Text Mining in R

Jarrod Griffin

1/14/2021

Importing Data

Tweets from the CCIDM Twitter page (https://twitter.com/CPP_CCIDM) were downloaded using the snscrape python package. Data was in the 'json' format, so we need to use the 'rjson' package to import it. All hashtags and mentions were removed manually. I will also generate IDs for each tweet.

```
#install.packages("rjson")
#install.packages('tidyverse')
#install.packages('tidytext')
library('rjson')
library('tidyverse')
library('tidytext')

tweets <- fromJSON(file = 'CCIDM_tweets.json') %>%
  as_tibble() %>%           #tidytext package uses tibbles
  cbind(tweet_id = 31:1)    #generate IDs (tweets are in reverse chronological order)

head(tweets)
```

```
##
## 1                 We would like to thank CCIDM alumnus @WilliamAtienza2  for joining Center members
## 2 We would like to thank everyone who participated in our workshops, attended our events, and helped
## 3
## 4                                                                  Our full, six part Virtual R Workshop Se
## 5                                                 Join the CCIDM, AMI, and Insights Association on No
## 6                                                                                  Thank you to tho
##   tweet_id
## 1       31
## 2       30
## 3       29
## 4       28
## 5       27
## 6       26
```

Tidy Text Format and Tokenization

The tidy text format takes after Hadley Wickham's definition of tidy data, which is that:

- Each variable is a column
- Each observation is a row

- Each type of observational unit is a table

Tidy text is defined as a **table with one token per row**.

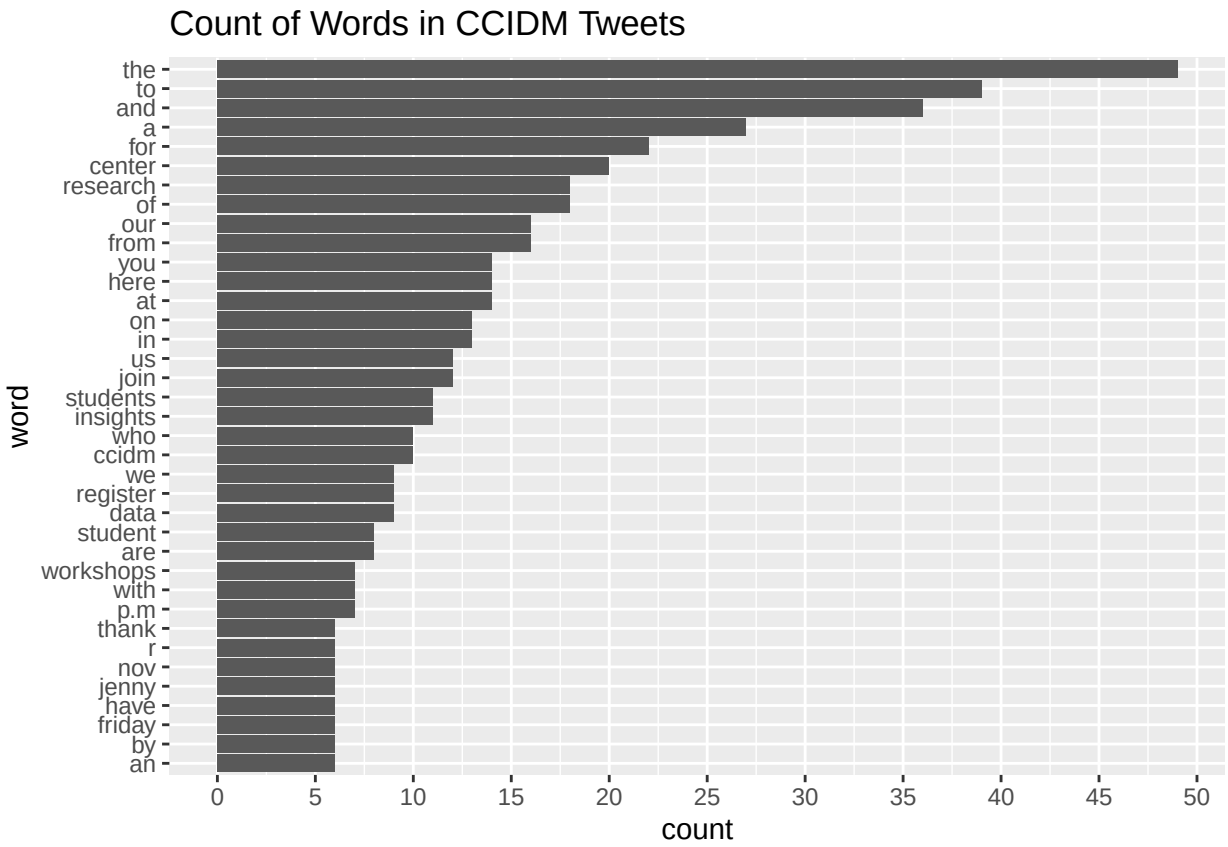
A token is defined as a **meaningful unit of text such as a word, sentence, paragraph or n-gram**.

The process of splitting the text up into tokens is called **tokenization**, and can be done by using the *unnest_tokens()* function.

```
tokenized_tweets <- unnest_tokens(tweets, input = 'tweet', output = 'word')
head(tokenized_tweets)
```

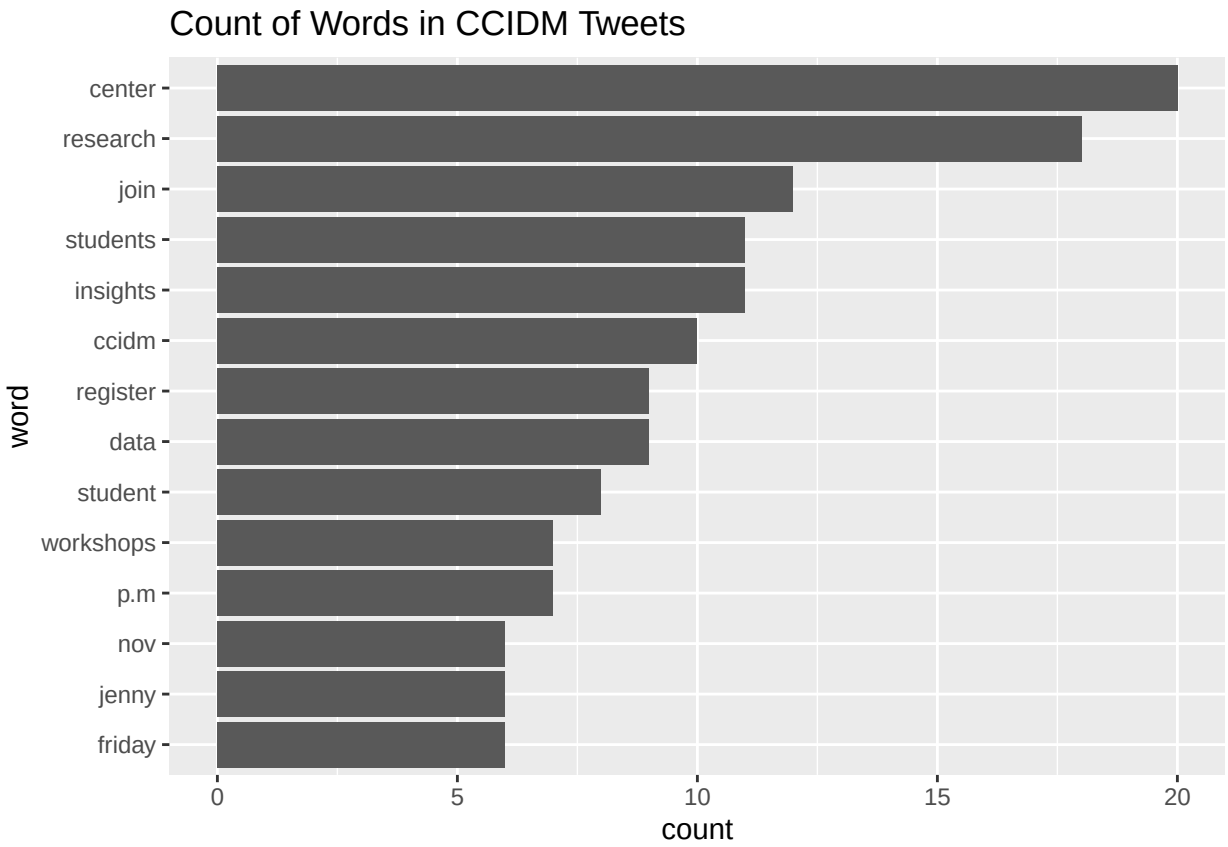
```
##     tweet_id  word
## 1         31    we
## 1.1       31 would
## 1.2       31  like
## 1.3       31    to
## 1.4       31 thank
## 1.5       31 ccidm
```

```
tokenized_tweets %>%
  count(word, sort = TRUE) %>%
  rename(count = n) %>%
  filter(count > 5) %>%
  mutate(word = reorder(word, count)) %>%
  ggplot(aes(x = count, y = word)) +
    geom_col()  +
    labs(title = "Count of Words in CCIDM Tweets") +
    scale_x_continuous(breaks = seq(0, 50, 5))
```



As you can see from the graph above, many of the words do not add value to our analysis. Words like "the", "and", or "to" are known as **stop words**. We will remove these stop words by calling the *anti_join(stop_words)* line of code. As you can see from the graph below, we have less words, but the words are much more interesting.

```
tokenized_tweets %>%
  anti_join(stop_words) %>% #finds where tweet words overlap with predefined stop words, and removes th
  count(word, sort = TRUE) %>%
  rename(count = n) %>%
  filter(count > 5) %>%
  mutate(word = reorder(word, count)) %>%
  ggplot(aes(x = count, y = word)) +
    geom_col() +
    labs(title = "Count of Words in CCIDM Tweets") +
    scale_x_continuous(breaks = seq(0, 50, 5))
```



There are many ways to visualize word counts, including word clouds as seen below.

```
#install.packages('ggwordcloud')
library('ggwordcloud')

tokenized_tweets %>%
  anti_join(stop_words) %>%
  count(word, sort = TRUE) %>%
  filter(n > 4) %>%
  ggplot(aes(label = word, size = n, color = n)) +
    geom_text_wordcloud() +
    scale_size_area(max_size = 15)
```


successful
seminar
workshops
student
workshop
director
insights
join
data
industry
students
center
ccidm
team
register
research
series
friday
yeon
jenny
p.m
nov
faculty
jarrod
marketing