TECNOLÓGICO NACIONAL DE MÉXICO

INSTITUTO TECNOLÓGICO DE TIJUANA

SUBDIRECCIÓN ACADÉMICA

DEPARTAMENTO DE SISTEMAS Y COMPUTACIÓN

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Carrera: Ingeniería Informática

Semestre: 9no

MATERIA: Minería de datos

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TRABAJOS: Practica 1

FECHA: 1/11/21

```
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#Librerias requeridas
library( dplyr )
library( tidytext )
library( textdata )
library( ggplot2 )
library( RColorBrewer )
library( wordcloud )
library( reshape2 )
library( tidyverse )

# El archivo esta subido a un github para facilitar su carga dentro de RStudio
mlpURL <- "https://raw.githubusercontent.com/SmilodonCub/DATA607/master/my-little-pony-transcript/clean_dialog.csv"
mlp_df <- read.csv( mlpURL )
dim( mlp_df )

#
colnames( mlp_df )

#En este apartado exploraremos los sentimientos como una funcion de la narrativa de los subsecuentes episodios de MLP.
# La pregunta es como los sentimientos varian a lo largo del dialogo del episodio?
episodeLines <- mlp_df %>%
  group_by( title ) %>% #with respect to episode title:
  mutate( id = row_number()) %>% #add a new feature 'id' to enumerate each row of text
  group_by( title, id) %>% #with respect to episode title & line of text(id):
  rowwise() %>%
  summarise( lines = paste(dialog, collapse = "&&")) %>%
  #paste all episode lines together delimited by '&&'
  mutate( lines = str_split( lines, "&&") ) %>%
  #mutate lines to a list of lines
  unnest( lines ) %>% #unnest list of lines to one line per row
  unnest_tokens(word, lines) #one token/word per line
head(episodeLines)

#list of first 6 episode title
AllEpisodes <- unique(episodeLines$title)[1:6]

#perform an inner join with the bing lexicon
pony_sentiment <- episodeLines %>%
  filter( title %in% AllEpisodes ) %>% #subset for the first 8 episodes
  inner_join(get_sentiments("bing")) %>% #inner join with 'bing' lexicon
  #for each title, tally the sentiment score of the
  #tokens in increments of 10 lines
  count(title, index = id %/% 6, sentiment) %>%
  spread(sentiment, n, fill = 0) %>%
  mutate(sentiment = positive - negative)
head( pony_sentiment )
```
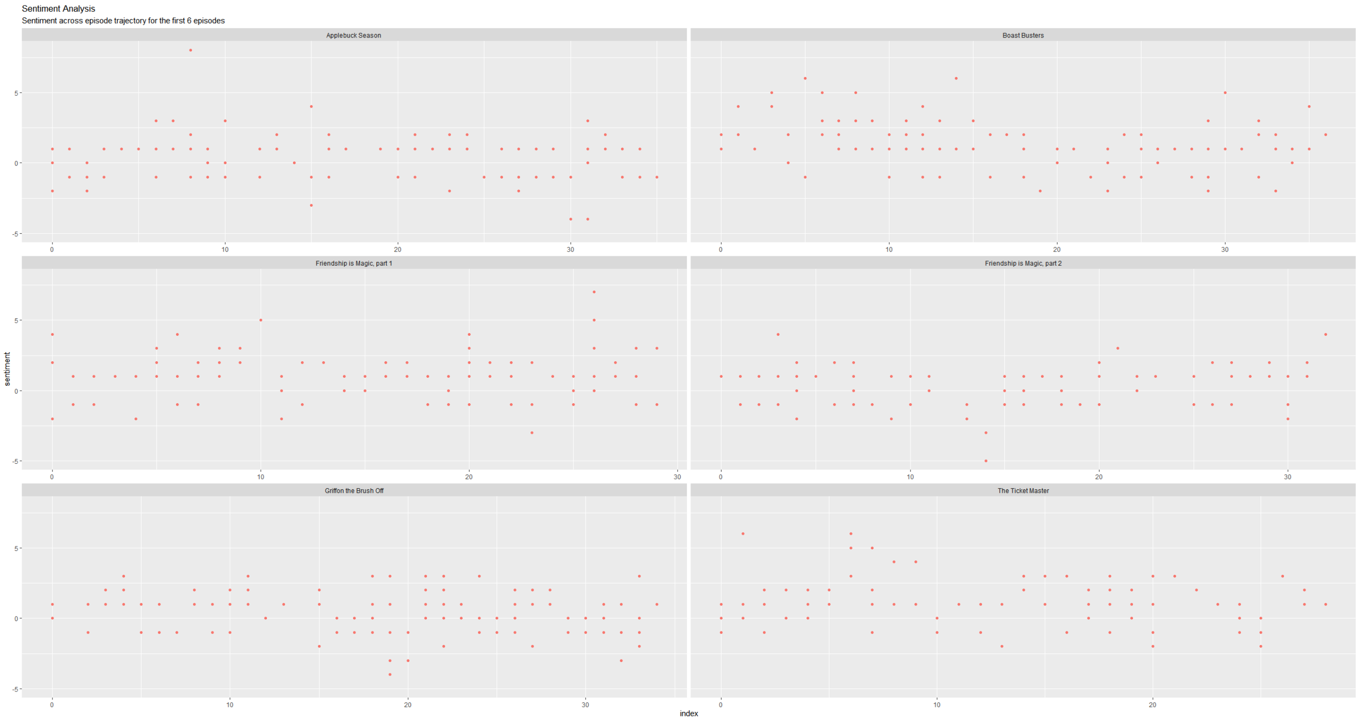
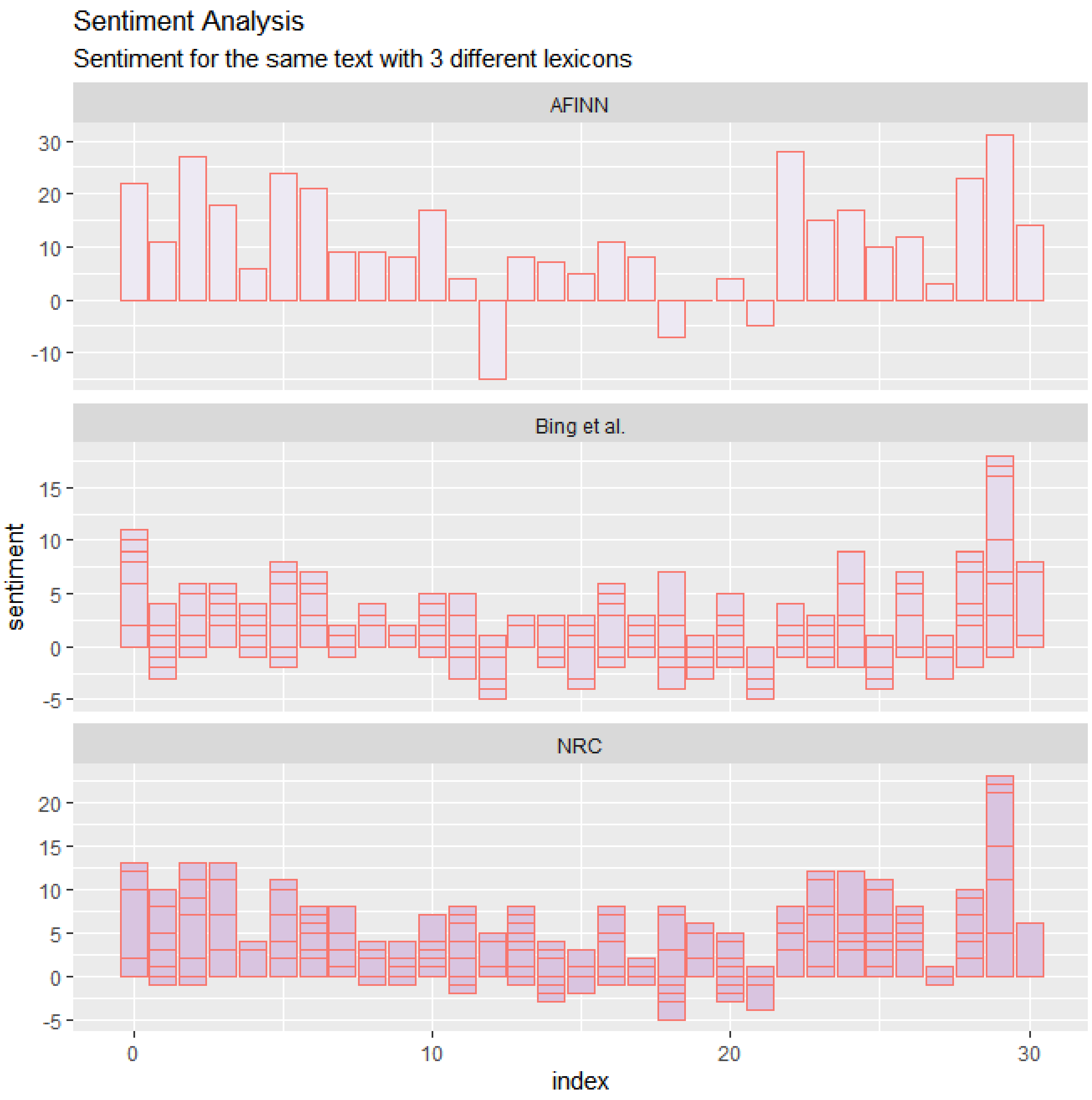
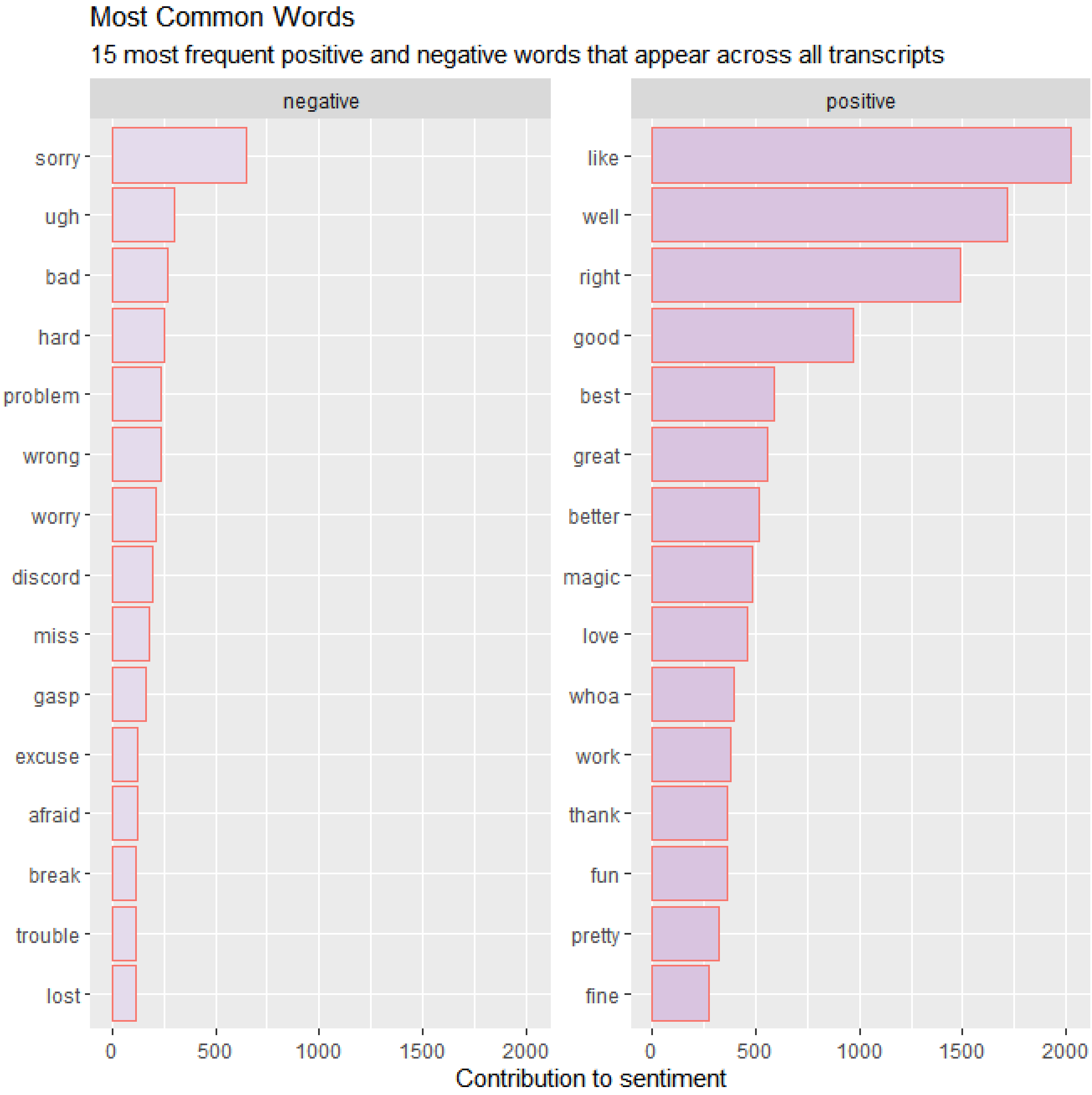

```
#Visualize sentiment over the course of episode narative:

colourCount = length(unique(pony_sentiment$title))
mycolors = colorRampPalette(brewer.pal(9, "PuRd"))(colourCount)

ggplot(pony_sentiment, aes(index, sentiment,color='black', fill = title)) +
  geom_point(show.legend = FALSE) +
  facet_wrap(~title, ncol = 2, scales = "free_x") +
  scale_fill_manual( values = mycolors) +
  labs( title = 'Sentiment Analysis', subtitle="Sentiment across episode
trajectory for the first 6 episodes")
```



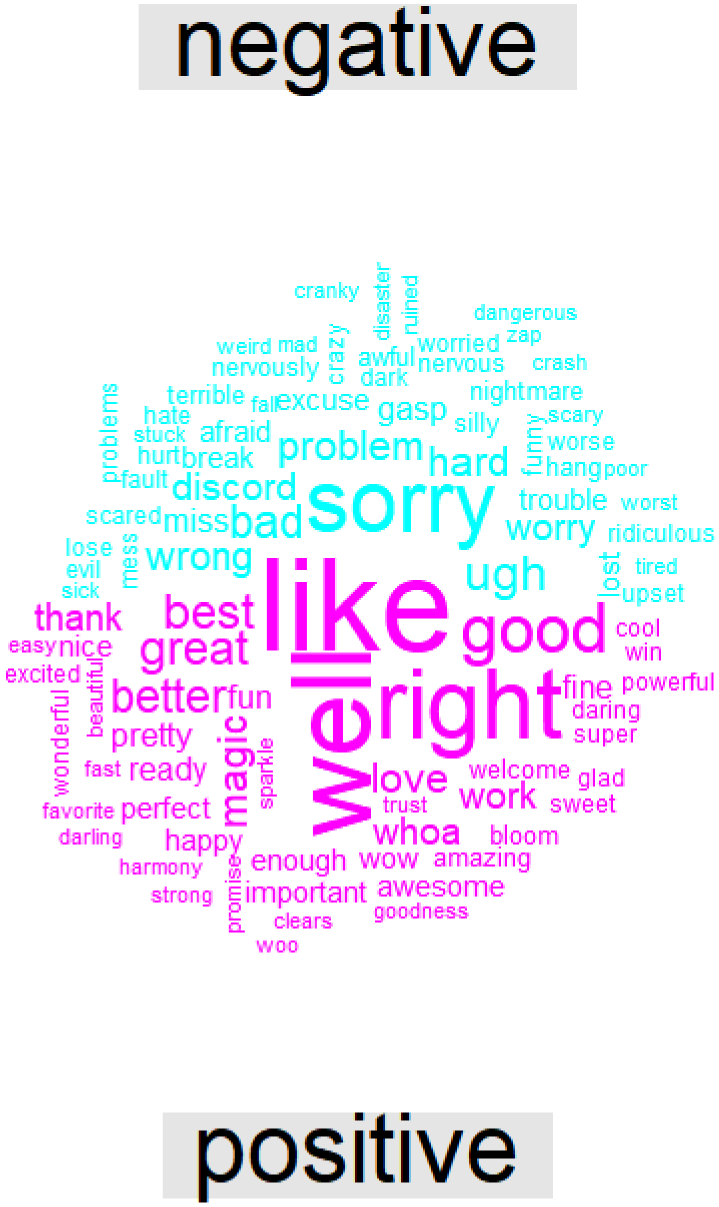
```
#Proceso para comparar dos episodios para tener un analisis mas completo de la
narrativa
#combining 2 episodes to have a longer narative to analyze:
doubleEpisode <- c('A Canterlot Wedding - Part 1', 'A Canterlot Wedding - Part 2')
#a dataframe for the first episode:
doubleEpLines1 <- episodeLines %>%
  filter( title %in% doubleEpisode[1] )
addlines <- max(doubleEpLines1$id)
#a dataframe for the second that increments the line 'id'
doubleEpLines2 <- episodeLines %>%
  filter( title %in% doubleEpisode[2] ) %>%
  mutate( id = id + addlines )
#bind the two episodes to one dataframe
doubleEpLines <- rbind( doubleEpLines1, doubleEpLines2)

#inner join with 'afinn' and sum sentiment value for every 10 lines
afinn <- doubleEpLines %>%
  inner_join(get_sentiments("afinn")) %>%
  group_by(index = id %/% 10) %>%
  summarise(sentiment = sum(value)) %>%
  mutate(method = "AFINN")
#inner join with 'bing' and 'nrc' also sum sentiment value for every 10 lines
bing_and_nrc <- bind_rows(doubleEpLines  %>%
                            inner_join(get_sentiments("bing")) %>%
                            mutate(method = "Bing et al."),
                          doubleEpLines  %>%
                            inner_join(get_sentiments("nrc") %>%
                                         filter(sentiment %in% c("positive",
                                                                 "negative"))) %>%
                            mutate(method = "NRC")) %>%
  count(method, index = id %/% 10, sentiment) %>%
  spread(sentiment, n, fill = 0) %>%
  mutate(sentiment = positive - negative)

#bind afinn, bing, and nrc data then visualize the narative sentiments
bind_rows(afinn,
          bing_and_nrc) %>%
  ggplot(aes(index, sentiment,color='black', fill = method)) +
  geom_col(show.legend = FALSE) +
  facet_wrap(~method, ncol = 1, scales = "free_y") +
  scale_fill_manual( values = mycolors[2:4]) +
  labs( title = 'Sentiment Analysis', subtitle="Sentiment for the same text with 3 different lexicons")

#This code demonstrates the differences in lexicon sentiment criterion:
nrc_sent <- get_sentiments("nrc") %>%
  filter(sentiment %in% c("positive",
                          "negative")) %>%
  count(sentiment)
nrc_ratio <- nrc_sent$n[1]/nrc_sent$n[2]

bing_sent <- get_sentiments("bing") %>%
  count(sentiment)
bing_ratio <- bing_sent$n[1]/bing_sent$n[2]

cat( 'The +/- ratio for nrc=', nrc_ratio, 'this < the +/- bing =',bing_ratio)
```



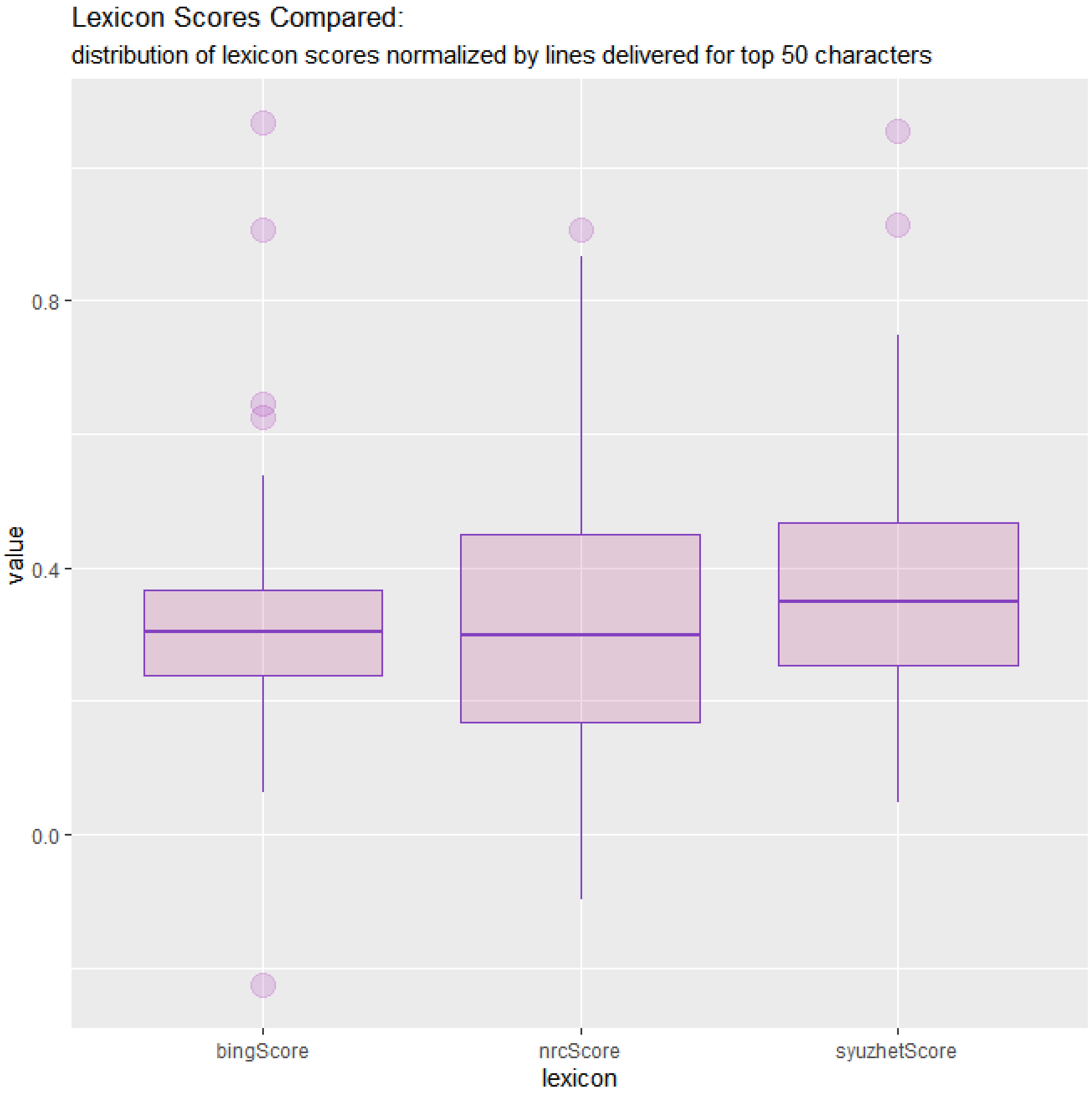
```
#Proceso para encontrar las palabras mas usadas de forma positiva y negativas
# Hacer un inner join para las etiquetas de sentimientos con toquen nos ayudara.
# aqui la manipulacion es usada para explorar las palabras usadas
#frequentemente para sentimientos positivos y negativos que aparecieron
#en los episodios my little pony
bing_word_counts <- episodeLines %>%
  group_by( word ) %>% #group with respect to word,
  summarise( n = n()) %>% #count a total for each words occurance
  inner_join(get_sentiments("bing")) %>% #join bing sentiments
  arrange( desc( n )) #arrange in descending order
head(bing_word_counts)

#Visualize the top 15 most frequent positive and negative words.

bing_word_counts %>%
  group_by(sentiment) %>%
  top_n(15,n) %>%
  ungroup() %>%
  mutate(word = reorder(word, n)) %>%
  ggplot(aes(word, n,color='black', fill = sentiment)) +
  geom_col(show.legend = FALSE) +
  facet_wrap(~sentiment, scales = "free_y") +
  labs(y = "Contribution to sentiment",
       x = NULL) +
  coord_flip() +
  scale_fill_manual( values = mycolors[3:4]) +
  labs( title = 'Most Common Words', subtitle="15 most frequent positive and
negative words that appear across all transcripts")

#There is a problem! In the top 10 negative words, ‘discord’ is listed.
#This is problematic, because Discord is the name of a villain in
#My Little Pony. We would like to add this nameto a list of stop words.
#Stop words are words that are to be excluded from further analysis.
#add 'discord' to the stop words...
custom_stop_words <- bind_rows(tibble(word = c("discord"),
                                      lexicon = c("custom")),
                               stop_words)
custom_stop_words
```



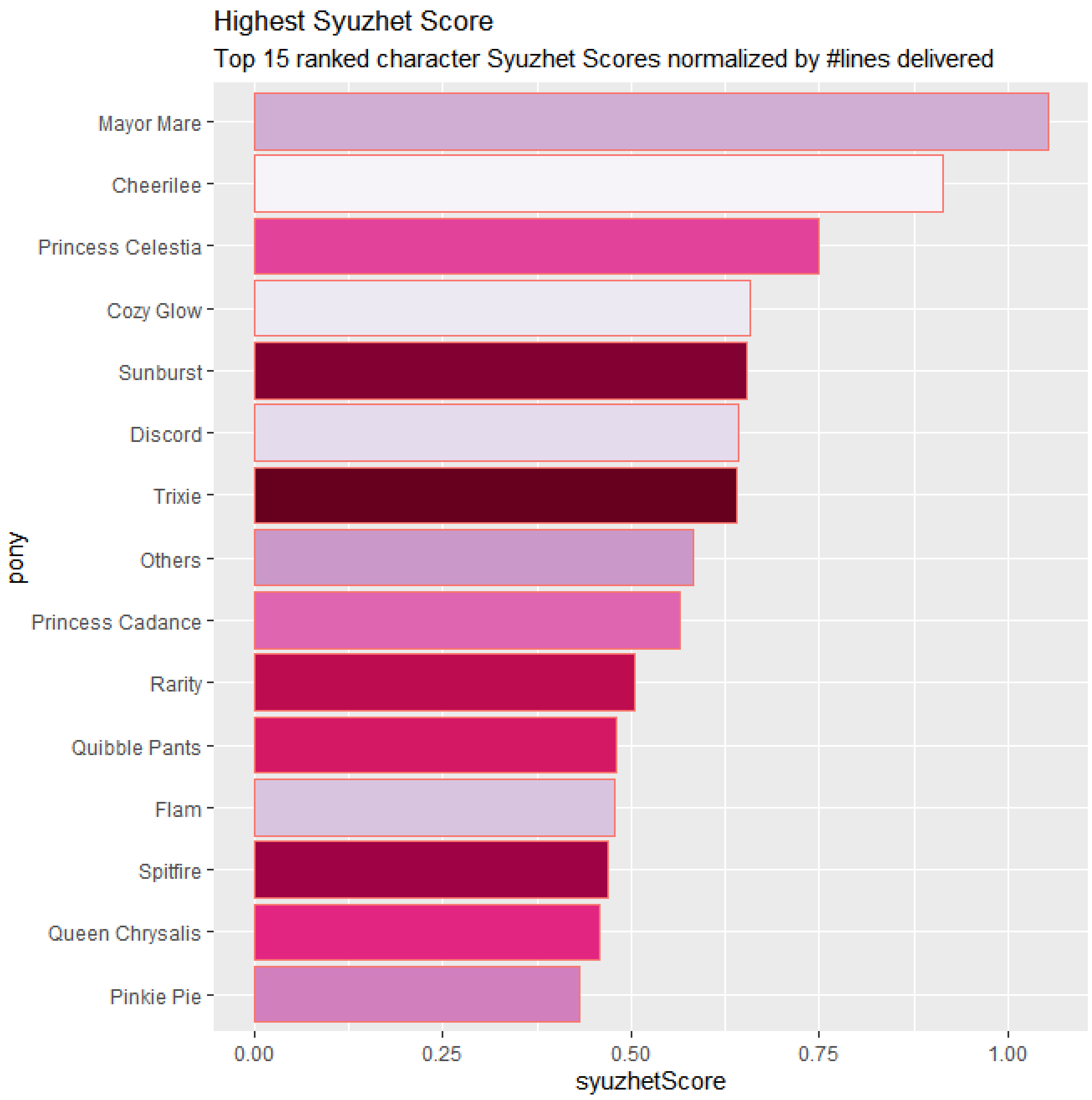
```
#Proceso para realizar nube de palabras
#basic word cloud
bing_word_counts %>%
  anti_join(stop_words) %>%
  with(wordcloud(word, n, max.words = 80,colors =
c("#F592AB","#BF408B","#B040BF","#8340BF")))

#word cloud that compares categorical tokens (positive vs negative sentiments)
bing_word_counts %>%
  inner_join(get_sentiments("bing")) %>%
  acast(word ~ sentiment, value.var = "n", fill = 0) %>%
  comparison.cloud(colors = c("cyan", "magenta"),
                   max.words = 100)
```



```
#Nuevo proceso para comparar a todos los personajes y sacar al mas positivo
ponies_top50 <- mlp_df %>%
  group_by( pony ) %>%
  summarise( count = n(), lines=paste(dialog, collapse="&&") ) %>%
  mutate(lines = str_split( lines, "&&")) %>%
  arrange( desc( count ) ) %>%
  top_n( 50, count ) %>%
  unnest( lines ) %>%
  unnest_tokens(word, lines)
unique(ponies_top50$pony)

#Acomodar
ponies_lineTally <- ponies_top50 %>%
  select( pony, count ) %>%
  group_by( pony ) %>%
  summarise( count = max(count) )
ponies_lineTally
```



```
#usa el get sentiment con la libreria syuzhey para construir los puntajes de
sentimientos
library( syuzhet )
ponies_top50$syuzhet <- get_sentiment(ponies_top50$word, method="syuzhet")
ponies_top50$bing <- get_sentiment(ponies_top50$word, method="bing")
ponies_top50$nrc <- get_sentiment(ponies_top50$word, method="nrc")

#junta a cada palabra con su respectivo pony y su calificacion
#group by pony and summarise the sums of the 3 lexicon scores
ponies_sentimentScores <- ponies_top50 %>%
  group_by( pony, count ) %>%
  summarise( syuzhetScore = sum( syuzhet ),
             bingScore = sum( bing ),
             nrcScore = sum( nrc ))
#normalize the scores to account for the number of lines delivered by each
character
ponies_sentimentScores <- ponies_sentimentScores %>%
  mutate( syuzhetScore = syuzhetScore/count,
          bingScore = bingScore/count,
          nrcScore = nrcScore/count)
summary( ponies_sentimentScores )


#pivot the data longer to facilitate plotting the distributions of scores by
lexicon
plotData <- ponies_sentimentScores %>%
  pivot_longer(cols = syuzhetScore:nrcScore, names_to = 'lexicon')
#visualize as box plot:
ggplot(plotData, aes(x=lexicon, y=value)) +
  geom_boxplot(color="#8340BF", fill="#BF408B", alpha=0.2,
               outlier.colour="#B040BF", outlier.fill="#B040BF", outlier.size=5) +
  labs( title = 'Lexicon Scores Compared:', subtitle="distribution of lexicon
scores normalized by lines delivered for top 50 characters")

colourCount = 15
mycolors = colorRampPalette(brewer.pal(50, "PuRd"))(colourCount)

plotData <- ponies_sentimentScores %>%
  arrange( desc( syuzhetScore )) %>%
  head( n = 15L )
ordered <- plotData$pony
ggplot(plotData, aes(x=pony, y=syuzhetScore, color='black',fill=factor(pony) )) +
  geom_bar( stat = 'identity' ) +
  scale_x_discrete( limits = rev(ordered)) +
  coord_flip() +
  scale_fill_manual(values = mycolors ) +
  theme(legend.position="none") +
  labs( title = 'Highest Syuzhet Score', subtitle = 'Top 15 ranked character
Syuzhet Scores normalized by #lines delivered')
```


Highest Syuzhet Score
Top 15 ranked character Syuzhet Scores normalized by #lines delivered
Mayor Mare
Cheerilee
Princess Celestia
Cozy Glow
Sunburst
Discord
Trixie
Others
Princess Cadance
Rarity
Quibble Pants
Flam
Spitfire
Queen Chrysalis
Pinkie Pie
pony
0.00
0.25
0.50
0.75
1.00
syuzhetScore