Milestone Porject - Coursera

Sora

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This report is a milestone report for the Coursera course, which aims to build a model for natural language process.

There are three parts in this report. The first part is to have a general idea about the data we are about to process. This includes knowing the storage requirement of loading data, and getting to know what the data looks like, etc. The second part is to clean the data. Becuse corpus contains numbers, capitals, punctuations, whitespace, we will try to eliminate those, create a clean data set. The third part starts to get into the data, calculating the work frequencies to help the prediction in the upcoming procedures.

Note: the fist element in list is en_US.blog,txt, the 2nd is en_US.news.txt, the 3rd element is en_US.twitter.txt

Part 1: First Glance at Data

Following is the file size. (Originally I was using lapply to do this, but for some unknown reason R markdown did not accpet lapply function)

```
library(R.utils)
library(gdata)
#for blog txt
humanReadable(file.size(a[1]),standard = "SI", unit = "MB")
```

```
## [1] "210.2 MB"
```

```
#for news txt
humanReadable(file.size(a[2]),standard = "SI", unit = "MB")
```

```
## [1] "205.8 MB"
```

```
#for twitter txt
humanReadable(file.size(a[3]),standard = "SI", unit = "MB")
```

```
## [1] "167.1 MB"
```

Next, we count the lines of each file.

```
countLines("en_US.twitter.txt") #2360148
```

```
## [1] 2360148
## attr(,"lastLineHasNewline")
## [1] TRUE
```

```
countLines("en_US.news.txt")  #1010242
```

```
## [1] 1010242
## attr(,"lastLineHasNewline")
## [1] TRUE
```

```
countLines("en_US.blogs.txt") #899288
```

```
## [1] 899288
## attr(,"lastLineHasNewline")
## [1] TRUE
```

Part 2: Clean Data

There are two steps in part. First, base on the total number of lines in each text file, we will randomly select some lines and read them, this is our training set.

Second, we will clean the training set.

```
# do result=line(file) to randonly select the readling lines in three files
line=function(x)
{
  a=c(2360148,1010242,899288)
  select=list()

  for(i in 1:length(a))
  {
    choice=rbinom(a[i],1,0.02)
  num=c(1:a[i])
  cho=choice*num
  cho=cho[cho!=0]
  select[[i]]=cho
  }
  return (select)  #the output is the index oflines to be read in each file
}
file=c("en_US.blogs.txt","en_US.news.txt","en_US.twitter.txt")
result=line(file)
#result[[1]] = blog; result[[2]]=news; result[[3]]=twitter

#now, read the lines according to index
one=result[[1]]
two=result[[2]]
three=result[[3]]
read=list()
READING = list()
for(i in 1:(length(one) - 1)) {
  READING[[i]] = scan(file[1], skip = diff(one)[i] - 1, nmax = 1, sep = "\n", what = "raw")
}
read[[1]] = do.call(rbind, READING)

for(i in 1:(length(two) - 1)) {
  READING[[i]] = scan(file[1], skip = diff(two)[i] - 1, nmax = 1, sep = "\n", what = "raw")
```

```
}
read[[2]] = do.call(rbind, READING)

for(i in 1:(length(three) - 1)) {
  READING[[i]] = scan(file[1], skip = diff(three)[i] - 1, nmax = 1, sep = "\n", what = "raw")
}
read[[3]] = do.call(rbind, READING)
```

Now we have randomly selected text lines and loaded them. Next, we will clean the training set.

```
#removePunctuation
library(tm)
for(i in 1:length(read))
{
  read[[i]]=removePunctuation(read[[i]])
  read[[i]]=tolower(read[[i]])
  read[[i]]=removeNumbers(read[[i]])
  #read[[i]]=removeWords(read[[i]])
  #after those removing, will create blank space at the removal place
#collapse extra white space into single blank. this shld be the last step
  read[[i]]=stripWhitespace(read[[i]])
}

#transform to matrix
space=matrix(unlist(read),ncol=1,byrow=TRUE)
```

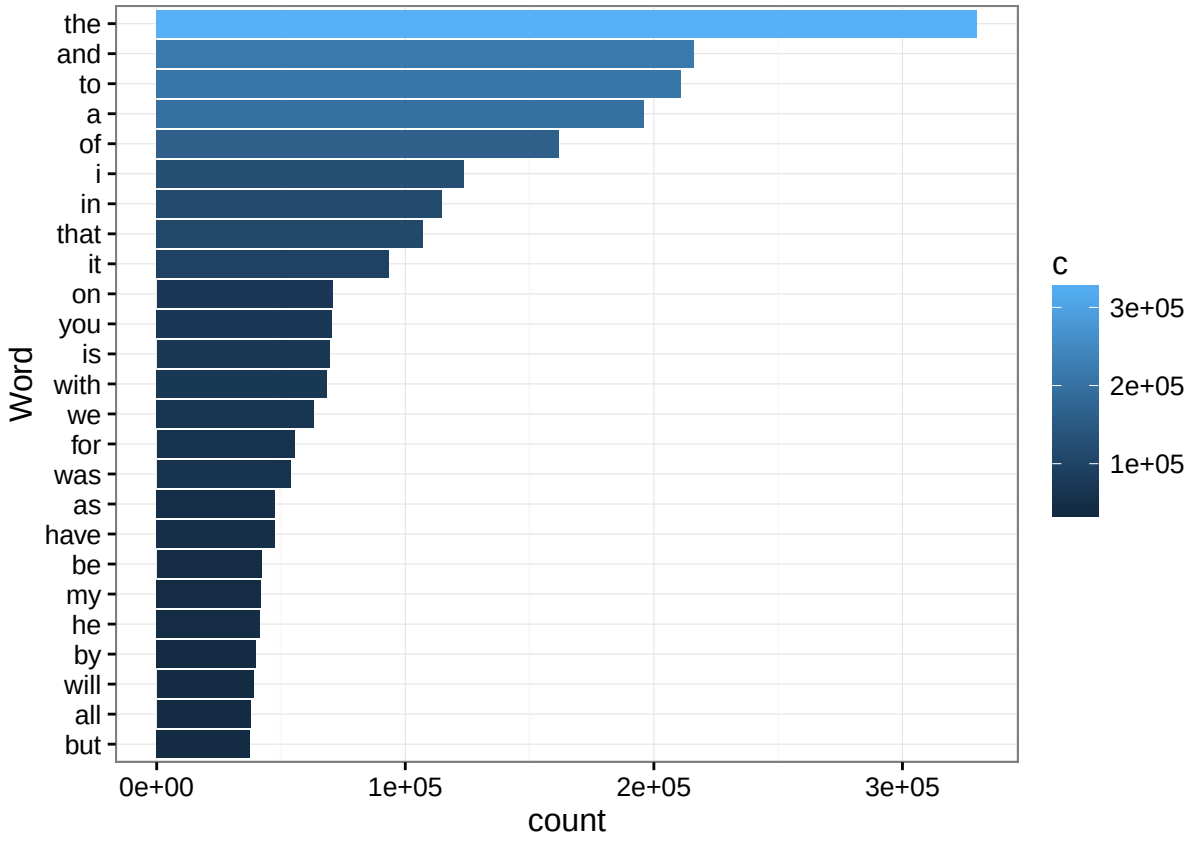
Part 3: Word Frequencies

In this part, we will see which unigram/bigram/trigram words are the most used.

Note: the code for graphing is referenced from http://rstudio-pubs-static.s3.amazonaws.com/41643_9dcfa51dda1d4c9cbe87ca8ed1d3b0a7.html

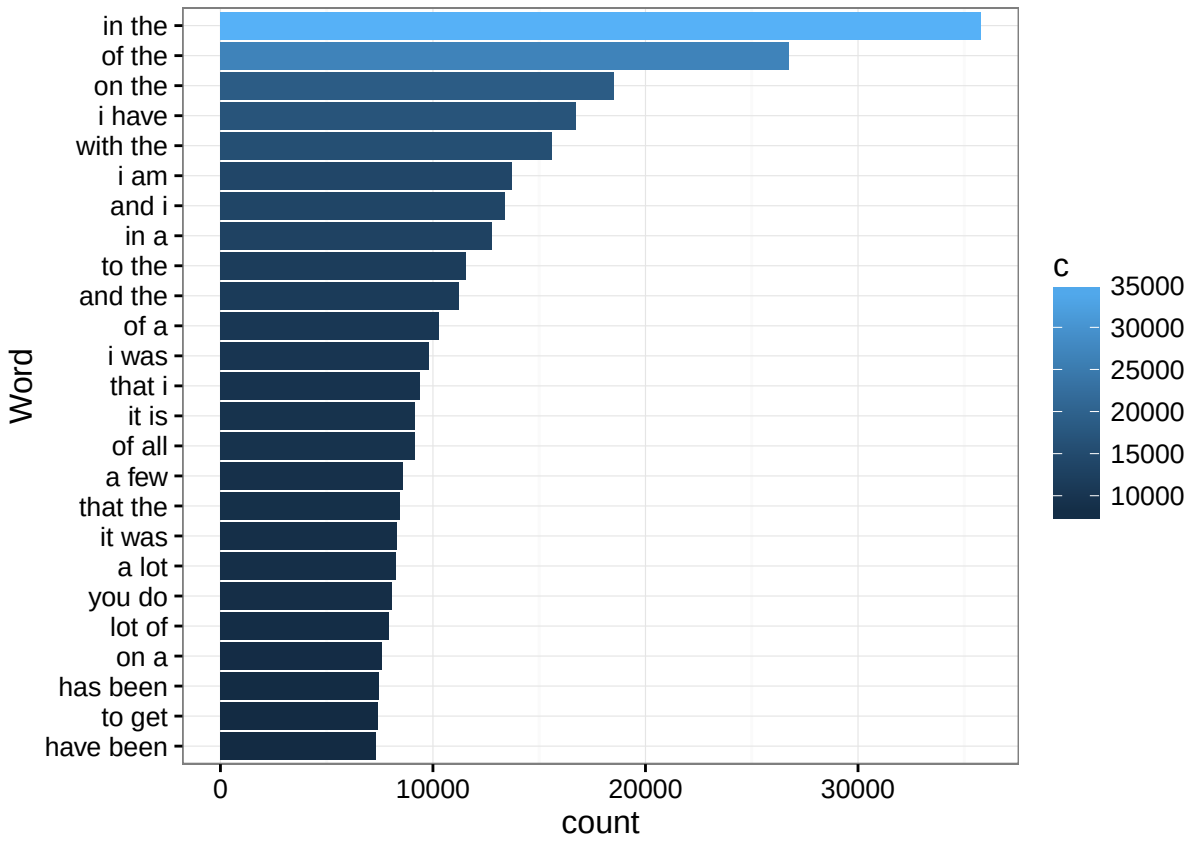
```
#count the frequency of unigram
library(stats)
b=unlist(strsplit(space, " "))
c=as.data.frame(sort(table(b),decreasing = T))
c$name=row.names(c)
c=c[1:25,]
colnames(c)=c("c","name")
#plot the top 25 frequent unigram words
#use geom_bar instead of geom_historgram.
#geom_histogram is for continuous data (it will do binning) and geom_bar is for discrete data.

#create a function so I don't need to plot 3 times. make sure the col names are c("c","name")
library(ggplot2)
plotgraph=function(x)
  {ggplot(data = x, aes(x = reorder(name, c), y = c)) +
  geom_bar(aes(fill = c), stat = "identity") +
  coord_flip() +
  labs(x = "Word",y="count") +
  theme_bw()
}
```

```
plotgraph(c)
```



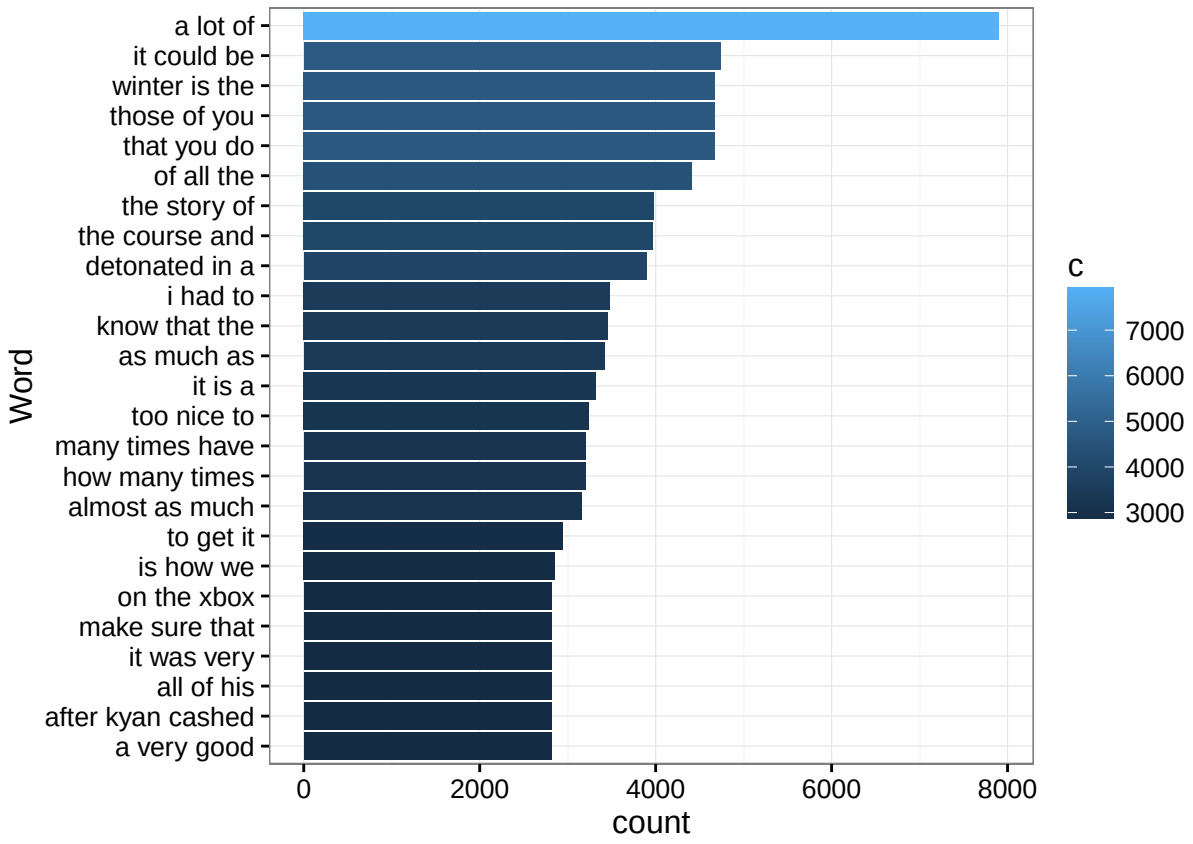
Next, the bigram word frequency.

```
#bigram
#transform data from data frame to textdocument "corpus"
bigram=vapply(ngrams(b,2L),paste,"",collapse = " ")
bigram=as.data.frame(sort(table(bigram),decreasing=T))
bigram$name=row.names(bigram)
row.names(bigram)=c(1:nrow(bigram))
colnames(bigram)=c("c","name")
top25=bigram[1:25,]
plotgraph(top25)
```



Last, the trigram word frequency.

```
#trigram
trigram=vapply(ngrams(b,3L),paste,"",collapse = " ")
trigram=as.data.frame(sort(table(trigram),decreasing=T))
trigram$name=row.names(trigram)
row.names(trigram)=c(1:nrow(trigram))
colnames(trigram)=c("c","name")
top25=trigram[1:25,]
plotgraph(top25)
```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