PS5 Submission

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```
library(tidyverse)
```

```
## Warning: package 'tidyverse' was built under R version 3.5.3
```

```
## -- Attaching packages ---------------------------------------- tidyverse 1.3.0 --
```

```
## v ggplot2 3.2.1     v purrr   0.3.3
## v tibble  2.1.3     v dplyr   0.8.3
## v tidyr   1.0.0     v stringr 1.4.0
## v readr   1.3.1     v forcats 0.4.0
```

```
## Warning: package 'ggplot2' was built under R version 3.5.3
```

```
## Warning: package 'tibble' was built under R version 3.5.3
```

```
## Warning: package 'tidyr' was built under R version 3.5.3
```

```
## Warning: package 'readr' was built under R version 3.5.3
```

```
## Warning: package 'purrr' was built under R version 3.5.3
```

```
## Warning: package 'dplyr' was built under R version 3.5.3
```

```
## Warning: package 'stringr' was built under R version 3.5.3
```

```
## Warning: package 'forcats' was built under R version 3.5.3
```

```
## -- Conflicts ------------------------------------------- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(tidytext)
```

```
## Warning: package 'tidytext' was built under R version 3.5.3
```

```
library(tm)
```

```
## Warning: package 'tm' was built under R version 3.5.3
```

```
## Loading required package: NLP
```

```
##
## Attaching package: 'NLP'
```

```
## The following object is masked from 'package:ggplot2':
##
##     annotate
```

```
library(sotu)
library(igraph) # for graph_from_data_frame function
```

```
## Warning: package 'igraph' was built under R version 3.5.3
```

```
##
## Attaching package: 'igraph'
```

```
## The following objects are masked from 'package:dplyr':
##
##     as_data_frame, groups, union
```

```
## The following objects are masked from 'package:purrr':
##
##     compose, simplify
```

```
## The following object is masked from 'package:tidyr':
##
##     crossing
```

```
## The following object is masked from 'package:tibble':
##
##     as_data_frame
```

```
## The following objects are masked from 'package:stats':
##
##     decompose, spectrum
```

```
## The following object is masked from 'package:base':
##
##     union
```

```
library(ggraph) # for network plot
```

```
## Warning: package 'ggraph' was built under R version 3.5.3
```

```
library(quanteda)
```

```
## Warning: package 'quanteda' was built under R version 3.5.3
```

```
## Package version: 1.5.1
```

```
## Parallel computing: 2 of 4 threads used.
```

```
## See https://quanteda.io for tutorials and examples.
```

```
##
## Attaching package: 'quanteda'
```

```
## The following object is masked from 'package:igraph':
##
##     as.igraph
```

```
## The following objects are masked from 'package:tm':
##
##     as.DocumentTermMatrix, stopwords
```

```
## The following object is masked from 'package:utils':
##
##     View
```

```
library(wordcloud)
```

```
## Warning: package 'wordcloud' was built under R version 3.5.3
```

```
## Loading required package: RColorBrewer
```

```
library(topicmodels)
```

```
## Warning: package 'topicmodels' was built under R version 3.5.3
```

```
library(textdata)
```

```
## Warning: package 'textdata' was built under R version 3.5.3
```

Pre-processing

```
platform <- read.csv("C:/Users/sharo/Box Sync/UChicago Courses/Unsupervised Machine Le
arning/Problem-Set-5-master/Party Platforms Data/platforms.csv", header = TRUE)
```

```
## Warning in read.table(file = file, header = header, sep = sep, quote =
## quote, : incomplete final line found by readTableHeader on 'C:/Users/sharo/
## Box Sync/UChicago Courses/Unsupervised Machine Learning/Problem-Set-5-
## master/Party Platforms Data/platforms.csv'
```

```
txt1 <- file.path("C:", "dem")
dir(txt1)
```

```
## [1] "d16.txt"
```

```
# Create corpus of democratic spee h
dem <- VCorpus(DirSource(txt1))
summary(dem)
```

```
##         Length Class             Mode
## d16.txt 2      PlainTextDocument list
```

```
# Pre-processing

# Start with punctuation
dem <- tm_map(dem, removePunctuation)

# Clean unique characters
for (j in seq(dem)) {
  dem[[j]] <- gsub("/", " ", dem[[j]])
  dem[[j]] <- gsub("â□□", " ", dem[[j]])
  dem[[j]] <- gsub("\\|", " ", dem[[j]])
  dem[[j]] <- gsub("@", " ", dem[[j]])
  dem[[j]] <- gsub("\200", " ", dem[[j]])
}


# Remove numbers
dem <- tm_map(dem, removeNumbers)

# Remove captialization
dem <- tm_map(dem, tolower)
dem <- tm_map(dem, PlainTextDocument)


# Remove superfluous words like articles or words with no substantive value for analys
is
stopwords("english")
```

```
##   [1] "i"         "me"        "my"        "myself"    "we"
##   [6] "our"       "ours"      "ourselves" "you"       "your"
##  [11] "yours"     "yourself"  "yourselves" "he"        "him"
##  [16] "his"       "himself"   "she"       "her"       "hers"
##  [21] "herself"   "it"        "its"       "itself"    "they"
##  [26] "them"      "their"     "theirs"    "themselves" "what"
##  [31] "which"     "who"       "whom"      "this"      "that"
##  [36] "these"     "those"     "am"        "is"        "are"
##  [41] "was"       "were"      "be"        "been"      "being"
##  [46] "have"      "has"       "had"       "having"    "do"
##  [51] "does"      "did"       "doing"     "would"     "should"
##  [56] "could"     "ought"     "i'm"       "you're"    "he's"
##  [61] "she's"     "it's"      "we're"     "they're"   "i've"
##  [66] "you've"    "we've"     "they've"   "i'd"       "you'd"
##  [71] "he'd"      "she'd"     "we'd"      "they'd"    "i'll"
##  [76] "you'll"    "he'll"     "she'll"    "we'll"     "they'll"
##  [81] "isn't"     "aren't"    "wasn't"    "weren't"   "hasn't"
##  [86] "haven't"   "hadn't"    "doesn't"   "don't"     "didn't"
##  [91] "won't"     "wouldn't"  "shan't"    "shouldn't" "can't"
##  [96] "cannot"    "couldn't"  "mustn't"   "let's"     "that's"
## [101] "who's"     "what's"    "here's"    "there's"   "when's"
## [106] "where's"   "why's"     "how's"     "a"         "an"
## [111] "the"       "and"       "but"       "if"        "or"
## [116] "because"   "as"        "until"     "while"     "of"
## [121] "at"        "by"        "for"       "with"      "about"
## [126] "against"   "between"   "into"      "through"   "during"
## [131] "before"    "after"     "above"     "below"     "to"
## [136] "from"      "up"        "down"      "in"        "out"
## [141] "on"        "off"       "over"      "under"     "again"
## [146] "further"   "then"      "once"      "here"      "there"
## [151] "when"      "where"     "why"       "how"       "all"
## [156] "any"       "both"      "each"      "few"       "more"
## [161] "most"      "other"     "some"      "such"      "no"
## [166] "nor"       "not"       "only"      "own"       "same"
## [171] "so"        "than"      "too"       "very"      "will"
```

```
dem <- tm_map(dem,
              removeWords,
              stopwords("english"))
dem <- tm_map(dem, PlainTextDocument) # redefine


# Create stem version of the corpus
dem_st <- tm_map(dem, stemDocument)
dem_st <- tm_map(dem_st, PlainTextDocument)

# Remove white space
dem <- tm_map(dem, stripWhitespace)
dem <- tm_map(dem, PlainTextDocument)

# Create dtm (matrix of term frequencies per document);
# dtm: each document is a row, and each term is a column
dtm1<- DocumentTermMatrix(dem)



# REPEAT THE SAME PROCESS FOR REPUBLICAN

txt2 <- file.path("C:", "rep")
dir(txt2)
```

```
## [1] "r16.txt"
```

```
rep <- VCorpus(DirSource(txt2))
summary(rep)
```

```
##         Length Class             Mode
## r16.txt 2      PlainTextDocument list
```

```
# Pre-processing
rep <- tm_map(rep, removePunctuation)


for (j in seq(rep)) {
  rep[[j]] <- gsub("/", " ", rep[[j]])
  rep[[j]] <- gsub("â□□", " ", rep[[j]])
  rep[[j]] <- gsub("\\|", " ", rep[[j]])
  rep[[j]] <- gsub("@", " ", rep[[j]])
  rep[[j]] <- gsub("\200", " ", rep[[j]])
}


rep <- tm_map(rep, removeNumbers)


rep <- tm_map(rep, tolower)
rep <- tm_map(rep, PlainTextDocument)

rep <- tm_map(rep,
               removeWords,
               stopwords("english"))
rep <- tm_map(rep, PlainTextDocument) # redefine


# Create stem version of corpus and store as new object
rep_st <- tm_map(rep, stemDocument)
rep_st <- tm_map(rep_st, PlainTextDocument)

rep <- tm_map(rep, stripWhitespace)
rep <- tm_map(rep, PlainTextDocument) # final redefine for retaining the lataest prepr
ocessing steps

# Create dtm (matrix of term frequencies per document);
# dtm: each document is a row, and each term is a column
dtm2<- DocumentTermMatrix(rep)
```

Data Visualization

```
## democrats    health   support   believe    people      must
##       207       130       123       117       107        91
```

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

```
## Warning in tm_map.SimpleCorpus(corpus, function(x) tm::removeWords(x,
## tm::stopwords())): transformation drops documents
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : strengthen could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : supporting could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : workforce could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : commission could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : criminal could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : bring could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : unacceptable could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : creation could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : digital could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : establish could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : men could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : regulators could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : wants could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : among could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : gap could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : peoples could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : problem could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : promise could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : sacred could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : supports could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : achieve could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : choice could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : constitution could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : grant could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : learn could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : providers could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : result could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : strongly could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : particularly could not be fit on page. It will
## not be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : bonds could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : crumbling could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : equally could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : harness could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : households could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : punishment could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : reside could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : stopping could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : trillions could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : walls could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : worldclass could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : alongside could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : authorization could not be fit on page. It will
## not be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : boards could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : coalition could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : coast could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : comes could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : creators could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : exclude could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : fleeing could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : forging could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : guantã¡namo could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : hate could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : heartbreaking could not be fit on page. It will
## not be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : laden could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : lawabiding could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : leads could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : nature could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : negotiations could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : parity could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : percentages could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : prevents could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : requiring could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : reunited could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : reviewing could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : scores could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : solution could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : suffer could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : taiwan could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : threaten could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : transparent could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : added could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : addictions could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : adopted could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : asked could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : association could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : boycott could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : bush could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : came could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : clients could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : clock could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : combats could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : concerning could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : connectivity could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : cooperate could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : costofliving could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : dead could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : defenses could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : deployments could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : directs could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : disaster could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : discriminates could not be fit on page. It will
## not be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : dolores could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : drowning could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : eastern could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : elevating could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : embolden could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : familiesâ could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : fellow could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : fertile could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : genocide could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : governmentfunded could not be fit on page. It will
## not be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : growthâ could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : guns could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : humanities could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : importation could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : indiaâ could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : invisible could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : jobcreating could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : judiciaries could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : latent could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : makers could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : mantle could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : mediumsized could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : mixed could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : muslim could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : neutrality could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : perpetrate could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : personal could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : pesticides could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : poisonous could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : precise could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : producers could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : prohibits could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : quarter could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : quota could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : racist could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : reauthorization could not be fit on page. It will
## not be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : replacing could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : resulting could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : shown could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : squeeze could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : started could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : thinking could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : trends could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : tying could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : unintentional could not be fit on page. It will
## not be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : unlawful could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : unparalleled could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : valuing could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : walked could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : warhead could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_dem), min.freq = 80, max.words = 150,
## colors = brewer.pal(8, : wholesalers could not be fit on page. It will not
## be plotted.
```

```
## government    federal       must   american     states    support
##        137        134        126        121        110        100
```

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

```
## Warning in tm_map.SimpleCorpus(corpus, function(x) tm::removeWords(x,
## tm::stopwords())): transformation drops documents
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : personnel could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : representatives could not be fit on page. It will
## not be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : status could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : farmers could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : dollars could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : partnerships could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : workplace could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : strategy could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : contributions could not be fit on page. It will
## not be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : divide could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : duty could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : fighting could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : improving could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : science could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : strengthen could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : certain could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : depend could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : grave could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : likely could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : pipeline could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : sex could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : acting could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : christians could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : directly could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : share could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : warfare could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : afghanistan could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : assisted could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : cornerstone could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : delegated could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : deliberately could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : deployed could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : electric could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : initiative could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : lifting could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : limiting could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : neglected could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : obergefell could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : offense could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : recession could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : simply could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : situation could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : asylum could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : aviation could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : beneficiaries could not be fit on page. It will
## not be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : combatting could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : controlling could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : endorsed could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : fourteenth could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : girls could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : illegality could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : legislate could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : longestablished could not be fit on page. It will
## not be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : offering could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : participants could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : plants could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : poses could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : prohibiting could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : reduces could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : reminded could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : search could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : secured could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : separate could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : soon could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : subsidize could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : symbol could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : ablebodied could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : abusive could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : agrees could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : alongside could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : attempting could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : baltic could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : became could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : budgetbusting could not be fit on page. It will
## not be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : burdened could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : capture could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : defied could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : degrading could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : denounce could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : devastating could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : discover could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : disgrace could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : dominant could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : doors could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : endrun could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : entitlement could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : exclusively could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : fanfare could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : firm could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : flagrantly could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : headway could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : illnamed could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : imagine could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : included could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : influences could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : infringe could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : insulated could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : invitation could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : japan could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : killer could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : labeled could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : landing could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : levying could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : looks could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : morality could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : morass could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : multiplication could not be fit on page. It will
## not be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : multitude could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : nationhood could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : outer could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : overextension could not be fit on page. It will
## not be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : overturn could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : panel could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : participated could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : phase could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : populace could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : probable could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : promised could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : prosecuting could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : quadrupling could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : qualified could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : rarely could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : redrawn could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : reimbursement could not be fit on page. It will
## not be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : revisit could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : sanctuary could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : segment could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : selfesteem could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : shrinking could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : slashed could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : smuggled could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : something could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : southwestern could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : staunch could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : stolen could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : surrender could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : thinks could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : transgression could not be fit on page. It will
## not be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : tyrannical could not be fit on page. It will not
## be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : uncompromised could not be fit on page. It will
## not be plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : uninsured could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : verifiable could not be fit on page. It will not
## be plotted.
```

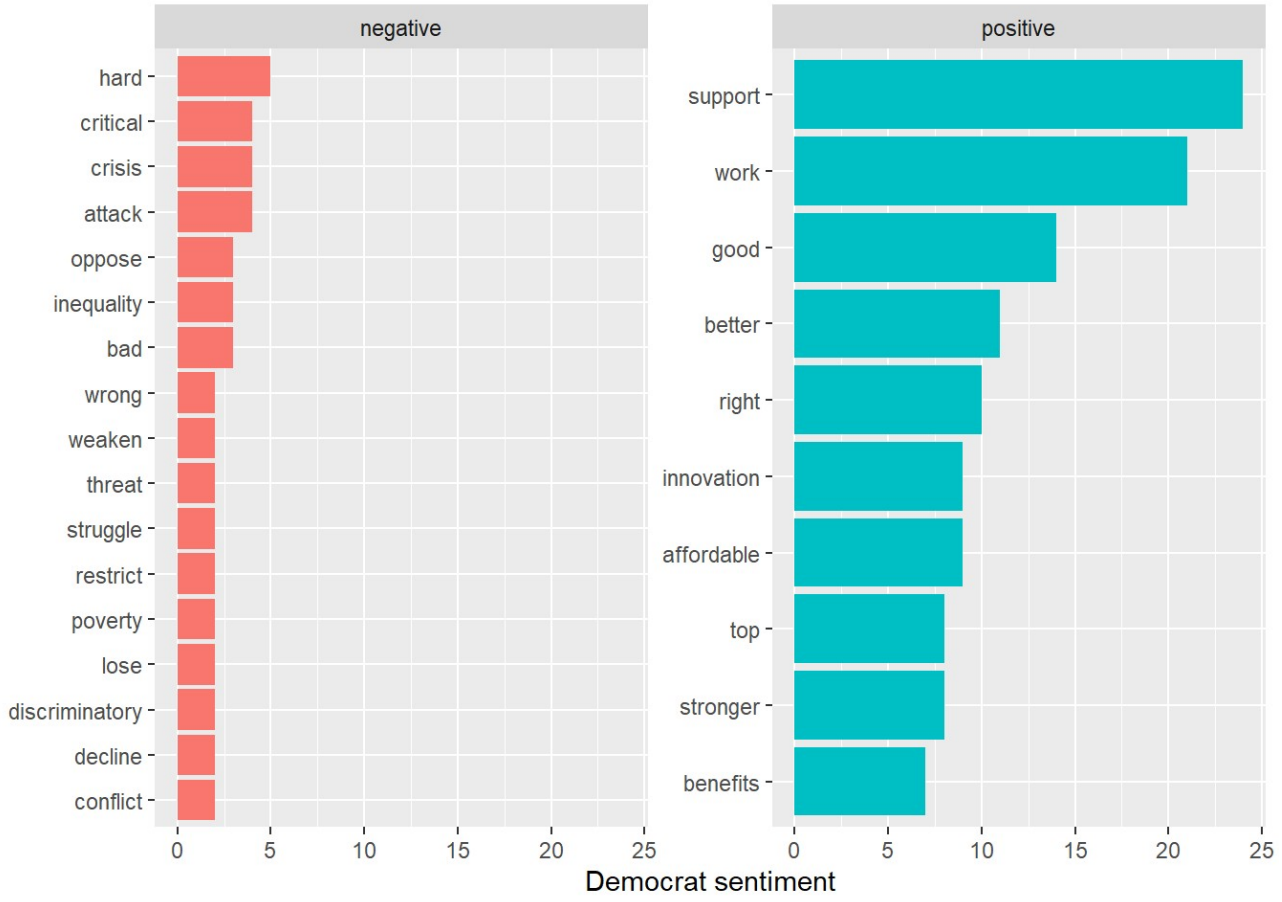
```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : wind could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(names(freq_rep), max.words = 150, min.freq = 80,
## colors = brewer.pal(8, : worked could not be fit on page. It will not be
## plotted.
```

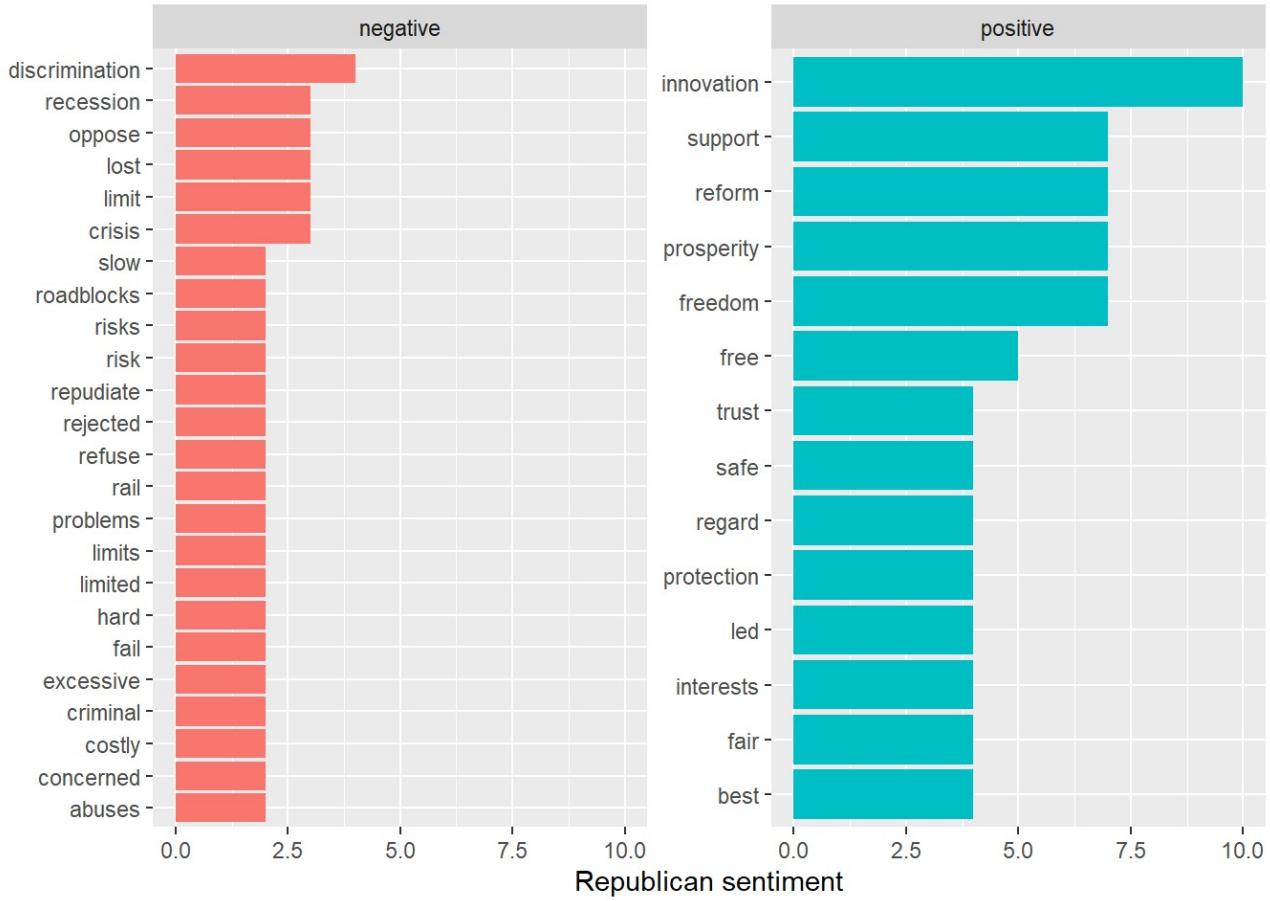
According to the wordcloud, Democrats make the partisanship loud and clear while Republicans don't call out their own party as often in their platform. "American" is emphasized, with high frequency of words like "fight" and "rights", which fit into the blue rhetoric. Interestingly, "health" seems to be a high-priority for democrats given its frequency. On the other hand, republicans focus on "government" and "states", with more assertive language such as "must". Within the republican narrative, high emphasis is put to "security" and "president".

Sentiment Analysis

```
## Joining, by = "word"Selecting by n
```

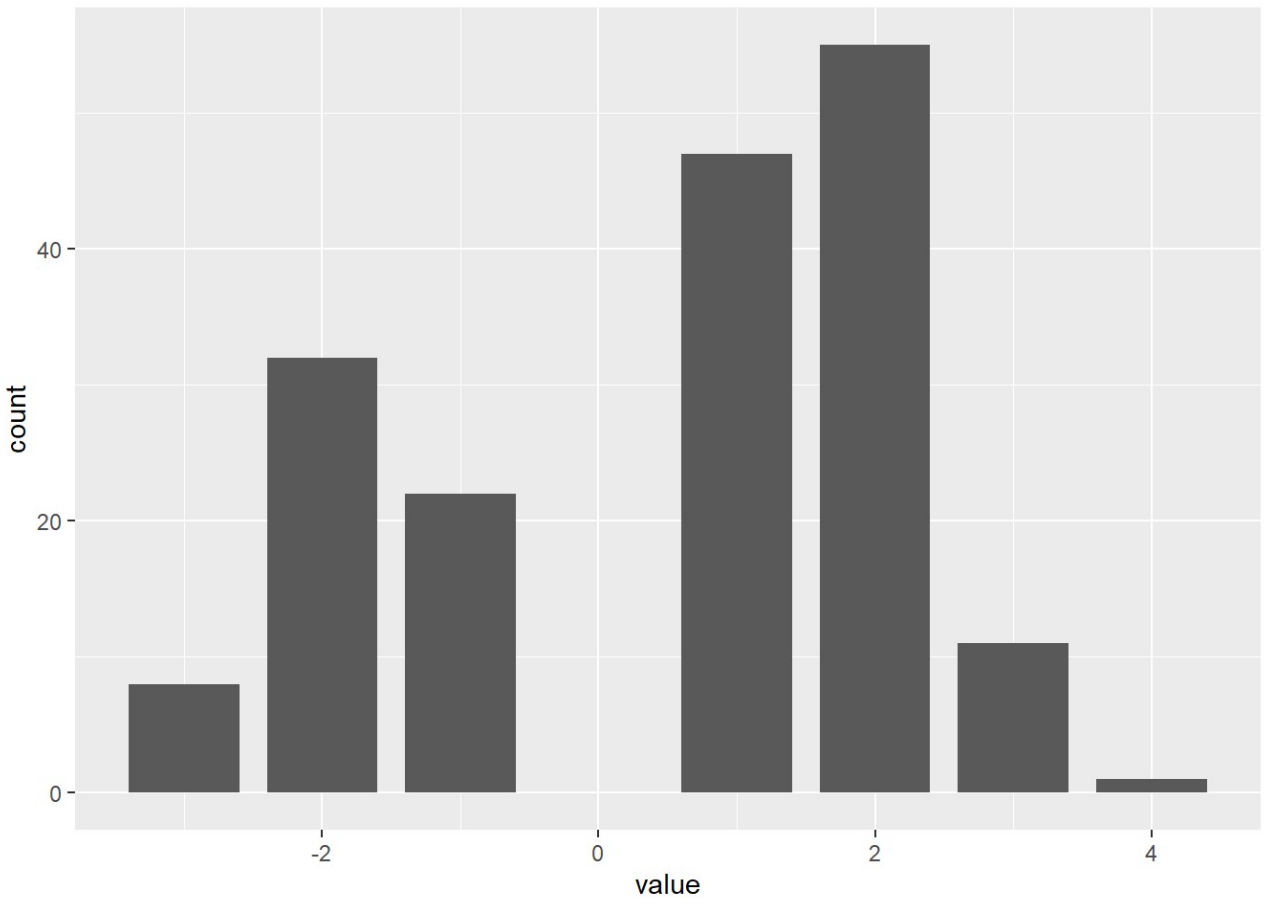



```
## Joining, by = "word"Selecting by n
```

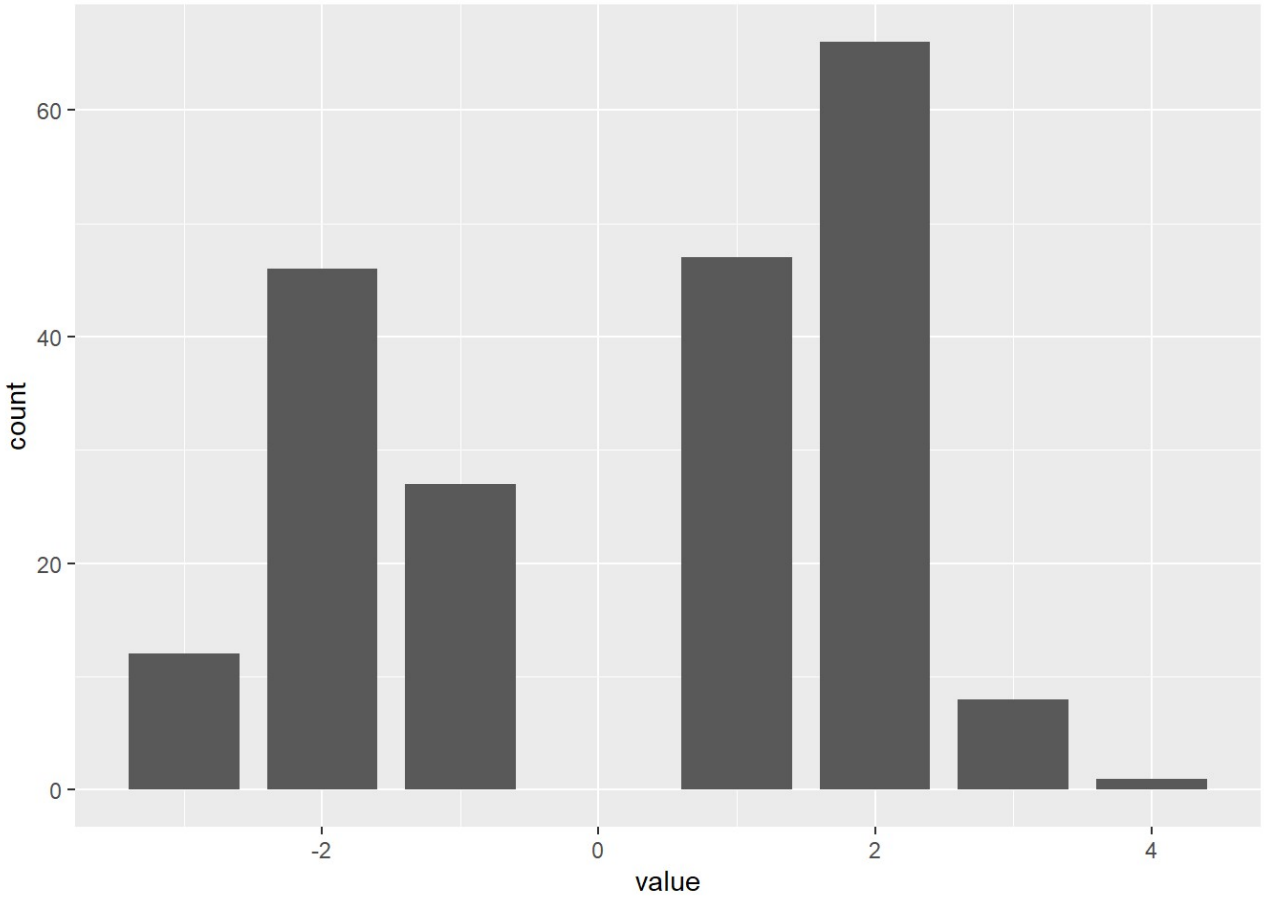


Looking at the top ten words used by Democrat, it seems like “support” contributes the most to the positive sentiment, with general positive wording such as “good” and “right”; whereas for Republican, words used in their platform paint a more concrete picture of their policy effort, with top word “innovation” and strong emphasis of “reform” and “prosperity”. Both parties mention the “crisis” our country is facing, but republican tends to identify more specific issues such as “discrimination” and “recession”. Overall, based on the bing dictionary, it seems Republican displays more optimism towards future, while Democrats is relatively vague.

```
## Joining, by = "word"
```




```
## Joining, by = "word"
```



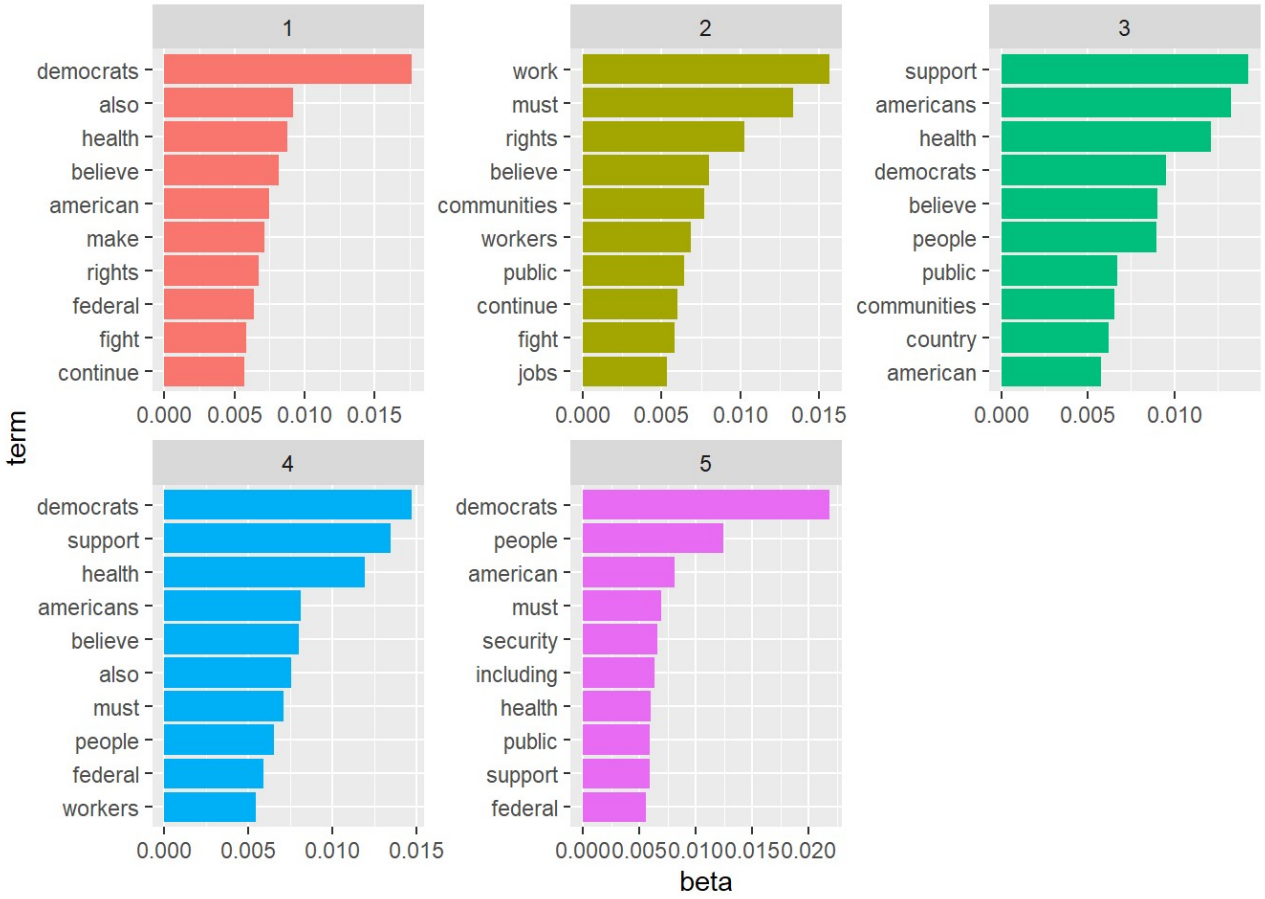
Looking at the distribution of sentiment scores based on AFINN dictionary, it seems like Democrat tend to use more positive words as there are higher counts of sentiment value 1 and 2, whereas republican have more -2 words.

Topic Modelings

```
## <<DocumentTermMatrix (documents: 1, terms: 3868)>>
## Non-/sparse entries: 3868/0
## Sparsity           : 0%
## Maximal term length: 22
## Weighting          : term frequency (tf)
```

```
## A LDA_VEM topic model with 5 topics.
```

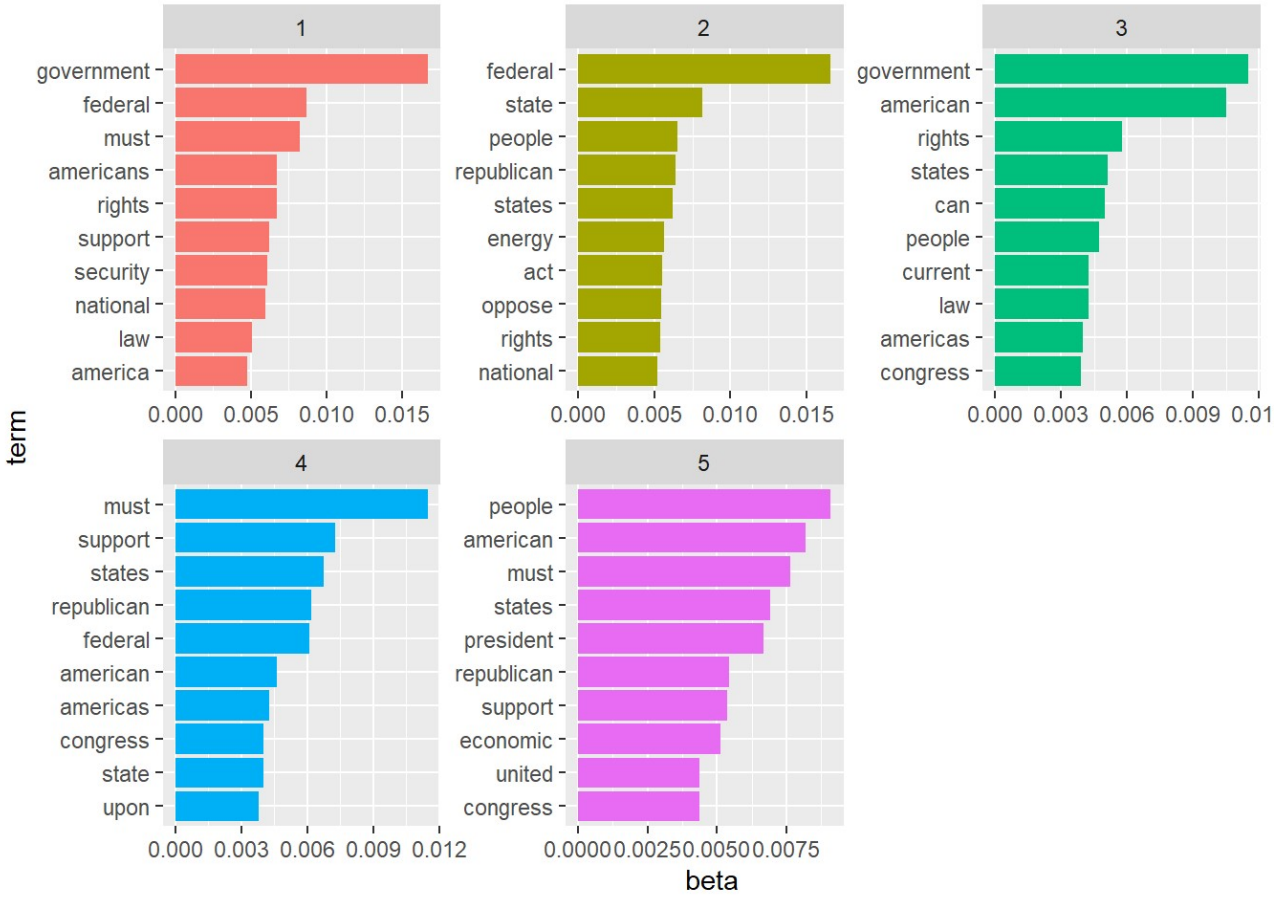
```
## # A tibble: 19,340 x 3
##    topic term             beta
##    <int> <chr>           <dbl>
##  1     1 □blocked   0.0000663
##  2     2 □blocked   0.0000965
##  3     3 □blocked   0.0000828
##  4     4 □blocked   0.00000743
##  5     5 □blocked   0.0000694
##  6     1 □countries 0.00000686
##  7     2 □countries 0.0000382
##  8     3 □countries 0.000170
##  9     4 □countries 0.000112
## 10     5 □countries 0.00000789
## # ... with 19,330 more rows
```




```
## <<DocumentTermMatrix (documents: 1, terms: 5248)>>
## Non-/sparse entries: 5248/0
## Sparsity           : 0%
## Maximal term length: 25
## Weighting          : term frequency (tf)
```

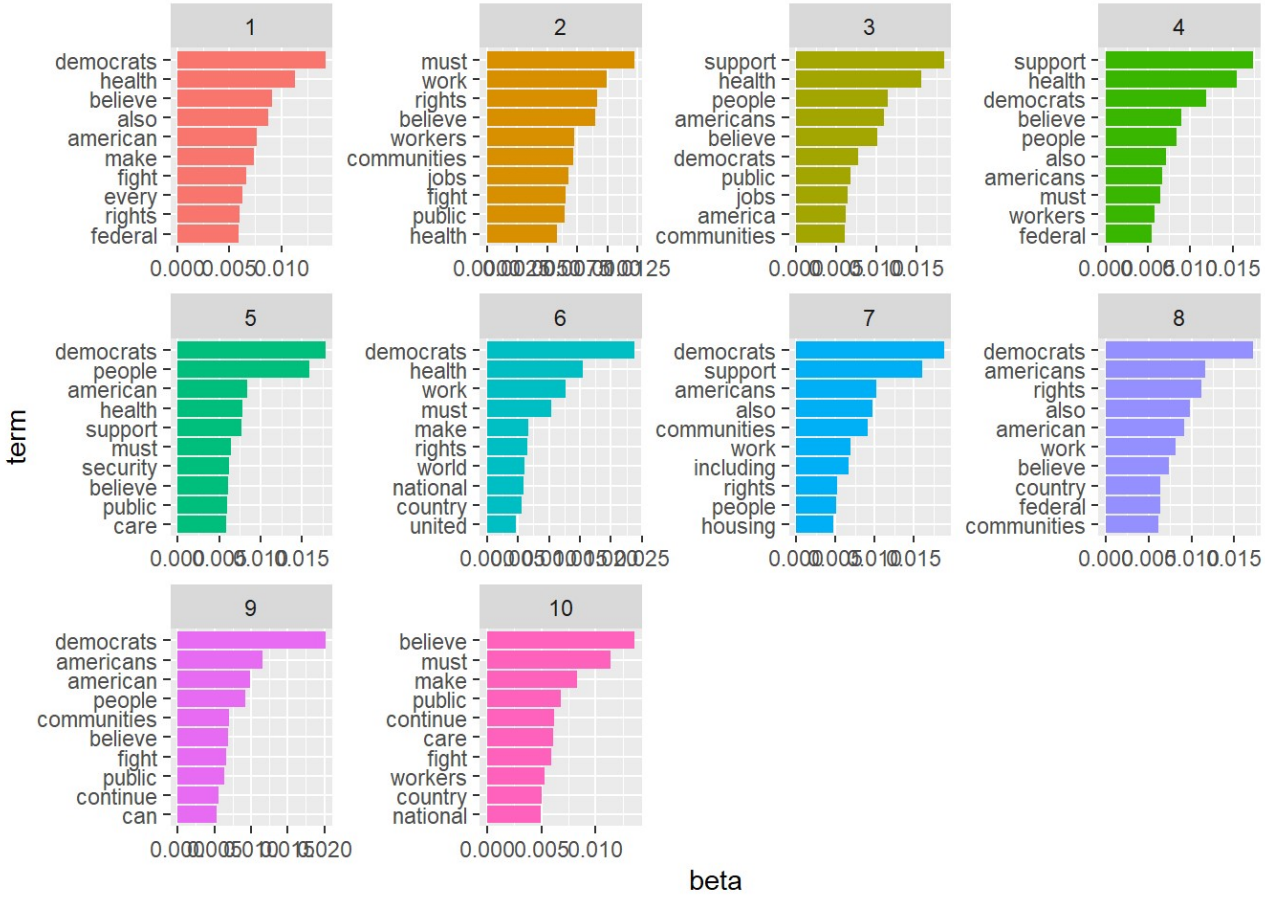
```
## A LDA_VEM topic model with 5 topics.
```

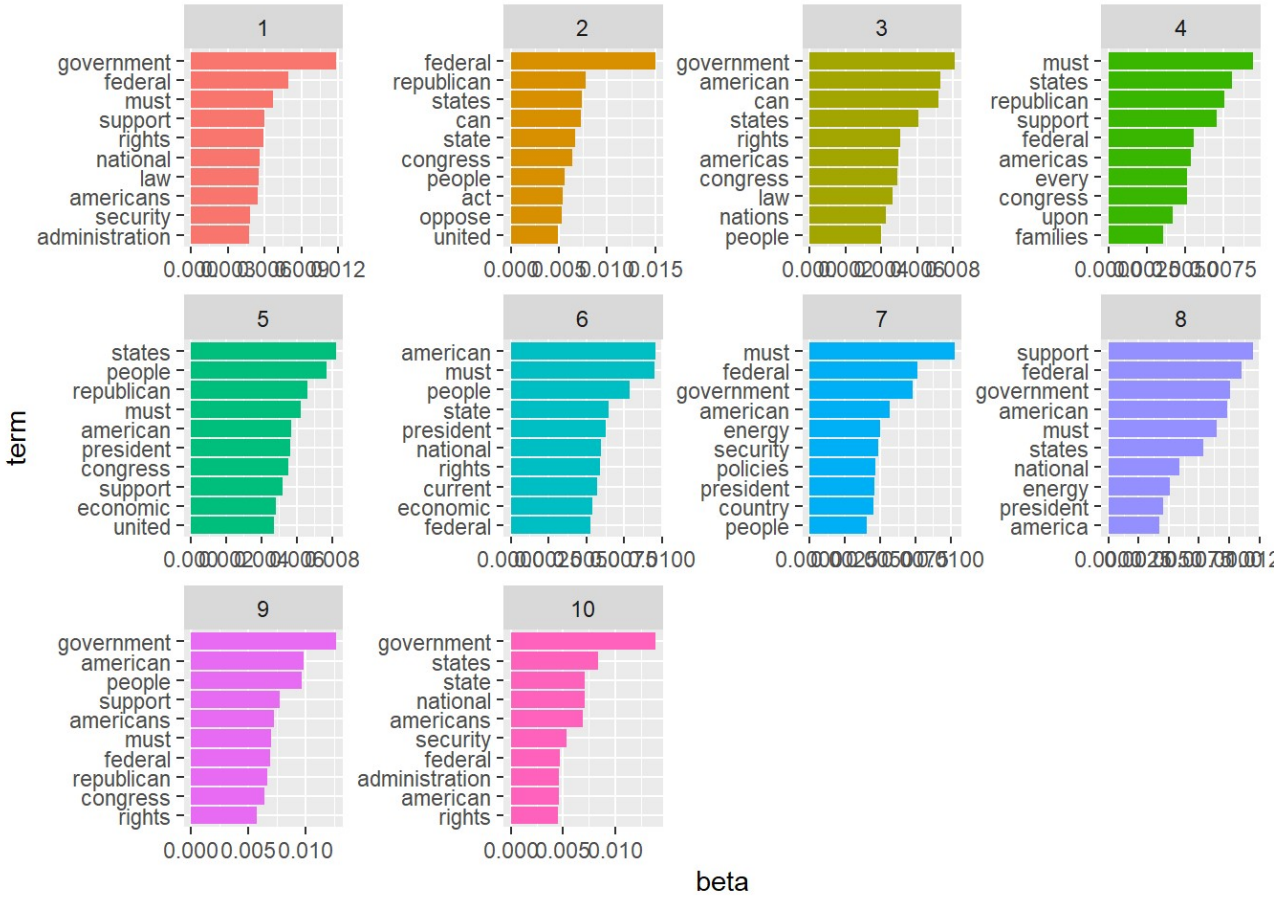
```
## # A tibble: 26,240 x 3
##    topic term            beta
##    <int> <chr>          <dbl>
##  1     1 □active   0.0000555
##  2     2 □active   0.0000222
##  3     3 □active   0.0000709
##  4     4 □active   0.00000259
##  5     5 □active   0.0000830
##  6     1 □billions 0.00000447
##  7     2 □billions 0.0000201
##  8     3 □billions 0.0000159
##  9     4 □billions 0.000115
## 10     5 □billions 0.000114
## # ... with 26,230 more rows
```



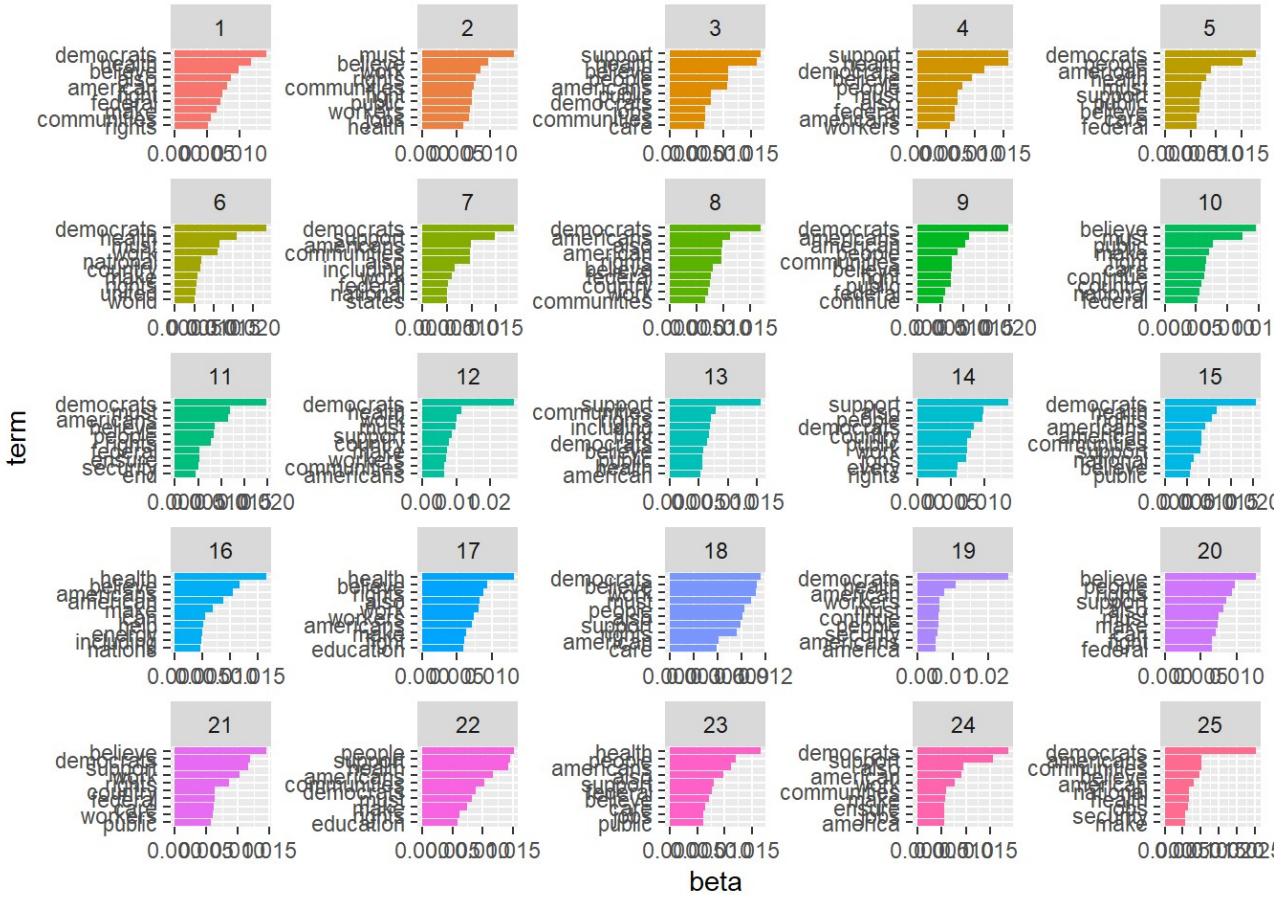
In general, it is hard to grasp different topics that democrat is trying to convey from their platform as there are cross-listing of many common words. Similarly, a lack of distinguishable theme is observed for republican, although one topic is more specific about economic wellbeing and another emphasizes national security matter.

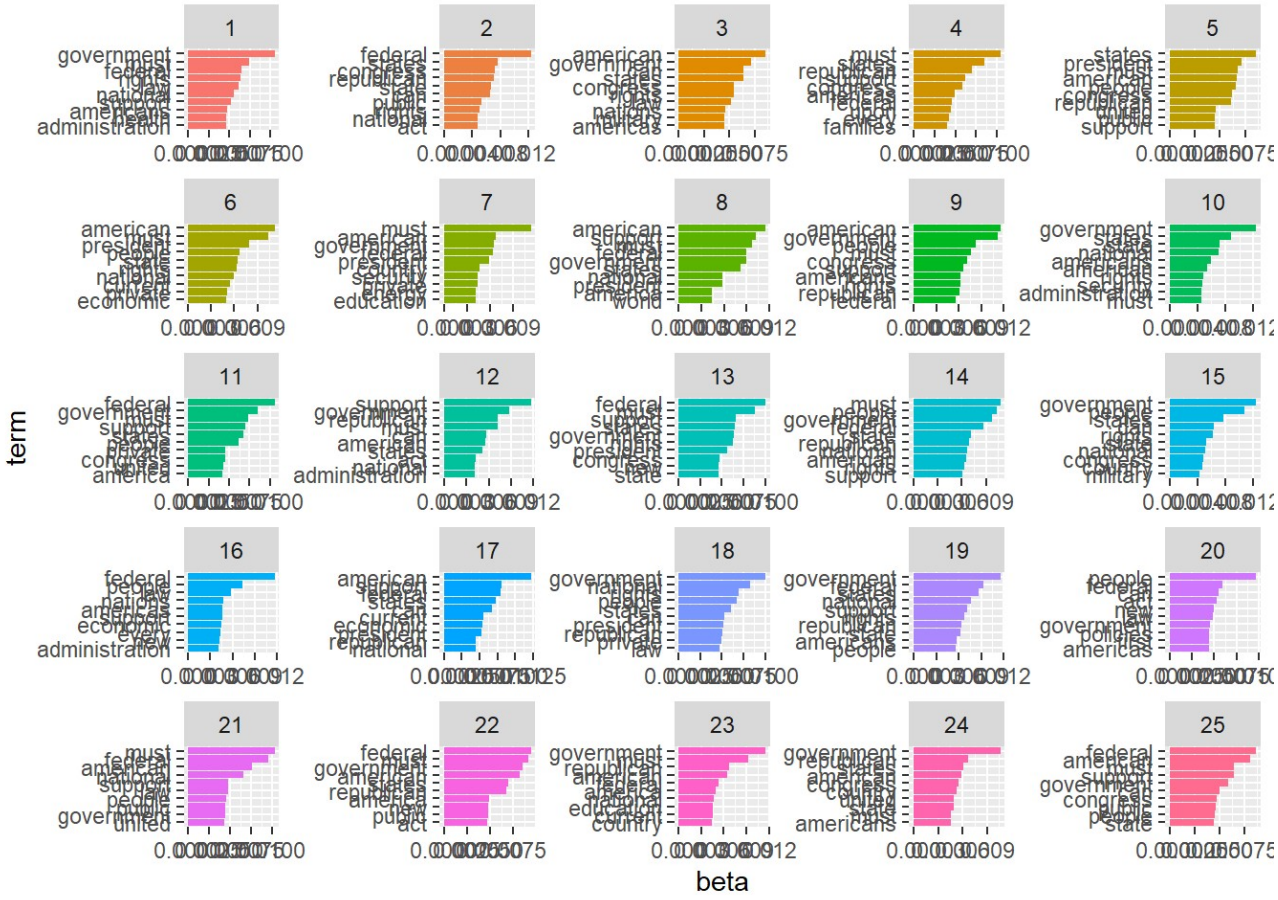
Fit topic models with k=10:





Fit topic models with k=25:


1
democrats
health
make
american
federal
communities
rights
2
must
believe
rights
communities
public
workers
health
3
support
health
people
american
democrats
communities
care
4
support
democrats
health
people
federal
america
workers
5
democrats
americans
people
health
must
support
public
believe
federal
6
democrats
health
must
work
national
country
make
rights
united
world
7
democrats
americans
support
communities
including
federal
national
states
8
democrats
americans
america
american
health
believe
country
communities
9
democrats
americans
america
communities
health
believe
federal
public
continue
10
believe
must
public
make
health
care
country
national
federal
11
democrats
americans
health
believe
people
federal
support
security
end
12
democrats
health
must
support
country
make
communities
workers
americans
13
support
communities
including
democrats
believe
public
health
american
14
support
people
democrats
country
must
work
every
rights
15
democrats
health
americans
america
communities
support
national
believe
public
16
health
believe
america
americans
make
work
energy
including
nations
17
health
believe
rights
also
work
americans
make
must
education
18
democrats
believe
work
must
people
rights
support
america
care
19
democrats
america
american
health
workers
must
country
people
security
america
20
believe
people
must
support
also
rights
make
federal
21
believe
democrats
support
must
work
country
federal
care
workers
public
22
people
support
health
americans
communities
democrats
make
rights
education
23
health
people
america
american
support
federal
believe
care
public
24
democrats
support
american
work
communities
make
ensure
america
25
democrats
americans
communities
believe
america
national
health
rights
security
make
term
beta



Calculate perplexity:

```
## [1] 1646.561
```

```
## [1] 1648.176
```

```
## [1] 1652.722
```

```
## [1] 2329.55
```

```
## [1] 2331.189
```

```
## [1] 2335.484
```

Based on the perplexity score, it seems like topic model with k=5 offers the lowest perplexity, meaning that it's better at predicting a sample text, therefore k=5 fits best among the three models for both parties.

From the k=10 model, it seems like two parties differ in the level of focus, as most topics for republican tend to stress national and state-level affairs, while democrats tend to address the American people. Specifically, for example, democrats has topic that touches on job access, while republican talks about economy in general. Additionally, there is a huge emphasis on health in the democrat platform, which is not seen in republican's agenda. Similarly, both parties have topic that features "support" to their people.

Concluding remarks

Personal biases aside, from a computational perspective, I would support Republican for the 2020 election because they offer a more positive outlook with reflection of current obstacles, in addition to their policy priority on national security and economy.