

*University of Louisville*

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# Sentiment Analysis Using R

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CECS 696

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# Introduction

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- ❖ Sentiment analysis is the process of identifying emotional contents within text using machine learning.
- ❖ The reason I chose this project was to build an independent solution to analyse sentiments and apply it to real-world problems.
- ❖ Data for the analysis is extracted in the form of tweets from Twitter.

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# System description

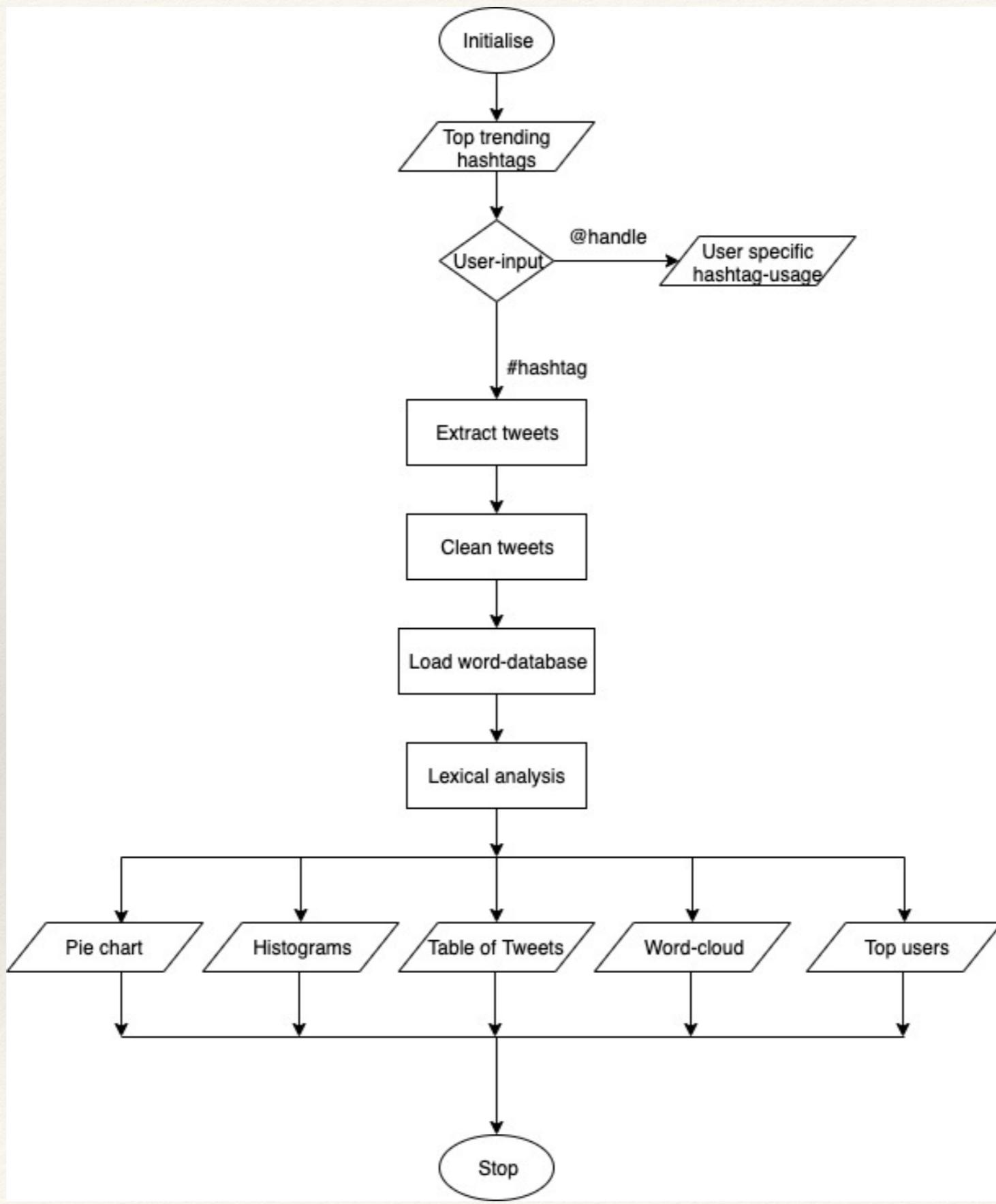
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- ❖ Tweets and other data from Twitter are extracted using the official Twitter API, twitteR for R language.
- ❖ Tweets are cleaned in R by removing stop words, punctuation, blank spaces, emoticons and URLs.
- ❖ A database of positive and negative words is loaded.
- ❖ This is used for lexical analysis, where the words in the tweets are compared with those in the database to predict the sentiment.

- ❖ Lexical analysis in context of sentiment analysis is a method where we compare unigrams to a pre-loaded word database.
- ❖ Then a tweet is assigned a certain sentiment score which can either be positive or negative.
- ❖ An overall score is calculated for the tweet and the results are tabulated, stored in a data frame.
- ❖ The results are then visualised in multiple forms.

- ❖ Secondary features include retrieving trending topics for a user-specified location and plotting frequently used hashtags of a specified user.
- ❖ Both features are primarily effectuated using the `twitteR` package for R language.
- ❖ Trending topics are retrieved using the WOEID (**W**here **O**n **E**arth **I**Dentifier) pertinent to the selected location.
- ❖ The frequently used hashtags of a user are plotted using `ggplot2` after analysing the user's Twitter-handle.

# Flowchart



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# Demonstration

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- I. Sentiment analysis of tweets
- II. Trending topics
- III. Twitter users' frequently used hashtags

# I. Sentiment analysis of tweets

# Main interface

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## Sentiment Analysis Using R

Enter data to be searched with '#'

#

Set the number of recent tweets to be used for analysis:

5                    500                    1,000

5 105 205 305 405 505 605 705 805 905 1,000

Analyse

[Summarised Results](#)

[Word-Cloud](#)

[Histograms](#)

[Pie Chart](#)

[Analysed Tweets](#)

[Top Users](#)

[Trending Topics](#)

[User specific hashtag-usage](#)

### Sentiment analysis results:

Total positive score:

Total negative score:

Overall sentiment score:

Negative sentiment index:

Positive sentiment index:

Negative sentiment in percent:

Positive sentiment in percent:

# Input hashtag to begin analysis

Enter data to be searched with '#'

Set the number of recent tweets to be used for analysis:

5

910

5

105

205

305

405

505

605

705

805

905

1,000

Analyse

# Summarised results

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## Sentiment Analysis Using R

Enter data to be searched with '#'

Set the number of recent tweets to be used for analysis:

5

5 105 205 305 405 505 605 705 805 905 1,000

[Analyse](#)

[Summarised Results](#) [Word-Cloud](#) [Histograms](#) [Pie Chart](#) [Analysed Tweets](#) [Top Users](#) [Trending Topics](#)

User specific hashtag-usage

### Sentiment analysis results:

Total positive score:

1106

Total negative score:

340

Overall sentiment score:

1446

Negative sentiment index:

0.2351314

Positive sentiment index:

0.7648686

Negative sentiment in percent:

23.51314

Positive sentiment in percent:

76.48686

# Word-cloud

<http://127.0.0.1:4154> |  [Open in Browser](#) | 

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# Sentiment Analysis Using R

**Enter data to be searched with '#'**

#MAGA

**Set the number of recent tweets to be used for analysis:**

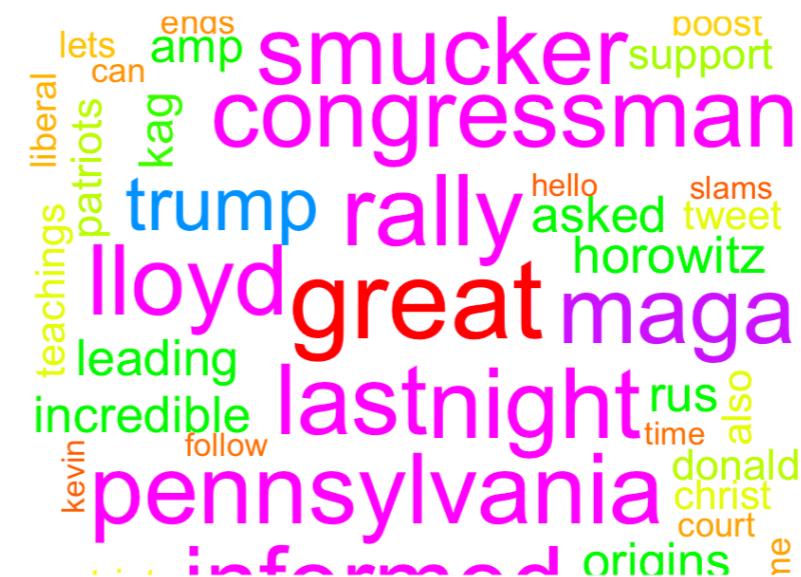
5  1,000

Analyse

Summarised Results Word-Cloud Histograms Pie Chart Analysed Tweets Top Users Trending Topics

## User specific hashtag-usage

## Most used words associated with the selected hashtag



# Histograms

http://127.0.0.1:4154 | [Open in Browser](#) | [C](#)

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## Sentiment Analysis Using R

Enter data to be searched with '#'

#MAGA

Set the number of recent tweets to be used for analysis:

5

1,000

Analyse

Summarised Results

Word-Cloud

Histograms

Pie Chart

Analysed Tweets

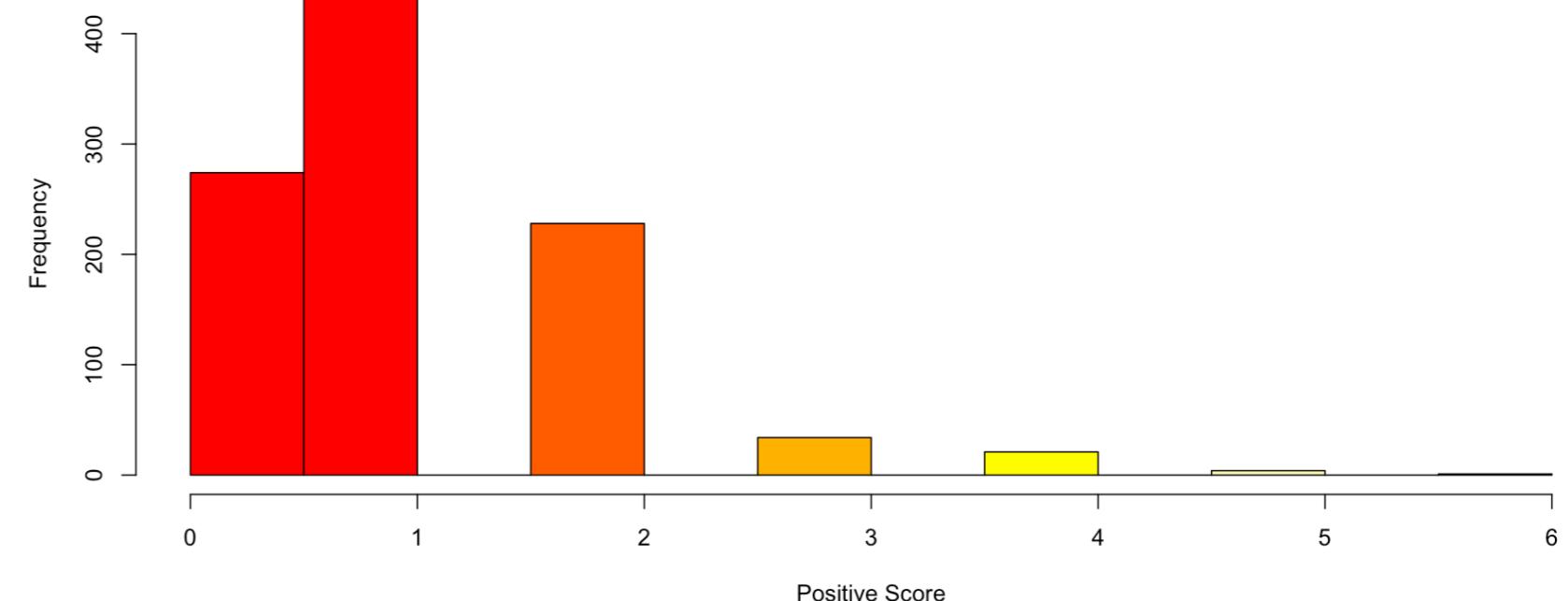
Top Users

Trending Topics

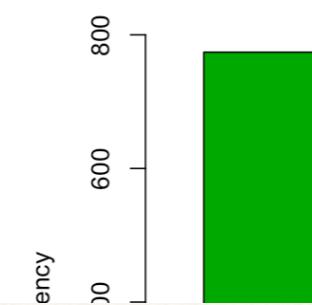
User specific hashtag-usage

Graphical portrayal of opinion-mining pertinent to this hashtag

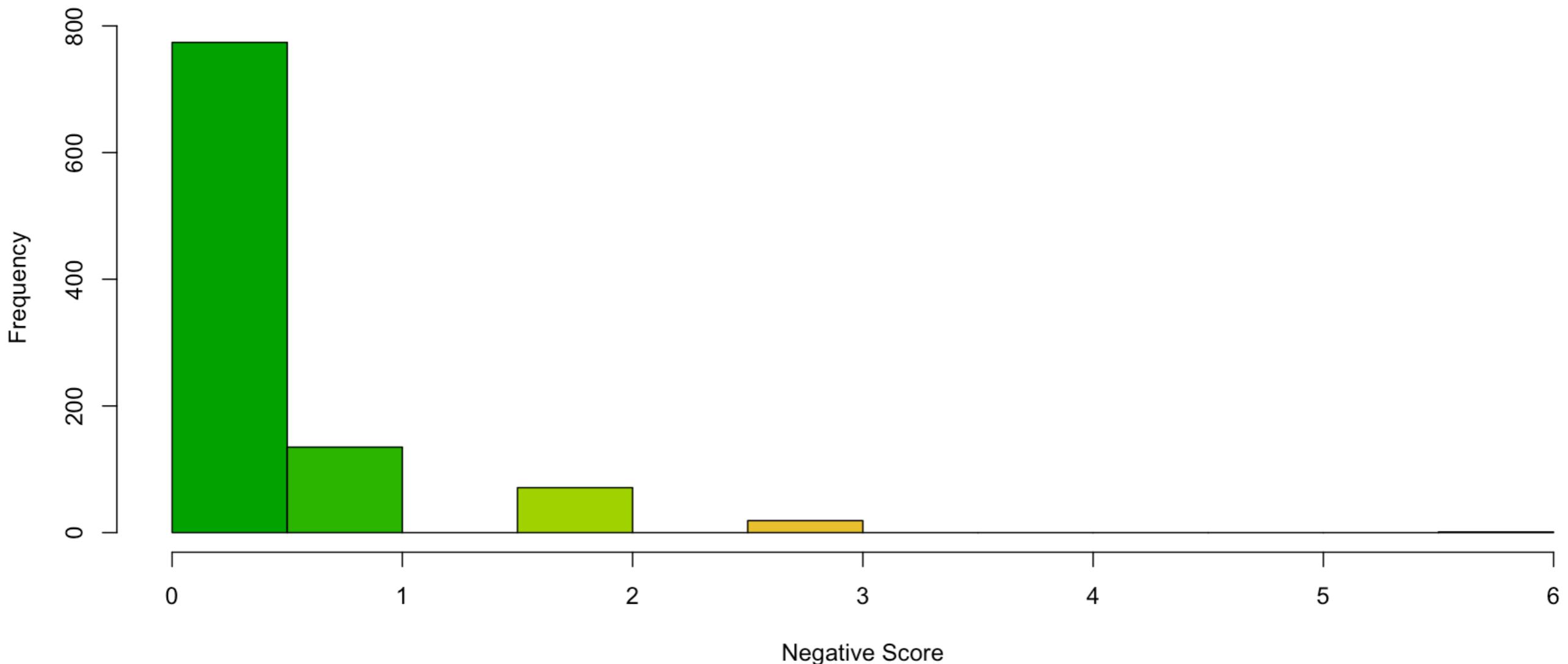
Histogram of Positive Sentiment



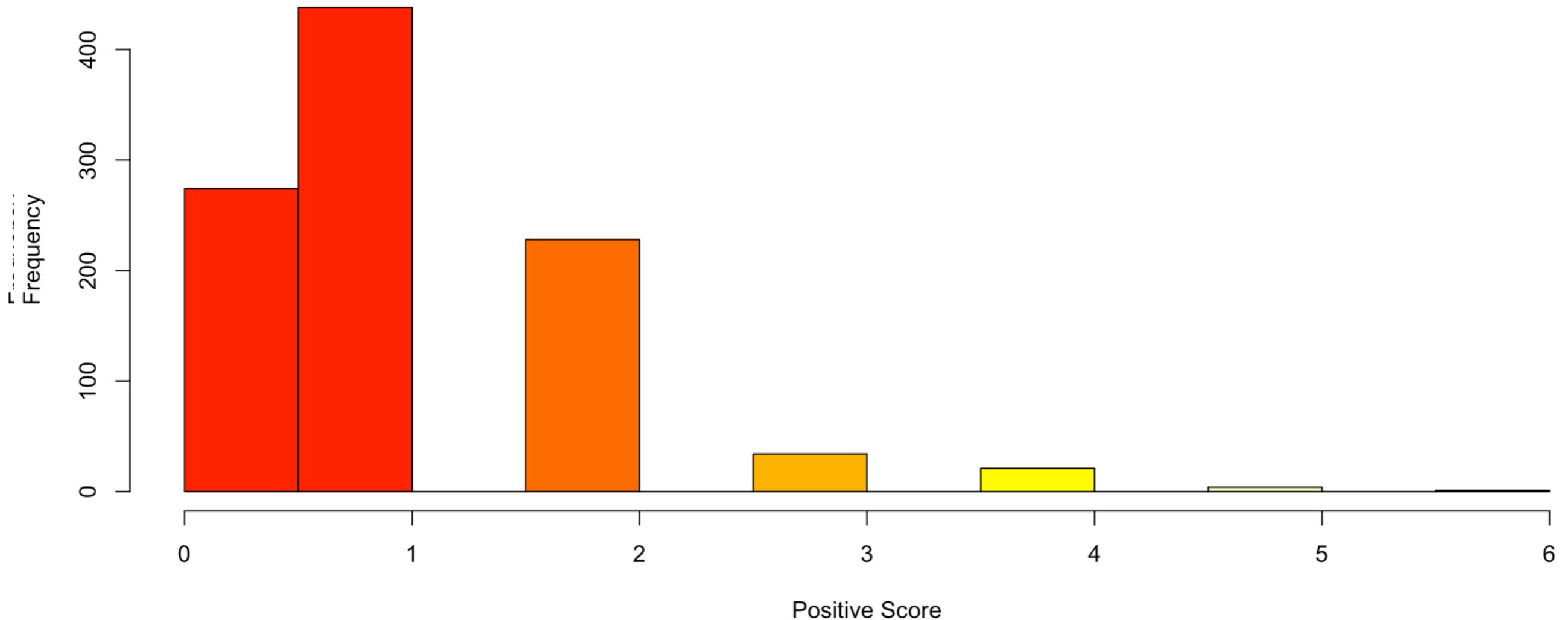
Histogram of Negative Sentiment



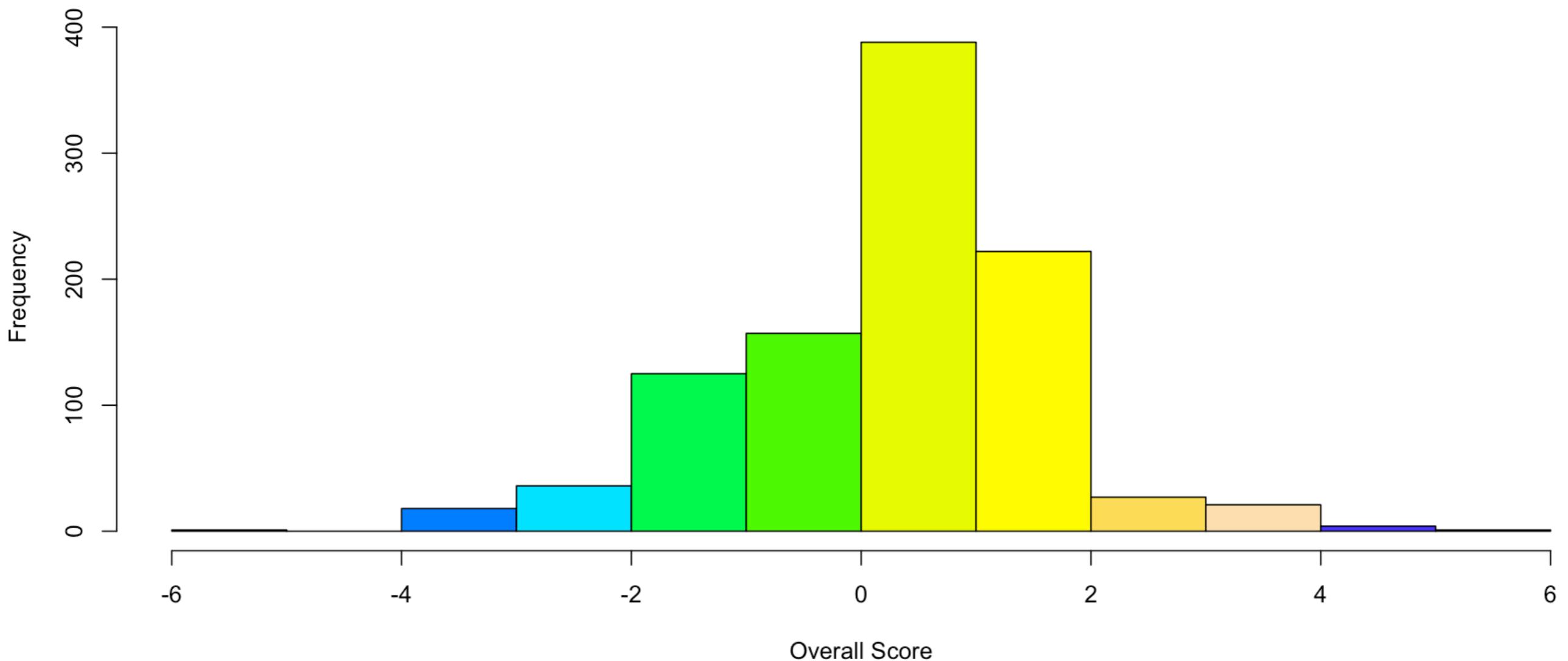
## Histogram of Negative Sentiment



## Histogram of Positive Sentiment



## Histogram of Score Sentiment



# Pie chart

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## Sentiment Analysis Using R

Enter data to be searched with '#'

#MAGA

Set the number of recent tweets to be used for analysis:

5

5 105 205 305 405 505 605 705 805 905 1,000

Analyse

[Summarised Results](#)

[Word-Cloud](#)

[Histograms](#)

[Pie Chart](#)

[Analysed Tweets](#)

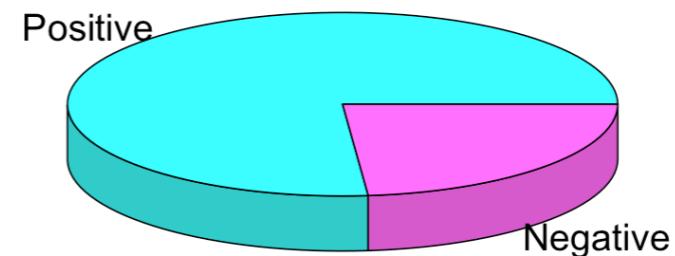
[Top Users](#)

[Trending Topics](#)

User specific hashtag-usage

### Pie Chart

#### Sentiment Analysis



# Analysed tweets

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## Sentiment Analysis Using R

Enter data to be searched with '#': #MAGA

Set the number of recent tweets to be used for analysis: 1,000

Analyse

Text	Positive	Negative	Score	PosPercent	NegPercent
Is the lable of #redhat a #hateable? I'd assume that's referring to #MAGA hats, right? Maybe the #ACLU. could actu /HFa5vkyBgw	1	0	1	100.00	0.00
@Jim_Jordan @prayingmedic This quote should go down in history #MAGA #KAG2020 #InGodWeTrust J.S. /wa7l7rLGWm	0	0	0	0.00	0.00
@chuckwooley @europe_rising Low performance = needing 15 flushes. #maga is full of shit. /lwm4eCKBzs	0	1	-1	0.00	100.00
RT @thedevman1: LETS TALK ABOUT ABUSE OF POWER. Those on the left can guffaw and chide and ridicule us #MAGA all you want but we realize i	0	3	-3	0.00	100.00
RT @JohnFugelsang: This tweet explains how it's possible to support Donald Trump while also following the teachings of Christ... It's	2	0	2	100.00	0.00
RT @WasOnceLou: So let me get this straight, Lev Parnas, sitting here with the Presidents personal lawyer @RudyGiuliani and who hes been	0	0	0	0.00	0.00
@KamalaHarris Bye Felecia! #Epsteindidntkillhimself #swalwellfart #maga #trump #cnn #nbc #abc #4chan #qanon /ZiZFKzneRm	1	0	1	100.00	0.00
@FranksBullitts #Americans #MAGA #KAG #DemocratsTheEnemyWithin @WDermere must try to understand that his poi /IF4KdRsUnG	0	0	0	0.00	0.00
RT @AmericanDiaries: I proud to say we got the most amazing attorney @FoyeWalkerPA . A true American who fights injustice. #MAGA https://t.	2	1	1	66.67	33.33
RT @TrumpMAGAQanon: @chuckwooley Big Mike has GAINED 100 LBS since Leaving the WH...! ...must look like Elvis after all the PB and Banana	2	0	2	100.00	0.00
@AVIACUSA The 1.5 Million Illegals does not count their spouse and kids so its more like 4 Million including the fr /8IBli0Rkot	1	0	1	100.00	0.00
RT @MattBatzel: This may be the worst take anyone has ever had on the Steele Dossier #maga #FisaReport @seanmdav /YLQIkPXPwU	0	1	-1	0.00	100.00
Former @realDonaldTrump workers share a stage with @JoeBiden and blast their ex-employer #maga #ImpeachAndConvict /t6P5QVREkN	0	0	0	0.00	0.00
@CallieCrandall2 @CNN Lol wth is we you & your whole 1 shadow?? Trump WILL continue to be your awesome most accom /AhnKqpFrB	2	0	2	100.00	0.00
RT @WasOnceLou: So let me get this straight, Lev Parnas, sitting here with the Presidents personal lawyer @RudyGiuliani and who hes been	0	0	0	0.00	0.00
RT @FredfromFlorida: @JIMSTEPHENS12 @111Athena111 @gr8tjude_08 @TsrTrump @Ray_White @JerryH1501 @eatkinson48 @KennethSHall2 @dejean76 @rrte	0	0	0	0.00	0.00
@DonaldJTrumpJr @dbongino @USNatArchives @GOP @POTUS @realDonaldTrump @DonaldJTrumpJr @FLOTUS @PARISDENNARD /ygktXNJ4IX	0	0	0	0.00	0.00
RT @TdLombard: #TdLombardExpress #MAGA Weekend Ride No rider train 1. Comment with your @ handle 2. Retweet this Twe	0	0	0	0.00	0.00
RT @RepublicanSwine: #SenateHearing #IGHearing #HorowitzIGReport #MAGA Trash #MAGATrash How Fucking sad is this. Mandatory Training ne	0	3	-3	0.00	100.00
RT @Victoensing_Incredible @kamalaharris asked IG Horowitz to investigate #williamharr for leading investigation	2	0	2	100.00	0.00

# Top users using this hashtag

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## Sentiment Analysis Using R

Enter data to be searched with '#'

Set the number of recent tweets to be used for analysis:

5

Analyse

Summarised Results Word-Cloud Histograms Pie Chart Analysed Tweets Top Users Trending Topics

User specific hashtag-usage

### Top 20 users who used this hashtag

#### Top 20 users using this hashtag

User	Tweets
alley167	9
mich_country	6
Realpatriot_911	5
Radio_Attitude	4
election020	3
RNinMI	3
yoakumgirl923	3
ActiveSpiritT13	2
veSpiritT13	2
Ann7837	2
lZmoderate	2
akkeRenee	2
BCharlotte	2
ing_retired	2
gpapapaco	2
ragonheart	2
CHiPs1988	2
hagan2015	2
leenaLilacs	2
ise_snively	2
jMoraGifts	2

## II. Frequently used hashtags Of selected Twitter user

# Input a twitter-handle

User specific hashtag-usage

**Analyse Twitter handle:**

@narendramodi

Analyse

# Most used hashtags

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## Sentiment Analysis Using R

Enter data to be searched with '#'

Set the number of recent tweets to be used for analysis:

5      500      1,000

5 105 205 305 405 505 605 705 805 905 1,000

Analyse

Summarised Results   Word-Cloud   Histograms   Pie Chart   Analysed Tweets   Top Users   Trending Topics

User specific hashtag-usage

Analyse Twitter handle:

Analyse

Hashtag frequencies in the tweets of the Twitter User

tag	freq
#mannkibaat	10.0
#diwali	6.5
#htls	4.5
#republicsummit	3.5
#constitutionday	3.5
#nitlecture	2.5
#changewithin	2.5
#cab	2.0
#bharatkilaxmi	2.0
#asean	2.0

Hashtag frequencies in the tweets of the Twitter User

### III. Trending topics

# Trending topics in the United States

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## Sentiment Analysis Using R

Enter data to be searched with '#'

Set the number of recent tweets to be used for analysis:

5

5 105 205 305 405 505 605 705 805 905 1,000

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### User specific hashtag-usage

Top trending topics according to location

Select a location

United States

### Location-based hot-topics, current:

**data**

#AEWDynamite

#impeachmentDebate

#Survivor

#TheMaskedSinger

#TheChallenge34

Devonte Graham

Jared Dudley

Space Force

The Last Jedi

Elaine

Victor Oladipo

Santana

LeeAnne

Oshie

DeBoer

Tom Wilson

Adrienne Bailon

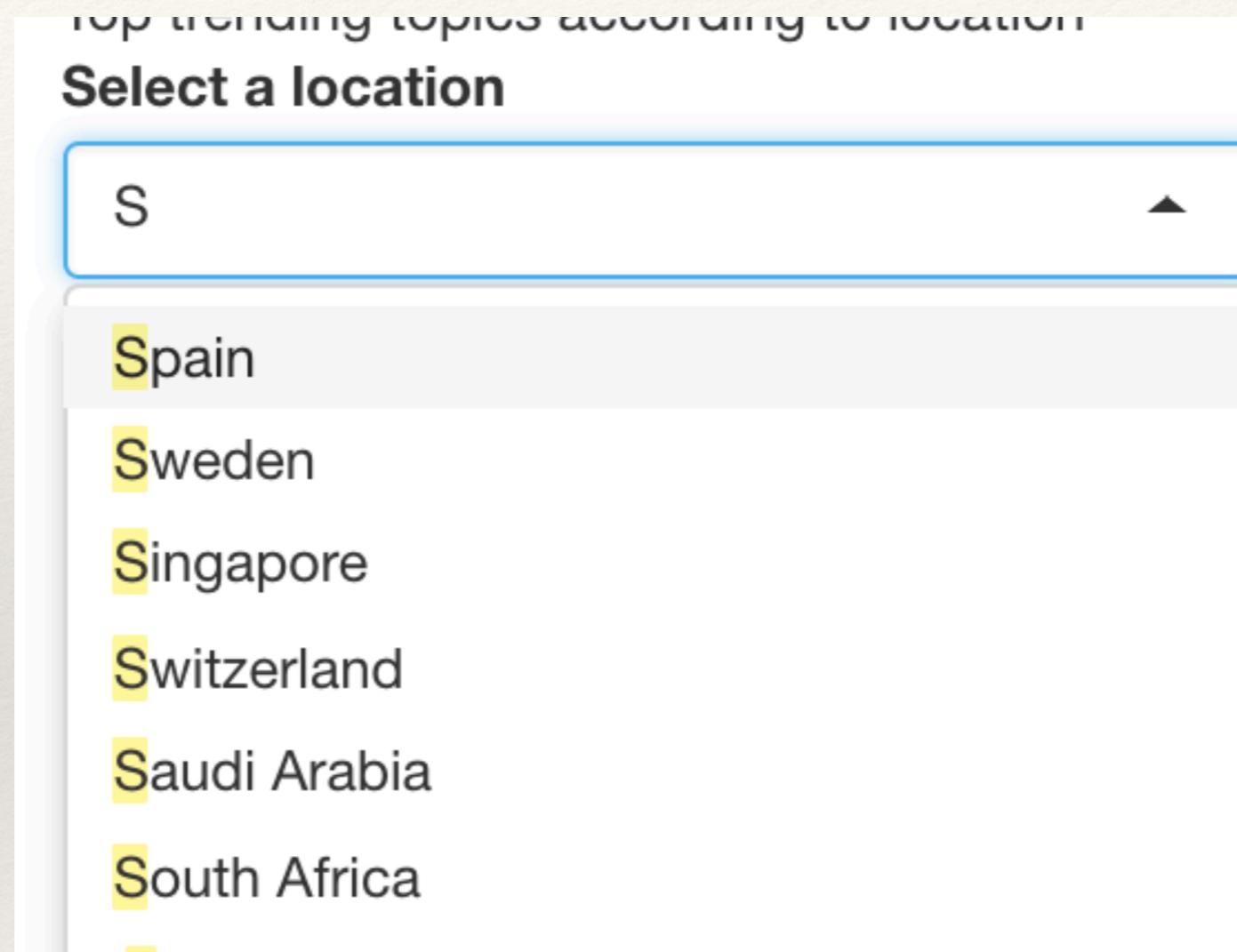
Travis Banks

Kevin Porter Jr

Keanu

Dakota Kai

# Typing ‘S’ in the search-box produces list of countries starting with that letter



# Trending topics in ‘Sweden’

Top trending topics according to location

Select a location

Sweden



Search

## Location-based hot-topics, current:

**data**

Times

rösler

atalanta

Adolf Hitler

Broberg

allettan

#timraik

malmö ff

#vikhockey

vattenfall

person of the year

Greta

#mh19

marie fredriksson

ASAP Rocky

telia

Time Magazine

Nobelfesten

ancelotti

# Trending topics worldwide

Top trending topics according to location

Select a location

Worldwide

Search

## Location-based hot-topics, current:

**data**

#FestejaBrasil

#AEWDynamite

#Bieber2020

#Survivor

#impeachmentDebate

Devonte Graham

梅宮辰夫さん

Michel Teló

Zé Neto e Cristiano

梅宮さん

Jared Dudley

Space Force

The Last Jedi

Kawhi

Raniel

Yasmin Santos

Sett

OLÁ 2020

Chicaiza

Maiara e Maraisa

LANSEI A BRABA

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# Conclusion

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- ❖ Sentiment analysis using R is a project that was successfully finished and performs up to the mark for the social media platform, Twitter.
- ❖ The features users can enjoy are:
  - ❖ Analyse Tweets using a certain hashtags
  - ❖ Analyse specified Twitter handles
  - ❖ Availing lists of trending topics in countries where Twitter is present.
- ❖ The results produced are unambiguous, precise and visualised to ease comprehension.
- ❖ The project works according to the goals set during the preliminary stages of the project-development.