Sentiment Analysis

2023-02-25

R Markdown

```
length(txt_dt$Review.Text)
```

```
## [1] 23486
```

```
View(txt_dt)
str(txt_dt)
```

```
## 'data.frame':    23486 obs. of  11 variables:
##  $ X                      : int  0 1 2 3 4 5 6 7 8 9 ...
##  $ Clothing.ID            : int  767 1080 1077 1049 847 1080 858 858 1077 1077 ...
##  $ Age                    : int  33 34 60 50 47 49 39 39 24 34 ...
##  $ Title                  : chr  "" "" "Some major design flaws" "My favorite buy!" ...
##  $ Review.Text            : chr  "Absolutely wonderful - silky and sexy and comfortable" "Lov
e this dress!  it's sooo pretty.  i happened to find it in a store, and i'm glad i did bc i neve
r would have"| __truncated__ "I had such high hopes for this dress and really wanted it to work
for me. i initially ordered the petite small "| __truncated__ "I love, love, love this jumpsuit.
it's fun, flirty, and fabulous! every time i wear it, i get nothing but great compliments!" ...
##  $ Rating                 : int  4 5 3 5 5 2 5 4 5 5 ...
##  $ Recommended.IND        : int  1 1 0 1 1 0 1 1 1 1 ...
##  $ Positive.Feedback.Count: int  0 4 0 0 6 4 1 4 0 0 ...
##  $ Division.Name          : chr  "Initmates" "General" "General" "General Petite" ...
##  $ Department.Name        : chr  "Intimate" "Dresses" "Dresses" "Bottoms" ...
##  $ Class.Name             : chr  "Intimates" "Dresses" "Dresses" "Pants" ...
```

```
sum(is.na(txt_dt))
```

```
## [1] 0
```

Text mining

```
## <<SimpleCorpus>>
## Metadata:  corpus specific: 1, document level (indexed): 0
## Content:  documents: 5
##
## [1] Absolutely wonderful - silky and sexy and comfortable
## [2] Love this dress!  it's sooo pretty.  i happened to find it in a store, and i'm glad i did
bc i never would have ordered it online bc it's petite.  i bought a petite and am 5'8".  i love
the length on me- hits just a little below the knee.  would definitely be a true midi on someone
who is truly petite.
## [3] I had such high hopes for this dress and really wanted it to work for me. i initially ord
ered the petite small (my usual size) but i found this to be outrageously small. so small in fac
t that i could not zip it up! i reordered it in petite medium, which was just ok. overall, the t
op half was comfortable and fit nicely, but the bottom half had a very tight under layer and sev
eral somewhat cheap (net) over layers. imo, a major design flaw was the net over layer sewn dire
ctly into the zipper - it c
## [4] I love, love, love this jumpsuit. it's fun, flirty, and fabulous! every time i wear it, i
get nothing but great compliments!
## [5] This shirt is very flattering to all due to the adjustable front tie. it is the perfect l
ength to wear with leggings and it is sleeveless so it pairs well with any cardigan. love this s
hirt!!!
```

```
## Warning in tm_map.SimpleCorpus(crps, tolower): transformation drops documents
```

```
## <<SimpleCorpus>>
## Metadata:  corpus specific: 1, document level (indexed): 0
## Content:  documents: 5
##
## [1] absolutely wonderful - silky and sexy and comfortable
## [2] love this dress!  it's sooo pretty.  i happened to find it in a store, and i'm glad i did
bc i never would have ordered it online bc it's petite.  i bought a petite and am 5'8".  i love
the length on me- hits just a little below the knee.  would definitely be a true midi on someone
who is truly petite.
## [3] i had such high hopes for this dress and really wanted it to work for me. i initially ord
ered the petite small (my usual size) but i found this to be outrageously small. so small in fac
t that i could not zip it up! i reordered it in petite medium, which was just ok. overall, the t
op half was comfortable and fit nicely, but the bottom half had a very tight under layer and sev
eral somewhat cheap (net) over layers. imo, a major design flaw was the net over layer sewn dire
ctly into the zipper - it c
## [4] i love, love, love this jumpsuit. it's fun, flirty, and fabulous! every time i wear it, i
get nothing but great compliments!
## [5] this shirt is very flattering to all due to the adjustable front tie. it is the perfect l
ength to wear with leggings and it is sleeveless so it pairs well with any cardigan. love this s
hirt!!!
```

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

```
## <<SimpleCorpus>>
## Metadata:  corpus specific: 1, document level (indexed): 0
## Content:  documents: 5
##
## [1] absolutely wonderful  silky and sexy and comfortable
## [2] love this dress  its sooo pretty  i happened to find it in a store and im glad i did bc i
never would have ordered it online bc its petite  i bought a petite and am 58  i love the length
on me hits just a little below the knee  would definitely be a true midi on someone who is truly
petite
## [3] i had such high hopes for this dress and really wanted it to work for me i initially orde
red the petite small my usual size but i found this to be outrageously small so small in fact th
at i could not zip it up i reordered it in petite medium which was just ok overall the top half
was comfortable and fit nicely but the bottom half had a very tight under layer and several some
what cheap net over layers imo a major design flaw was the net over layer sewn directly into the
zipper  it c
## [4] i love love love this jumpsuit its fun flirty and fabulous every time i wear it i get not
hing but great compliments
## [5] this shirt is very flattering to all due to the adjustable front tie it is the perfect le
ngth to wear with leggings and it is sleeveless so it pairs well with any cardigan love this shi
rt
```

```
## Warning in tm_map.SimpleCorpus(crps, removeNumbers): transformation drops
## documents
```

```
## <<SimpleCorpus>>
## Metadata:  corpus specific: 1, document level (indexed): 0
## Content:  documents: 5
##
## [1] absolutely wonderful  silky and sexy and comfortable
## [2] love this dress  its sooo pretty  i happened to find it in a store and im glad i did bc i
never would have ordered it online bc its petite  i bought a petite and am   i love the length o
n me hits just a little below the knee  would definitely be a true midi on someone who is truly
petite
## [3] i had such high hopes for this dress and really wanted it to work for me i initially orde
red the petite small my usual size but i found this to be outrageously small so small in fact th
at i could not zip it up i reordered it in petite medium which was just ok overall the top half
was comfortable and fit nicely but the bottom half had a very tight under layer and several some
what cheap net over layers imo a major design flaw was the net over layer sewn directly into the
zipper  it c
## [4] i love love love this jumpsuit its fun flirty and fabulous every time i wear it i get not
hing but great compliments
## [5] this shirt is very flattering to all due to the adjustable front tie it is the perfect le
ngth to wear with leggings and it is sleeveless so it pairs well with any cardigan love this shi
rt
```

```
## Warning in tm_map.SimpleCorpus(crps, removeWords, stopwords("english")):
## transformation drops documents
```

```
## <<SimpleCorpus>>
## Metadata:  corpus specific: 1, document level (indexed): 0
## Content:  documents: 5
##
## [1] absolutely wonderful  silky  sexy  comfortable
## [2] love  dress   sooo pretty   happened  find    store  im glad   bc  never   ordered  onlin
e bc  petite   bought  petite      love  length   hits just  little   knee   definitely   true m
idi  someone   truly petite
## [3]    high hopes   dress  really wanted   work    initially ordered  petite small  usual siz
e   found    outrageously small  small  fact     zip    reordered   petite medium   just ok over
all  top half  comfortable  fit nicely   bottom half    tight  layer  several somewhat cheap net
layers imo  major design flaw   net  layer sewn directly   zipper   c
## [4]  love love love  jumpsuit  fun flirty  fabulous every time  wear   get nothing  great com
pliments
## [5]  shirt   flattering   due   adjustable front tie    perfect length  wear  leggings    sle
eveless   pairs well   cardigan love  shirt
```

```
## Warning in tm_map.SimpleCorpus(crps, content_transformer(removeURL)):
## transformation drops documents
```

```
## <<SimpleCorpus>>
## Metadata:  corpus specific: 1, document level (indexed): 0
## Content:  documents: 5
##
## [1] absolutely wonderful  silky  sexy  comfortable
## [2] love  dress   sooo pretty   happened  find    store  im glad   bc  never   ordered  onlin
e bc  petite   bought  petite      love  length   hits just  little   knee   definitely   true m
idi  someone   truly petite
## [3]    high hopes   dress  really wanted   work    initially ordered  petite small  usual siz
e   found    outrageously small  small  fact     zip    reordered   petite medium   just ok over
all  top half  comfortable  fit nicely   bottom half    tight  layer  several somewhat cheap net
layers imo  major design flaw   net  layer sewn directly   zipper   c
## [4]  love love love  jumpsuit  fun flirty  fabulous every time  wear   get nothing  great com
pliments
## [5]  shirt   flattering   due   adjustable front tie    perfect length  wear  leggings    sle
eveless   pairs well   cardigan love  shirt
```

```
## Warning in tm_map.SimpleCorpus(cln_data, stripWhitespace): transformation drops
## documents
```

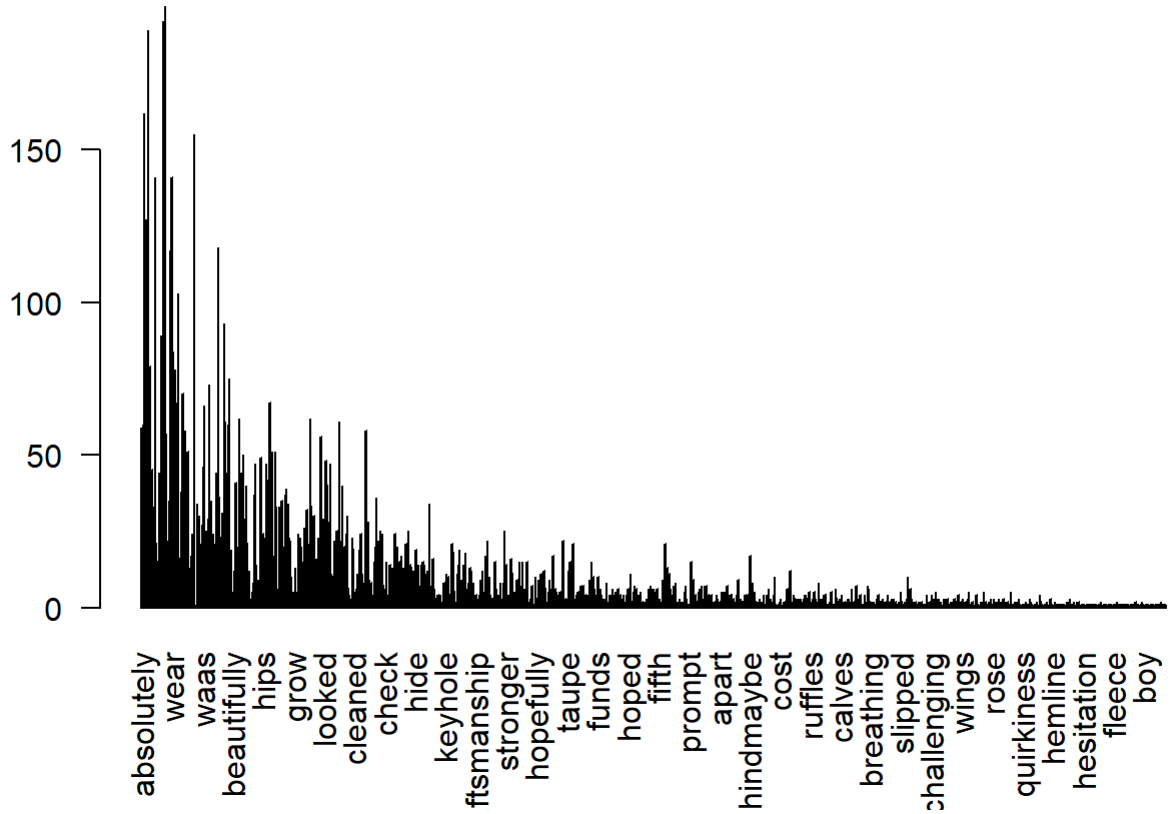
```
## <<SimpleCorpus>>
## Metadata:  corpus specific: 1, document level (indexed): 0
## Content:  documents: 5
##
## [1] absolutely wonderful silky sexy comfortable
## [2] love dress sooo pretty happened find store im glad bc never ordered online bc petite boug
ht petite love length hits just little knee definitely true midi someone truly petite
## [3]  high hopes dress really wanted work initially ordered petite small usual size found outr
ageously small small fact zip reordered petite medium just ok overall top half comfortable fit n
icely bottom half tight layer several somewhat cheap net layers imo major design flaw net layer
sewn directly zipper c
## [4]  love love love jumpsuit fun flirty fabulous every time wear get nothing great compliment
s
## [5]  shirt flattering due adjustable front tie perfect length wear leggings sleeveless pairs
well cardigan love shirt
```

Sentiment analysis

```
#install.packages("Rcpp")
library(Rcpp)
#update.packages("Rcpp")


#install.packages("wordcloud")
#install.packages("tmap")
library(wordcloud)
```

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

```
library(tmap)

dt_mtx <- TermDocumentMatrix(cln_data[1:500])
mp <- as.matrix(dt_mtx)
wd <- rowSums(mp)
barplot(wd,
        las = 2,
        col = rainbow(50))
```




```
vtx <- sort(rowSums(mp),decreasing=TRUE)

dt <- data.frame(word = names(vtx),freq=vtx)
head(dt, 15)
```

```
##          word freq
## top       top  197
## size     size  192
## love     love  189
## dress   dress  162
## like     like  155
## fit       fit  141
## wear     wear  141
## just     just  127
## fabric fabric  118
## great   great  117
## small   small  114
## color   color  103
## little little  100
## look     look   95
## will     will   93
```

```
require(stats)


#Sentiemnt Analysis
#install.packages("syuzhet")
#install.packages("lubridate")
#install.packages("ggplot2")
#install.packages("scales")
#install.packages("reshape2")
#install.packages("dplyr")
library(syuzhet)
library(lubridate)
```

```
## Loading required package: timechange
```

```
##
## Attaching package: 'lubridate'
```

```
## The following objects are masked from 'package:base':
##
##     date, intersect, setdiff, union
```

```
library(ggplot2)
```

```
##
## Attaching package: 'ggplot2'
```

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

```
library(scales)
```

```
##
## Attaching package: 'scales'
```

```
## The following object is masked from 'package:syuzhet':
##
##     rescale
```

```
library(reshape2)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
# Obtain sentiment scores
head(dt)
```

```
##        word freq
## top     top  197
## size   size  192
## love   love  189
## dress dress  162
## like   like  155
## fit     fit  141
```

```
get_nrc_sentiment('perfect')
```

```
## Warning: `spread_()` was deprecated in tidyr 1.2.0.
## ℹ Please use `spread()` instead.
## ℹ The deprecated feature was likely used in the syuzhet package.
##   Please report the issue to the authors.
```

```
##   anger anticipation disgust fear joy sadness surprise trust negative positive
## 1     0            1       0    0   1       0        0     1        0        1
```

```
get_nrc_sentiment('shit')
```

```
##   anger anticipation disgust fear joy sadness surprise trust negative positive
## 1     1            0       1    0   0       0        0     0        1        0
```

```
get_nrc_sentiment('recommend')
```

```
##   anger anticipation disgust fear joy sadness surprise trust negative positive
## 1     0            0       0    0   0       0        0     1        0        1
```

```
get_nrc_sentiment('love')
```

```
##   anger anticipation disgust fear joy sadness surprise trust negative positive
## 1     0            0       0    0   1       0        0     0        0        1
```

```
get_nrc_sentiment('like')
```

```
##   anger anticipation disgust fear joy sadness surprise trust negative positive
## 1     0            0       0    0   0       0        0     0        0        0
```

```
get_nrc_sentiment('flattering')
```

```
##   anger anticipation disgust fear joy sadness surprise trust negative positive
## 1     0            0       0    0   1       0        0     0        0        1
```

```
get_nrc_sentiment('Absolutely wonderful - silky and sexy and comfortable')
```

```
##   anger anticipation disgust fear joy sadness surprise trust negative positive
## 1     0            0       0    0   1       0        1     1        0        1
```

```
get_nrc_sentiment(txt_dt$Review.Text[2])
```

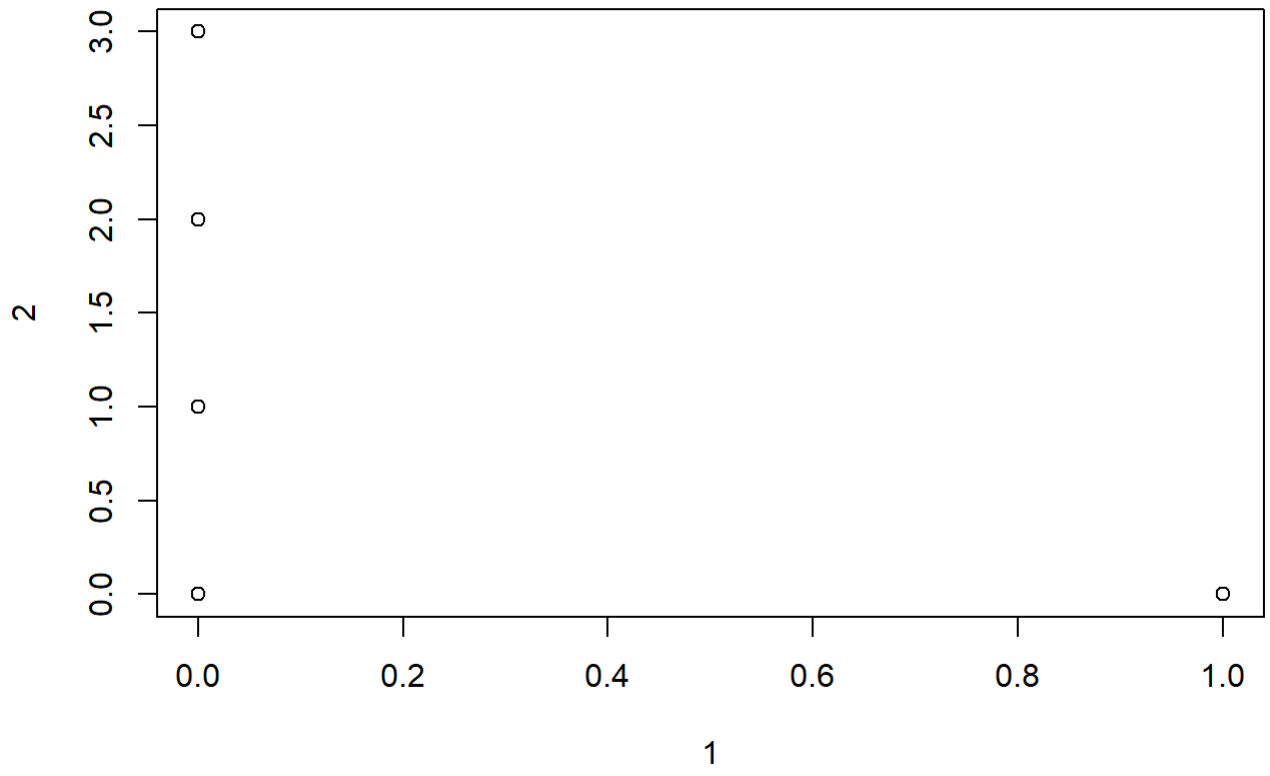
```
##   anger anticipation disgust fear joy sadness surprise trust negative positive
## 1     0            3       0    0   3       0        0     1        0        4
```

```
get_nrc_sentiment(txt_dt$Review.Text[5])
```

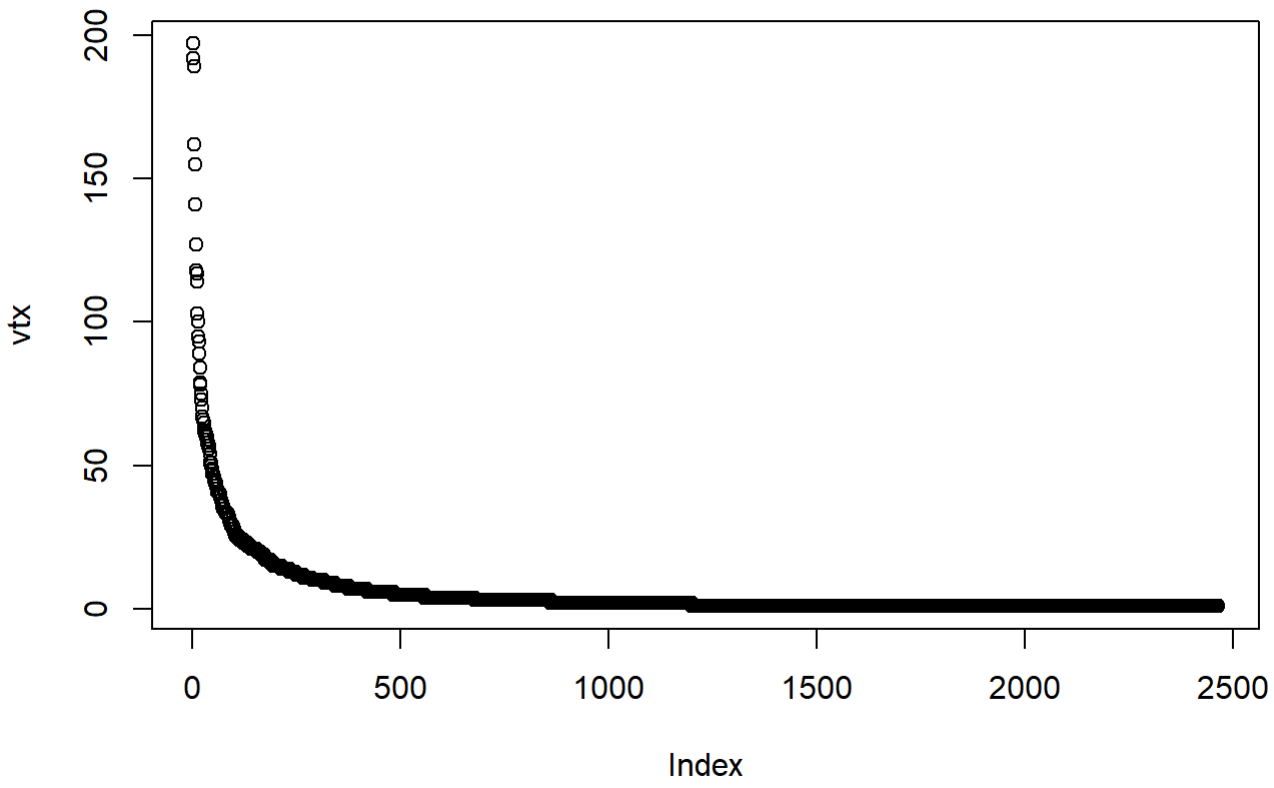
```
##   anger anticipation disgust fear joy sadness surprise trust negative positive
## 1     0            1       0    0   3       0        0     2        1        3
```

Data visualization

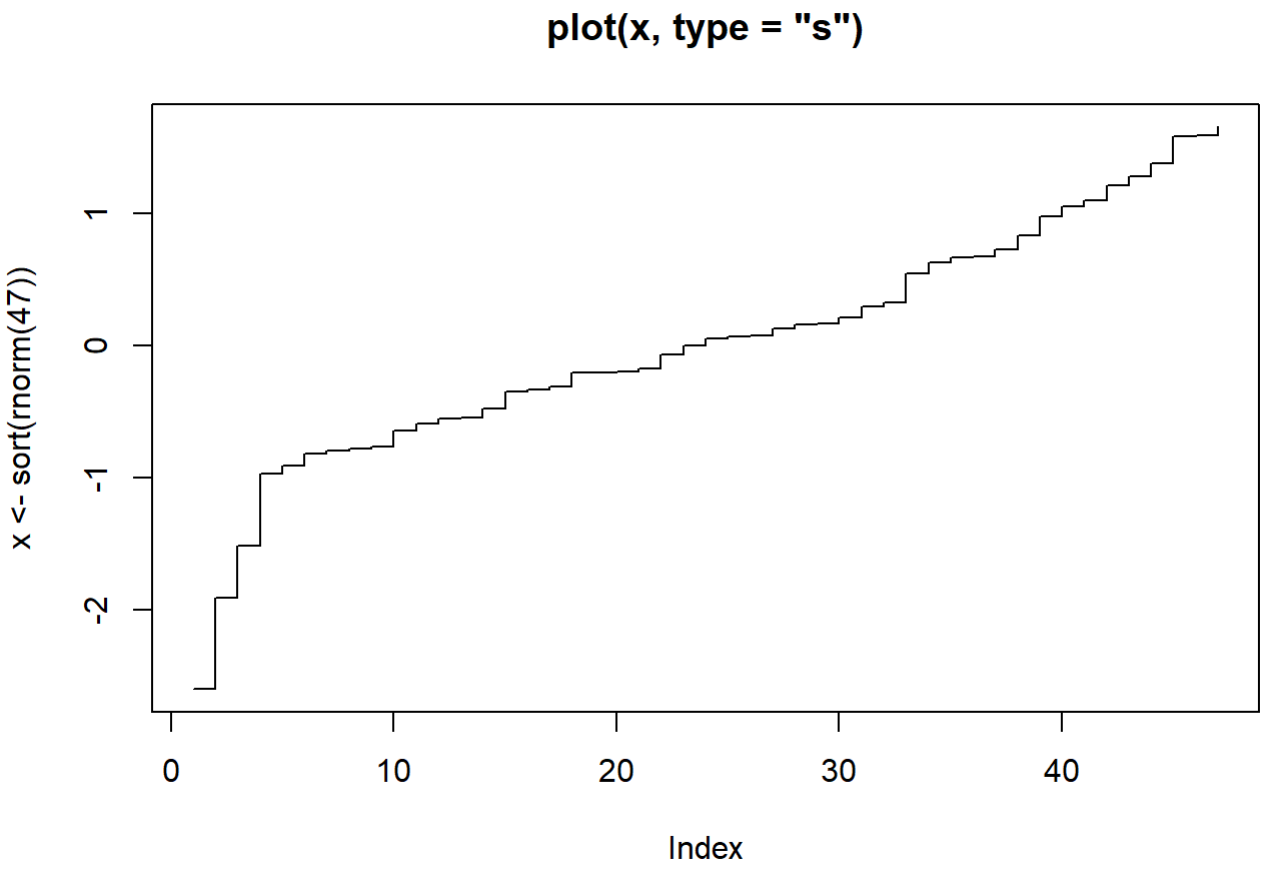
```
plot(mp)
```




```
plot(vtx)
```




```
plot(x <- sort(rnorm(47)), type = "s", main = "plot(x, type = \"s\")")
```




```
#install.packages("tmap")
library(tmap)
set.seed(572)
wordcloud(words = dt$word, freq = dt$freq, min.freq = 1,
          max.words=200, random.order=FALSE, rot.per=0.35,
          colors=brewer.pal(8, "Dark2"))
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : thought could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : better could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : compliments could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : around could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : something could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : comfy could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : shoulders could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : though could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : easily could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : price could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : received could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : pattern could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : slightly could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : nicely could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : wasnt could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : coat could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : different could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : makes could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : stretch could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : picture could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : reviews could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : especially could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : feminine could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : torso could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : sizes could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : someone could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : everything could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : regular could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : smaller could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : may could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : cant could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : sizing could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : recommend could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : another could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : quite could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : shorter could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : glad could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : dresses could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : snug could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : wore could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : without could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : fine could not be fit on page. It will not be plotted.
```

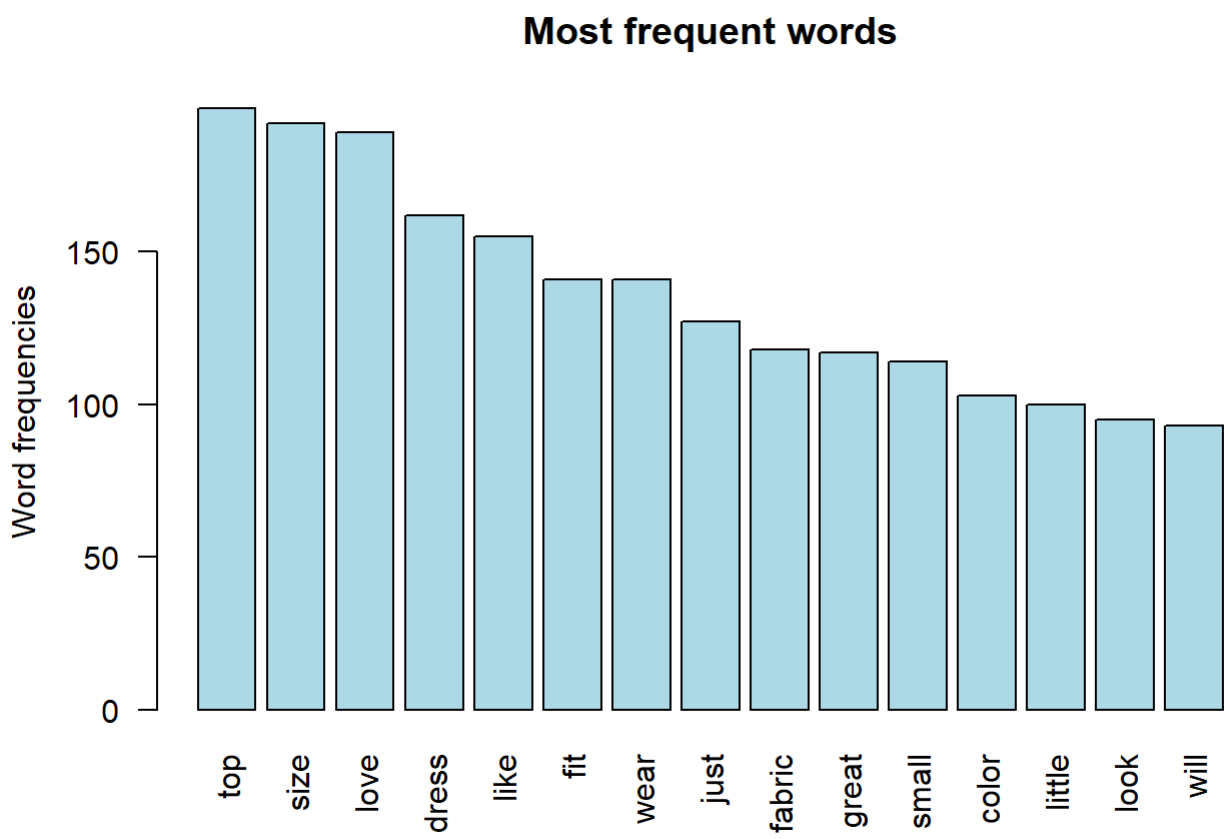
```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : returned could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : spring could not be fit on page. It will not be plotted.
```

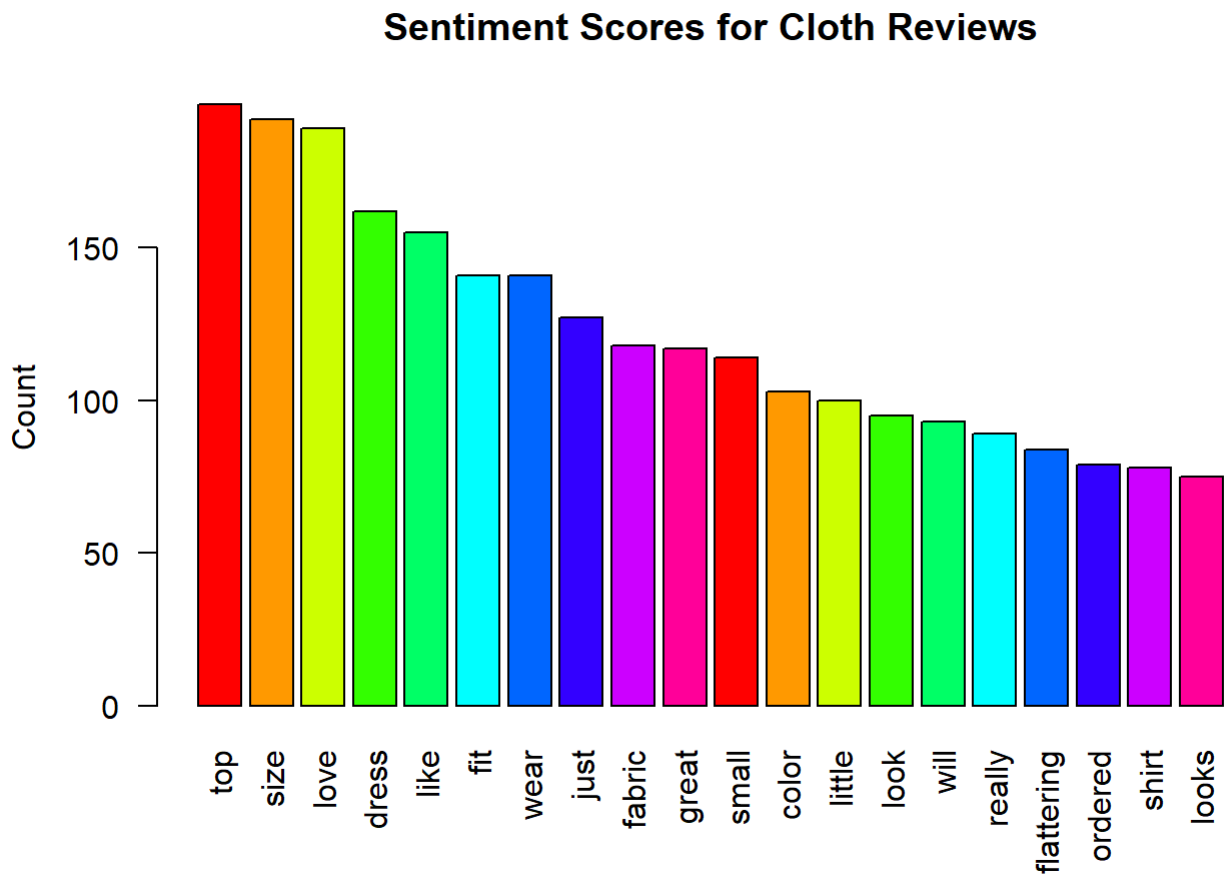
```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : easy could not be fit on page. It will not be plotted.
```

```
## Warning in wordcloud(words = dt$word, freq = dt$freq, min.freq = 1, max.words =
## 200, : normally could not be fit on page. It will not be plotted.
```


```
barplot(dt[1:15,]$freq, las = 2, names.arg = dt[1:15,]$word,
        col ="lightblue", main ="Most frequent words",
        ylab = "Word frequencies")
```

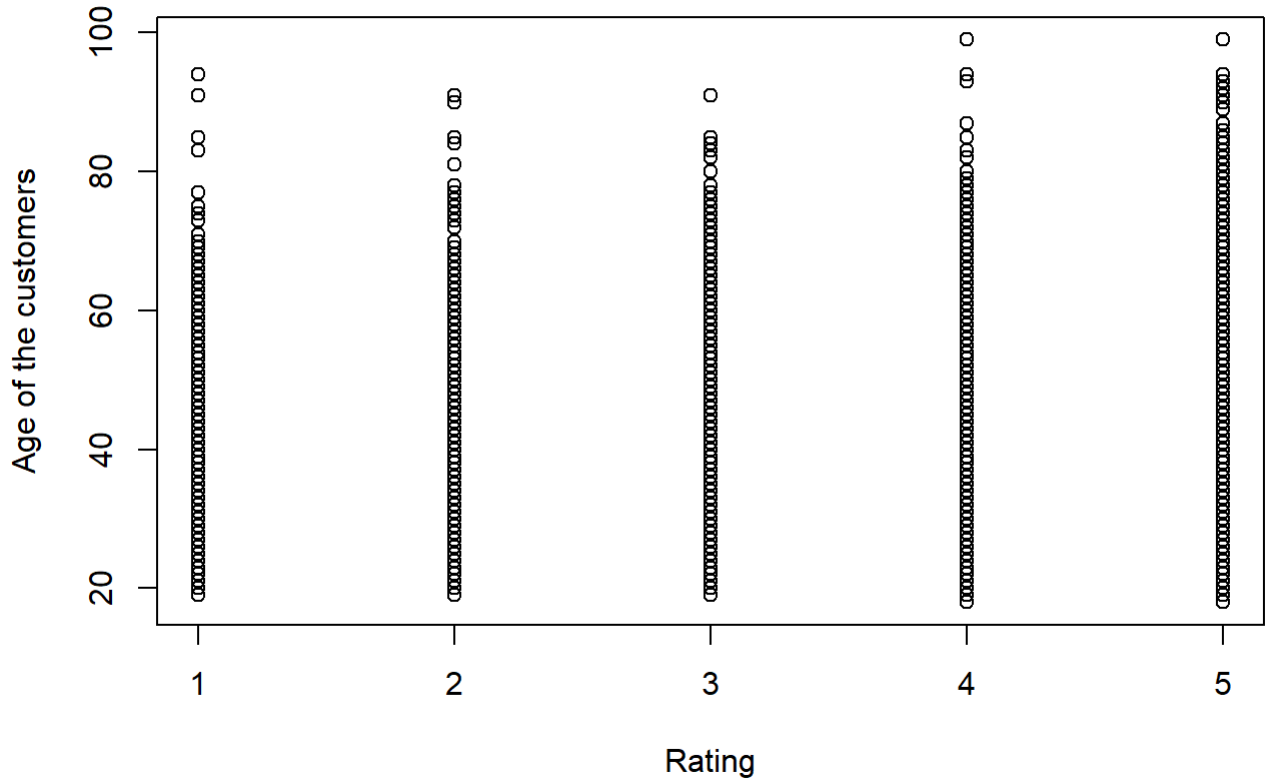



```
barplot(dt[1:20,]$freq, names.arg = dt[1:20,]$word,
        las = 2,
        col = rainbow(10),
        ylab = 'Count',
        main = 'Sentiment Scores for Cloth Reviews')
```

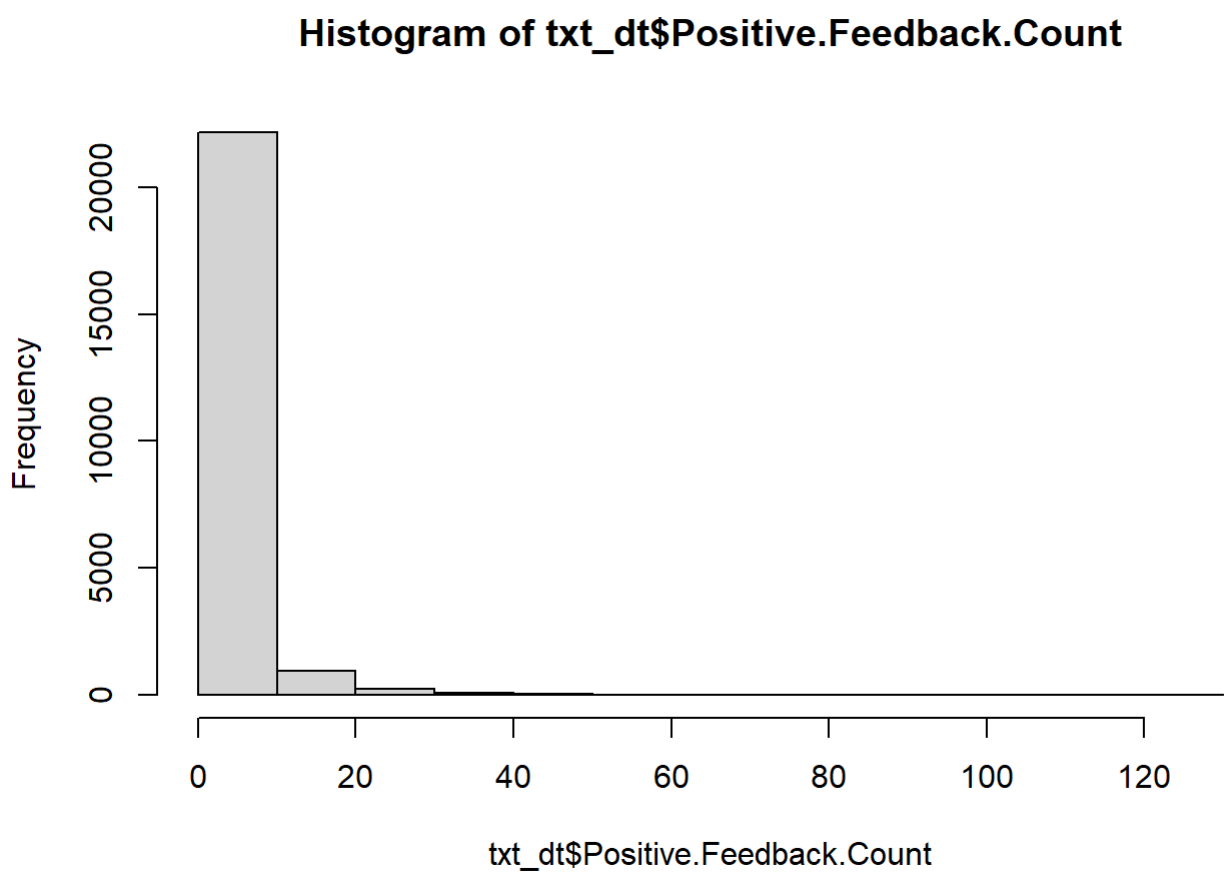


Further expolrations

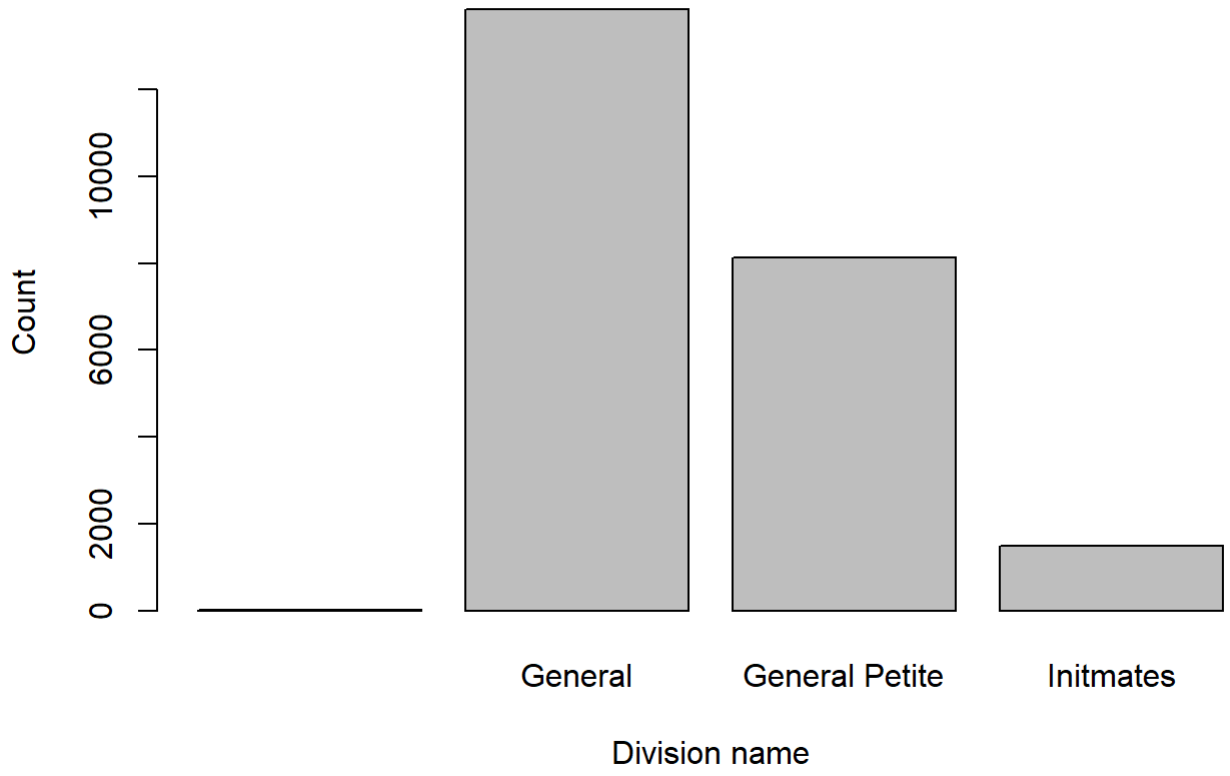
```
#scatter plots
x <- c(txt_dt$Rating)
y <- c(txt_dt$Age)
plot(x,y, xlab='Rating', ylab='Age of the customers')
```



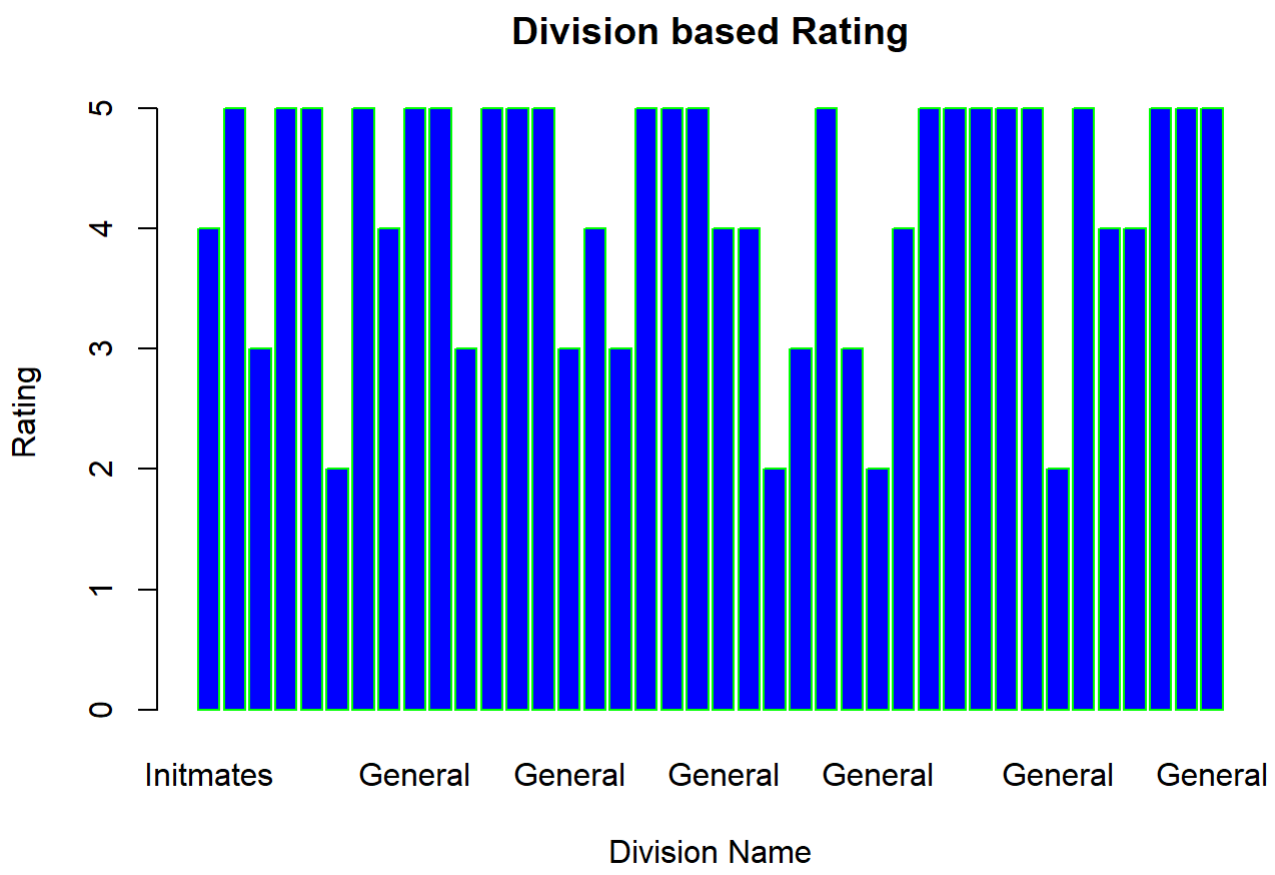

```
# histogram plots
hist(txt_dt$Positive.Feedback.Count)
```




```
# Bar plots
plot(as.factor(txt_dt$Division.Name), xlab= 'Division name', ylab='Count')
```




```
barplot(txt_dt$Rating[0:40],names.arg=txt_dt$Division.Name[0:40],xlab="Division Name",ylab="Rati
ng",col="blue",
        main="Division based Rating",border="green")
```



Topic modelling

```
txt_dt$Title <- NULL
txt_dt$Review.Text <- NULL
txt_dt$Division.Name <- NULL
txt_dt$Department.Name <- NULL
txt_dt$Class.Name <- NULL
str(txt_dt)
```

```
## 'data.frame':    23486 obs. of  6 variables:
##  $ X                      : int  0 1 2 3 4 5 6 7 8 9 ...
##  $ Clothing.ID            : int  767 1080 1077 1049 847 1080 858 858 1077 1077 ...
##  $ Age                    : int  33 34 60 50 47 49 39 39 24 34 ...
##  $ Rating                 : int  4 5 3 5 5 2 5 4 5 5 ...
##  $ Recommended.IND        : int  1 1 0 1 1 0 1 1 1 1 ...
##  $ Positive.Feedback.Count: int  0 4 0 0 6 4 1 4 0 0 ...
```

```
library(lmtest)
```

```
## Loading required package: zoo
```

```
##
## Attaching package: 'zoo'
```

```
## The following objects are masked from 'package:base':
##
##     as.Date, as.Date.numeric
```

```
library(tidyverse)
```

```
## ── Attaching packages
## ─────────────────────────────────────
## tidyverse 1.3.2 ──
```

```
## ✓ tibble  3.1.8     ✓ purrr   1.0.0
## ✓ tidyr   1.2.1     ✓ stringr 1.5.0
## ✓ readr   2.1.3     ✓ forcats 0.5.2
## ── Conflicts ──────────────────────────────────────── tidyverse_conflicts() ──
## ✕ ggplot2::annotate()      masks NLP::annotate()
## ✕ lubridate::as.difftime() masks base::as.difftime()
## ✕ readr::col_factor()      masks scales::col_factor()
## ✕ lubridate::date()        masks base::date()
## ✕ purrr::discard()         masks scales::discard()
## ✕ dplyr::filter()          masks stats::filter()
## ✕ lubridate::intersect()   masks base::intersect()
## ✕ dplyr::lag()             masks stats::lag()
## ✕ lubridate::setdiff()     masks base::setdiff()
## ✕ lubridate::union()       masks base::union()
```

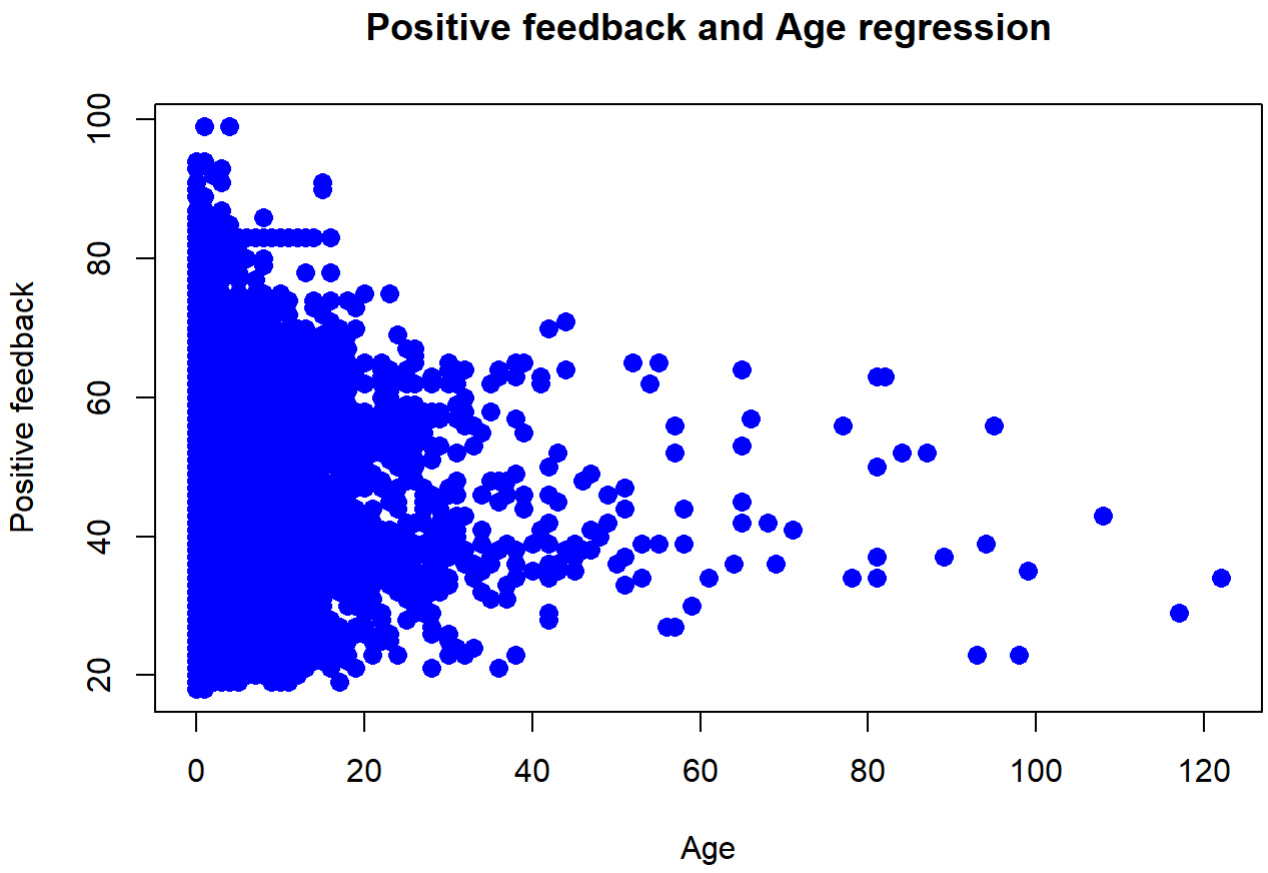
```
library(caTools)

# Modelling techniques: Linear Regression Analysis

linear= lm(formula = txt_dt$Positive.Feedback.Count ~ txt_dt$Age,
           data = txt_dt)
summary(linear)
```

```
##
## Call:
## lm(formula = txt_dt$Positive.Feedback.Count ~ txt_dt$Age, data = txt_dt)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
##  -3.552  -2.452  -1.832   0.128 119.648
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 1.671780   0.135960  12.296  < 2e-16 ***
## txt_dt$Age  0.020004   0.003027   6.608 3.99e-11 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 5.697 on 23484 degrees of freedom
## Multiple R-squared:  0.001856,   Adjusted R-squared:  0.001813
## F-statistic: 43.66 on 1 and 23484 DF,  p-value: 3.986e-11
```

```
coef(linear)
```

```
## (Intercept)  txt_dt$Age
##  1.67178019  0.02000429
```

```
plot(txt_dt$Positive.Feedback.Count, txt_dt$Age,col = "blue",main = "Positive feedback and Age r
egression",
    abline(lm(txt_dt$Positive.Feedback.Count ~ txt_dt$Age)),cex = 1.3,pch = 16,xlab = "Age",ylab
= "Positive feedback")
```


Positive feedback and Age regression
Positive feedback
20
40
60
80
100
0
20
40
60
80
100
120
Age