title: "Análise de Sentimentos do Twitter"

author: "Pedro Schneider"

date: "24 de novembro de 2017"

output:

word_document: default

Introdução

Este é um trabalho de análise de rede social - Twitter. A idéia foi gerar algumas informações de análise de sentimentos. Foram utilzados como termos de busca no Twitter, marcas esportivas relacionada ao esporte Tênis (um dos hobbies do autor). Primeiramente foi gerado uma visualiação através do formato wordcloud e em seguida atribuído scores positivos e negativos as tweets para uma classificação e comparação entre as marcas.

Pacotes e Autenticação

OBS: as credenciais tem que ser inseridas conforme credenciais individuais de cada usuário.

```
# Instalando e Carregando o Pacote twitteR

#install.packages("twitteR")
#install.packages("httr")
#install.packages("devtools")
library(twitteR)
library(httr)
library(devtools)

## Warning: package 'devtools' was built under R version 3.4.2

# Criando autenticação no Twitter, inserir autenticação propria de conta

api_key <- "inserir key aqui"
api_secret <- "inserir secret aqui"
access_token <- "inserir token aqui"
access_token_secret <- "inserir token_secret aqui"

Autenticando no Twitter
setup_twitter_oauth(api_key, api_secret, access_token,
access_token_secret)

## [1] "Using direct authentication"
```

Capturando os tweets e efetuando limpezas

```
wilson_tweets = searchTwitter("Wilson Tennis", n = 500, lang = "en")
```

```
## Warning in doRppAPICall("search/tweets", n, params = params,
## retryOnRateLimit = retryOnRateLimit, : 500 tweets were requested but
the
## API can only return 175

nike_tweets = searchTwitter("NikeCourt", n = 500, lang = "en")
head_tweets = searchTwitter("Head Tennis", n = 500, lang = "en")
babolat_tweets = searchTwitter("Babolat", n = 500, lang = "en")

# Visualizando as primeiras linhas do objeto tweets
head(wilson_tweets)

## [[1]]
## [1] "ozbargain: Tom Gibson: Wilson Jumbo Ball $4.69 @ Tennis Only
https://t.co/rlBAChClcY"
##
## [[2]]
## [1] "ActuTennis365: #Tennis raquette de tennis wilson
https://t.co/tgtagvVBv5"
##
## [[3]]
## [1] "hallie_huynh: RT @HowsYourWife: Hey look at me guys I m Maritza
Thanh Truc Le. Lmaoaoaoao bro I miss tennis WOW omg one tree hill and
Russell Wilson. So "
##
## [[4]]
## [1] "Lilayyyyy_n: RT @HowsYourWife: Hey look at me guys I m Maritza
Thanh Truc Le. Lmaoaoaoao bro I miss tennis WOW omg one tree hill and
Russell Wilson. So "
##
## [[5]]
## [1] "HowsYourWife: Hey look at me guys I m Maritza Thanh Truc Le.
Lmaoaoaoao bro I miss tennis WOW omg one tree hill and Russell Wilso
https://t.co/YIjVkmv29p"
##
## [[6]]
## [1] "ActuTennis365: #Tennis RAQUETTE DE TENNIS WILSON PRO STAFF LS
https://t.co/vFhXUGsfok"

head(nike_tweets)

## [[1]]
## [1] "kamilkteam: Some shots from yesterday
<ed><U+00A0><U+00BD><ed><U+00B8><U+009C> #Tennis @WilsonTennis @Nikecourt
https://t.co/gJA8brCX49"
##
## [[2]]
## [1] "AhmetTuran53: RT @Safran1520: @CaroGarcia @Nikecourt @yonex_com
@lyonaeroports Happy birthday
<ed><U+00A0><U+00BC><ed><U+00BE><U+008A><ed><U+00A0><U+00BC><ed><U+00BE><
U+0081><ed><U+00A0><U+00BC><ed><U+00BE><U+0088><ed><U+00A0><U+00BC><ed><U
```

```
+00BE><U+0089><ed><U+00A0><U+00BC><ed><U+00BE><U+00BE><ed><U+00A0><U+00BC
><ed><U+00BE><U+00BE><ed><U+00A0><U+00BC><ed><U+00BE><U+00BE>
https://t.co/ohTWHEYj70"
##
## [[3]]
## [1] "jana_rezacova: RT @TennisConnected: Shop the #NikeCourt looks for
#Dimitrov &amp; #JackSock at the ATP Finals this week. LINK to shop -&gt;
https://t.co/1gFRcvsh "
##
## [[4]]
## [1] "highleveltennis: @tony_9u @WilsonTennis @WilsonSportingG
@TennisAcademy01 @usta @Nikecourt nice follow through!"
##
## [[5]]
## [1] "TennisConnected: Shop the #NikeCourt looks for #Dimitrov &amp;
#JackSock at the ATP Finals this week. LINK to shop -&gt;
https://t.co/BmXMG4sVEs"
##
## [[6]]
## [1] "jadrankacorvila: RT @JJlovesTennis: .@MariaSharapova s stunning
Riccardo Tisci-designed @Nikecourt US Open dress has been voted the WTA s
2017 Fashion Favor "
```

`head`(head_tweets)

```
## [[1]]
## [1] "oraeekene: RT @eyooekpo: A great story of how dreams are made and
realised...In primary school, I had a table tennis board rental business,
in Law Sch "
##
## [[2]]
## [1] "CaerphillyLTC: #CTC members, don t forget that you can sign up to
British Tennis Membership (BTM) for free! Just head to
https://t.co/PhtQEoAhrs"
##
## [[3]]
## [1] "TmjNycHealthWlf: Join the Berkeley College team! See our latest
#job opening here: https://t.co/chHEqW4uOa #HealthWelfare #NewYork, NY
#Hiring #CareerArc"
##
## [[4]]
## [1] "Pfagell: Quiet the voice in your head that fears rejection &amp;
derive joy from your passions; reframe nerves as excitement &amp; m
https://t.co/bhWoAdmxT1"
##
## [[5]]
## [1] "ramahr: Howard Head s innovative sporting goods revolutionize
skiing and tennis for amateurs and pros alike  https://t.co/B8EXNES2Xn"
##
## [[6]]
```

```
## [1] "itsmeraja619: RT @ForumVijayaMall: Head over to @ForumVijayaMall
to witness Table Tennis Super League 2017, an exclusive #TableTennis
league between 8 te "
```

```r
head(babolat_tweets)
```

```
## [[1]]
## [1] "Agent_Bonexxx: @embodo_glycel Babolat"
##
## [[2]]
## [1] "pinkyvirtudazo: The babolat team with coach Rosalie Duenas
Tumbagahan and the official photo bomber Jun France!
<ed><U+00A0><U+00BD><ed><U+00B8><U+0081><ed><U+00A0><U+00BD><ed><U+00B8><
U+0081><ed><U+00A0><U+00BD><ed><U+00B8><U+0081>"
##
## [[3]]
## [1] "TrillBotTrillin: Mia is complaining that my bank texts me when
they buy your brother Babolat underwear."
##
## [[4]]
## [1] "BabolatSouthMia: Group from Argentina at the demo day in North
Miami Beach.#Babolat #Pure Aero https://t.co/pRorVnlnOr"
##
## [[5]]
## [1] "Stringjob: Babolat Pure Aero Babolat RPM Blast 18 (57lbs)"
##
## [[6]]
## [1] "Stringjob: Babolat Pure Aero Babolat RPM Blast 18 (53lbs)"
```

```r
# Instalando o pacote para Text Mining.

#install.packages("tm")
#install.packages("SnowballC")
library(SnowballC)
library(tm)
```

```
## Warning: package 'tm' was built under R version 3.4.2
```

```
## Loading required package: NLP
```

```
##
## Attaching package: 'NLP'
```

```
## The following object is masked from 'package:httr':
##
##     content
```

```r
# Tratamento (limpeza, organização e transformação) dos dados coletados

wilson_tweetlist <- sapply(wilson_tweets, function(x) x$getText())
wilson_tweetcorpus <- Corpus(VectorSource(wilson_tweetlist))
toSpace <- content_transformer(function(x, pattern) gsub(pattern, " ",
```

```r
x))
wilson_tweetcorpus <- tm_map(wilson_tweetcorpus, toSpace, "/")
wilson_tweetcorpus <- tm_map(wilson_tweetcorpus, toSpace, "@")
wilson_tweetcorpus <- tm_map(wilson_tweetcorpus, toSpace, "\\|")
wilson_tweetcorpus <- tm_map(wilson_tweetcorpus, toSpace, "/|@|\\|")
wilson_tweetcorpus <- tm_map(wilson_tweetcorpus, removeNumbers)
wilson_tweetcorpus <- tm_map(wilson_tweetcorpus, removePunctuation)
wilson_tweetcorpus <- tm_map(wilson_tweetcorpus, toSpace, "\n")
wilson_tweetcorpus <- tm_map(wilson_tweetcorpus,
function(x)removeWords(x, stopwords("english")))
wilson_tweetcorpus <- tm_map(wilson_tweetcorpus, removeWords,
c("https","tco"))
wilson_tweetcorpus <- tm_map(wilson_tweetcorpus, stripWhitespace)
#wilson_tweetcorpus <- sapply(wilson_tweetcorpus,function(row) iconv(row,
"latin1", "ASCII", sub=""))
wilson_tweetcorpus <- tm_map(wilson_tweetcorpus,
content_transformer(tolower))

nike_tweetlist <- sapply(nike_tweets, function(x) x$getText())
nike_tweetcorpus <- Corpus(VectorSource(nike_tweetlist))
toSpace <- content_transformer(function(x, pattern) gsub(pattern, " ",
x))
nike_tweetcorpus <- tm_map(nike_tweetcorpus, toSpace, "/")
nike_tweetcorpus <- tm_map(nike_tweetcorpus, toSpace, "@")
nike_tweetcorpus <- tm_map(nike_tweetcorpus, toSpace, "\\|")
nike_tweetcorpus <- tm_map(nike_tweetcorpus, toSpace, "/|@|\\|")
nike_tweetcorpus <- tm_map(nike_tweetcorpus, removeNumbers)
nike_tweetcorpus <- tm_map(nike_tweetcorpus, removePunctuation)
nike_tweetcorpus <- tm_map(nike_tweetcorpus, toSpace, "\n")
nike_tweetcorpus <- tm_map(nike_tweetcorpus, function(x)removeWords(x,
stopwords("portuguese")))
nike_tweetcorpus <- tm_map(nike_tweetcorpus, removeWords,
c("https","tco"))
nike_tweetcorpus <- tm_map(nike_tweetcorpus, stripWhitespace)
nike_tweetcorpus <- sapply(nike_tweetcorpus,function(row) iconv(row,
"latin1", "ASCII", sub=""))
#nike_tweetcorpus <- tm_map(nike_tweetcorpus,
content_transformer(tolower))

head_tweetlist <- sapply(head_tweets, function(x) x$getText())
head_tweetcorpus <- Corpus(VectorSource(head_tweetlist))
toSpace <- content_transformer(function(x, pattern) gsub(pattern, " ",
x))
head_tweetcorpus <- tm_map(head_tweetcorpus, toSpace, "/")
head_tweetcorpus <- tm_map(head_tweetcorpus, toSpace, "@")
head_tweetcorpus <- tm_map(head_tweetcorpus, toSpace, "\\|")
head_tweetcorpus <- tm_map(head_tweetcorpus, toSpace, "/|@|\\|")
head_tweetcorpus <- tm_map(head_tweetcorpus, removeNumbers)
head_tweetcorpus <- tm_map(head_tweetcorpus, removePunctuation)
head_tweetcorpus <- tm_map(head_tweetcorpus, toSpace, "\n")
```

```
head_tweetcorpus <- tm_map(head_tweetcorpus, function(x)removeWords(x,
stopwords("portuguese")))
head_tweetcorpus <- tm_map(head_tweetcorpus, removeWords,
c("https","tco"))
head_tweetcorpus <- tm_map(head_tweetcorpus, stripWhitespace)
head_tweetcorpus <- sapply(head_tweetcorpus,function(row) iconv(row,
"latin1", "ASCII", sub=""))
#head_tweetcorpus <- tm_map(head_tweetcorpus,
content_transformer(tolower))

babolat_tweetlist <- sapply(babolat_tweets, function(x) x$getText())
babolat_tweetcorpus <- Corpus(VectorSource(babolat_tweetlist))
toSpace <- content_transformer(function(x, pattern) gsub(pattern, " ",
x))
babolat_tweetcorpus <- tm_map(babolat_tweetcorpus, toSpace, "/")
babolat_tweetcorpus <- tm_map(babolat_tweetcorpus, toSpace, "@")
babolat_tweetcorpus <- tm_map(babolat_tweetcorpus, toSpace, "\\|")
babolat_tweetcorpus <- tm_map(babolat_tweetcorpus, toSpace, "/|@|\\|")
babolat_tweetcorpus <- tm_map(babolat_tweetcorpus, removeNumbers)
babolat_tweetcorpus <- tm_map(babolat_tweetcorpus, removePunctuation)
babolat_tweetcorpus <- tm_map(babolat_tweetcorpus, toSpace, "\n")
babolat_tweetcorpus <- tm_map(babolat_tweetcorpus,
function(x)removeWords(x, stopwords("portuguese")))
babolat_tweetcorpus <- tm_map(babolat_tweetcorpus, removeWords,
c("https","tco"))
babolat_tweetcorpus <- tm_map(babolat_tweetcorpus, stripWhitespace)
babolat_tweetcorpus <- sapply(babolat_tweetcorpus,function(row)
iconv(row, "latin1", "ASCII", sub=""))
#babolat_tweetcorpus <- tm_map(babolat_tweetcorpus,
content_transformer(tolower))
```

Visualizando com o WordCloud

```
# Instalando o pacote wordcloud

#install.packages("RColorBrewer")
#install.packages("wordcloud")
library(RColorBrewer)
library(wordcloud)

## Warning: package 'wordcloud' was built under R version 3.4.2

# Gerando uma nuvem palavras
pal2 <- brewer.pal(8,"Dark2")
wordcloud(wilson_tweetcorpus,
        min.freq = 2,
        scale = c(5,1),
        random.color = F,
        max.word = 60,
        random.order = F,
        colors = pal2)
```

```
pal2 <- brewer.pal(8,"Dark2")
wordcloud(nike_tweetcorpus,
          min.freq = 2,
          scale = c(5,1),
          random.color = F,
          max.word = 60,
          random.order = F,
          colors = pal2)
```

```
## Warning in wordcloud(nike_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : mariasharapovas could not be fit on page. It will
not
## be plotted.

## Warning in wordcloud(nike_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : tiscidesigned could not be fit on page. It will
not be
## plotted.

## Warning in wordcloud(nike_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : rogerfederer could not be fit on page. It will not
be
## plotted.

## Warning in wordcloud(nike_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : atpworldtour could not be fit on page. It will not
be
## plotted.
```

```
## Warning in wordcloud(nike_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : serenawilliams could not be fit on page. It will
not be
## plotted.

## Warning in wordcloud(nike_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : nittoatpfinals could not be fit on page. It will
not be
## plotted.

## Warning in wordcloud(nike_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : dimitrov could not be fit on page. It will not be
## plotted.

## Warning in wordcloud(nike_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : mariasharapova could not be fit on page. It will
not be
## plotted.

## Warning in wordcloud(nike_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : failure could not be fit on page. It will not be
## plotted.

## Warning in wordcloud(nike_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : feedthebeast could not be fit on page. It will not
be
## plotted.

## Warning in wordcloud(nike_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : opportunity could not be fit on page. It will not
be
## plotted.

## Warning in wordcloud(nike_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : jugartenis could not be fit on page. It will not
be
## plotted.
```

```
pal2 <- brewer.pal(8,"Dark2")
wordcloud(head_tweetcorpus,
          min.freq = 2,
          scale = c(5,1),
          random.color = F,
          max.word = 60,
          random.order = F,
          colors = pal2)

## Warning in wordcloud(head_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : headtennis could not be fit on page. It will not
be
## plotted.

## Warning in wordcloud(head_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : tennisexpress could not be fit on page. It will
not be
## plotted.

## Warning in wordcloud(head_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : qualify could not be fit on page. It will not be
## plotted.

## Warning in wordcloud(head_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : dfcxlgk could not be fit on page. It will not be
## plotted.
```

```
## Warning in wordcloud(head_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : tennis could not be fit on page. It will not be
## plotted.

## Warning in wordcloud(head_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : sloanestephens could not be fit on page. It will
not be
## plotted.

## Warning in wordcloud(head_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : xohnxcxppo could not be fit on page. It will not
be
## plotted.

## Warning in wordcloud(head_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : business could not be fit on page. It will not be
## plotted.

## Warning in wordcloud(head_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : dreams could not be fit on page. It will not be
## plotted.

## Warning in wordcloud(head_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : primary could not be fit on page. It will not be
## plotted.

## Warning in wordcloud(head_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : realisedin could not be fit on page. It will not
be
## plotted.

## Warning in wordcloud(head_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : school could not be fit on page. It will not be
## plotted.

## Warning in wordcloud(head_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : kskupski could not be fit on page. It will not be
## plotted.

## Warning in wordcloud(head_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : anywhere could not be fit on page. It will not be
## plotted.

## Warning in wordcloud(head_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : watching could not be fit on page. It will not be
## plotted.

## Warning in wordcloud(head_tweetcorpus, min.freq = 2, scale = c(5, 1),
## random.color = F, : liverpooltc could not be fit on page. It will not
be
## plotted.
```

```
pal2 <- brewer.pal(8,"Dark2")
wordcloud(babolat_tweetcorpus,
          min.freq = 2,
          scale = c(5,1),
          random.color = F,
          max.word = 60,
          random.order = F,
          colors = pal2)
```

Análise de Sentimento

```r
# Criando uma função para avaliar o sentimento
#install.packages("stringr")
#install.packages("plyr")
library(stringr)
```

```
## Warning: package 'stringr' was built under R version 3.4.2
```

```r
library(plyr)
```

```
## Warning: package 'plyr' was built under R version 3.4.2
```

```
##
## Attaching package: 'plyr'
```

```
## The following object is masked from 'package:twitteR':
##
##     id
```

```r
sentimento.score = function(sentences, pos.words, neg.words, .progress =
'none')
{

  # Criando um array de scores com lapply
  scores = laply(sentences,
                 function(sentence, pos.words, neg.words)
                 {
                   sentence = gsub("[[:punct:]]", "", sentence)
```

```r
                    sentence = gsub("[[:cntrl:]]", "", sentence)
                    sentence =gsub('\\d+', '', sentence)
                    tryTolower = function(x)
                    {
                      y = NA
                      try_error = tryCatch(tolower(x), error=function(e)
e)
                      if (!inherits(try_error, "error"))
                        y = tolower(x)
                      return(y)
                    }

                    sentence = sapply(sentence, tryTolower)
                    word.list = str_split(sentence, "\\s+")
                    words = unlist(word.list)
                    pos.matches = match(words, pos.words)
                    neg.matches = match(words, neg.words)
                    pos.matches = !is.na(pos.matches)
                    neg.matches = !is.na(neg.matches)
                    score = sum(pos.matches) - sum(neg.matches)
                    return(score)
                  }, pos.words, neg.words, .progress = .progress )

  scores.df = data.frame(text = sentences, score = scores)
  return(scores.df)
}

# Mapeando as palavras positivas e negativas

pos = readLines("palavras_positivas.txt")
neg = readLines("palavras_negativas.txt")


# Obtendo texto
wilson_txt = sapply(wilson_tweets, function(x) x$getText())
nike_txt = sapply(nike_tweets, function(x) x$getText())
head_txt = sapply(head_tweets, function(x) x$getText())
babolat_txt = sapply(babolat_tweets, function(x) x$getText())

# Vetor de tweets das marcas
nd = c(length(wilson_txt), length(nike_txt), length(head_txt),
length(babolat_txt))


# Juntando os textos
marcas = c(wilson_txt, nike_txt, head_txt, babolat_txt)

# Aplicando função para calcular o score de sentimento
scores = sentimento.score(marcas, pos, neg, .progress = 'text')
```

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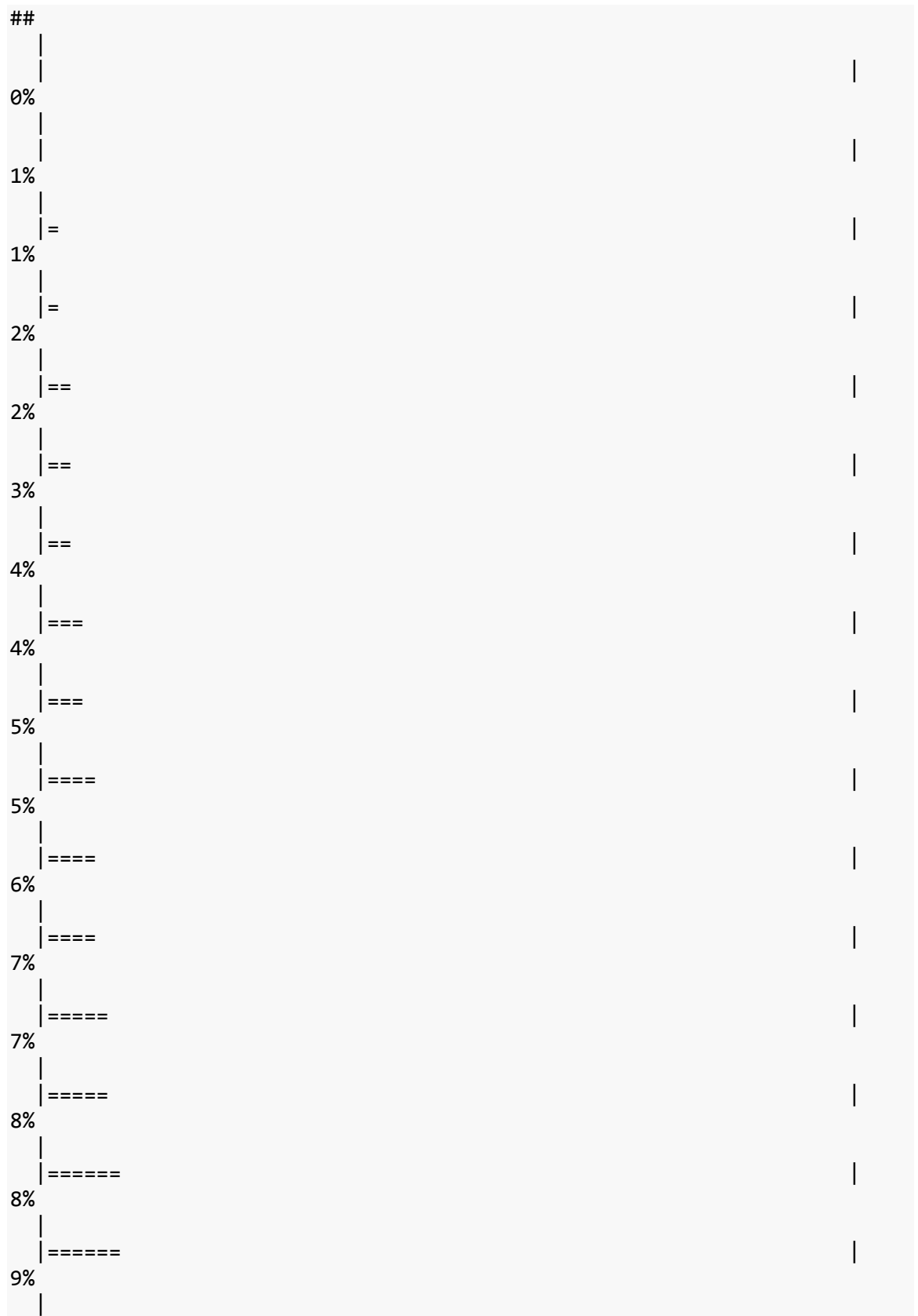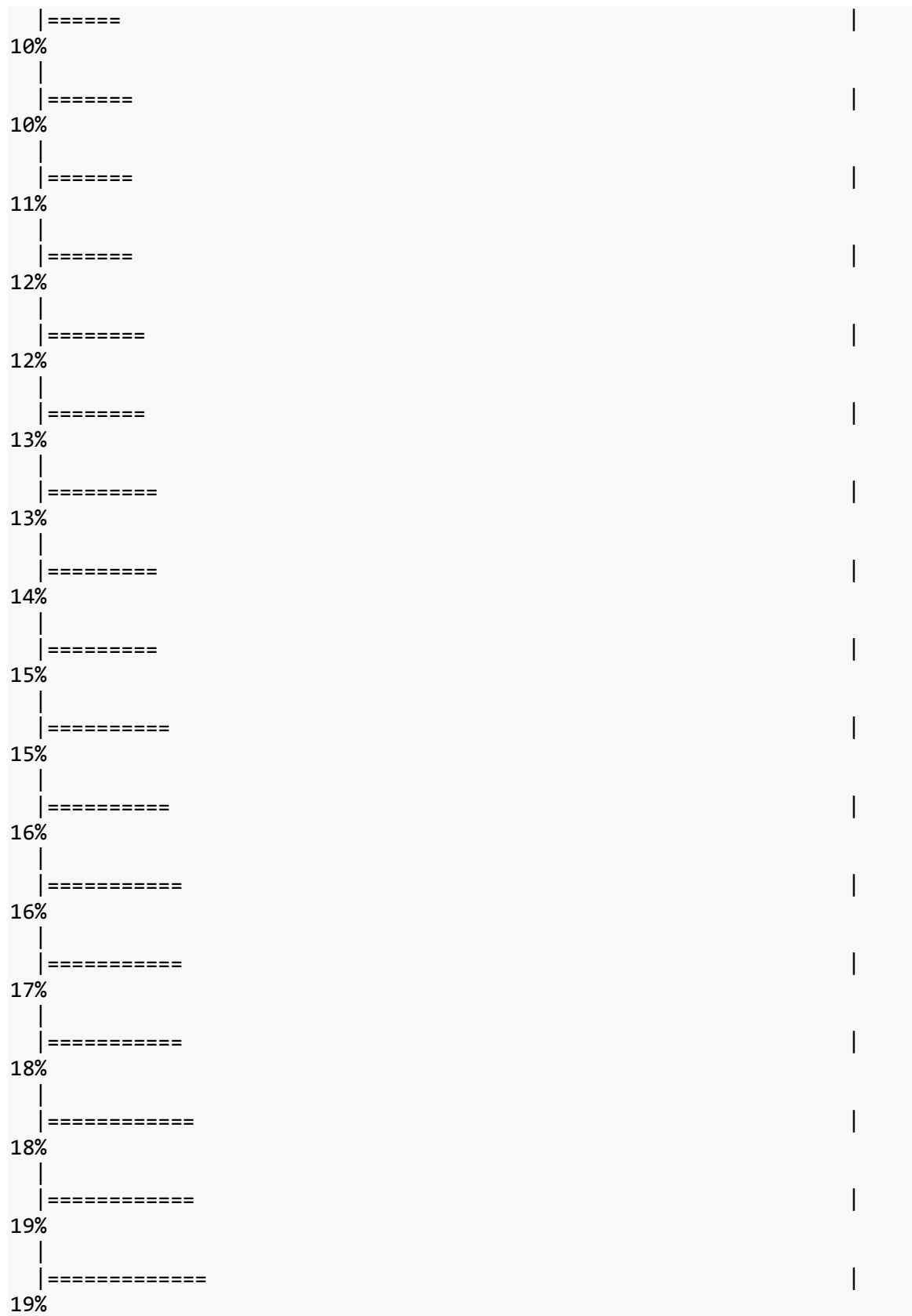
```
    |
    |============                                                    |
20%
    |
    |============                                                    |
21%
    |
    |============                                                    |
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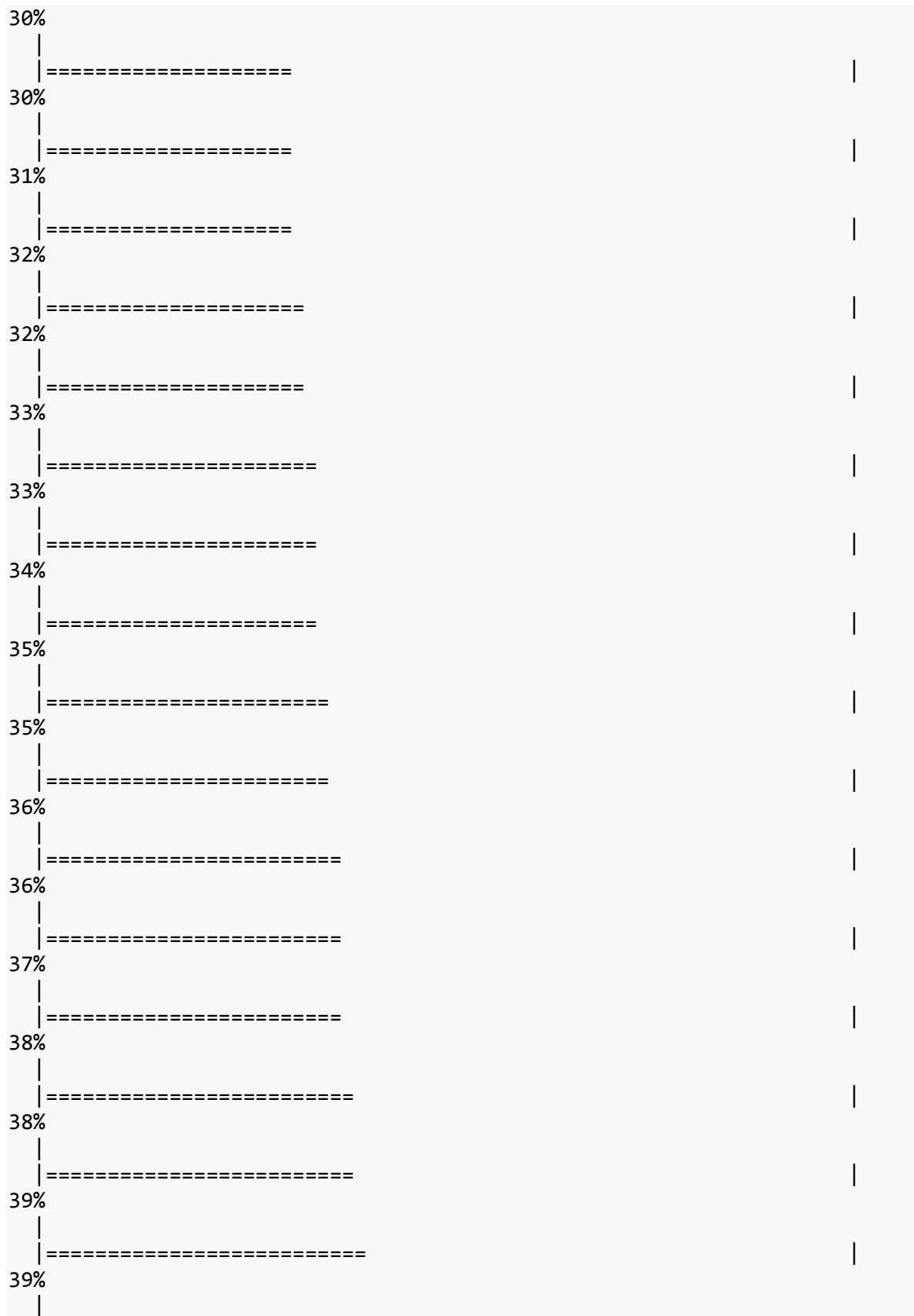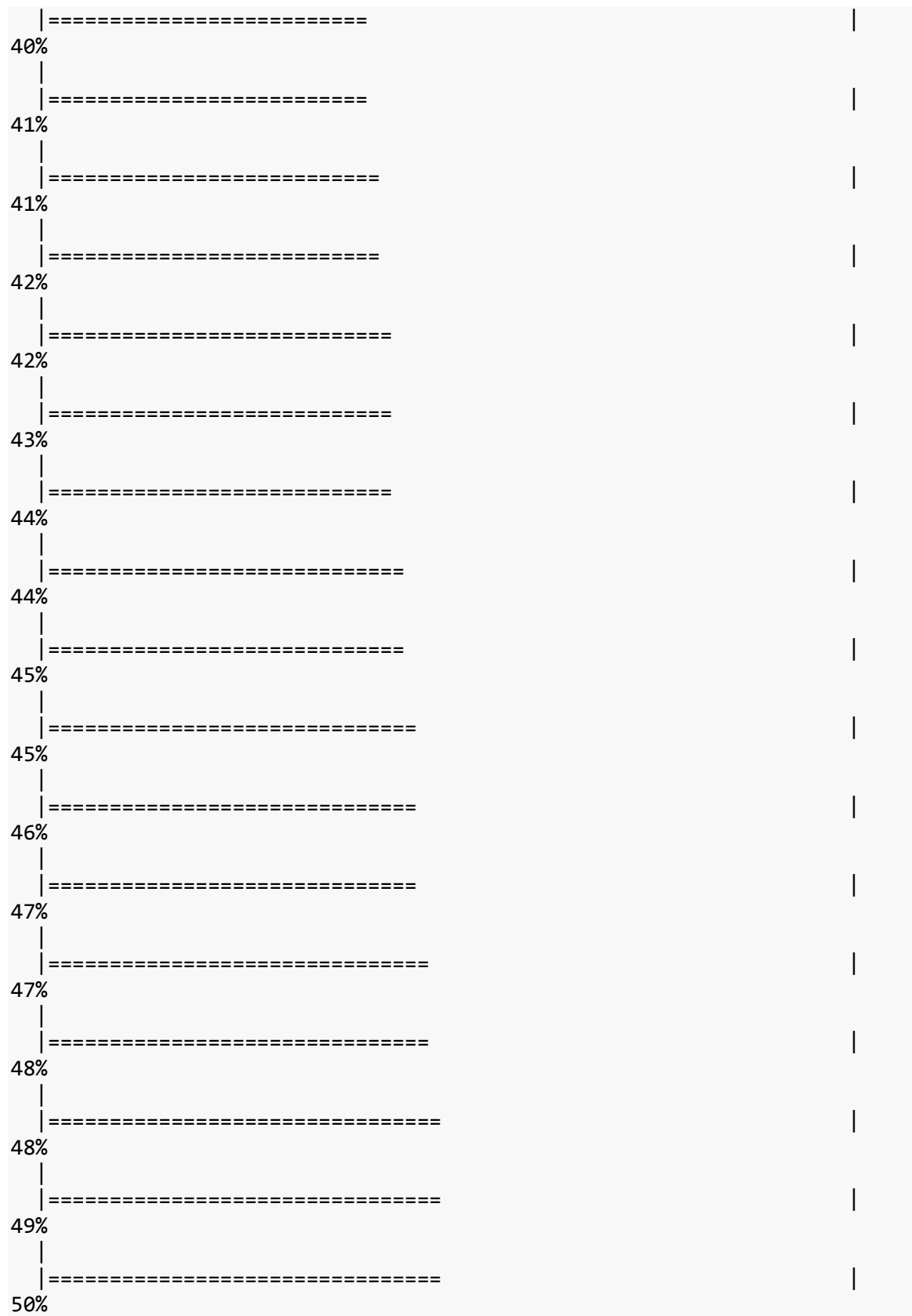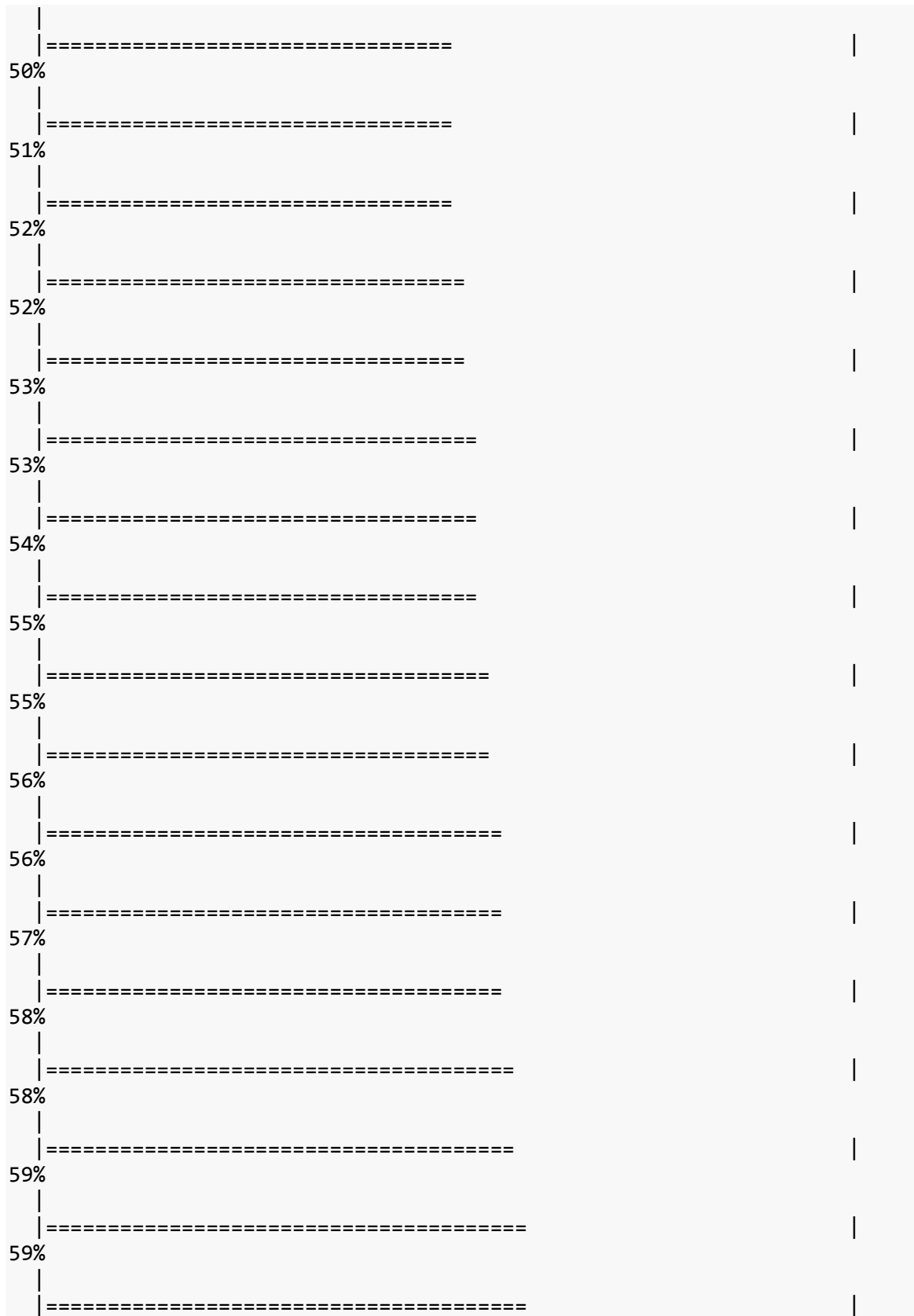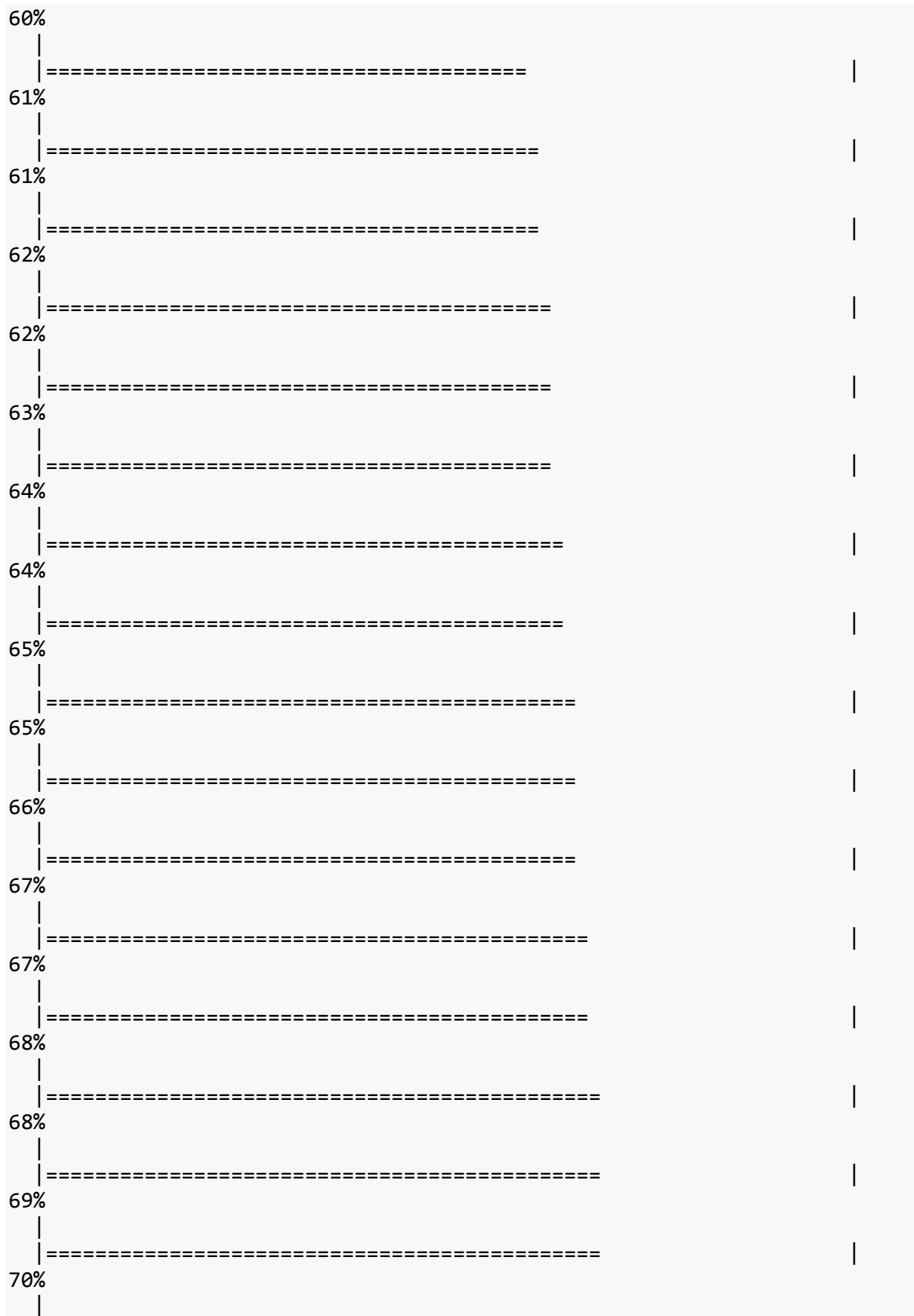
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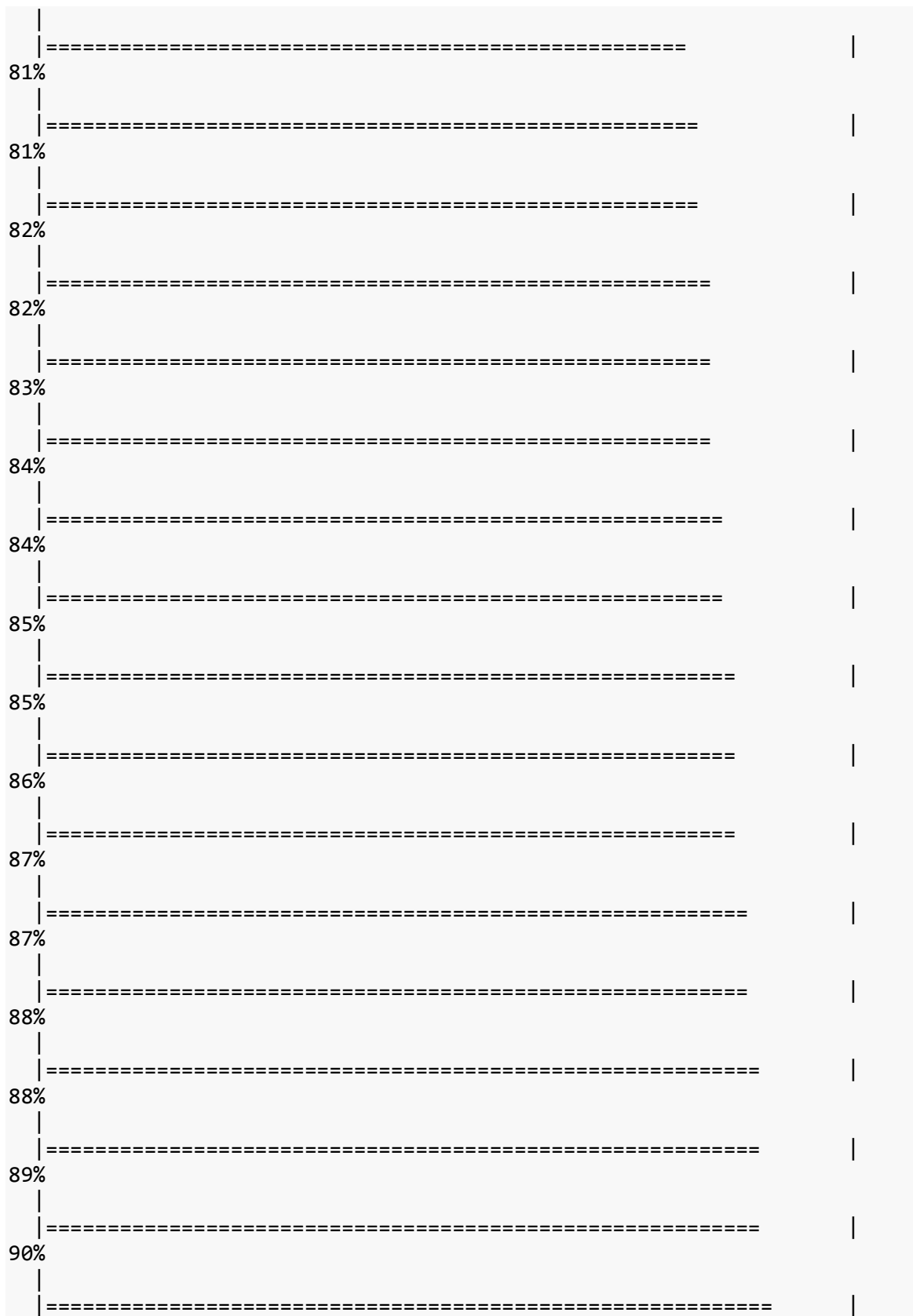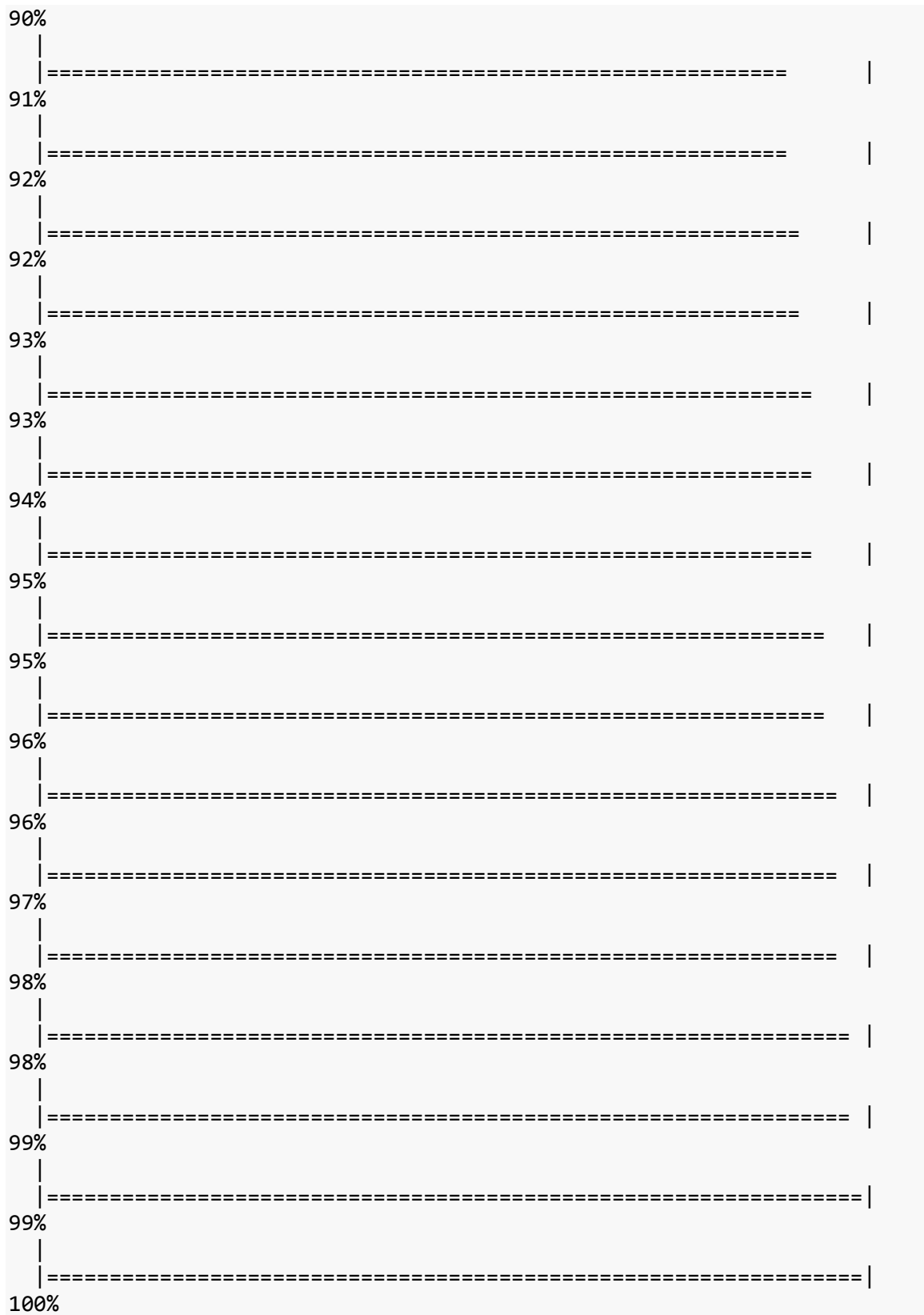
```r
# Calculando o score por marca

scores$marca = factor(rep(c("wilson", "nike", "head", "babolat"), nd))
scores$muito.pos = as.numeric(scores$score >= 2)
scores$muito.neg = as.numeric(scores$score <= -2)

# Calculando o total
numpos = sum(scores$muito.pos)
numneg = sum(scores$muito.neg)

# Score global
global_score = round( 100 * numpos / (numpos + numneg) )
#head(scores)
```

Visualizaçoes dos Scores de Sentimentos

```r
# colors
cols = c("#7CAE00", "#00BFC4", "#F8766D", "#C77CFF")
names(cols) = c("wilson", "nike", "head", "babolat")

# boxplot
#install.packages("ggplot2")
library(ggplot2)

##
## Attaching package: 'ggplot2'

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

ggplot(scores, aes(x=marca, y=score, group=marca)) +
  geom_boxplot(aes(fill=marca)) +
  scale_fill_manual(values=cols) +
  geom_jitter(colour="gray40",
              position=position_jitter(width=0.2), alpha=0.3)
```
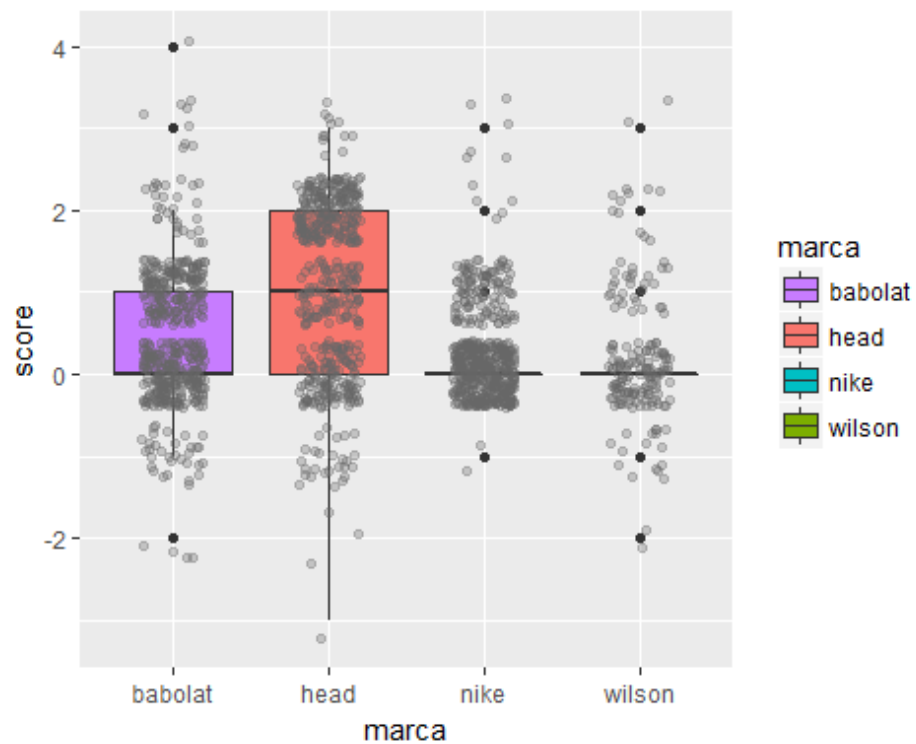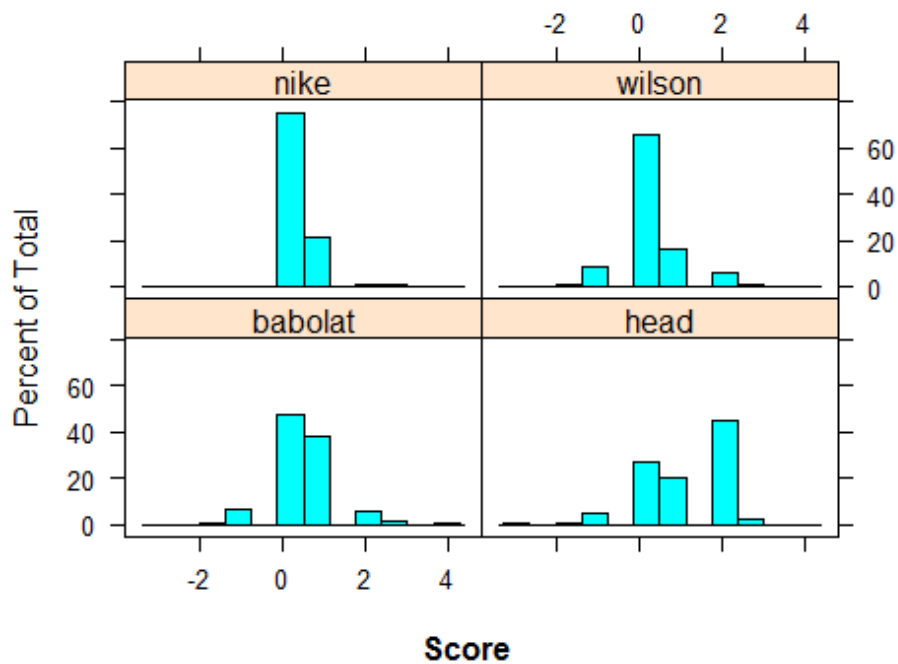
```
#opts(title = "Boxplot - Marcas Sentiment Scores")

# Gerando um histograma com o lattice
#install.packages("lattice")
library(lattice)

## Warning: package 'lattice' was built under R version 3.4.2

histogram(data = scores, ~score|marca, main = "Análise de Sentimentos",
xlab = "", sub = "Score")
```

Análise de Sentimentos


```r
# barplot of average score
meanscore = tapply(scores$score, scores$marca, mean)
df = data.frame(marca=names(meanscore), meanscore=meanscore)
df$marcas <- reorder(df$marca, df$meanscore)

f <- ggplot(df, aes(df$marca, df$meanscore))
f + geom_bar(stat= "identity",aes(color=marca,fill=marca))
```