Project4

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```r
library(tm)
library(knitr)
library(plyr)
library(wordcloud)
library(tidyverse)
library(tm)
library(magrittr)
library(data.table)
library(e1071)
library(caret)
library(randomForest)
```

```r
ham="~/Shariq School/SPS/Data 607/SpamHam/easy_ham"
count_ham=length(list.files(path = ham))
ham_list=list.files(ham)
count_ham
```

```
## [1] 2550
```

```r
spam= "~/Shariq School/SPS/Data 607/SpamHam/spam_2"
count_spam=length(list.files(path = spam))
spam_list=list.files(spam)
count_spam
```

```
## [1] 1397
```

```r
spam_list=list.files(spam)
ham_text = NA
for(i in 1:length(ham_list))
{
  path=paste0(ham, "/", ham_list[1])
  text =readLines(path)
  list= list(paste(text, collapse="\n"))
  ham_text = c(ham_text,list)

}

spam_text = NA
for(i in 1:length(spam_list))
{
  path=paste0(spam, "/", spam_list[1])
  text =readLines(path)
  list= list(paste(text, collapse="\n"))
  spam_text = c(spam_text,list)
}
```

```
email_body <- function(ham_text){
  message = str_split(ham_text,"\n\n") %>% unlist()
  body = paste(message[2:length(message)], collapse=' ' )
  return(body)
}

ham_text <- email_body(ham_text)
```

general filtering opts:

```
# Building a new corpus
ham_corpus =VCorpus(VectorSource(unlist(lapply(ham_text, as.character))))
ham_terms_matrix = TermDocumentMatrix(ham_corpus,control= list(removePunctuation=TRUE, removeNumbers=TRU
ham_corpus = tm_map(ham_corpus, removeNumbers)
ham_corpus = tm_map(ham_corpus, removeWords, stopwords())
ham_corpus = tm_map(ham_corpus, removePunctuation)
ham_corpus = tm_map(ham_corpus, stemDocument)
ham_corpus = tm_map(ham_corpus, stripWhitespace)
ham_terms_matrix = TermDocumentMatrix(ham_corpus)

spam_corpus= VCorpus(VectorSource(spam_text))
spam_terms_matrix= TermDocumentMatrix(spam_corpus,control=list(removePunctuation=TRUE, removeNumbers=TRU
spam_corpus = tm_map(spam_corpus, removeNumbers)
spam_corpus = tm_map(spam_corpus, removeWords, stopwords())
spam_corpus = tm_map(spam_corpus, removePunctuation)
spam_corpus = tm_map(spam_corpus, stemDocument)
spam_corpus = tm_map(spam_corpus, stripWhitespace)
spam_terms_matrix = TermDocumentMatrix(spam_corpus)
```

```
#ham_df =as.data.frame(unlist(ham_text),stringsAsFactors = FALSE)
#ham_df$type = "ham"
#colnames(ham_df) = c("text","Classification")
#ham_df


#spam_df =as.data.frame(unlist(spam_text),stringsAsFactors = FALSE)
#spam_df$type = "spam"
#colnames(spam_df) = c("text","Classification")
#spam_df
```

```
spam_df = as.data.frame(as.table(spam_terms_matrix))
spam_df$spam_ham = "SPAM"
colnames(spam_df) = c('TERM', 'SPAM_DOCS', 'SPAM_FREQ', 'TYPE_SPAM')
spam_df = subset(spam_df, select = -c(2) )
```

```r
spam_df$SPAM_FREQ[is.na(spam_df$SPAM_FREQ)] = '0'
spam_df = ddply(spam_df, .(TERM, TYPE_SPAM), summarize, SPAM_FREQ = sum(as.numeric(SPAM_FREQ)))
head(spam_df, n = 20)
```

```
##                TERM TYPE_SPAM SPAM_FREQ
## 1             above      SPAM      1397
## 2            accept      SPAM      1397
## 3               add      SPAM      1397
## 4          addrarpa      SPAM      2794
## 5           address      SPAM     11176
## 6         addressbr      SPAM      2794
## 7             again      SPAM      1397
## 8              also      SPAM      1397
## 9           america      SPAM      1397
## 10       americanbr      SPAM      1397
## 11  americanexpress      SPAM      1397
## 12              and      SPAM      5588
## 13              ani      SPAM      1397
## 14           answer      SPAM      2794
## 15           appear      SPAM      4191
## 16              are      SPAM      1397
## 17             asbr      SPAM      1397
## 18              ask      SPAM      1397
## 19           author      SPAM      1397
## 20            avail      SPAM      1397
```

```r
ham_df = as.data.frame(as.table(ham_terms_matrix))
ham_df$spam_ham = "HAM"
colnames(ham_df) = c('TERM', 'HAM_DOCS', 'HAM_FREQ', 'TYPE_HAM')
ham_df = subset(ham_df, select = -c(2) )
ham_df$HAM_FREQ[is.na(ham_df$HAM_FREQ)] = '0'
ham_df = ddply(ham_df, .(TERM, TYPE_HAM), summarize, HAM_FREQ = sum(as.numeric(HAM_FREQ)))
head(ham_df, n = 20)
```

```
##                       TERM TYPE_HAM HAM_FREQ
## 1                      abl      HAM     2550
## 2                   actual      HAM     2550
## 3                      ago      HAM     2550
## 4                      and      HAM     2550
## 5                      aug      HAM    33150
## 6                     bulk      HAM     2550
## 7                      cfd      HAM     2550
## 8           charsetusascii      HAM     2550
## 9                    chris      HAM     5100
## 10                    code      HAM     2550
## 11                    come      HAM     5100
## 12                 command      HAM     7650
## 13                  compil      HAM     2550
## 14              contenttyp      HAM     2550
## 15                   creat      HAM     2550
## 16                     cvs      HAM     2550
## 17  cwgdatedfaddeepeddycom      HAM     5100
## 18                   date      HAM     5100
## 19                    day      HAM     2550
## 20                  debug      HAM     2550
```

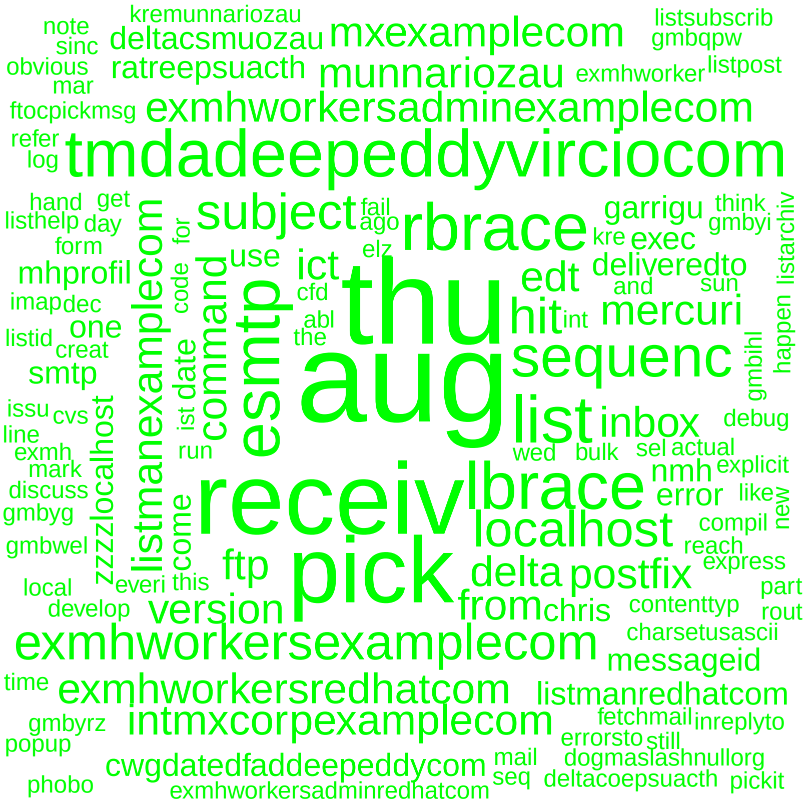
```
# Bind the data frames
spam_ham_df = merge(x = ham_df, y = spam_df, by="TERM", all = TRUE)
nrow(spam_ham_df)
```

```
## [1] 416
```

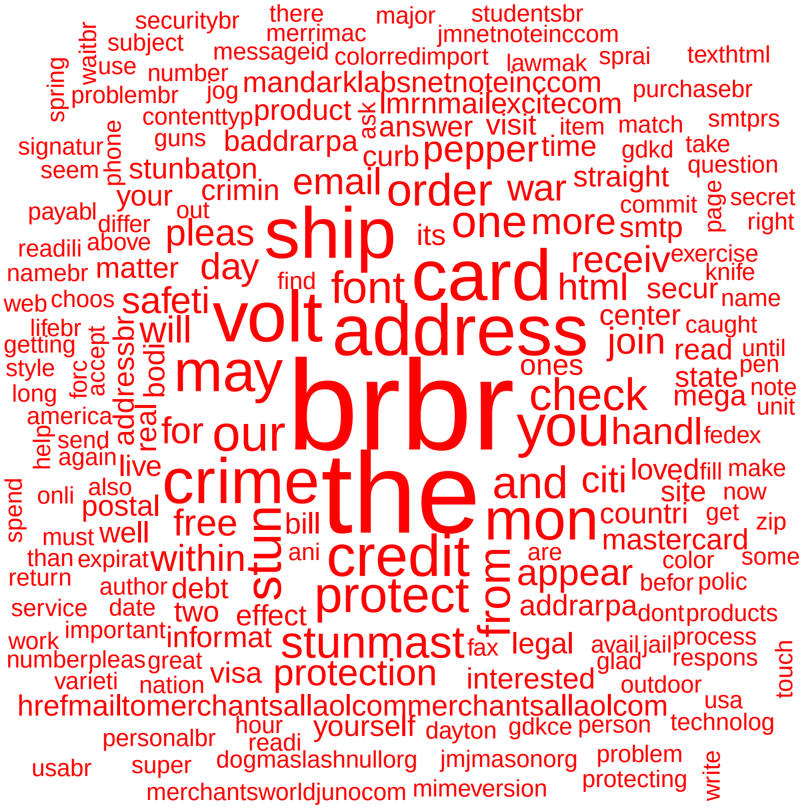
```
spam_ham_df<- spam_ham_df[sample(nrow(spam_ham_df)),]
head(spam_ham_df, n=20)
```

```
##                                               TERM TYPE_HAM HAM_FREQ TYPE_SPAM
## 44                                         explicit      HAM     2550      <NA>
## 277                               lmrnmailexcitecom     <NA>       NA      SPAM
## 245                                            gdkd     <NA>       NA      SPAM
## 132                                      returnpath      HAM     2550      SPAM
## 198                                            bodi     <NA>       NA      SPAM
## 168                                   zzzzlocalhost      HAM     5100      <NA>
## 91                                            local      HAM     2550      <NA>
## 387                                           until     <NA>       NA      SPAM
## 96                                    maillocalhost      HAM     2550      <NA>
## 265                                            jail     <NA>       NA      SPAM
## 104                                       messageid      HAM     5100      SPAM
## 394                                         varieti     <NA>       NA      SPAM
## 65  httpslistmanexamplecommailmanlistinfoexmhwork      HAM     5100      <NA>
## 97                      mailtoexmhworkersexamplecom      HAM     2550      <NA>
## 408                                           worth     <NA>       NA      SPAM
## 176                                           again     <NA>       NA      SPAM
## 296                                            more     <NA>       NA      SPAM
## 72                                              int      HAM     2550      <NA>
## 410                                        xkeyword     <NA>       NA      SPAM
## 19                                              day      HAM     2550      SPAM
##     SPAM_FREQ
## 44         NA
## 277      2794
## 245      1397
## 132      1397
## 198      2794
## 168        NA
## 91         NA
## 387      1397
## 96         NA
## 265      1397
## 104      1397
## 394      1397
## 65         NA
## 97         NA
## 408      1397
## 176      1397
## 296      4191
## 72         NA
## 410      1397
## 19       4191
```

```
wordcloud(ham_corpus, max.words = 200, random.order = FALSE, colors=c('green'))
```



```
wordcloud(spam_corpus, max.words = 200, random.order = FALSE, colors=c('red'))
```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mandarklabsnetnoteinccom
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