Lab Report 3

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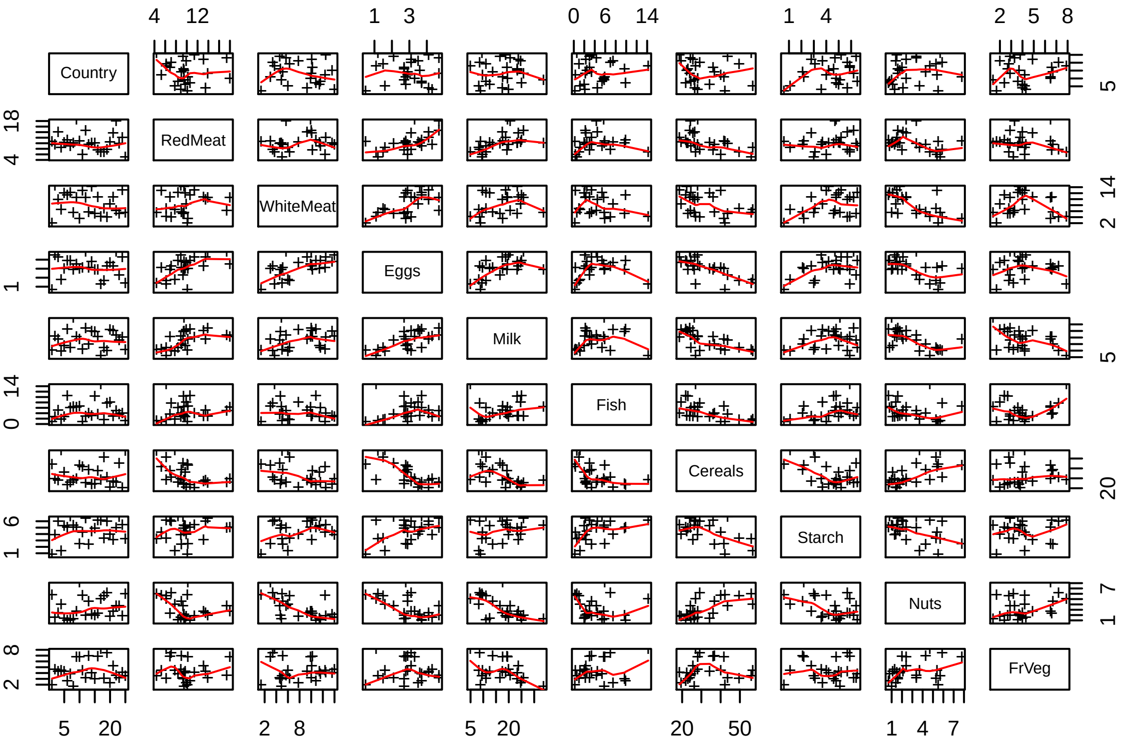
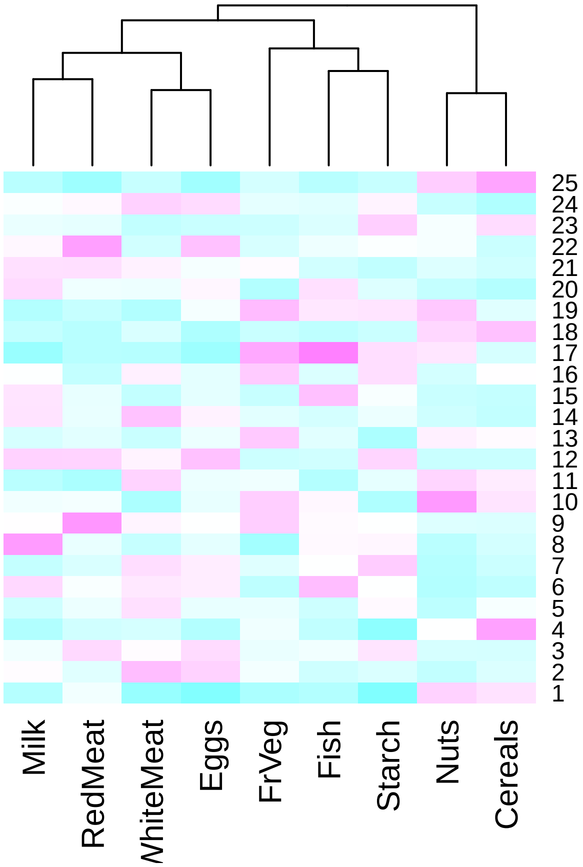
2016 M09 27

Let us plot the scatterplots of pairs of variables in the data file `protein.txt`.



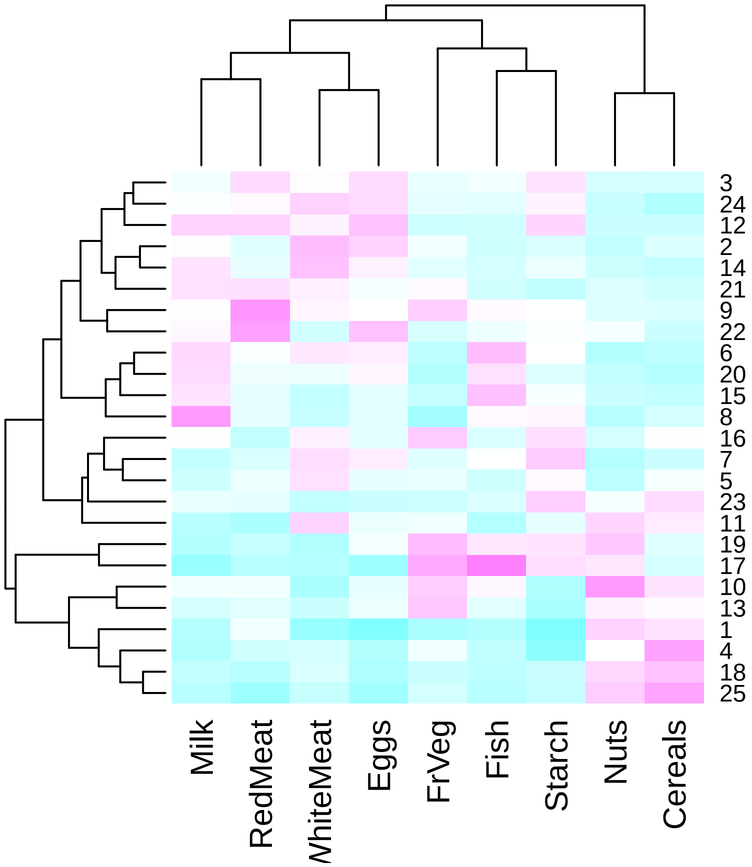
We see that it is a bit hard to interpret the correlations in data, even with a smoother line. Possibly we could say that nuts and fruit & vegetables are positively correlated, as are white meat and eggs. Other than that, it is difficult to say.

We instead plot a heatmap of the data with rows unpermuted to see if we can say more from that. The numbers of the Countries are given.



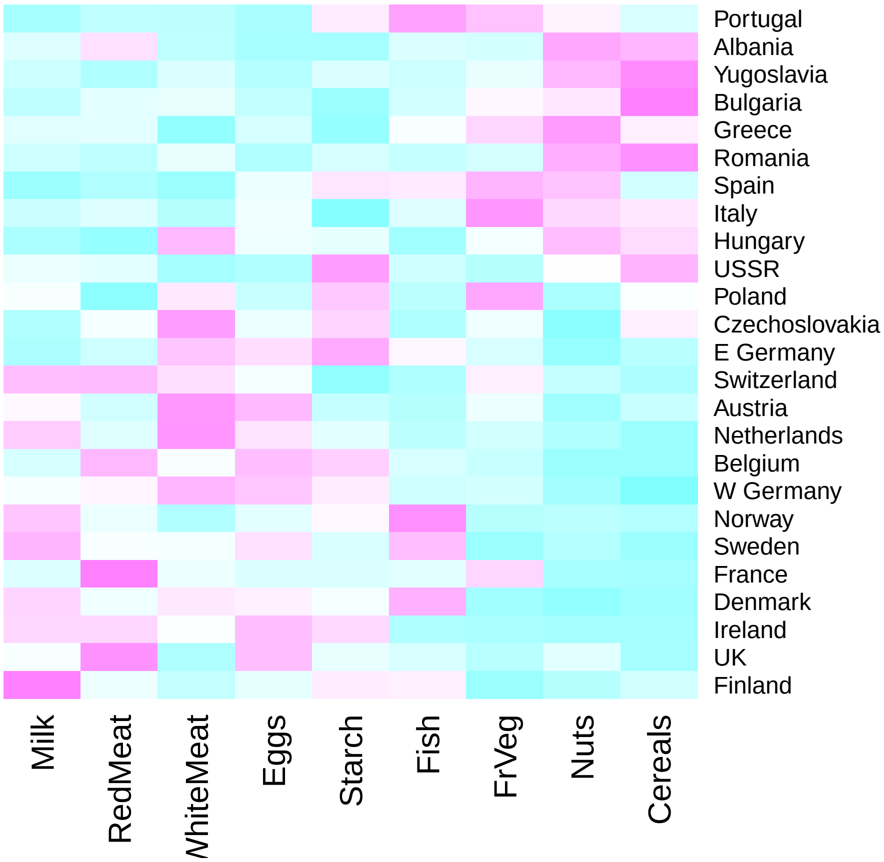
```
##  [1] "Albania"        "Austria"        "Belgium"        "Bulgaria"
##  [5] "Czechoslovakia" "Denmark"        "E Germany"      "Finland"
##  [9] "France"         "Greece"         "Hungary"        "Ireland"
## [13] "Italy"          "Netherlands"    "Norway"         "Poland"
## [17] "Portugal"       "Romania"        "Spain"          "Sweden"
## [21] "Switzerland"    "UK"             "USSR"           "W Germany"
## [25] "Yugoslavia"
```

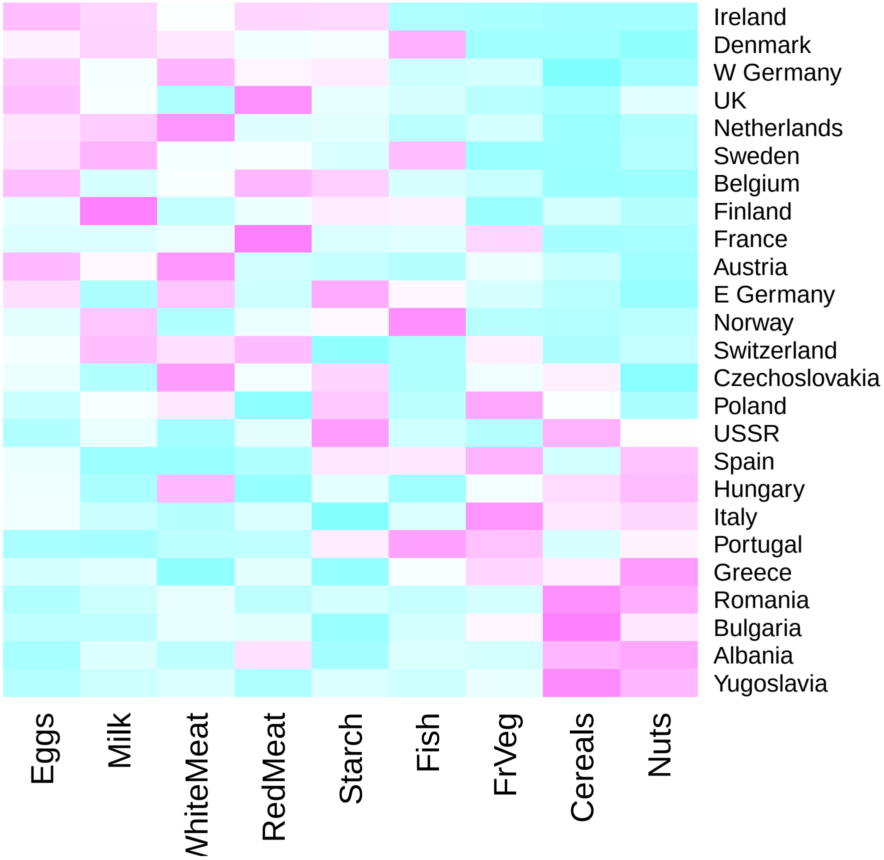
Still not very clear if you ask me. Let us try actually using some hierachial clustering.



Now it looks like we have two main clusters. The northwestern industrial nations of Europe and the south eastern then communist hell-holes. I would say milk and red meat variables characterize the former while nuts and cereals are the hallmark of the latter.

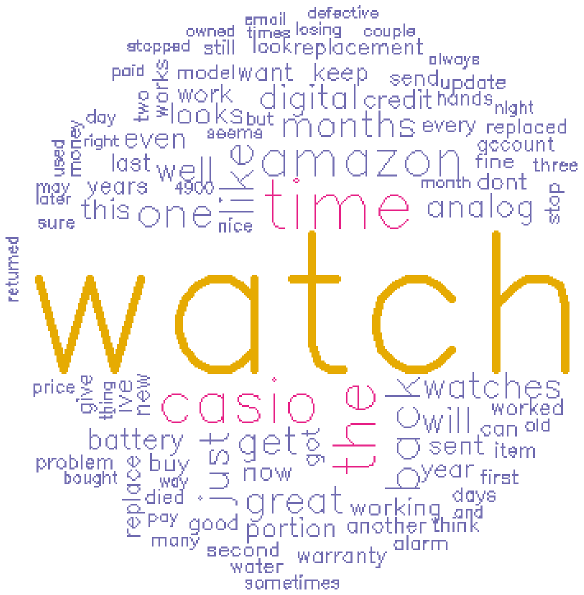
Let us perform Anti-robinson unweighted seriation and PCA seriations, let us then present the corresponding heatmaps and comment about the clusters.

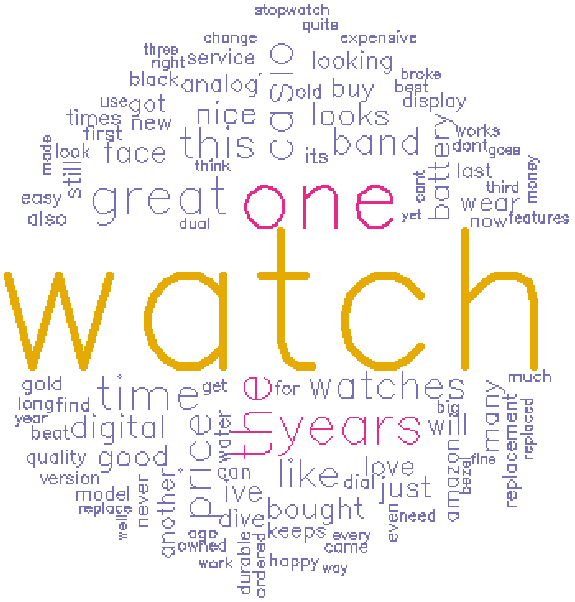

Portugal
Albania
Yugoslavia
Bulgaria
Greece
Romania
Spain
Italy
Hungary
USSR
Poland
Czechoslovakia
E Germany
Switzerland
Austria
Netherlands
Belgium
W Germany
Norway
Sweden
France
Denmark
Ireland
UK
Finland
Milk
RedMeat
WhiteMeat
Eggs
Starch
Fish
FrVeg
Nuts
Cereals



It looks like the two seriation techniques backup the clusterings found in the hierarchial clustering heatmap. In PCA seriation Eggs emerge as important variable for the first cluster, the same variable we saw correlated with white meat in the scatterplot pairs.

We download reviews of casio watch from amazon, the first group negative and the second group positive and make wordclouds about them.



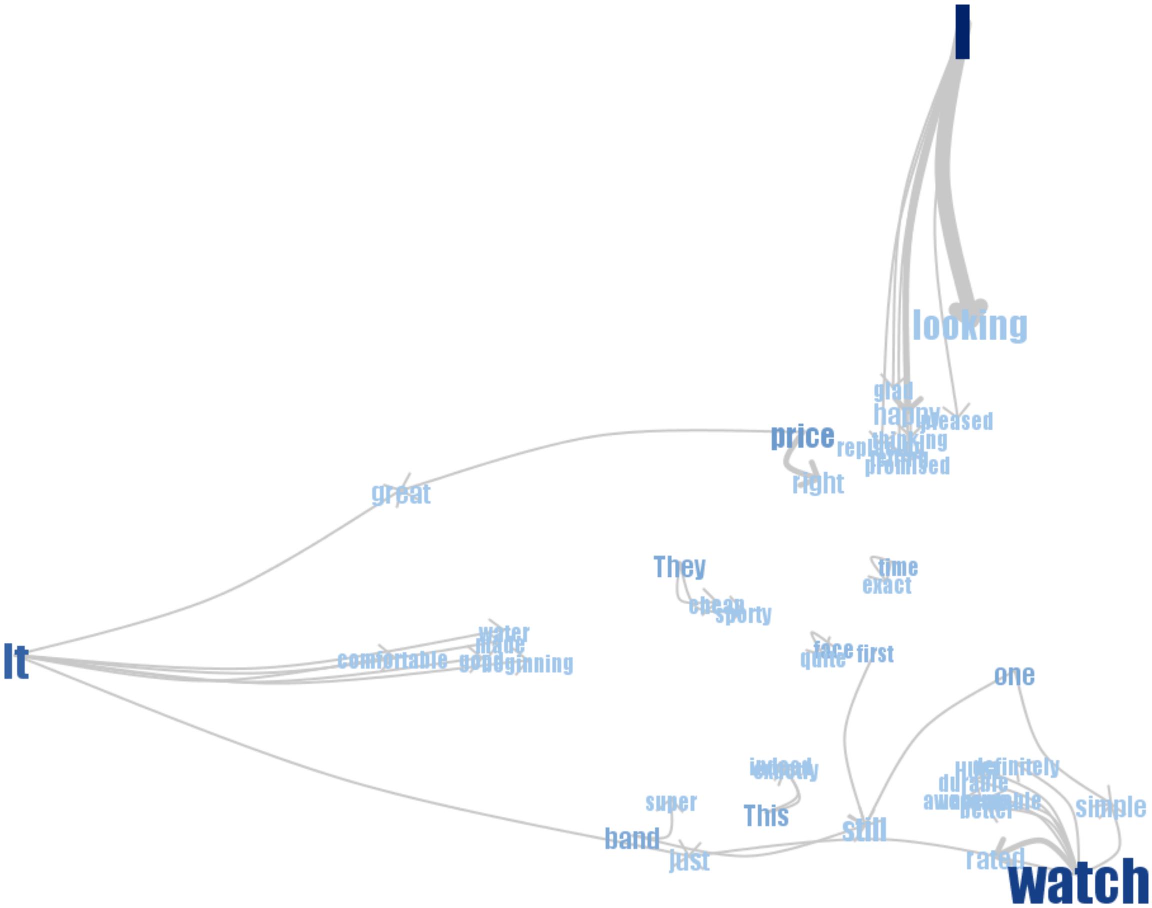


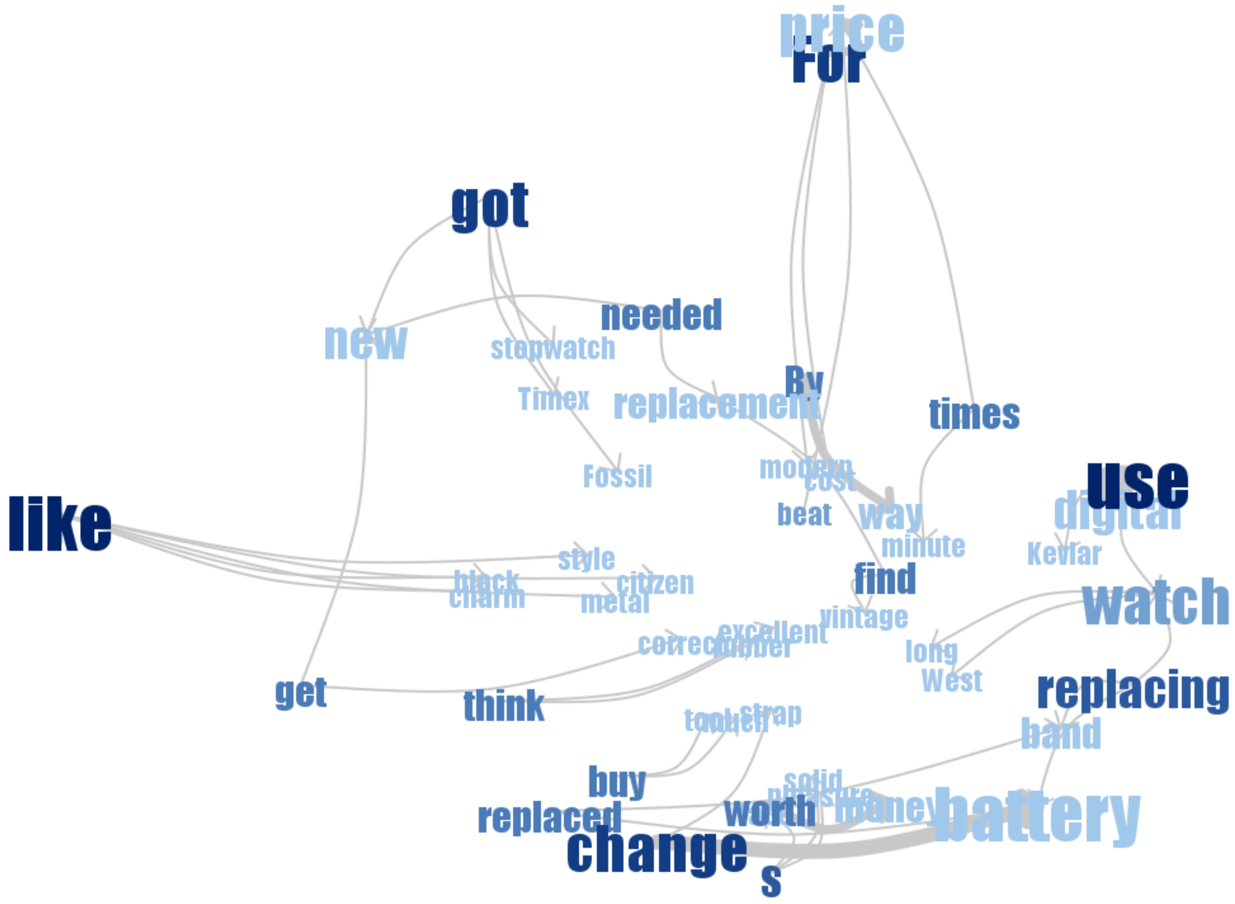
One can see that the word most common is naturally watch. The negative review wordcloud has some content of “defective”, “stopped”,“problem” and “battery” while the positive review wordcloud uses “great”,“like”,“love” and “band”.

Now we make phrase-nets for the two review groups with the link words

- am,is,are,was,were
- a,the
- at
- of

First for the positive reviews




price
For
got
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new
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Timex
replacement
By
times
Fossil
modern
cost
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use
digital
minute
Kevlar
like
style
black
charm
citizen
metal
find
watch
vintage
excellent
correct
rubber
long
West
get
think
replacing
band
tool
touch
strap
buy
solid
pleasure
money
replaced
worth
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change
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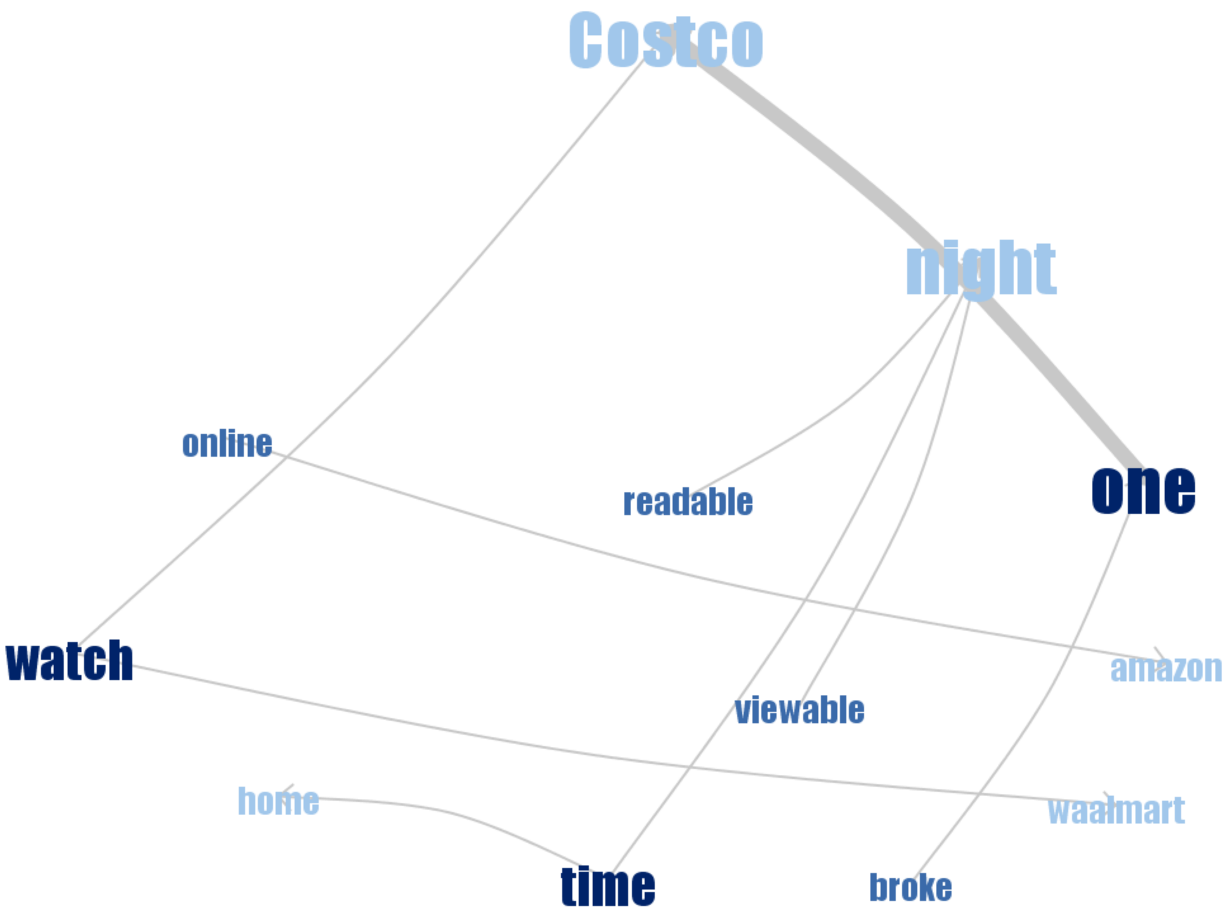
Costco
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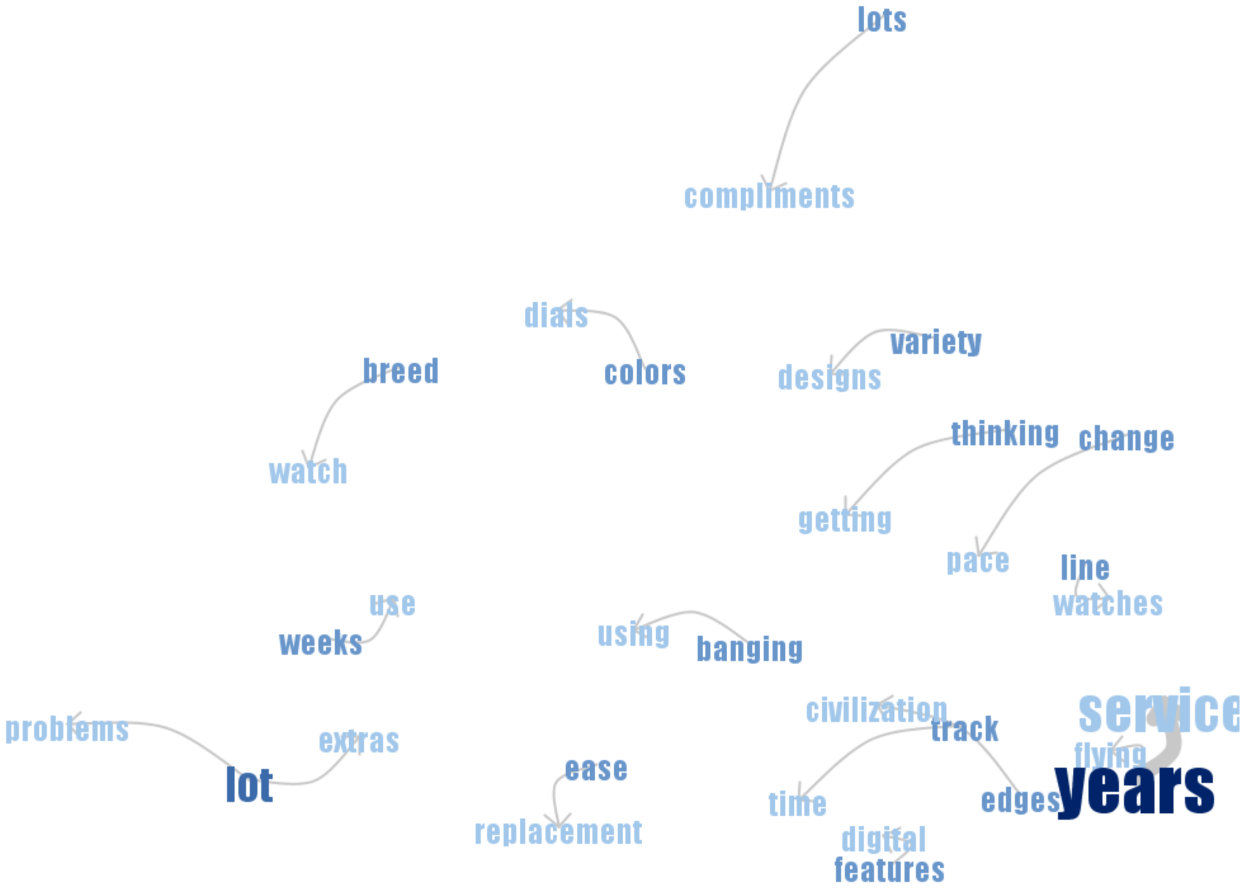
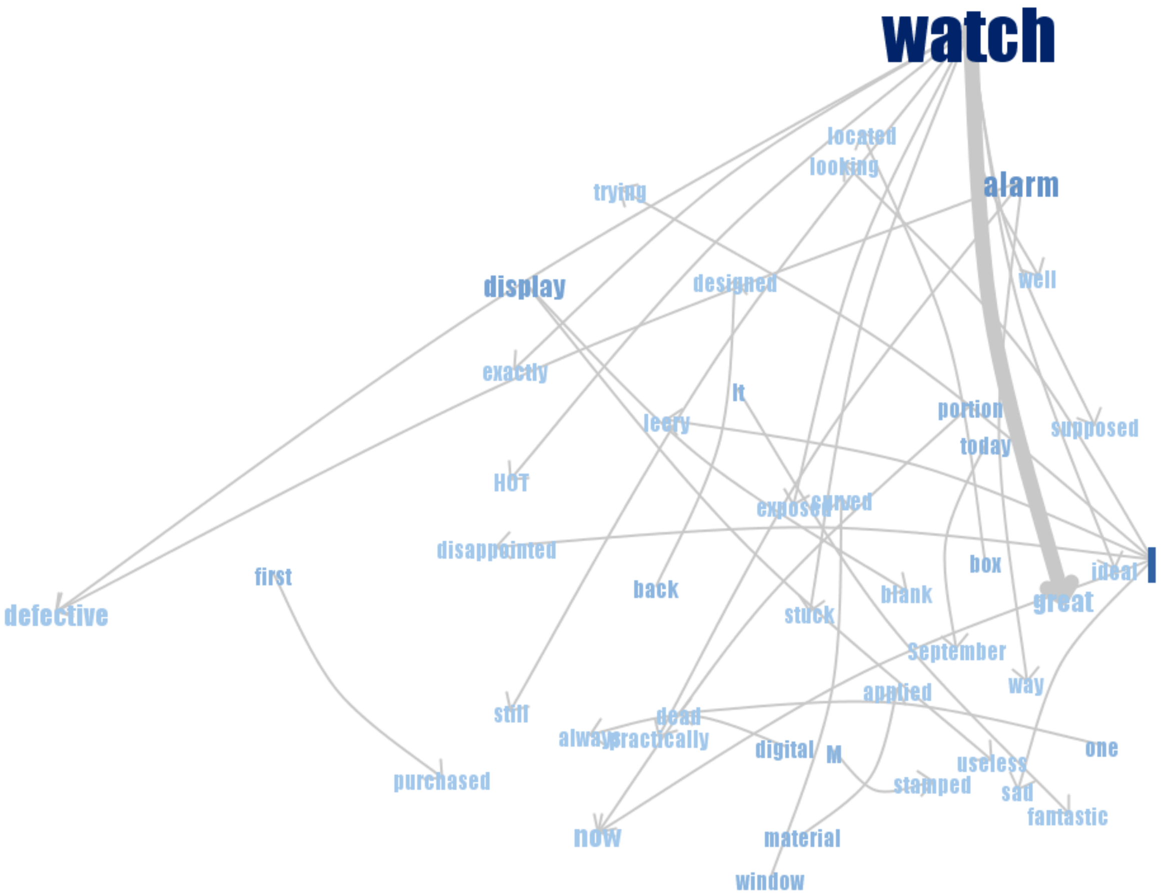
one
watch
amazon
viewable
home
waalmart
time
broke



Then we do it for the negative reviews


watch
located
looking
trying
alarm
display
designed
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portion
supposed
today
HOT
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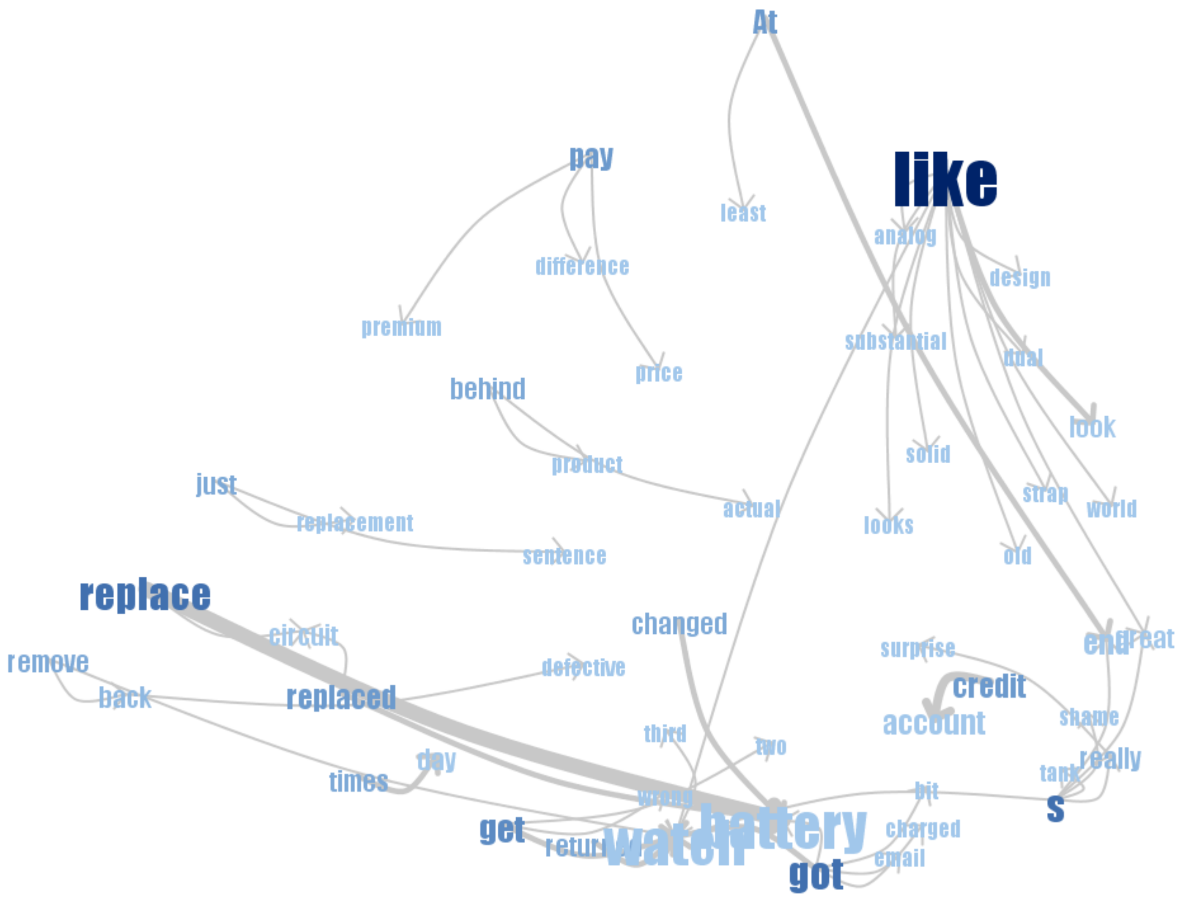
curved
disappointed
first
box
ideal
I
defective
back
blank
great
stuck
September
way
applied
still
dead
always
practically
digital
M
one
useless
purchased
stamped
sad
fantastic
now
material
window


At
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like
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analog
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dual
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look
solid
product
just
actual
strap
world
replacement
looks
old
sentence
replace
changed
circuit
surprise
end
great
remove
defective
credit
back
replaced
account
third
two
shame
day
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times
tank
wrong
bit
s
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battery
charged
return
watch
email
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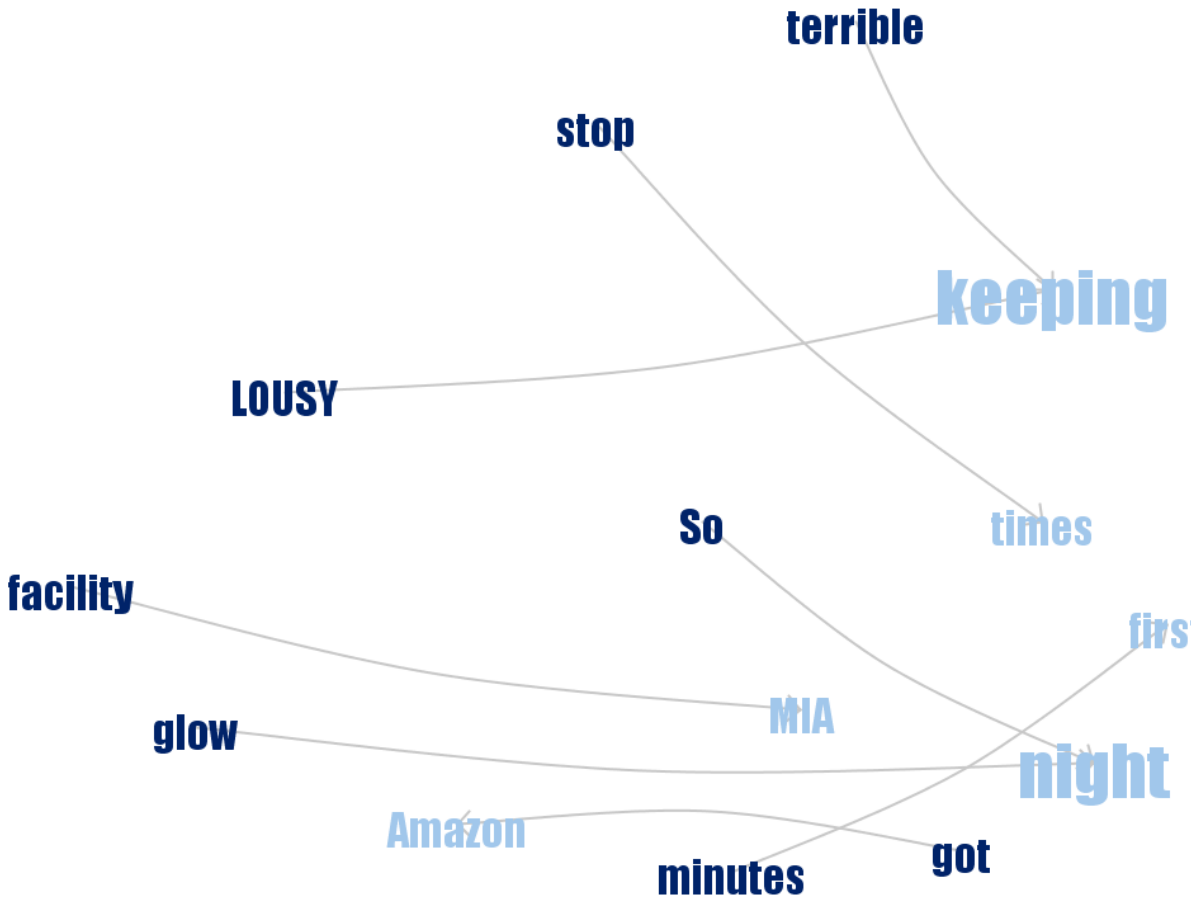
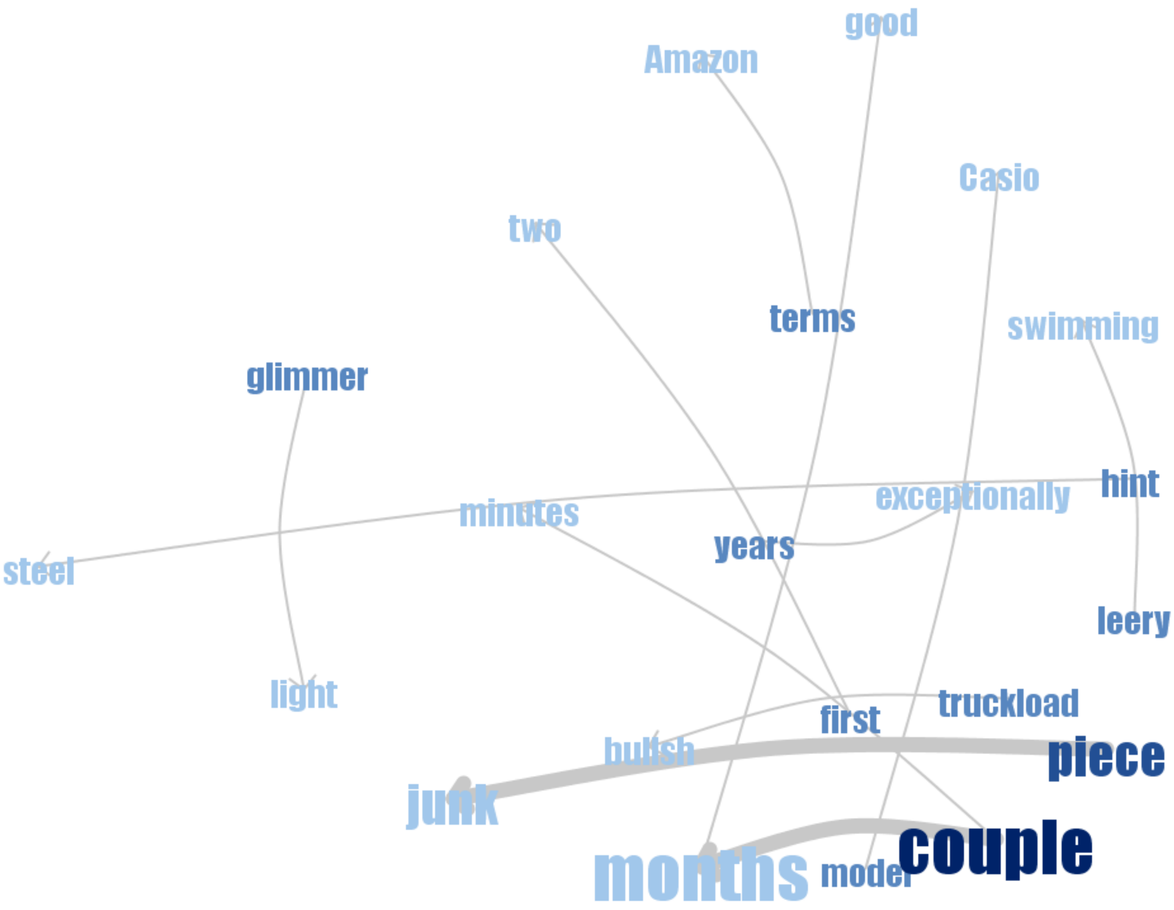

terrible
stop
keeping
LOUSY
So
times
facility
first
MIA
glow
night
Amazon
got
minutes



As we can see, there is some difference between the two groups, for instance the phrase “I am looking” is much more common among the positive reviews while “Piece of junk” is more common among negative reviews. Both groups appear to be talking about the battery and something about replacement of either watch or battery. The stores Costco is mentioned by positive reviewers and Amazon by the negative reviewers.

The word tree site seems to suggest that some negative reviewers actually would have given a good review if not for some minor thing that irked them.

Appendix

R code

```
library(ggplot2)
library(seriation)
library(RColorBrewer)
#library(slam)
#library(tm)
#library(wordcloud)
prodata <- read.delim("protein.txt")
pairs(prodata, panel = panel.smooth,pch = "+")
proscaled <- as.matrix(scale(prodata[,2:10]))
heatmap(proscaled, Rowv = NA, scale = "none",
        col = cm.colors(256))
```

```r
as.character(prodata[,1])
heatmap(proscaled, Rowv = NULL, scale = "none",
        col = cm.colors(256))
rowdist<-dist(proscaled)
coldist<-dist(t(proscaled))

order1<-seriate(rowdist, "BBURCG")
order2<-seriate(coldist, "BBURCG")
ord1<-get_order(order1)
ord2<-get_order(order2)
reordmatr<-proscaled[rev(ord1),ord2]
heatmap(reordmatr, Colv=NA, Rowv=NA,
        labRow = prodata[rev(ord1),1],
        col=cm.colors(256))

order3<-seriate(proscaled, "PCA")
order4<-seriate(t(proscaled), "PCA")
ord3<-get_order(order3)
ord4<-get_order(order4)
reordmatr2<-proscaled[rev(ord3),ord4]
heatmap(reordmatr2, Colv=NA, Rowv=NA,
        labRow = prodata[rev(ord3),1],
        col=cm.colors(256))
# data<-read.table("OneTwo.txt",header=F, sep='\n') #Read file
# mycorpus <- Corpus(DataframeSource(data)) #Creating corpus (collection of text data)
# mycorpus <- tm_map(mycorpus, removePunctuation)
# mycorpus <- tm_map(mycorpus, function(x) removeWords(x, stopwords("english")))
# tdm <- TermDocumentMatrix(mycorpus) #Creating term-document matrix
# m <- as.matrix(tdm)
# v <- sort(rowSums(m),decreasing=TRUE) #Sum up the frequencies of each word
# d <- data.frame(word = names(v),freq=v) #Create one column=names,second=frequences
# pal <- brewer.pal(6,"Dark2")
# pal <- pal[-(1:2)] #Create palette of colors
# wordcloud(d$word,d$freq, scale=c(8,.3),min.freq=2,max.words=100, random.order=F,
#           rot.per=.15, colors=pal, vfont=c("sans serif","plain"))
#
# data2<-read.table("Five.txt",header=F, sep='\n') #Read file
# mycorpus2 <- Corpus(DataframeSource(data2)) #Creating corpus (collection of text data)
# mycorpus2 <- tm_map(mycorpus2, removePunctuation)
# mycorpus2 <- tm_map(mycorpus2, function(x) removeWords(x, stopwords("english")))
# tdm2 <- TermDocumentMatrix(mycorpus2) #Creating term-document matrix
# m2 <- as.matrix(tdm2)
# v2 <- sort(rowSums(m2),decreasing=TRUE) #Sum up the frequencies of each word
# d2 <- data.frame(word = names(v2),freq=v2) #Create one column=names,second=frequences
# wordcloud(d2$word,d2$freq, scale=c(8,.3),min.freq=2,max.words=100, random.order=F,
#           rot.per=.15, colors=pal, vfont=c("sans serif","plain"))
##
##
```