

R Notebook

Code ▾

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```
# Required
install.packages("doParallel")
```

```
trying URL 'https://cran.rstudio.com/bin/macosx/el-capitan/contrib/3.6/doParallel_1.0.1
5.tgz'
Content type 'application/x-gzip' length 196281 bytes (191 KB)
=====
downloaded 191 KB
```

The downloaded binary packages are in
/var/folders/hm/2md7sccd0479bw81zsh0yyq80000gn/T//RtmptjktGz/downloaded_packages

Hide

```
library(doParallel)
```

```
Loading required package: foreach
Loading required package: iterators
Loading required package: parallel
```

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```
# Find how many cores are on your machine
detectCores() # Result = Typically 4 to 6
```

```
[1] 4
```

Hide

```
# Create Cluster with desired number of cores. Don't use them all! Your computer is runn
ing other processes.
cl <- makeCluster(2)

# Register Cluster
registerDoParallel(cl)

# Confirm how many cores are now "assigned" to R and RStudio
getDoParWorkers() # Result 2
```

```
[1] 2
```

Hide

```
# Stop Cluster. After performing your tasks, stop your cluster.  
stopCluster(cl)
```

Hide

```
install.packages("caret")
```

```
trying URL 'https://cran.rstudio.com/bin/macosx/el-capitan/contrib/3.6/caret_6.0-85.tgz'  
Content type 'application/x-gzip' length 6264988 bytes (6.0 MB)  
=====  
downloaded 6.0 MB
```

```
The downloaded binary packages are in  
  /var/folders/hm/2md7sccd0479bw81zsh0yyq80000gn/T//RtmptjktGz/downloaded_packages
```

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```
install.packages("plotly")
```

```
trying URL 'https://cran.rstudio.com/bin/macosx/el-capitan/contrib/3.6/plotly_4.9.2.tgz'  
Content type 'application/x-gzip' length 2987045 bytes (2.8 MB)  
=====  
downloaded 2.8 MB
```

```
The downloaded binary packages are in  
  /var/folders/hm/2md7sccd0479bw81zsh0yyq80000gn/T//RtmptjktGz/downloaded_packages
```

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```
library(caret)
```

```
Loading required package: lattice  
Loading required package: ggplot2  
Registered S3 method overwritten by 'dplyr':  
  method      from  
  print.rowwise_df  
Registered S3 method overwritten by 'data.table':  
  method      from  
  print.data.table
```

Hide

```
library(plotly)
```

Registered S3 method overwritten by 'htmlwidgets':

```
method      from  
print.htmlwidget tools:rstudio
```

Attaching package: 'plotly'

The following object is masked from 'package:ggplot2':

```
last_plot
```

The following object is masked from 'package:stats':

```
filter
```

The following object is masked from 'package:graphics':

```
layout
```

Hide

```
largeMatrix <- read.csv("LargeMatrix.csv")
```

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```
# no nas present  
sum(is.na(largeMatrix))
```

```
[1] 0
```

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```
iphone_smallMatrix <- read.csv("iphone_smallmatrix_labeled_8d.csv")  
samsung_smallMatrix <- read.csv("galaxy_smallmatrix_labeled_9d.csv")
```

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```
names(iphone_smallMatrix)
```

[1]	"iphone"	"samsunggalaxy"	"sonyxperia"	"nokialumina"	"htcphone"
[6]	"ios"	"googleandroid"	"iphonecampos"	"samsungcampos"	"sonycampo
s"					
[11]	"nokiacampos"	"htccampos"	"iphonecamneg"	"samsungcamneg"	"sonycamne
g"					
[16]	"nokiacamneg"	"htccamneg"	"iphonecamunc"	"samsungcamunc"	"sonycamun
c"					
[21]	"nokiacamunc"	"htccamunc"	"iphonedispos"	"samsungdispos"	"sonydispo
s"					
[26]	"nokiadispos"	"htcdispos"	"iphonedisneg"	"samsungdisneg"	"sonydisne
g"					
[31]	"nokiadisneg"	"htcdisneg"	"iphonedisunc"	"samsungdisunc"	"sonydisun
c"					
[36]	"nokiadisunc"	"htcdisunc"	"iphoneperpos"	"samsungperpos"	"sonyperpo
s"					
[41]	"nokiaperpos"	"htcperpos"	"iphoneperneg"	"samsungperneg"	"sonyperne
g"					
[46]	"nokiaperneg"	"htcperneg"	"iphoneperunc"	"samsungperunc"	"sonyperun
c"					
[51]	"nokiaperunc"	"htcperunc"	"iosperpos"	"googleperpos"	"iosperneg"
[56]	"googleperneg"	"iosperunc"	"googleperunc"	"iphonesentiment"	

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```
names(samsung_smallMatrix)
```

[1]	"iphone"	"samsunggalaxy"	"sonyxperia"	"nokialumina"	"htcphone"
[6]	"ios"	"googleandroid"	"iphonecampos"	"samsungcampos"	"sonycampo
s"					
[11]	"nokiacampos"	"htccampos"	"iphonecamneg"	"samsungcamneg"	"sonycamne
g"					
[16]	"nokiacamneg"	"htccamneg"	"iphonecamunc"	"samsungcamunc"	"sonycamun
c"					
[21]	"nokiacamunc"	"htccamunc"	"iphonedispos"	"samsungdispos"	"sonydispo
s"					
[26]	"nokiadispos"	"htcdispos"	"iphonedisneg"	"samsungdisneg"	"sonydisne
g"					
[31]	"nokiadisneg"	"htcdisneg"	"iphonedisunc"	"samsungdisunc"	"sonydisun
c"					
[36]	"nokiadisunc"	"htcdisunc"	"iphoneperpos"	"samsungperpos"	"sonyperpo
s"					
[41]	"nokiaperpos"	"htcperpos"	"iphoneperneg"	"samsungperneg"	"sonyperne
g"					
[46]	"nokiaperneg"	"htcperneg"	"iphoneperunc"	"samsungperunc"	"sonyperun
c"					
[51]	"nokiaperunc"	"htcperunc"	"iosperpos"	"googleperpos"	"iosperneg"
[56]	"googleperneg"	"iosperunc"	"googleperunc"	"galaxysentiment"	

[Hide](#)

```
#summary(iphone_smallMatrix$ios)
str(iphone_smallMatrix)
```

```

'data.frame':  12973 obs. of  59 variables:
 $ iphone      : int  1 1 1 1 1 41 1 1 1 1 ...
 $ samsunggalaxy : int  0 0 0 0 0 0 0 0 0 0 ...
 $ sonyxperia   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokialumina  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htcphone     : int  0 0 0 0 0 0 0 0 0 0 ...
 $ ios          : int  0 0 0 0 0 6 0 0 0 0 ...
 $ googleandroid : int  0 0 0 0 0 0 0 0 0 0 ...
 $ iphonecampos : int  0 0 0 0 0 1 1 0 0 0 ...
 $ samsungcampos : int  0 0 0 0 0 0 0 0 0 0 ...
 $ sonycampos   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokiacampos  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htccampos    : int  0 0 0 0 0 0 0 0 0 0 ...
 $ iphonecamneg : int  0 0 0 0 0 3 1 0 0 0 ...
 $ samsungcamneg : int  0 0 0 0 0 0 0 0 0 0 ...
 $ sonycamneg   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokiacamneg  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htccamneg    : int  0 0 0 0 0 0 0 0 0 0 ...
 $ iphonecamunc : int  0 0 0 0 0 7 1 0 0 0 ...
 $ samsungcamunc : int  0 0 0 0 0 0 0 0 0 0 ...
 $ sonycamunc   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokiacamunc  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htccamunc    : int  0 0 0 0 0 0 0 0 0 0 ...
 $ iphonedispos : int  0 0 0 0 0 1 13 0 0 0 ...
 $ samsungdispos : int  0 0 0 0 0 0 0 0 0 0 ...
 $ sonydispos   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokiadispos  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htcdispos    : int  0 0 0 0 0 0 0 0 0 0 ...
 $ iphonedisneg : int  0 0 0 0 0 3 10 0 0 0 ...
 $ samsungdisneg : int  0 0 0 0 0 0 0 0 0 0 ...
 $ sonydisneg   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokiadisneg  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htcdisneg    : int  0 0 0 0 0 0 0 0 0 0 ...
 $ iphonedisunc : int  0 0 0 0 0 4 9 0 0 0 ...
 $ samsungdisunc : int  0 0 0 0 0 0 0 0 0 0 ...
 $ sonydisunc   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokiadisunc  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htcdisunc    : int  0 0 0 0 0 0 0 0 0 0 ...
 $ iphoneperpos : int  0 1 0 1 1 0 5 3 0 0 ...
 $ samsungperpos : int  0 0 0 0 0 0 0 0 0 0 ...
 $ sonyperpos   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokiaperpos  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htcperpos    : int  0 0 0 0 0 0 0 0 0 0 ...
 $ iphoneperneg : int  0 0 0 0 0 0 4 1 0 0 ...
 $ samsungperneg : int  0 0 0 0 0 0 0 0 0 0 ...
 $ sonyperneg   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokiaperneg  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htcperneg    : int  0 0 0 0 0 0 0 0 0 0 ...
 $ iphoneperunc : int  0 0 0 1 0 0 5 0 0 0 ...
 $ samsungperunc : int  0 0 0 0 0 0 0 0 0 0 ...
 $ sonyperunc   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokiaperunc  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htcperunc    : int  0 0 0 0 0 0 0 0 0 0 ...

```

```
$ iosperpos      : int  0 0 0 0 0 0 0 0 0 0 0 ...  
$ googleperpos   : int  0 0 0 0 0 0 0 0 0 0 0 ...  
$ iosperneg      : int  0 0 0 0 0 0 0 0 0 0 0 ...  
$ googleperneg   : int  0 0 0 0 0 0 0 0 0 0 0 ...  
$ iosperunc      : int  0 0 0 0 0 0 0 0 0 0 0 ...  
$ googleperunc   : int  0 0 0 0 0 0 0 0 0 0 0 ...  
$ iphonesentiment: int  0 0 0 0 0 4 4 0 0 0 ...
```

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```
str(samsung_smallMatrix)
```

```

'data.frame':  12911 obs. of  59 variables:
 $ iphone      : int  1 1 1 0 1 2 1 1 4 1 ...
 $ samsunggalaxy : int  0 0 1 0 0 0 0 0 0 0 ...
 $ sonyxperia   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokialumina  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htcphone     : int  0 0 0 1 0 0 0 0 0 0 ...
 $ ios          : int  0 0 0 0 0 0 0 0 0 0 ...
 $ googleandroid : int  0 0 0 0 0 0 0 0 0 0 ...
 $ iphonecampos : int  0 0 1 0 0 1 0 0 0 0 ...
 $ samsungcampos : int  0 0 1 0 0 0 0 0 0 0 ...
 $ sonycampos   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokiacampos  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htccampos    : int  0 0 0 0 0 0 0 0 0 0 ...
 $ iphonecamneg : int  0 0 0 0 0 0 0 0 0 0 ...
 $ samsungcamneg : int  0 0 0 0 0 0 0 0 0 0 ...
 $ sonycamneg   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokiacamneg  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htccamneg    : int  0 0 0 0 0 0 0 0 0 0 ...
 $ iphonecamunc : int  0 0 0 0 0 0 0 0 0 0 ...
 $ samsungcamunc : int  0 0 0 0 0 0 0 0 0 0 ...
 $ sonycamunc   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokiacamunc  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htccamunc    : int  0 0 0 0 0 0 0 0 0 0 ...
 $ iphonedispos : int  0 1 0 0 0 0 2 0 0 0 ...
 $ samsungdispos : int  0 0 0 0 0 0 0 0 0 0 ...
 $ sonydispos   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokiadispos  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htcdispos    : int  0 0 0 1 0 0 0 0 0 0 ...
 $ iphonedisneg : int  0 1 0 0 0 0 0 0 0 0 ...
 $ samsungdisneg : int  0 0 0 0 0 0 0 0 0 0 ...
 $ sonydisneg   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokiadisneg  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htcdisneg    : int  0 0 0 0 0 0 0 0 0 0 ...
 $ iphonedisunc : int  0 1 0 0 0 0 0 0 0 0 ...
 $ samsungdisunc : int  0 0 0 0 0 0 0 0 0 0 ...
 $ sonydisunc   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokiadisunc  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htcdisunc    : int  0 0 0 1 0 0 0 0 0 0 ...
 $ iphoneperpos : int  0 0 0 0 0 0 0 0 0 0 ...
 $ samsungperpos : int  0 0 0 0 0 0 0 0 0 0 ...
 $ sonyperpos   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokiaperpos  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htcperpos    : int  0 0 0 1 0 0 0 0 0 0 ...
 $ iphoneperneg : int  0 0 0 0 0 0 0 0 0 0 ...
 $ samsungperneg : int  0 0 0 0 0 0 0 0 0 0 ...
 $ sonyperneg   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokiaperneg  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htcperneg    : int  0 0 0 1 0 0 0 0 0 0 ...
 $ iphoneperunc : int  0 0 0 0 0 0 0 0 0 0 ...
 $ samsungperunc : int  0 0 0 0 0 0 0 0 0 0 ...
 $ sonyperunc   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ nokiaperunc  : int  0 0 0 0 0 0 0 0 0 0 ...
 $ htcperunc    : int  0 0 0 1 0 0 0 0 0 0 ...

```



```
$ iosperpos      : int  0 0 0 0 0 0 0 0 0 0 ...
$ googleperpos   : int  0 0 0 0 0 0 0 0 0 0 ...
$ iosperneg      : int  0 0 0 0 0 0 0 0 0 0 ...
$ googleperneg   : int  0 0 0 0 0 0 0 0 0 0 ...
$ iosperunc      : int  0 0 0 0 0 0 0 0 0 0 ...
$ googleperunc   : int  0 0 0 0 0 0 0 0 0 0 ...
$ galaxyssentiment: int  5 3 3 0 1 0 3 5 5 5 ...
```

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```
# no missing values
sum(is.na(iphone_smallMatrix))
```

```
[1] 0
```

[Hide](#)

```
sum(is.na(samsung_smallMatrix))
```

```
[1] 0
```

[Hide](#)

```
# There are no empty columns
colSums(iphone_smallMatrix)
```

	iphone	samsunggalaxy	sonyxpria	nokialumina	htcphone	
ios	27867	923	312	30	1779	
1976						
googleandroid	iphonecampos	samsungcampos	sonycampos	nokiacampos		ht
ccampos	514	3757	697	129	89	
1469						
iphonecamneg	samsungcamneg	sonycamneg	nokiacamneg	htccamneg		iphon
ecamunc	3044	710	30	80	1206	
3289						
samsungcamunc	sonycamunc	nokiacamunc	htccamunc	iphonedispos		samsun
gdispos	243	42	47	611	9304	
819						
sonydispos	nokiadispos	htcdispos	iphonedisneg	samsungdisneg		son
ydisneg	148	129	2051	7894	856	
161						
nokiadisneg	htcdisneg	iphonedisunc	samsungdisunc	sonydisunc		noki
adisunc	103	1509	6550	352	59	
64						
htcdisunc	iphoneperpos	samsungperpos	sonyperpos	nokiaperpos		ht
cperpos	812	7854	803	112	138	
1660						
iphoneperneg	samsungperneg	sonyperneg	nokiaperneg	htcperneg		iphon
eperunc	6313	832	83	133	1562	
3880						
samsungperunc	sonyperunc	nokiaperunc	htcperunc	iosperpos		googl
eperpos	287	30	72	832	768	
500						
iosperneg	googleperneg	iosperunc	googleperunc	iphonesentiment		
	747	755	429	209	48318	

[Hide](#)

```
colSums(samsung_smallMatrix)
```

	iphone	samsunggalaxy	sonyxperia	nokialumina	htcphone	
ios	28525	921	311	30	1775	
1972						
googleandroid	iphonecampos	samsungcampos	sonycampos	nokiacampos	ht	
ccampos	513	3733	693	125	89	
1461						
iphonecamneg	samsungcamneg	sonycamneg	nokiacamneg	htccamneg	iphon	
ecamunc	3027	710	30	80	1202	
3278						
samsungcamunc	sonycamunc	nokiacamunc	htccamunc	iphonedispos	samsun	
gdispos	241	40	47	608	9251	
814						
sonydispos	nokiadispos	htcdispos	iphonedisneg	samsungdisneg	son	
ydisneg	143	129	2039	7849	856	
161						
nokiadisneg	htcdisneg	iphonedisunc	samsungdisunc	sonydisunc	noki	
adisunc	103	1501	6519	351	58	
64						
htcdisunc	iphoneperpos	samsungperpos	sonyperpos	nokiaperpos	ht	
cperpos	810	7786	801	110	138	
1653						
iphoneperneg	samsungperneg	sonyperneg	nokiaperneg	htcperneg	iphon	
eperunc	6269	832	83	133	1559	
3847						
samsungperunc	sonyperunc	nokiaperunc	htcperunc	iosperpos	googl	
eperpos	285	28	72	829	768	
500						
iosperneg	googleperneg	iosperunc	googleperunc	galaxysentiment		
	747	755	429	209	49430	

There are multiple phones in this dataset.

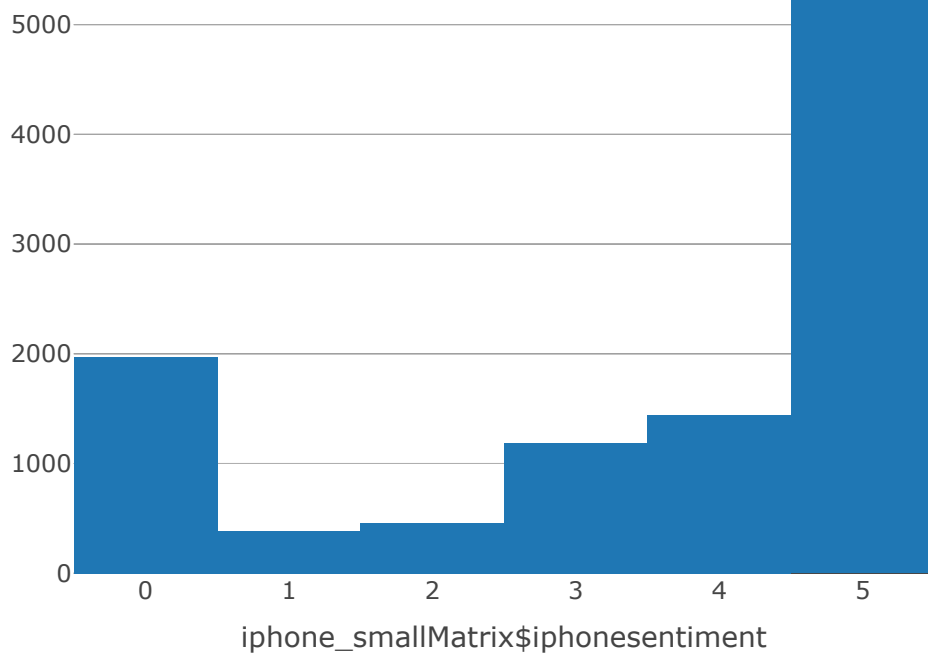
Hide

```
plot_ly(iphone_smallMatrix, x= ~iphone_smallMatrix$iphonesentiment, type='histogram')
```

7000

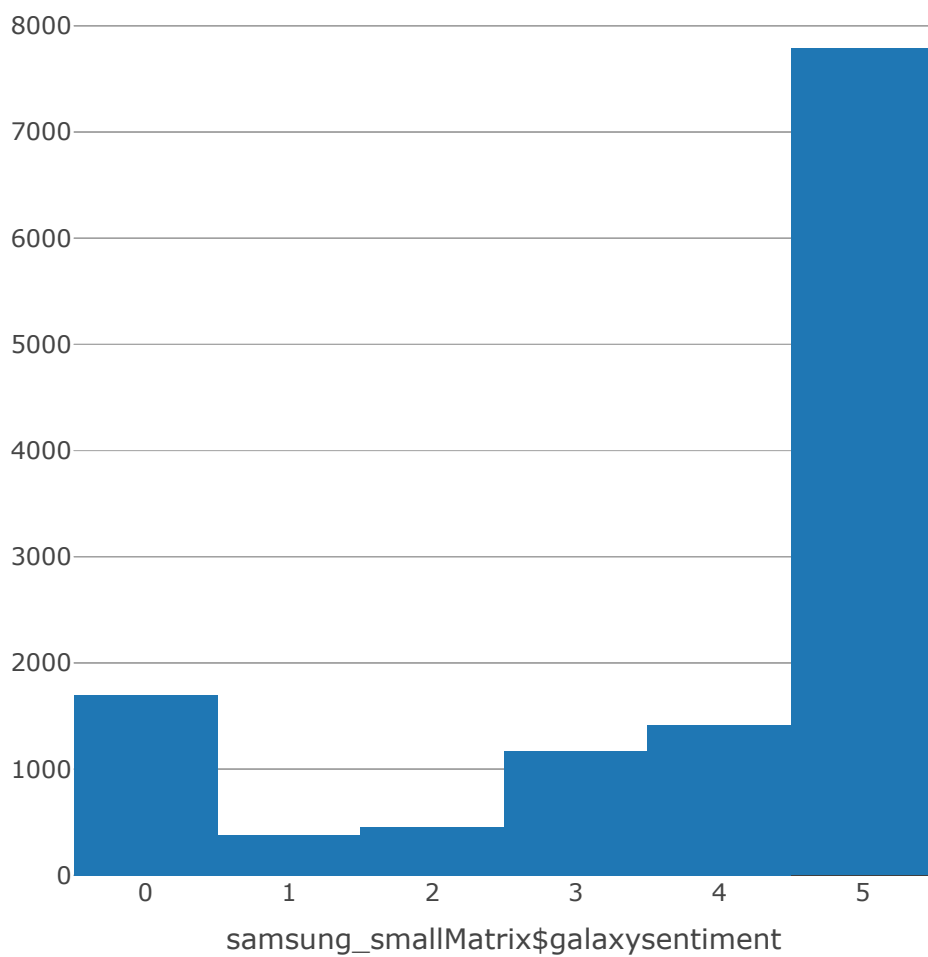
6000





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```
plot_ly(samsung_smallMatrix, x= ~samsung_smallMatrix$galaxysentiment, type='histogram')
```



Hide

NA

0: very negative

1: negative

2: somewhat negative

3: somewhat positive

4: positive

5: very positive

Interesting.

We have two datasets. iphone and samsung. iphone has all the same variables, except for the variable "iphonesentiment". the galaxy dataset is similar with "galaxysentiment".

We already have too many unnecessary predictors, including google, nokia, htc, and sony phones. We are only looking for samsung galaxy and iphone.

Hide

```
sort(names(iphone_smallMatrix))
```

```
[1] "googleandroid" "googleperneg" "googleperpos" "googleperunc" "htccamneg"
[6] "htccampos"     "htccamunc"    "htcdisneg"    "htcdispos"    "htcdisunc"
[11] "htcperneg"     "htcperpos"    "htcperunc"    "htcphone"     "ios"
[16] "iosperneg"     "iosperpos"    "iosperunc"    "iphone"       "iphonecamn
eg"

[21] "iphonecampos"  "iphonecamunc" "iphonedisneg" "iphonedispos" "iphonedisu
nc"
[26] "iphoneperneg"  "iphoneperpos" "iphoneperunc" "iphonesentiment" "nokiacamne
g"
[31] "nokiacampos"   "nokiacamunc"  "nokiadisneg"  "nokiadispos"  "nokiadisun
c"
[36] "nokialumina"   "nokiaperneg"  "nokiaperpos"  "nokiaperunc"  "samsungcam
neg"
[41] "samsungcampos" "samsungcamunc" "samsungdisneg" "samsungdispos" "samsungdis
unc"
[46] "samsunggalaxy" "samsungperneg" "samsungperpos" "samsungperunc" "sonycamne
g"
[51] "sonycampos"    "sonycamunc"   "sonydisneg"   "sonydispos"   "sonydisun
c"
[56] "sonyperneg"    "sonyperpos"   "sonyperunc"   "sonyxperia"
```

Hide

```
toFilter <- grepl('iphone', colnames(iphone_smallMatrix))
iphones <- iphone_smallMatrix[toFilter]
colnames(iphones)
```

```
[1] "iphone"          "iphonecampos"    "iphonecamneg"    "iphonecamunc"    "iphonedispos"
[6] "iphonedisneg"    "iphonedisunc"    "iphoneperpos"    "iphoneperneg"    "iphoneperunc"
[11] "iphonesentiment"
```

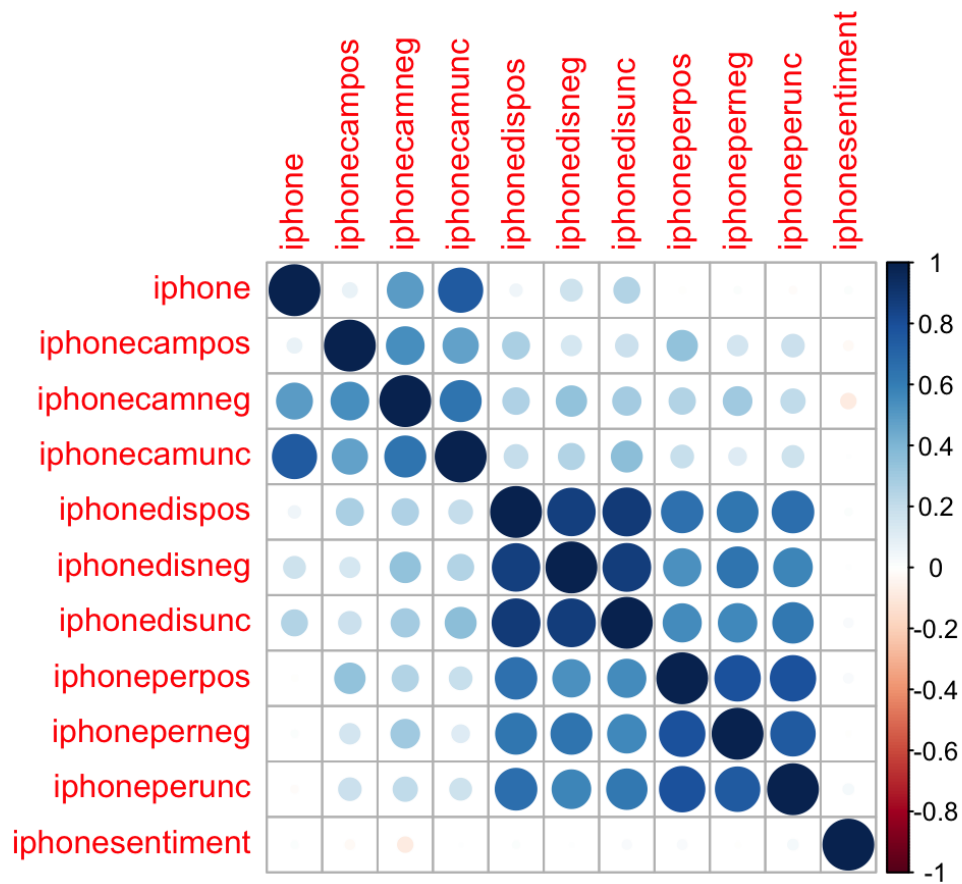
*is ios attribute considered part of iphone? I say no, because if it was, then it would have had ios in front of it.

Hide

```
# correlation matrix
#install.packages("corrplot")
#library(corrplot)
#options(max.print=1000000)

corr_matrix <- cor(iphones)

corr_plot <- corrplot(as.matrix(corr_matrix))
```



Hide

corr_plot

	iphone	iphonecampos	iphonecamneg	iphonecamunc	iphonedispos	iphoned
isneg						
iphone 72621	1.000000000	0.07815733	0.49052359	0.750403174	0.05262462	0.1755
iphonecampos 50674	0.078157326	1.000000000	0.54133997	0.473266316	0.27258655	0.1486
iphonecamneg 78956	0.490523588	0.54133997	1.000000000	0.643460020	0.26198314	0.3468
iphonecamunc 53711	0.750403174	0.47326632	0.64346002	1.000000000	0.20900762	0.2532
iphonedispos 65387	0.052624621	0.27258655	0.26198314	0.209007616	1.000000000	0.8687
iphonedisneg 00000	0.175572621	0.14865067	0.34687896	0.253253711	0.86876539	1.0000
iphonedisunc 50578	0.250929821	0.18831003	0.29907429	0.361321734	0.88302623	0.8799
iphoneperpos 88336	-0.009507666	0.34833242	0.25756896	0.190248578	0.65935383	0.5308
iphoneperneg 95104	0.013863107	0.15191863	0.30887521	0.113175498	0.63776843	0.6409
iphoneperunc 44418	-0.016037424	0.18725962	0.21757939	0.174433158	0.66523752	0.5700
iphonesentiment 44905	0.014858654	-0.02973122	-0.08396314	0.001443485	0.01454682	0.0031
	iphonedisunc	iphoneperpos	iphoneperneg	iphoneperunc	iphonesentiment	
iphone	0.25092982	-0.009507666	0.013863107	-0.01603742	0.014858654	
iphonecampos	0.18831003	0.348332416	0.151918629	0.18725962	-0.029731217	
iphonecamneg	0.29907429	0.257568960	0.308875213	0.21757939	-0.083963139	
iphonecamunc	0.36132173	0.190248578	0.113175498	0.17443316	0.001443485	
iphonedispos	0.88302623	0.659353827	0.637768430	0.66523752	0.014546824	
iphonedisneg	0.87995058	0.530888336	0.640995104	0.57004442	0.003144905	
iphonedisunc	1.000000000	0.554364879	0.564479458	0.62392944	0.027172723	
iphoneperpos	0.55436488	1.000000000	0.794832452	0.79182763	0.029637900	
iphoneperneg	0.56447946	0.794832452	1.000000000	0.75948372	-0.004804058	
iphoneperunc	0.62392944	0.791827630	0.759483720	1.000000000	0.037199859	
iphonesentiment	0.02717272	0.029637900	-0.004804058	0.03719986	1.000000000	

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```
# keep columns only for iphone and samsunggalaxy
```