Sharat_Sripada_HW10.R

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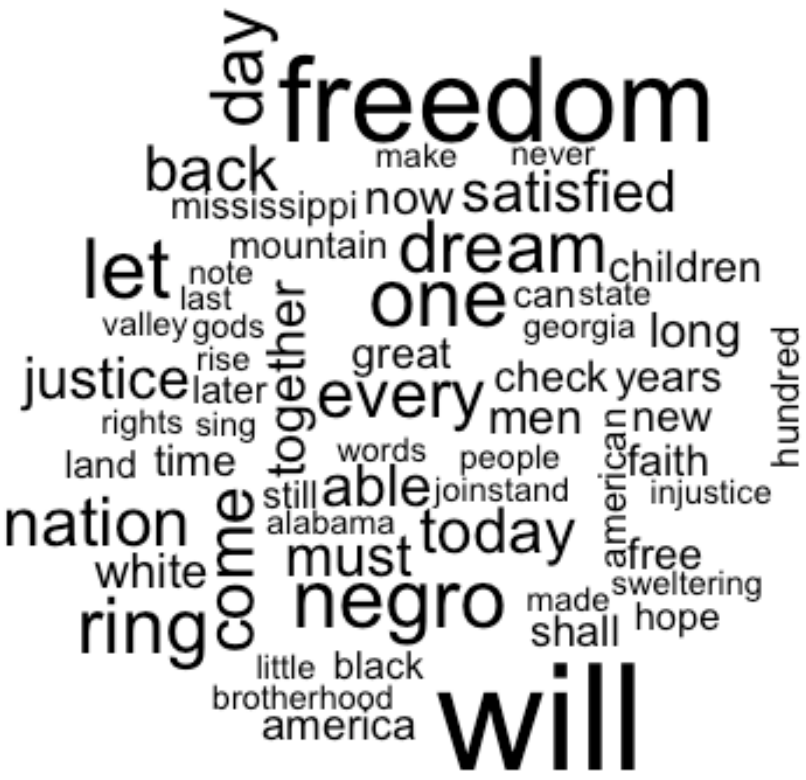
```
#
#       Course: IST-687
#       Name: Sharat Sripada
#       Homework #10
#       Due Date: 3/22/2020
#       Date Submitted: 3/22/2020
#       Topic: Text-mining
#



# install.packages("tm")
library(tm)

## Loading required package: NLP

# install.packages("wordcloud")
library(wordcloud)

## Loading required package: RColorBrewer

get_sentiment_score <- function(word_corpus){
  tdm <- TermDocumentMatrix(word_corpus)
  # convert tdm into a matrix called "m"
  m <- as.matrix(tdm)
  wordCounts <- rowSums(m)
  my_df <- data.frame(word = names(wordCounts), freq = wordCounts)
  AFINN <-
read.delim("/Users/ssharat/Downloads/HW10AFINN111_2_2_2_2_2_2_2_2_2_2_2_2.txt
",sep="\t",header = FALSE)
  colnames(AFINN) <- c("Word", "Score")
  # Merge the affinity score data-frame with wordcounts
  mergedTable <- merge(my_df, AFINN, by.x="word", by.y="Word")
  overallScore <- sum(mergedTable$freq * mergedTable$Score)
  totalWords <- sum(wordCounts)
  print(overallScore/totalWords)
  return(overallScore/totalWords)
}

get_pos_neg_ratios <- function(corpus_words, p, n){
  tdm <- TermDocumentMatrix(corpus_words)
  # convert tdm into a matrix called "m"
  m <- as.matrix(tdm)
```

```
  # create a list of word counts for the first quarter and sort the list
  wordCounts <- rowSums(m)
  wordCounts <- sort(wordCounts, decreasing=TRUE)
  totalWords <- sum(wordCounts)
  # create a vector that contains all the words in "wordCounts1"
  words <- names(wordCounts)
  # locate which words in first quarter were positive (appeared in positive-
word list)
  matchedP <- match(words, p, nomatch = 0)
  # calculate the number of positive words in first quarter
  ptotalNumber <- sum(wordCounts[which(matchedP != 0)])
  # calculate the ratio of positive words
  ratiop <- ptotalNumber/totalWords
  # locate which words in first quarter were negative (appeared in negative-
word list)
  matchedN <- match(words, n, nomatch = 0)
  # calculate the number of negative words
  ntotalNumber <- sum(wordCounts[which(matchedN != 0)])
  # calculate the ratio of negative words
  ration <- ntotalNumber/totalWords
  return(c(ratiop, ration))
}

mlk <- readLines("/Users/ssharat/Downloads/MLK_2_2_2_2_2_2_2_2_2_2.txt")
mlk <- mlk[which(mlk != "")] # remove all blank lines in the text

#   Create a term matrix
# interprets each element of the "mlk" as a document and create a vector
source
words.vec <- VectorSource(mlk)
# create a Corpus, a "Bag of Words"
words.corpus <- Corpus(words.vec)
# first step transformation: make all of the letters in "words.corpus"
lowercase
words.corpus <- tm_map(words.corpus, content_transformer(tolower))

## Warning in tm_map.SimpleCorpus(words.corpus,
content_transformer(tolower)):
## transformation drops documents

# second step transformation: remove the punctuation in "words.corpus"
words.corpus <- tm_map(words.corpus, removePunctuation)

## Warning in tm_map.SimpleCorpus(words.corpus, removePunctuation):
transformation
## drops documents

# third step transformation: remove numbers in "words.corpus"
words.corpus <- tm_map(words.corpus, removeNumbers)
```

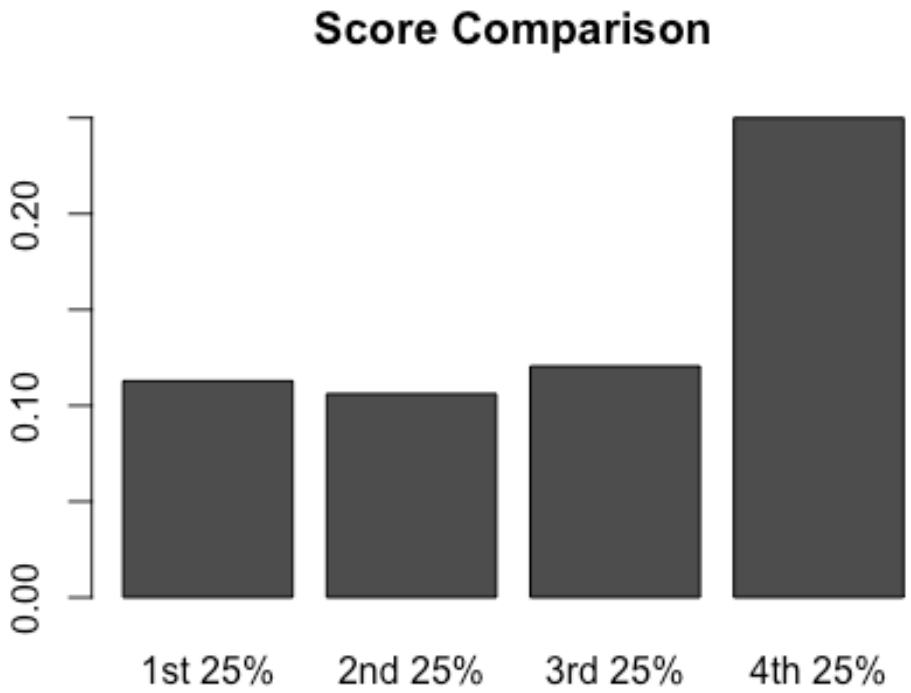
```
## Warning in tm_map.SimpleCorpus(words.corpus, removeNumbers):
transformation
## drops documents

# final step transformation: take out the "stop" words, such as "the", "a"
and "at"
words.corpus <- tm_map(words.corpus, removeWords, stopwords("english"))

## Warning in tm_map.SimpleCorpus(words.corpus, removeWords,
stopwords("english")):
## transformation drops documents

# create a term-document matrix "tdm"
tdm <- TermDocumentMatrix(words.corpus)

# convert tdm into a matrix called "m"
m <- as.matrix(tdm)

# create a list of counts for each word named "wordCounts"
wordCounts <- rowSums(m)

# create a vector "words" that contains all the words in "wordCounts"
words <- names(wordCounts)

# sort words in "wordCounts" by frequency
wordCounts_decr <- sort(wordCounts, decreasing=TRUE)

# Build Word Cloud
cloudFrame <- data.frame(word = names(wordCounts_decr), freq=wordCounts_decr)
wordcloud(cloudFrame$word, cloudFrame$freq)
```




```
wordcloud(names(wordCounts_decr),
          wordCounts_decr,
          min.freq=3,
          max.words=50,
          rot.per=.35,
          colors=brewer.pal(8,"Dark2"))
```


```
# Get setiment score
get_sentiment_score(words.corpus)

## [1] 0.1343639

## [1] 0.1343639

# Get sentiment score for 1st quarter
cutpoint <- round(length(words.corpus)/4)
words.corpus1 <- words.corpus[1:cutpoint]
score1 <- get_sentiment_score(words.corpus1)

## [1] 0.1128527

# Get sentiment score for 2nd quarter
words.corpus2 <- words.corpus[(cutpoint+1):(2*cutpoint)]
score2 <- get_sentiment_score(words.corpus2)

## [1] 0.1061224

# Get sentiment score for 3rd quarter
words.corpus3 <- words.corpus[(2*cutpoint+1):(3*cutpoint)]
score3 <- get_sentiment_score(words.corpus3)

## [1] 0.1205674
```

```r
# Get sentiment score for 4th quarter
words.corpus4 <- words.corpus[(3*cutpoint+1):length(words.corpus)]
score4 <- get_sentiment_score(words.corpus4)

## [1] 0.25

# Plot a bar-graph for the above
sentiment_scores <- cbind(score1, score2, score3, score4)
barplot(sentiment_scores, names.arg = c("1st 25%","2nd 25%","3rd 25%","4th
25%"), main = "Score Comparison")
```




```r
# Comparing the sentiment scores with postive & negative word index
pos <- "/Users/ssharat/Downloads/positivewords_2_2_2_2_2_2_2_2_2_2_2.txt"
p <- scan(pos, character(0), sep = "\n")
neg <- "/Users/ssharat/Downloads/negativewords_2_2_2_2_2_2_2_2_2_2_2.txt"
n <- scan(neg, character(0), sep = "\n")

# remove useless rows (row 1 to row 34) of "p"
p <- p[-c(1:34)]
# remove useless rows (row 1 to row 34) of "n"
n <- n[-c(1:34)]

# Get postive & negative ratio for 1st quarter
cutpoint <- round(length(words.corpus)/4)
```

```r
words.corpus1 <- words.corpus[1:cutpoint]
ratios1 <- c(get_pos_neg_ratios(words.corpus1, p, n))
print(ratios1)
```

```
## [1] 0.09717868 0.10344828
```

```r
# Get postive & negative ratio for 2nd quarter
words.corpus2 <- words.corpus[(cutpoint+1):(2*cutpoint)]
ratios2 <- c(get_pos_neg_ratios(words.corpus1, p, n))
print(ratios2)
```

```
## [1] 0.09717868 0.10344828
```

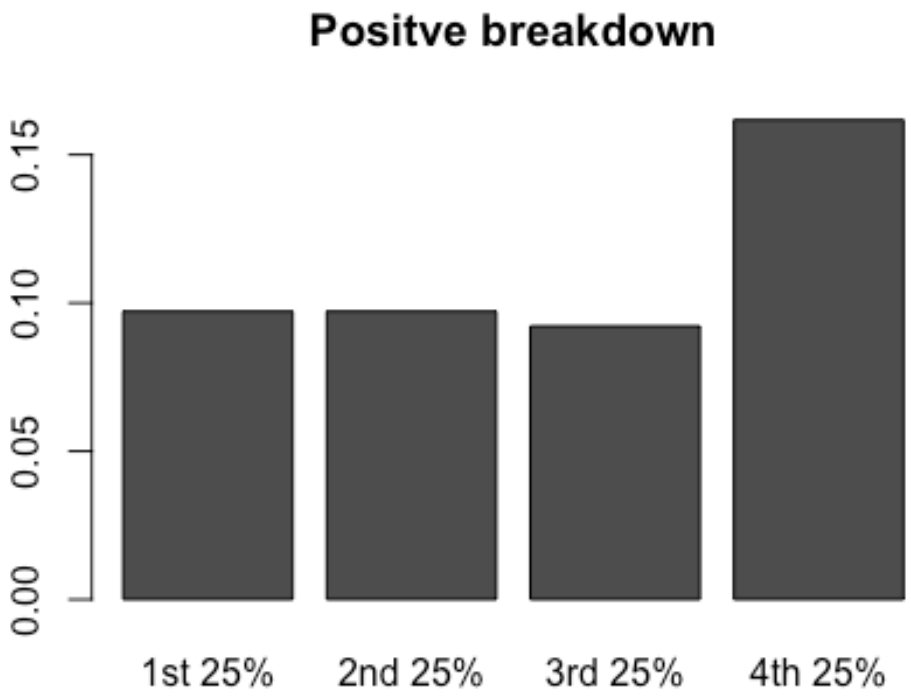
```r
# Get postive & negative ratio for 3rd quarter
words.corpus3 <- words.corpus[(2*cutpoint+1):(3*cutpoint)]
ratios3 <- c(get_pos_neg_ratios(words.corpus3, p, n))
print(ratios3)
```

```
## [1] 0.09219858 0.06382979
```

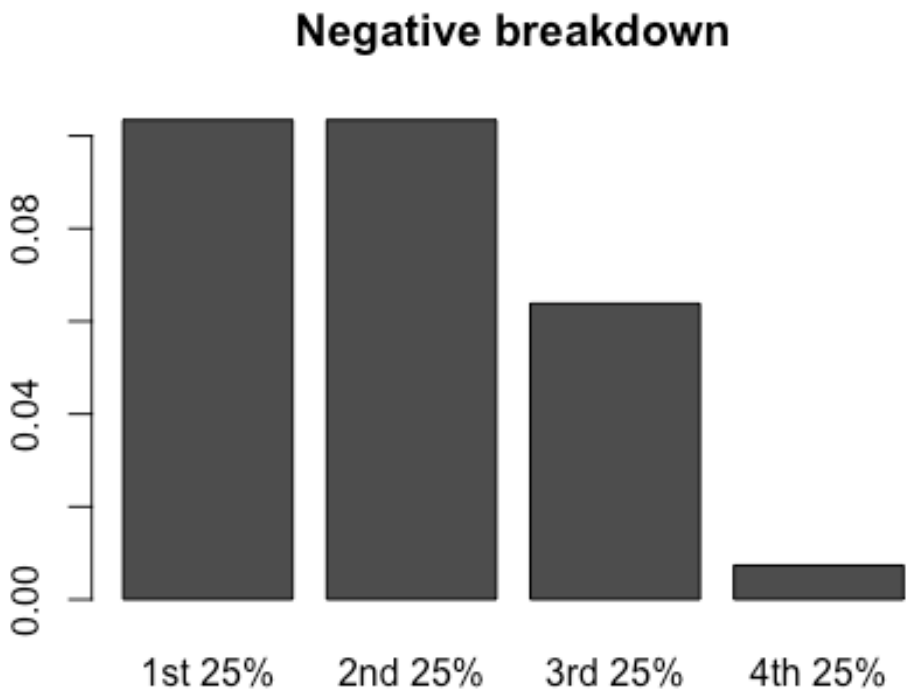
```r
# Get postive & negative ratio for 4th quarter
words.corpus4 <- words.corpus[(3*cutpoint+1):length(words.corpus)]
ratios4 <- c(get_pos_neg_ratios(words.corpus4, p, n))
print(ratios4)
```

```
## [1] 0.161764706 0.007352941
```

```r
# Plot a bar-graph for postive ratio
positive_ratio <- cbind(ratios1[1], ratios2[1], ratios3[1], ratios4[1])
barplot(positive_ratio, names.arg = c("1st 25%","2nd 25%","3rd 25%","4th
25%"), main = "Positve breakdown")
```




```r
# Plot a bar-graph for negative ratio
positive_ratio <- cbind(ratios1[2], ratios2[2], ratios3[2], ratios4[2])
barplot(positive_ratio, names.arg = c("1st 25%","2nd 25%","3rd 25%","4th
25%"), main = "Negative breakdown")
```


Negative breakdown
0.00
0.04
0.08
1st 25%
2nd 25%
3rd 25%
4th 25%