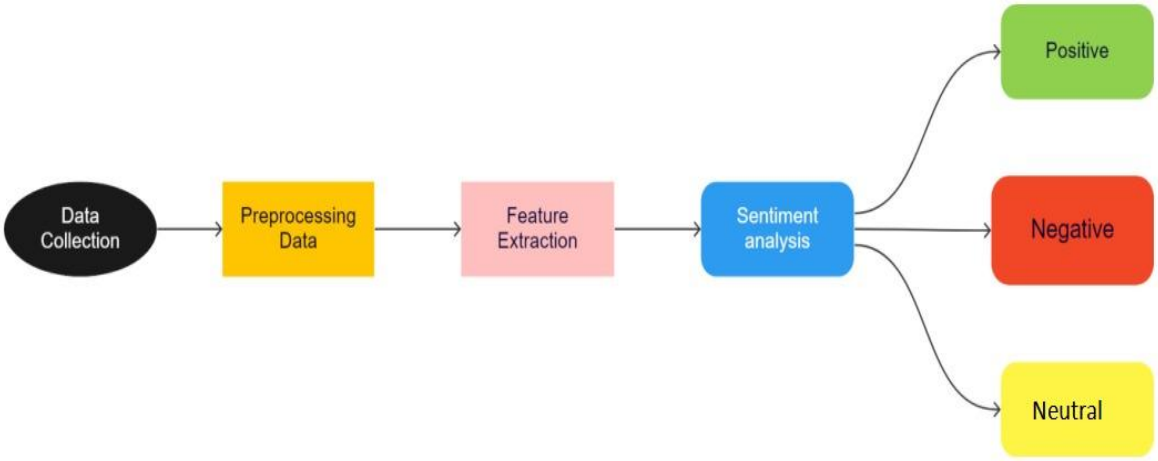
Algorithm 2: Data Extraction

Step 1: Access Tweepy Library to use functions Tweepy facilitates
Step 2: Connect to jump server of Twitter using Tweepy
Step 3: Connect to web server of Twitter using the jump server as an intermediate
Step 4: Connect to the API storage server of twitter using Tweepy
Step 5: Tweepy extracts Tweets from the API storage server and stores it in a local instance.

Algorithm 3: Data Analysis

Step 1: Go through all the data acquired from the Tweets using a for-loop
Step 2: Analyse the tweet data using Text-Blob functions
Step 3: Print the sentiment acquired from the data using Text-Blob analysis
Step 4: Classify the analysed sentiment into positive, negative and neutral stances and then store them as individual counters.
Step 5: Plot a Pie-Chart denoting the general perceived sentiments from the tweets using the counters as a reference.


Artificial Intelligence
SUB domain
SUB domain
NLP
Machine Learning
Use features
Sentiment Analysis
Use techniques


Data Collection
Preprocessing Data
Feature Extraction
Sentiment analysis
Positive
Negative
Neutral

Result Analysis/ Screenshots

CODE DATA:

```
[ ] # tweepy explore
    dir(tweepy)

    # connected to jump server of twitter
    auth=tweepy.OAuthHandler(consumer_key,consumer_sec)

    # now we can connect from jump server to web server of twitter
    auth.set_access_token(access_token,access_token_sec)

    # now we can connect to API storge server of twitter
    api_connect=tweepy.API(auth)

    tweet_data=api_connect.search('NLP',count=1000)
```

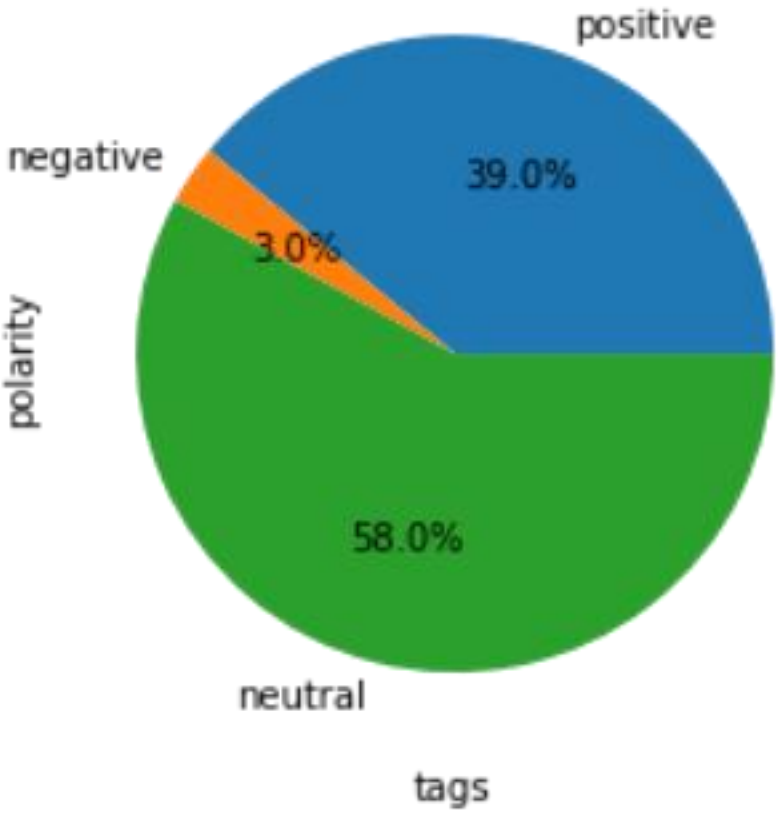
```
[ ] for tweet in tweet_data:
      print(tweet.text)

    RT @TheBeanList: 🚨 BEAN LIST x SHIKIGAI WL GIVEAWAY 🚨

    To enter:
    1️⃣ Like &amp;amp; Retweet
    2️⃣ Follow @TheBeanList &amp;amp; @shikigai_nft
    3️⃣ Tag 2 Frie…
    RT @scrooge_coin: #SCROOGECOIN Poker Room Beta Tournament was a HUGE SUCCESS!

    Thank you to everyone who participated.

    You early #holder…
    RT @NFT_Wormholes: 🎯One-Click Create NFT Activity

    🎁Rewards: S-NFT&amp;amp;ERB Dual Native Coin Airdrop

    🌍Place: Meteorite NFT Marketplace

    Jo…
    RT @ChooseBrand: Check out Happy rabbit jumping on OpenSea!
    https://t.co/GpFWcYH99i
    #NFT #NFTs #NFTartwork #OpenSeaNFT #openseanfts #NFT #N…
    RT @choco3i: Caught Scurvy ☠️ #NewNFTProfilePic NFT by @OCBalpha https://t.co/mZeU9FB3yW
    RT @Gemcorporations: $100 GIVEAWAY || 48 Hours ❤️
```

```
pos=0
neg=0
neu=0

# printing line by line
for tweet in tweet_data:
   #print(tweet.text)
   analysis=TextBlob(tweet.text) # here it will apply NLP\
   print(analysis.sentiment)
   # now checking polarity only
   if analysis.sentiment.polarity > 0:
      print("Positive")
      pos=pos+1
   elif analysis.sentiment.polarity == 0 :
      print("Neutral")
      neu=neu+1
   else :
      print("Negative")
      neg=neg+1

# ploting graphs
plt.xlabel("tags")
plt.ylabel("polarity")
#plt.bar(['pos','neg','neu'],[pos,neg,neu])
plt.pie([pos,neg,neu],labels=['pos','neg','neu'],autopct="%1.1f%%")
plt.show()
```

OUTPUT:

```
[ ] Sentiment(polarity=0.0, subjectivity=0.0)
    Neutral
    Sentiment(polarity=0.35, subjectivity=0.55)
    Positive
    Sentiment(polarity=0.35, subjectivity=0.55)
    Positive
    Sentiment(polarity=0.35, subjectivity=0.55)
    Positive
    Sentiment(polarity=0.0, subjectivity=0.0)
    Neutral
    Sentiment(polarity=0.0, subjectivity=0.0)
    Neutral
    Sentiment(polarity=0.0, subjectivity=0.6)
    Neutral
    Sentiment(polarity=0.0, subjectivity=0.0)
    Neutral
    Sentiment(polarity=0.35, subjectivity=0.55)
    Positive
    Sentiment(polarity=0.35, subjectivity=0.55)
    Positive
    Sentiment(polarity=0.35, subjectivity=0.55)
    Positive
    Sentiment(polarity=0.0, subjectivity=1.0)
    Neutral
    Sentiment(polarity=0.0, subjectivity=0.0)
    Neutral
```

RESULT ANALYSIS:



Conclusion and Future Scope

In this project, we have developed a model to sentiment analysis which allows the processing of `Twitter API` streaming feed in real time and to classify its polarity to provide valuable insight in industry and users .

Our built classifier can be utilized as data analysis tools in NLTK. Therefore, in general we can use our proposal technique to sentiment analysis for any device, public figure or sports team that is better than any other existing model with high accuracy performance.

The `future` work will focus on building the platform and testing it for a significant number of messages, with the aim of determining if Twitter is a platform suitable for deciding whether a tweet is in `Positive, Negative,` or `Neutral` view from that users who post on Twitter.