```
library("SnowballC")
library("twitteR")
library("syuzhet")
library("ROAuth")
library("base64enc")
library("openssl")
library("httpuv")
library("dplyr")
library("ggplot2")
library("wordcloud")
library("dplyr")
library("tidytext")
library("tidyr")
library("stringr")


#Invoke Twitter API
consumer_key <- 'abc'
consumer_secret <- ' abc '
access_token <- ' abc '
access_secret <- ' abc '

twitteR:::setup_twitter_oauth(consumer_key, consumer_secret, access_token, access_secret)


#Pulling latest 2000 tweets from Jet's 'customer service' twitter handle - @JetHeads
tweets <- userTimeline("JetHeads", n=2000)
n.tweet <- length(tweets)
```

```
1     @HeathCliffR We are so sorry to hear about this. We would love to look
further into this with you. Send us a DM. https://t.co/7jHgak5Xib
2
@jaywongofficial No problem, thank you for the suggestion! -Tyler
3               @jaywongofficial Fair enough, Justin! I'll be sure to pass t
hat request along. <ed><U+00A0><U+00BD><ed><U+00B8><U+0082>- Chris
4                           @Ben_Jata Great choice, purple is definitely you
r color. <ed><U+00A0><U+00BD><ed><U+00B8><U+0089> @empirestatebldg
5 @joe_darko Hello Joe! If you're missing a shipment, we'd love the opportun
ity to look into this for you and provide… https://t.co/BVxOVKIxwk
6  @joe_darko Hey Joe. We're sorry that you've had a less than perfect exper
ience while shopping on Jet. We'd love to… https://t.co/beJZAAKtH6
```

```
#Summarizing information about tweets in a data frame
tweets.df <- twListToDF(tweets)

head(tweets.df)
head(tweets.df$text)
```

```
[1] "@HeathCliffR We are so sorry to hear about this. We would love to look
further into this with you. Send us a DM. https://t.co/7jHgak5Xib"
[2] "@jaywongofficial No problem, thank you for the suggestion! -Tyler"
[3] "@jaywongofficial Fair enough, Justin! I'll be sure to pass that request
along. \xed��\xed�\u0082- Chris"
[4] "@Ben_Jata Great choice, purple is definitely your color. \xed��\xed�\
u0089 @empirestatebldg"
[5] "@joe_darko Hello Joe! If you're missing a shipment, we'd love the oppor
tunity to look into this for you and provide… https://t.co/BVxOVKIxwk"
[6] "@joe_darko Hey Joe. We're sorry that you've had a less than perfect exp
erience while shopping on Jet. We'd love to… https://t.co/beJZAAKtH6"
```

```
#Cleaning the tweets for further analysis
tweets.df2 = gsub("&amp", "", tweets.df$text)
tweets.df2 = gsub("(RT|via)((?:\\b\\W*@\\w+)+)", "", tweets.df2)
tweets.df2 = gsub("@\\w+", "", tweets.df2)
tweets.df2 = gsub("[[:punct:]]", "", tweets.df2)
tweets.df2 = gsub("[[:digit:]]", "", tweets.df2)
tweets.df2 = gsub("http\\w+", "", tweets.df2)
tweets.df2 = gsub("[ \t]{2,}", "", tweets.df2)
tweets.df2 = gsub("^\\s+|\\s+$", "", tweets.df2)
tweets.df2 = gsub("[^0-9A-Za-z///' ]","", tweets.df2)

head(tweets.df2) #Cleaned list of tweets containing only English alphabets
```

```
[1] "We are so sorry to hear about this We would love to look further into t
his with you Send us a DM"
[2] "No problem thank you for the suggestion Tyler"
[3] "Fair enough Justin Ill be sure to pass that request along  Chris"
[4] "Great choice purple is definitely your color "
[5] "Hello Joe If youre missing a shipment wed love the opportunity to look
into this for you and provide"
[6] "Hey Joe Were sorry that youve had a less than perfect experience while
shopping on Jet Wed love to"
```

```
#Converting datatype to vectors
word.df <- as.vector(tweets.df2)

#Using 'Syuzhet' to break the senitimets into 10 different emotions
emotion.df <- get_nrc_sentiment(word.df)
emotion.df2 <- cbind(tweets.df2, emotion.df)
head(emotion.df2)
```

	anger	anticipation	disgust	fear	joy	sadness	surprise	trust	negative	positive
1	0	0	0	0	1	0	0	0	0	1
2	0	0	0	1	0	1	0	0	1	0
3	1	0	1	1	0	1	0	0	1	1
4	0	0	0	0	0	0	0	0	0	1
5	0	1	0	1	1	1	0	1	1	3
6	0	2	0	0	3	0	1	2	0	3

```
#Creating the binary output to a data frame
a <- sum(emotion.df2$anger)
b <- sum(emotion.df2$anticipation)
c <- sum(emotion.df2$disgust)
d <- sum(emotion.df2$fear)
e <- sum(emotion.df2$joy)
f <- sum(emotion.df2$sadness)
g <- sum(emotion.df2$surprise)
h <- sum(emotion.df2$trust)
i <- sum(emotion.df2$positive)
j <- sum(emotion.df2$negative)

emotion.df3 <- data.frame(a,b,c,d,e,f,g,h,i,j)

colnames(emotion.df3) <- c("anger", "aniticipation", "disgust", "fear", "joy", "sadness", "surprise",
"trust",
                "positive", "negative")
emotion.df3
```

```
anger aniticipation disgust fear  joy sadness surprise trust positive negative
112           983      66    112  1241   136      369   973     1929      230
```

```
#extracting sentiment score for each tweet
sent.value <- get_sentiment(word.df)
sent.value
```

```
[1]  0.25 -0.25  0.00  0.90  1.55  1.40  0.75  1.75  1.50  1.00  2.25  2.5
5  2.25  0.75  0.25  1.75
  [17]  0.80  1.50  0.90  1.75  1.50  1.60  2.65  1.75  0.50  0.50  1.75
0.00  0.75  2.30  0.50  3.00
  [33]  0.50  2.00  0.00  0.00  3.40  1.25  0.00  0.00  1.25  1.80  1.00
0.75  0.00  1.30  0.75  0.80
  [49]  0.25  1.80  0.25  0.50  0.50  1.85  1.50  0.75  0.75  0.00 -1.50
1.75  1.75  0.50  0.75  0.90
  [65]  1.55  0.80  0.00  0.75  1.55  1.30  0.00  1.30  0.25  1.25  3.00
0.50 -0.50 -0.10  1.25  0.75
  [81]  2.30  2.55  0.00 -0.75  1.10  4.15  0.50  0.50  1.50 -1.25  0.05
0.00  1.50  1.75  0.00  1.35
  [97]  0.25  0.60  0.50  0.80  0.30  1.00  0.50  0.00  2.85  1.60  0.00
0.50  0.50  1.80  2.50  1.25
 [113]  1.60  2.55  1.75  0.00  1.10  0.50  2.00  1.25  2.05  0.50  0.50
0.50  0.30  0.00  1.25  0.50
 [129]  0.50  2.75 -0.30  1.25  2.40  1.30  1.00  0.60  1.75  1.35  0.75
1.00  0.80  1.15  0.00  1.00
 [145]  1.65  2.40  1.80  0.30  0.60  1.25  1.75 -0.35  1.15  1.30  2.40
2.15 -0.50  0.75  1.50  1.35
 [161]  1.55  1.85  0.00  0.60  1.35  1.50  1.55  0.20  0.75  1.75  1.80
0.50  1.30 -1.60  2.00  1.50
 [177]  0.75  0.00  1.30  0.10  0.75  0.25  1.60  1.00  0.15  1.50  0.75
1.25  2.00  0.75  2.30  3.25
 [193]  1.25  2.70  0.50  2.55  3.35  2.00 -0.50 -0.95  0.90  0.75  1.10
1.85  0.75  2.05  0.50 -0.75
 [209]  0.50 -0.60  1.40  1.35  2.10  1.10 -0.50  1.25  1.75 -0.75  1.00
1.75 -0.15  1.75  2.25  0.75
```

```
 [225]  1.80  1.90  0.75  0.50  1.00  1.00  1.60  1.75  1.25  1.55  0.60 -
0.15  0.50  0.00  1.90  1.75
 [241]  0.25 -0.25  1.25  1.75  3.00  0.75  1.85  1.40  2.10  0.00  1.25
2.45  0.65  1.25  1.25  0.75
 [257]  2.55  1.50  1.25  0.00 -0.25  1.25  0.75  0.75  0.00  1.75  0.90
0.15  0.50  0.00  1.50  0.00
 [273]  1.55  2.10  2.65  3.65  2.85  1.35  1.25  2.10  0.60  3.15  1.75
1.75  0.75  1.25  1.25  0.60
 [289]  0.50  2.60  1.50 -0.50  1.25  3.65  2.25  0.75  1.25  1.10  0.50
0.25  2.55  0.50  1.60  0.75
 [305]  0.75  0.80  2.60  0.60  1.25  1.50  0.80  1.05  0.75  1.25 -0.50 -
0.50  0.50  0.75  0.60  0.85
 [321]  1.10  0.00 -0.50  0.50  1.25  0.75  2.25  1.30 -0.10  2.25  1.75
1.10  1.15  0.00  1.15  0.00
 [337] -0.50  0.50  0.00  2.90  2.20  0.00  1.75  0.50 -0.75  2.80  0.25
0.75  0.00  1.60  1.00  2.55
 [353] -2.00  3.65  1.25  1.90  0.50 -0.50  1.60 -0.20  1.25  2.25  0.80
1.75  2.55  0.50  1.60  1.25
 [369] -0.50  1.75  0.00  1.35  3.55  1.15  1.00  1.55  0.75  2.10  1.20
0.10  2.45  1.10  1.00  1.50
 [385]  1.65  2.00  0.00  1.00  0.75  0.50  1.35  1.65  0.25 -0.40  1.75
3.40  0.00  2.00  2.50  1.25
 [401]  0.50  1.90  2.10 -0.50  0.50  1.85  1.75  1.10  1.50  2.25  1.50
1.70  1.25  0.75  1.25  0.60
 [417] -0.25  1.25  2.55  0.25  1.25  1.25  0.00  2.30  1.25  1.25  1.60
1.25  2.25  2.75  1.00  1.75
 [433]  0.45  2.30  0.50  2.20  1.50 -0.50  0.75  0.25  1.25 -0.80  0.75
0.80  1.10 -0.80  1.25  2.25
 [449]  0.75  2.25  0.50  1.35  1.75  2.10  0.00  1.30  1.50  1.25  2.30
1.90  0.60  1.80  2.40  0.50
 [465] -0.25  1.65  0.15  0.50  2.85  2.00  0.75  2.40  1.75  0.50  0.00
3.00 -0.25  2.25  1.25  1.70
 [481]  0.60  0.75  1.95  0.25  0.75  0.30  2.00  0.50  2.65  1.85  2.00
1.00  1.15 -0.50  0.00  2.25
 [497]  1.20  0.00  0.00  1.40  2.40  2.30  1.90 -0.50  2.05  1.85  0.75
1.50  1.75  0.00  1.35  1.60
 [513]  1.65  1.60  1.80  0.25  2.25  0.00  0.10  0.00  1.00  1.25  1.35
0.25  1.95  2.15  2.25  0.50
 [529]  1.00 -0.75  2.00  0.50  0.00  0.00  0.25  0.60  0.75  0.50  2.00
0.60  0.75  0.50  0.50  0.50
 [545]  1.65  1.50  0.50  1.25  0.50  0.50  2.30  0.60  1.80  1.70 -0.70
2.35  0.75  1.00  1.60 -0.25
 [561]  0.50 -0.50  1.00  0.75  1.25  1.80  1.00 -0.75 -0.75  1.90  2.00
0.60  3.00  1.75 -0.50  1.00
```

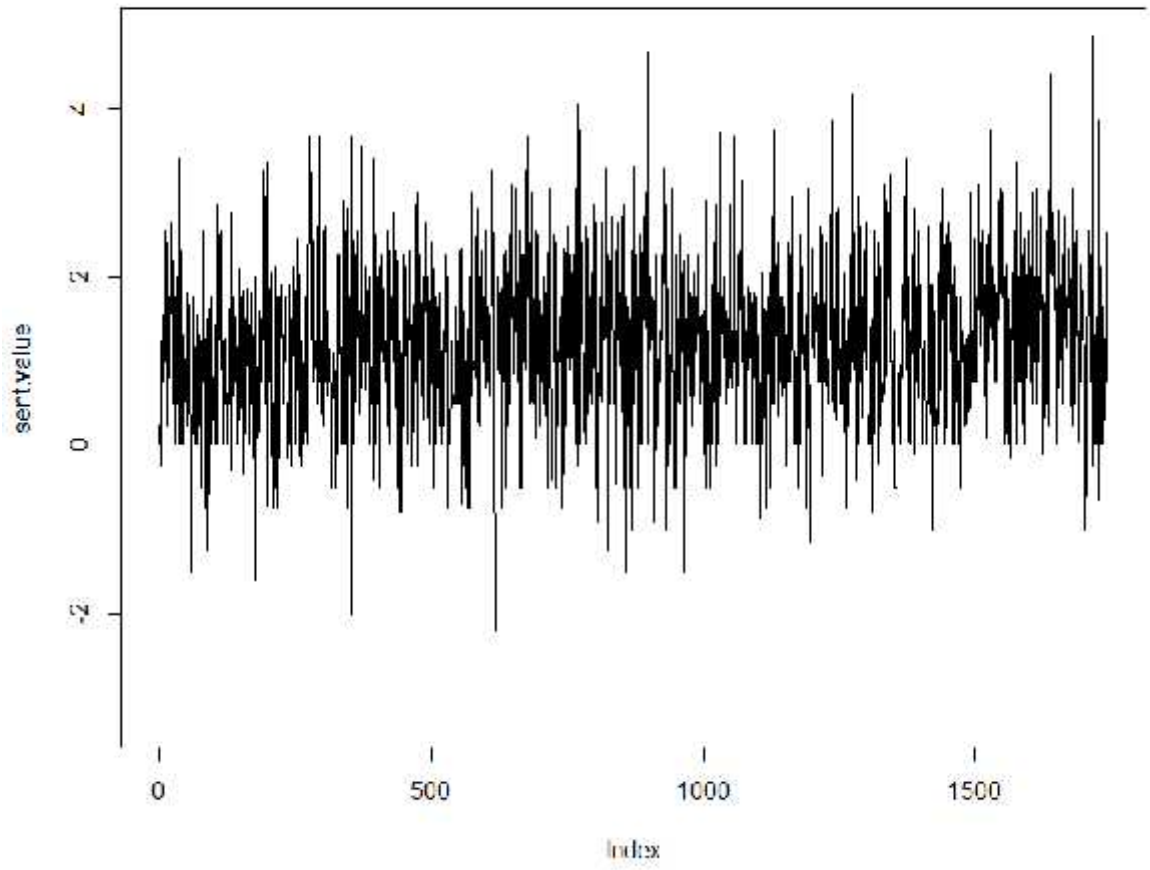
```
#Pulling out the most positive tweet
most.positive <- word.df[sent.value == max(sent.value)]
most.positive
```

```
[1] "Were always happy to assist in any way that we can Thank you for your l
ove and support Enjoy your new vacuum "
```

```
#Pulling out the most negative tweet
most.negative <- word.df[sent.value <= min(sent.value)]
most.negative
```

```
[1] "Were terribly sorry to hear that your order was delayed and unfortunate
ly damaged We definitely want to"
```

```
#Sentiment score plot
plot(sent.value, type = "l")
abline(h=0, col="red")
```




```
#Segregating positive, negative and neutral tweets
positive.tweets <- word.df[sent.value > 0]
head(positive.tweets)
```

```
[1] "We are so sorry to hear about this We would love to look further into t
his with you Send us a DM"
[2] "Great choice purple is definitely your color "
[3] "Hello Joe If youre missing a shipment wed love the opportunity to look
into this for you and provide"
[4] "Hey Joe Were sorry that youve had a less than perfect experience while
shopping on Jet Wed love to"
[5] "Were so glad our Jet Heads could help you out That is what were here fo
r If you ever have any fu"
[6] "Please send us a DM atand we would be happy to look further into this f
or you"
```

```
negative.tweets <- word.df[sent.value < 0]
head(negative.tweets)
```

```
[1] "No problem thank you for the suggestion Tyler"
[2] "Hi Barbara were so sorry about the confusion in charges We are unable t
o send a DM to you here is the"
[3] "Hey there thank you for reaching out I am sorry for any confusion howev
er were not an airline but an o"
[4] "Sales tax is added depending on the state you live in Jeremiah We will
get more information from y"
[5] "No problem Definitely keep an eye out Nicole"
[6] "Oh snap Youre not wrong That would definitely be on the top of our wors
t sounds to hear list Tyler"
```

```
neutral.tweets <- word.df[sent.value == 0]
head(neutral.tweets)
```

```
[1] "Fair enough Justin Ill be sure to pass that request along  Chris"
[2] "No problem Marie We are always happy to help Tyler"
[3] "Hey there send us a DM and we will look into this for youStephanie"
[4] "That is terrible This not the experience we aim to give our members Wer
e glad that Tammy got you"
[5] "No problem Lex We are always happy to help Tyler"
[6] "Hey Lex shipping timeframes can vary based on where your order is comin
g from You can always view"
```

```
#Reformatting all tweets in 3 categories
category_senti <- ifelse(sent.value < 0, "Negative", ifelse(sent.value > 0, "Positive", "Neutral"))

head(category_senti)
```

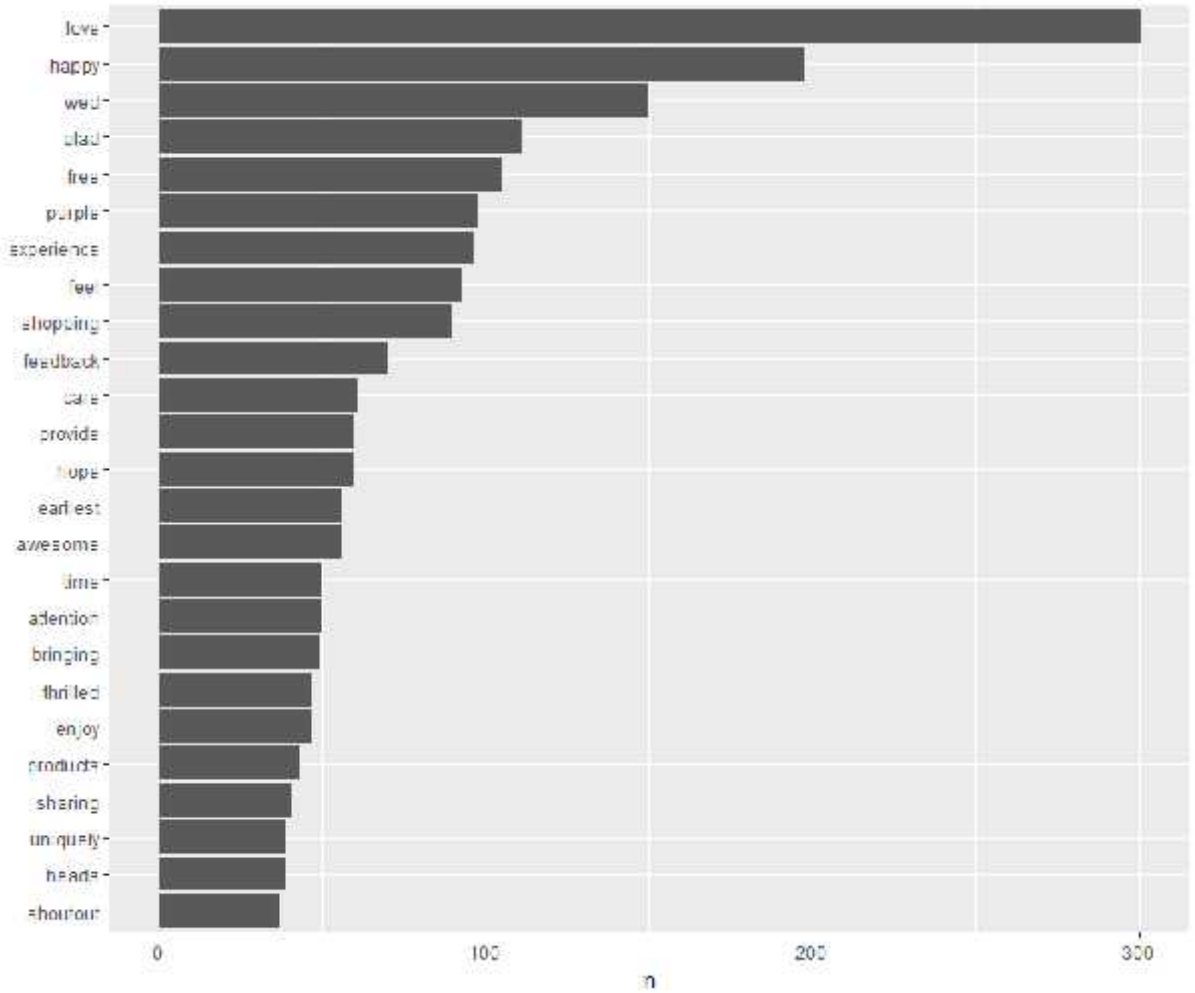
```
[1] "Positive" "Negative" "Neutral"  "Positive" "Positive" "Positive"
```

```
table(category_senti)
```

```
Negative  Neutral Positive
   123      122     1499
```

```
#Creating Positive and Negative tweets dataframe with customized stop words
data <- data_frame(text = positive.tweets)
data2 <- data_frame(text = negative.tweets)
custom_stop_words <- bind_rows(stop_words,
                  data_frame(word = c("hey", "jet", "dm", "yo", "tyler", "nicole", "send",
                                      "youve", "youre", "dont", "hear"),lexicon = "nrp"))

data("stop_words") # Remove stop_words
```

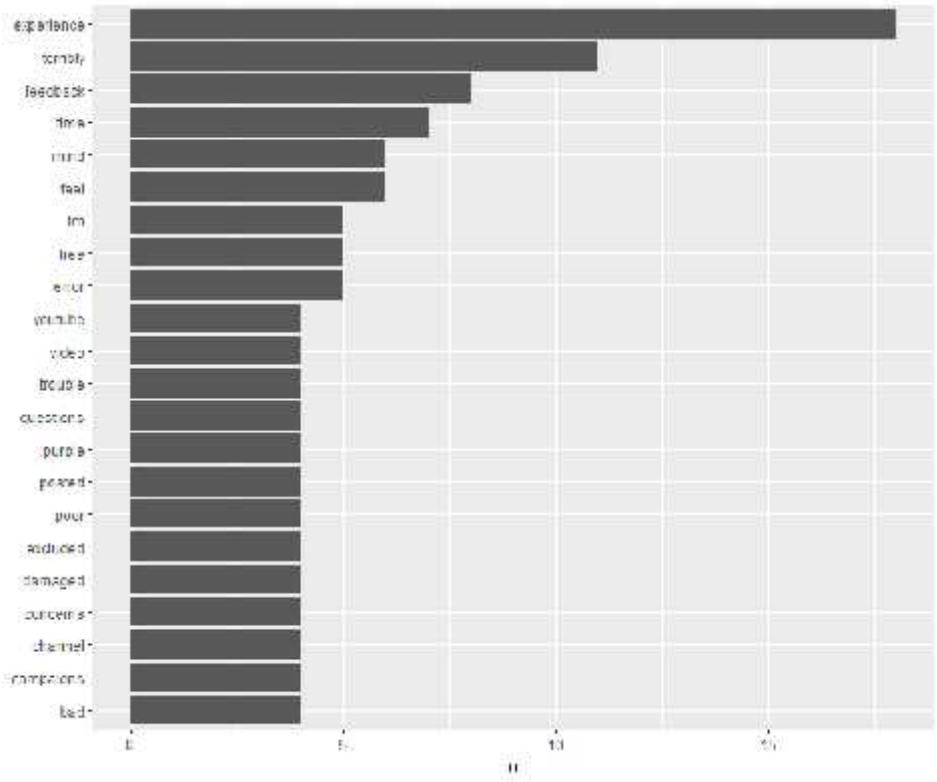
```
#tokenized each word in each line for Positive tweets
tidydata <- data %>% unnest_tokens(word, text) %>%
  anti_join(custom_stop_words) %>%
  count(word, sort = TRUE) %>%
  filter(!word %in% custom_stop_words$word,
         str_detect(word, "[a-z]"))


#visualizing word ranking of Positive tweets
tidydata %>% top_n(25) %>%
  mutate(word = reorder(word,n)) %>%
  ggplot(aes(word, n)) +
  geom_col() +
  xlab(NULL) +
  coord_flip()
```



```
#Wordcloud Visualization of Positive tweets
tidydata %>% with(wordcloud(word, n, max.words = 30, random.order=FALSE,
                            rot.per=0.30,
                            use.r.layout=FALSE,
                            colors=brewer.pal(8, "Dark2")))
```


```
#tokenized each word in each line for Negative tweets
tidydata <- data2 %>% unnest_tokens(word, text) %>%
  anti_join(custom_stop_words) %>%
  count(word, sort = TRUE) %>%
  filter(!word %in% custom_stop_words$word,
         str_detect(word, "[a-z]"))
```

```
#visualizing word ranking of Negative tweets
tidydata %>% top_n(13) %>%
  mutate(word = reorder(word,n)) %>%
  ggplot(aes(word, n)) +
  geom_col() +
  xlab(NULL) +
  coord_flip()
```



#Wordcloud Visualization of Negative tweets

```
tidydata %>% with(wordcloud(word, n, max.words = 50, random.order=FALSE,
                            rot.per=0.30,
                            use.r.layout=FALSE,
                            colors=brewer.pal(8, "Dark2")))
```

```
#Exploring high frequency words in sentences

#For negative tweets - 'terribly' is mostly used in a sentence with 'Sorry'
Negative_word <-data2 %>%
  filter(str_detect(text, "terribly"))
Negative_word
```

```
1 Were terribly sorry for the delay with your very first order We want nothi
ng more than to provide yo
 2 We are terribly sorry for the delay with receiving your order Please send
us a DM and we can look
 3 Hi Melanie We are terribly sorry that you have not received a response to
your email but weve se
 4 Were terribly sorry for the listing error on our end but were thrilled th
at you were properly take
 5 Hi Kev were terribly sorry to see that the Bananas and Potatoes arrived i
n less than perfect conditio
 6 Were terribly sorry for the excessive emails youve received from us This
is an error that has been
 7 Hi Kenzie this is absolutely not the way we want you to receive your orde
rs from us Were terribly
 8 Hi Kimberly Were terribly sorry to hear that our website is giving you tr
ouble while trying to place a~
 9 Were terribly sorry to hear that your order was delayed and unfortunately
damaged We definitely want to
10 Were terribly sorry to hear that you received the Ping Pong table damaged
This is definitely somethi
11 Hello Josh were terribly sorry to hear that your order was messed up but
we want you to know that we
```