Fun Text Mining Project

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A survey was conducted among sports fan about their impressions on convention sports and e-sport. This project uses modified data from Hui Du at UGA.

Let's dig into their response to see what are some common impressions

```
df1 <- read.csv("words.csv")</pre>
# combine columns 2 to 21
col <- colnames(df1)[2:21]</pre>
df1 $text <- apply(df1 [,col], 1, paste, collapse = " ")</pre>
df2 \leftarrow df1[,c(1,22)]
head(df2)
##
     ID
## 1
## 2 2
## 3 3
## 4 4
## 5 5
## 6 6
##
## 1
## 2
## 3 It is old school It brings many families together It is a good conversation point Almost everyone
## 5
## 6
# formatting
library(tm)
## Loading required package: NLP
library(quanteda)
## Package version: 2.0.1
## Parallel computing: 2 of 8 threads used.
```

```
## See https://quanteda.io for tutorials and examples.
## Attaching package: 'quanteda'
## The following objects are masked from 'package:tm':
##
##
       as.DocumentTermMatrix, stopwords
## The following objects are masked from 'package:NLP':
##
##
       meta, meta<-
## The following object is masked from 'package:utils':
##
       View
corpus <- corpus(df2, docid_field = "ID",</pre>
                  text_field = "text",
                  unique_docnames = TRUE)
corpus <- Corpus(VectorSource(corpus))</pre>
# clean text
corpus <- tm_map(corpus, tolower)</pre>
corpus <- tm_map(corpus, removePunctuation)</pre>
corpus <- tm_map(corpus, removeNumbers)</pre>
corpus <- tm_map(corpus, stemDocument)</pre>
clean <- tm_map(corpus, removeWords, stopwords('english'))</pre>
# stopwords('english')
clean <- tm_map(clean, removeWords, c('veri'))</pre>
inspect(corpus[1:3])
## <<SimpleCorpus>>
## Metadata: corpus specific: 1, document level (indexed): 0
## Content: documents: 3
##
##
##
##
##
##
## it is old school it bring mani famili togeth it is a good convers point almost everyon know someth a
# Inspect word frequency
freq <- TermDocumentMatrix(clean)</pre>
freqset <- as.data.frame(as.matrix(freq))</pre>
write.table(freqset, file='wordfreq_all.csv', sep = ',')
## <<TermDocumentMatrix (terms: 1989, documents: 450)>>
## Non-/sparse entries: 9832/885218
## Sparsity
## Maximal term length: 15
## Weighting
                      : term frequency (tf)
```

findFreqTerms(freq,lowfreq = 5)

##	[1]	"basebal"	llhi all	"broadcast"	"busi"	"can"
##	[6]	"competit"	"big"	"entertain"	"eye"	"fair"
##	[11]	"fast"	"comput" "great"	"hand"	"lucrat"	"nba"
##	[16]	"new"	"nfl"	"nhl"	"particip"	"physic"
##	[21]	"realli"	"salari"	"skill"	"small"	"smart"
##	[26]	"attend"	"creativ"	"enjoy"	"friend"	"game"
##	[31]	"good"	"happi"	"innov"	"interest"	"join"
##	[36]	"joy"	"leagu"	"lot"	"practic"	"team"
##	[41]	"train"	"athlet"	"audienc"	"bring"	"differ"
##	[46]	"dont"	"event"	"everyon"	"famili"	"get"
##	[51]	"grow"	"know"	"mani"	"media"	"money"
##	[56]	"old"	"onli"	"peopl"	"popular"	"rise"
##	[61]	"school"	"someth"	"spend"	"sport"	"think"
##	[66]	"togeth"	"tradit"	"young"	"contract"	"injuri"
##	[71]	"internet"	"sponsorship"	"tournament"	"uniform"	"box"
##	[76]	"fantasi"	"focus"	"larg"	"onlin"	"pace"
##	[81]	"stream"	"teamwork"	"televis"	"twitch"	"championship"
##	[86]	"cheer"	"commit"	"disput"	"electron"	"organ"
##	[91]	"play"	"prepar"	"profess"	"talent"	"varieti"
##	[96]	"video"	"addict"	"best"	"involv"	"jump"
##	[101]	"natur"	"run"	"view"	"crowd"	"difficult"
##	[106]	"fun"	"intens"	"rich"	"stadium"	"sweat"
##	[111]	"access"	"conveni"	"countri"	"high"	"learn"
##	[116]	"like"	"make"	"much"	"profession"	"take"
##	[121]	"thing"	"watch"	"wish"	"exercis"	"fame"
##	[126]	"overpaid"	"thrill"	"win"	"bar"	"crazi"
##	[131]	"gambl"	"group"	"hockey"	"import"	"korea"
##	[136]	"opportun"	"polit"	"reflex"	"requir"	"sad"
##	[141]	"season"	"starcraft"	"tribal"	"nice"	"odd"
##	[146]	"quick"	"wast"	"better"	"career"	"control"
##	[151]	"energi"	"enthusiast"	"fit"	"free"	"gain"
##	[156]	"healthi"	"mind"	"pleasant"	"social"	"stress"
##	[161]	"challeng"	"hardwork"	"incom"	"real"	"sourc"
##	[166]	"beer"	"cool"	"drink"	"excit"	"parti"
##	[171]	"communic"	"dure"	"esport"	"just"	"one"
##	[176]	"player"	"tactic"	"cant"	"funni"	"help"
##	[181]	"honest"	"improv"	"knowledg"	"posit"	"time"
##	[186]	"basketbal"	"headset"	"paid"	"ticket"	"brain"
##	[191]	"coach"	"compet"	"famous"	"footbal"	"legend"
##	[196]	"platform"	"scholarship"	"uniti"	"world"	"ball"
##	[201]	"hope"	"jolli"	"expert"	"hobbi"	"live"
##		"relax"	"interact"	"lazi"	"strong"	"counter"
##	[211]	"cup"	"fifa"	"lol"	"soccer"	"strike"
##		"videogam"	"youtub"	"nerdi"	"bet"	"brand"
##		"cheerlead"	"food"	"loud"	"action"	"bros"
##		"call"	"duti"	"expens"	"manag"	"super"
##	[231]	"equip"	"graphic"	"citi"	"playstat"	"pubg"
##		"bodi"	"intellig"	"life"	"short"	"sponsor"
##		"advertis"	"announc"	"fan"	"field"	"prize"
##		"strateg"	"strength"	"success"	"uniqu"	"dumb"
##	[251]	"full"	"nerd"	"spectat"	"stupid"	"dollar"

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## [256] "gamer"
                          "gear"
                                           "huge"
                                                           "million"
                                                                            "six"
   [261] "spirit"
                                                                            "glori"
                          "trophi"
                                           "adrenalin"
                                                           "champion"
                                                                            "home"
  [266] "rivalri"
                          "stake"
                                           "winner"
                                                           "hard"
## [271] "hour"
                          "mental"
                                                                            "work"
                                           "pressur"
                                                           "strategi"
   [276] "aggress"
                          "awesom"
                                           "bore"
                                                           "long"
                                                                            "realist"
## [281] "technic"
                          "cheat"
                                                           "shooter"
                                                                            "speed"
                                           "playoff"
  [286] "vouth"
                          "award"
                                                           "nation"
                                                                            "avail"
                                           "connect"
## [291] "kid"
                                                           "see"
                                                                            "top"
                          "love"
                                           "pay"
   [296] "want"
                          "way"
                                           "year"
                                                           "coordin"
                                                                            "digit"
   [301] "less"
                                           "activ"
                                                                            "name"
##
                          "sunday"
                                                           "health"
   [306] "payment"
                          "perform"
                                           "score"
                                                           "stand"
                                                                            "star"
                                           "generat"
                                                           "look"
                                                                            "understand"
   [311] "come"
                          "easi"
                                                           "well"
##
   [316] "communiti"
                          "histori"
                                           "miss"
                                                                            "colleg"
## [321] "level"
                          "role"
                                                           "virtual"
                                                                            "athletic"
                                           "technolog"
## [326] "instinct"
                          "trade"
                                           "amaz"
                                                           "confid"
                                                                            "eager"
   [331]
         "engag"
                          "fierc"
                                           "madden"
                                                           "choos"
                                                                            "dota"
   [336] "fortnit"
                          "non"
                                           "male"
                                                           "streamer"
##
                                                                            "support"
## [341] "sit"
                          "tough"
                                           "individu"
                                                           "industri"
                                                                            "match"
  [346] "start"
                          "tech"
                                           "worldwid"
                                                           "attent"
                                                                            "problem"
  [351] "relief"
                          "solv"
                                           "status"
                                                           "competitor"
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##
   [356] "dedic"
                          "distanc"
                                           "experi"
                                                           "victori"
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## [361] "race"
                          "reward"
                                           "age"
                                                           "corpor"
                                                                            "sometim"
## [366] "follow"
                          "need"
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                                                           "muscl"
                                           "multiplay"
## [371] "earn"
                          "iob"
                                                           "disciplin"
                                                                            "logic"
                                           "passion"
## [376] "rule"
                                                           "foot"
                                                                            "believ"
                          "alway"
                                           "feel"
  [381] "favorit"
                          "now"
                                           "capac"
                                                           "critic"
                                                                            "excercis"
## [386] "goal"
                          "increas"
                                           "memori"
                                                           "outdoor"
                                                                            "power"
                                           "self"
                                                           "talk"
                                                                            "use"
##
   [391] "respons"
                          "screen"
## [396] "visual"
                          "arena"
                                           "invest"
                                                           "cultur"
                                                                            "danger"
  [401] "enough"
                          "tension"
                                           "proud"
                                                           "dream"
                                                                            "potenti"
## [406] "seat"
                          "endur"
                                           "boost"
                                                           "develop"
                                                                            "modern"
##
   [411] "espn"
                          "final"
                                           "hall"
                                                           "abil"
                                                                            "loyalti"
                                                           "lame"
## [416] "major"
                          "special"
                                           "hero"
                                                                            "celebr"
## [421] "everi"
                          "sound"
                                                                            "qualiti"
                                           "encourag"
                                                           "enthusiasm"
                                                                            "consol"
   [426] "elit"
                          "intern"
                                           "becom"
                                                           "calm"
## [431] "person"
                          "movement"
                                           "overwatch"
                                                                            "part"
                                                           "techniqu"
## [436] "fight"
                          "fighter"
                                           "seri"
                                                           "inspir"
                                                                            "teenag"
## [441] "futur"
                          "owner"
                                           "comfort"
                                                           "creat"
                                                                            "give"
## [446] "stay"
                          "bad"
                                           "motiv"
                                                           "draft"
                                                                            "serious"
## [451] "back"
                          "deal"
                                           "low"
                                                           "still"
                                                                            "advanc"
## [456] "effort"
                          "curios"
                                           "pass"
                                                           "fake"
                                                                            "competet"
## [461] "greedi"
                          "cricket"
                                           "attitud"
                                                           "confus"
                                                                            "mlb"
                          "xbox"
                                           "lose"
## [466] "statist"
                                                           "loser"
                                                                            "profit"
## [471] "market"
                          "base"
                                           "asian"
                                                           "wonder"
                                                                            "general"
## [476] "usual"
                          "simul"
                                                           "achiev"
                                                                            "energet"
                                           "friendship"
                                                                            "men"
## [481]
         "pride"
                          "soon"
                                           "summer"
                                                           "smash"
##
  [486]
         "thevr"
                          "olymp"
                                           "relat"
                                                           "trendi"
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## [491] "reduc"
                                           "man"
                                                           "domin"
                          "right"
                                                                            "escap"
## [496] "noth"
                          "american"
                                           "form"
                                                           "concuss"
                                                                            "regular"
```

delete words appears less than 0.05 % frequency

```
word <- removeSparseTerms(freq, 0.995)
word1 <- as.data.frame(as.matrix(word))</pre>
```

```
rownames(word1)<-make.names(rownames(word))
word <- as.matrix(word1)
head(word1)</pre>
```

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##		148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164
##	basebal	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
##	big	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	broadcast	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	busi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
##	can	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	competit	0	4	1	0	2	0	0	0	2	1	4	2	0	0	3	0	3
##		165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181
##	basebal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	big	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	broadcast	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	busi	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0 3
##	can competit	0	1	1	1	4	0	1	0	0	0	2	0	0	3	0	0	2
##	competit	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198
##	basebal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	big	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	broadcast	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	busi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	can	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
##	competit	1	0	0	1	0	0	0	0	2	0	2	0	0	0	2	1	1
##	•	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215
##	basebal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	big	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0
##	broadcast	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
##	busi	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
##	can	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
44	compotit	^	1	^	_	_	_	^	^	0	4	2			^	0	_	
##	competit	0	T	0	2	0	2	0	0	3	1	3	1	1	0	2	3	0
##	competit	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	0 232
	basebal	216 0	217	218	219 0	220	221	222	223	224	225	226	227	228	229	230	231	232
## ## ##	basebal big	216 0 0	217 0 0	218 0 0	219 0 1	220 0 0	221 0 0	222 0 0	223 0 0	224 0 0	225 0 0	226 0 0	227 0 0	228 0 0	229 0 0	230 0 0	231 0 0	232
## ## ## ##	basebal big broadcast	216 0 0	217 0 0 0	218 0 0 0	219 0 1 0	220 0 0 0	221 0 0	222 0 0 0	223 0 0 0	224 0 0 0	225 0 0 0	226 0 0	227 0 0	228 0 0	229 0 0	230 0 0	231 0 0	232 0 0 0
## ## ## ##	basebal big broadcast busi	216 0 0 0	217 0 0 0 0	218 0 0 0 0	219 0 1 0	220 0 0 0 0	221 0 0 0 0	222 0 0 0 0	223 0 0 0 0	224 0 0 0 0	225 0 0 0 0	226 0 0 0	227 0 0 0 0	228 0 0 0 0	229 0 0 0 0	230 0 0 0 0	231 0 0 0 0	232 0 0 0 0
## ## ## ## ##	basebal big broadcast busi can	216 0 0 0 0	217 0 0 0 0 0	218 0 0 0 0 0	219 0 1 0 0	220 0 0 0 0	221 0 0 0 0	222 0 0 0 0	223 0 0 0 0	224 0 0 0 0 0	225 0 0 0 0	226 0 0 0 0	227 0 0 0 0	228 0 0 0 0	229 0 0 0 0	230 0 0 0 0	231 0 0 0 0	232 0 0 0 0 0
## ## ## ## ## ##	basebal big broadcast busi	216 0 0 0 0 0 1	217 0 0 0 0 0	218 0 0 0 0 0 2	219 0 1 0 0 0 3	220 0 0 0 0 0 0	221 0 0 0 0 0	222 0 0 0 0 0 0	223 0 0 0 0 0	224 0 0 0 0 0	225 0 0 0 0 0	226 0 0 0 0 0 1	227 0 0 0 0 0	228 0 0 0 0 0	229 0 0 0 0 0 2	230 0 0 0 0 0	231 0 0 0 0 0	232 0 0 0 0 0 0 4
## ## ## ## ## ##	basebal big broadcast busi can competit	216 0 0 0 0 0 1 233	217 0 0 0 0 0 1 234	218 0 0 0 0 0 2 235	219 0 1 0 0 0 3 236	220 0 0 0 0 0 1 237	221 0 0 0 0 0 0 238	222 0 0 0 0 0 2 239	223 0 0 0 0 0 0 240	224 0 0 0 0 0 0 0 241	225 0 0 0 0 0 0 242	226 0 0 0 0 0 1 243	227 0 0 0 0 0 0 0 244	228 0 0 0 0 0 1 245	229 0 0 0 0 0 2 246	230 0 0 0 0 0 0 0 247	231 0 0 0 0 0 0 248	232 0 0 0 0 0 0 4 249
## ## ## ## ## ##	basebal big broadcast busi can competit basebal	216 0 0 0 0 0 1 233 0	217 0 0 0 0 0 1 234 0	218 0 0 0 0 0 2 235 0	219 0 1 0 0 0 3 236 0	220 0 0 0 0 0 1 237 0	221 0 0 0 0 0 0 238 0	222 0 0 0 0 0 2 239 0	223 0 0 0 0 0 0 240	224 0 0 0 0 0 0 0 241 0	225 0 0 0 0 0 0 242 0	226 0 0 0 0 0 1 243 0	227 0 0 0 0 0 0 244 0	228 0 0 0 0 0 1 245	229 0 0 0 0 0 2 246 1	230 0 0 0 0 0 0 247 0	231 0 0 0 0 0 0 248 0	232 0 0 0 0 0 4 249 0
## ## ## ## ## ## ##	basebal big broadcast busi can competit basebal big	216 0 0 0 0 1 233 0	217 0 0 0 0 0 1 234 0	218 0 0 0 0 2 235 0	219 0 1 0 0 0 3 236 0	220 0 0 0 0 0 1 237 0	221 0 0 0 0 0 0 238 0	222 0 0 0 0 0 2 239 0	223 0 0 0 0 0 0 240 0	224 0 0 0 0 0 0 241 0	225 0 0 0 0 0 0 242 0	226 0 0 0 0 1 243 0	227 0 0 0 0 0 0 244 0	228 0 0 0 0 0 1 245 0	229 0 0 0 0 2 246 1 2	230 0 0 0 0 0 0 247 0	231 0 0 0 0 0 0 248 0	232 0 0 0 0 0 4 249 0
## ## ## ## ## ## ##	basebal big broadcast busi can competit basebal big broadcast	216 0 0 0 0 0 1 233 0 0	217 0 0 0 0 0 1 234 0 0	218 0 0 0 0 2 235 0 0	219 0 1 0 0 0 3 236 0 0	220 0 0 0 0 0 1 237 0 0	221 0 0 0 0 0 0 238 0 0	222 0 0 0 0 2 239 0 0	223 0 0 0 0 0 0 240 0 0	224 0 0 0 0 0 0 241 0 0	225 0 0 0 0 0 0 242 0 0	226 0 0 0 0 0 1 243 0 0	227 0 0 0 0 0 0 244 0 0	228 0 0 0 0 0 1 245 0 0	229 0 0 0 0 2 246 1 2	230 0 0 0 0 0 0 247 0 1	231 0 0 0 0 0 0 248 0 0	232 0 0 0 0 0 4 249 0 0
## ## ## ## ## ## ##	basebal big broadcast busi can competit basebal big broadcast busi	216 0 0 0 0 0 1 233 0 0 0	217 0 0 0 0 0 1 234 0 0	218 0 0 0 0 2 235 0 0 0 2	219 0 1 0 0 0 3 236 0 0 0	220 0 0 0 0 0 1 237 0 0 0	221 0 0 0 0 0 0 238 0 0 0	222 0 0 0 0 0 2 239 0 0 0	223 0 0 0 0 0 0 240 0 0	224 0 0 0 0 0 0 241 0 0 0	225 0 0 0 0 0 0 242 0 0 0	226 0 0 0 0 1 243 0 0 0	227 0 0 0 0 0 0 244 0 0	228 0 0 0 0 0 1 245 0 0 0	229 0 0 0 0 2 246 1 2 0	230 0 0 0 0 0 0 247 0 1 0	231 0 0 0 0 0 0 248 0 0 0	232 0 0 0 0 0 4 249 0 0 0
## ## ## ## ## ## ## ##	basebal big broadcast busi can competit basebal big broadcast busi can	216 0 0 0 0 0 1 233 0 0	217 0 0 0 0 0 1 234 0 0	218 0 0 0 0 2 235 0 0	219 0 1 0 0 0 3 236 0 0	220 0 0 0 0 0 1 237 0 0	221 0 0 0 0 0 0 238 0 0	222 0 0 0 0 2 239 0 0	223 0 0 0 0 0 0 240 0 0 0	224 0 0 0 0 0 0 241 0 0	225 0 0 0 0 0 242 0 0 0	226 0 0 0 0 0 1 243 0 0	227 0 0 0 0 0 0 244 0 0	228 0 0 0 0 0 1 245 0 0	229 0 0 0 0 2 246 1 2	230 0 0 0 0 0 0 247 0 1	231 0 0 0 0 0 0 248 0 0	232 0 0 0 0 0 4 249 0 0
## ## ## ## ## ## ## ##	basebal big broadcast busi can competit basebal big broadcast busi	216 0 0 0 0 1 233 0 0 0 0	217 0 0 0 0 1 234 0 0 0 0	218 0 0 0 0 2 235 0 0 0 2 0	219 0 1 0 0 3 236 0 0 0 0	220 0 0 0 0 1 237 0 0 0 0	221 0 0 0 0 0 0 238 0 0 0 0	222 0 0 0 0 2 239 0 0 0 0	223 0 0 0 0 0 240 0 0 0 3	224 0 0 0 0 0 0 241 0 0 0	225 0 0 0 0 0 242 0 0 0 0	226 0 0 0 0 1 243 0 0 0 0	227 0 0 0 0 0 0 244 0 0 0 0 3	228 0 0 0 0 1 245 0 0 0 0	229 0 0 0 0 2 246 1 2 0 0	230 0 0 0 0 0 247 0 1 0 0 0	231 0 0 0 0 0 248 0 0 0 0	232 0 0 0 0 4 249 0 0 0 0 4
## ## ## ## ## ## ## ## ## ## ## ## ##	basebal big broadcast busi can competit basebal big broadcast busi can	216 0 0 0 0 1 233 0 0 0 0	217 0 0 0 0 1 234 0 0 0	218 0 0 0 0 2 235 0 0 0 2 0	219 0 1 0 0 3 236 0 0 0	220 0 0 0 0 1 237 0 0 0 0	221 0 0 0 0 0 0 238 0 0 0	222 0 0 0 0 2 239 0 0 0 0	223 0 0 0 0 0 240 0 0 0 3	224 0 0 0 0 0 0 241 0 0 0	225 0 0 0 0 0 242 0 0 0	226 0 0 0 0 1 243 0 0 0	227 0 0 0 0 0 0 244 0 0 0	228 0 0 0 0 1 245 0 0 0 0	229 0 0 0 0 2 246 1 2 0 0	230 0 0 0 0 0 0 247 0 1 0 0	231 0 0 0 0 0 248 0 0 0 0	232 0 0 0 0 0 4 249 0 0 0 0
## ## ## ## ## ## ## ## ## ## ## ## ##	basebal big broadcast busi can competit basebal big broadcast busi can competit	216 0 0 0 0 1 233 0 0 0 0 1 250	217 0 0 0 0 1 234 0 0 0 0 0 251	218 0 0 0 0 2 235 0 0 0 2 2 0 2	219 0 1 0 0 3 236 0 0 0 0 0 253	220 0 0 0 0 1 237 0 0 0 0 0 254	221 0 0 0 0 0 0 238 0 0 0 0 0 255	222 0 0 0 0 2 239 0 0 0 0 0 2 256	223 0 0 0 0 0 240 0 0 0 3 257	224 0 0 0 0 0 241 0 0 0 0 258	225 0 0 0 0 0 242 0 0 0 0 1 259	226 0 0 0 0 1 243 0 0 0 0 1 260	227 0 0 0 0 0 0 244 0 0 0 0 3 261	228 0 0 0 0 1 245 0 0 0 0 0 262	229 0 0 0 0 2 246 1 2 0 0 1 0 263	230 0 0 0 0 0 247 0 1 0 0 0 264	231 0 0 0 0 0 248 0 0 0 255	232 0 0 0 0 0 4 249 0 0 0 0 4 266
## ## ## ## ## ## ## ## ## ## ## ## ##	basebal big broadcast busi can competit basebal big broadcast busi can competit	216 0 0 0 0 0 1 233 0 0 0 0 0 0 1 235 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	217 0 0 0 0 0 1 234 0 0 0 0 0 251 0	218 0 0 0 0 2 235 0 0 2 0 2 0 0 0 0 0 2 2 2 3 5 0 0 0 0 0 0 0 0 0 0 0 0 0	219 0 1 0 0 3 236 0 0 0 0 0 253 0	220 0 0 0 0 1 237 0 0 0 0 0 254 0	221 0 0 0 0 0 0 0 238 0 0 0 0 0 0 255 0	2222 0 0 0 0 0 2 239 0 0 0 0 0 2 239 0 0 0 0 0 0 0 0 0 0 0 0 0	223 0 0 0 0 0 0 240 0 0 0 0 3 257 0	224 0 0 0 0 0 0 0 0 241 0 0 0 0 0 0 258 0	225 0 0 0 0 0 0 242 0 0 0 0 0 259 0	226 0 0 0 0 1 243 0 0 0 0 1 260 0	227 0 0 0 0 0 0 0 244 0 0 0 0 3 261 0	228 0 0 0 0 0 1 245 0 0 0 0 0 262 0	229 0 0 0 0 2 246 1 2 0 0 1 0 2	230 0 0 0 0 0 0 0 247 0 1 0 0 0 0 1 2464 0	231 0 0 0 0 0 248 0 0 0 0 2 265 0	232 0 0 0 0 4 249 0 0 0 0 4 266 0
######################################	basebal big broadcast busi can competit basebal big broadcast busi can competit basebal	216 0 0 0 0 0 1 233 0 0 0 0 0 0 0 1 235 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	217 0 0 0 0 0 1 234 0 0 0 0 0 0 0 255 1 0 0 0 0 0 0 0 0 0 0 0 0 0	218 0 0 0 0 2 235 0 0 2 0 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0	219 0 1 0 0 3 236 0 0 0 0 0 253 0 0	220 0 0 0 0 1 237 0 0 0 0 0 254 0 0	221 0 0 0 0 0 0 0 238 0 0 0 0 0 0 255 0 0	2222 0 0 0 0 0 2 2339 0 0 0 0 0 0 0 0 0 0 0 0 0	223 0 0 0 0 0 0 240 0 0 0 0 3 257 0 0	224 0 0 0 0 0 0 241 0 0 0 0 0 258 0 0	225 0 0 0 0 0 0 0 242 0 0 0 0 1 259 0 0	226 0 0 0 0 1 243 0 0 0 0 1 260 0	227 0 0 0 0 0 0 244 0 0 0 0 3 261 0 0	228 0 0 0 0 1 245 0 0 0 0 0 262 0 0	229 0 0 0 0 2 246 1 2 0 0 0 1 0 0	230 0 0 0 0 0 0 247 0 1 0 0 0 1 264 0 0	231 0 0 0 0 0 248 0 0 0 0 2 265 0 0	232 0 0 0 0 4 249 0 0 0 0 4 266 0 0
## ## ## ## ## ## ## ## ## ## ## ## ##	basebal big broadcast busi can competit basebal big broadcast busi can competit basebal bisi busi busi can competit	216 0 0 0 0 0 1 233 0 0 0 0 0 1 250 0	217 0 0 0 0 0 1 234 0 0 0 0 0 0 0 0 0 0 0 0 0	218 0 0 0 0 2 235 0 0 0 2 2 0 0 0 0 0 0 0 0 0 0 0 0 0	219 0 1 0 0 3 236 0 0 0 0 0 253 0 0	220 0 0 0 0 1 237 0 0 0 0 0 254 0 0	221 0 0 0 0 0 0 238 0 0 0 0 0 255 0 0	2222 0 0 0 0 0 2 2339 0 0 0 0 0 0 0 0 0 0 0 0 0	223 0 0 0 0 0 0 240 0 0 0 0 3 257 0 0	2244 0 0 0 0 0 0 2411 0 0 0 0 0 2588 0 0	225 0 0 0 0 0 0 242 0 0 0 0 0 1 259 0 0	226 0 0 0 0 1 243 0 0 0 0 1 260 0 0	227 0 0 0 0 0 0 244 0 0 0 0 3 261 0 0	228 0 0 0 0 0 1 245 0 0 0 0 0 0 262 0 0	229 0 0 0 0 2 246 1 2 0 0 1 0 263 0 0	230 0 0 0 0 0 0 247 0 0 0 1 264 0 0	231 0 0 0 0 0 248 0 0 0 0 2 265 0 0	232 0 0 0 0 4 249 0 0 0 4 266 0 0
######################################	basebal big broadcast busi can competit basebal big broadcast busi can competit basebal bisi busi busi can competit basebal big broadcast busi	216 0 0 0 0 0 1 233 0 0 0 0 0 1 250 0 0	217 0 0 0 0 0 1 234 0 0 0 0 0 251 0 0 0	218 0 0 0 0 2 2355 0 0 0 2 2 0 0 0 0 0 0 0 0 0 0 0 0 0	219 0 1 0 0 3 236 0 0 0 0 253 0 0 0 0 1	220 0 0 0 0 0 1 237 0 0 0 0 254 0 0 0 1 1	221 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2222 0 0 0 0 0 2 2339 0 0 0 0 0 0 0 0 0 0 0 0 0	223 0 0 0 0 0 0 0 0 0 0 0 0 0	224 0 0 0 0 0 0 0 0 0 241 0 0 0 0 0 258 0 0 0 0 0 2 2	225 0 0 0 0 0 0 242 0 0 0 0 0 1 259 0 0 0	226 0 0 0 0 1 243 0 0 0 0 1 260 0 0	227 0 0 0 0 0 0 244 0 0 0 0 3 261 0 0 0 1	228 0 0 0 0 0 1 245 0 0 0 0 0 0 0 0 0 0 0 0 0	229 0 0 0 0 2 246 1 2 0 0 1 0 263 0 0 0	230 0 0 0 0 0 0 0 247 0 1 0 0 0 1 264 0 0 0 0 0 0 0 0 0 0 0 0 0	231 0 0 0 0 0 248 0 0 0 2 265 0 0 0	232 0 0 0 0 4 249 0 0 0 4 266 0 0 0
######################################	basebal big broadcast busi can competit basebal big broadcast busi can competit basebal busi can competit	216 0 0 0 0 0 1 2333 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	217 0 0 0 0 0 1 2344 0 0 0 0 0 0 0 0 0 0 0 0 0	218 0 0 0 0 2 235 0 0 0 2 2 0 0 0 1 1 1 269	219 0 1 0 0 0 3 236 0 0 0 0 0 253 0 0 0 0 1 250 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1	220 0 0 0 0 1 237 0 0 0 0 0 254 0 0 0 1 271	221 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2222 0 0 0 0 0 2 239 0 0 0 0 0 0 0 0 0 0 0 0 0	223 0 0 0 0 0 0 0 0 0 0 0 0 0	224 0 0 0 0 0 0 241 0 0 0 0 0 258 0 0 0 258 275	225 0 0 0 0 0 0 242 0 0 0 0 0 0 0 0 0 0 0 0	226 0 0 0 0 1 243 0 0 0 0 0 0 0 0 0 0 260 0 0 0 277	2277 0 0 0 0 0 0 0 0 0 0 0 0 0	228 0 0 0 0 0 1 245 0 0 0 0 0 0 0 0 0 0 0 0 0	229 0 0 0 0 2 246 1 2 0 0 1 0 2 263 0 0 0 0 2 286 3 0 0 0 0 0 0 0 0 0 0 0 0 0	230 0 0 0 0 0 0 247 0 1 0 0 0 1 264 0 0 0 0 281	231 0 0 0 0 0 248 0 0 0 0 2 265 0 0 0 0 2 265 0 0 0 2 2 2 2 2 2 2 2 2 2 2 2 2	232 0 0 0 0 4 249 0 0 0 0 4 266 0 0 0 0 283
#######################################	basebal big broadcast busi can competit basebal big broadcast busi can competit basebal big broadcast busi can competit basebal big broadcast busi busi can competit basebal	216 0 0 0 0 0 1 2333 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	217 0 0 0 0 0 1 234 0 0 0 0 0 0 0 0 0 0 0 0 0	218 0 0 0 0 2 235 0 0 0 2 2 0 0 0 2 1 1 2 2 0 0 0 0 0 0 0 0 0 0 0 0 0	219 0 1 0 0 3 236 0 0 0 0 253 0 0 0 0 253 0 0 0 0 0 0 0 0 0 0 0 0 0	220 0 0 0 0 0 1 237 0 0 0 0 0 0 0 0 0 0 1 254 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1	221 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2222 0 0 0 0 2 239 0 0 0 0 0 0 0 0 0 0 0 0 0	223 0 0 0 0 0 0 240 0 0 0 0 0 0 0 0 0 0 0 0 0	224 0 0 0 0 0 0 241 0 0 0 0 0 0 0 0 0 0 0 0 0	225 0 0 0 0 0 242 0 0 0 0 0 1 259 0 0 0 0 1 227 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	226 0 0 0 0 1 243 0 0 0 0 1 260 0 0 0 0 277 0	2277 0 0 0 0 0 0 0 0 0 0 0 0 0	228 0 0 0 0 1 245 0 0 0 0 0 0 0 0 0 0 0 0 0	229 0 0 0 0 2 246 1 2 0 0 1 0 2 263 0 0 0 2 288 0 0 0 0 0 0 0 0 0 0 0 0 0	230 0 0 0 0 0 0 247 0 0 0 0 0 1 264 0 0 0 0 287 1 0 0 0 0 0 0 0 0 0 0 0 0 0	231 0 0 0 0 0 248 0 0 0 0 2 265 0 0 0 0 2 282 1	232 0 0 0 0 4 249 0 0 0 0 4 266 0 0 0 0 283 0
###########################	basebal big broadcast busi can competit basebal big broadcast busi can competit basebal big broadcast busi can competit basebal big broadcast busi busi busi busi busi busi busi busi	216 0 0 0 0 0 1 233 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	217 0 0 0 0 0 1 234 0 0 0 0 0 0 0 0 0 0 0 0 0	218 0 0 0 0 2 235 0 0 0 252 0 0 0 1 1 269 0	219 0 1 0 0 3 236 0 0 0 0 0 253 0 0 0 0 1 270 0 0	220 0 0 0 0 1 237 0 0 0 0 0 254 0 0 0 0 1 271 0 0	221 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2222 0 0 0 0 0 2 2339 0 0 0 0 0 0 0 0 0 0 0 0 0	223 0 0 0 0 0 0 240 0 0 0 0 3 257 0 0 0 0 3 274 0 0 0	2244 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	225 0 0 0 0 0 242 0 0 0 0 0 1 259 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	226 0 0 0 0 1 243 0 0 0 0 1 260 0 0 0 0 0 0 0 0 0 0 0 0 0	227 0 0 0 0 0 0 244 0 0 0 0 0 3 261 0 0 0 0 1 278 0 0 0 0 0 0 0 0 0 0 0 0 0	228 0 0 0 0 1 245 0 0 0 0 0 0 0 0 0 0 0 0 0	229 0 0 0 0 2 246 1 2 0 0 1 0 263 0 0 0 2 280 0 1 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	230 0 0 0 0 0 0 247 0 0 0 0 1 264 0 0 0 0 0 281 0 0 0 0 0 0 0 0 0 0 0 0 0	231 0 0 0 0 0 248 0 0 0 0 2 265 0 0 0 0 2 282 1 1	232 0 0 0 0 4 249 0 0 0 0 4 266 0 0 0 0 283 0 0
##############################	basebal big broadcast busi can competit basebal big broadcast busi can competit basebal big broadcast busi can competit basebal big broadcast busi busi can competit basebal	216 0 0 0 0 0 1 2333 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	217 0 0 0 0 0 1 234 0 0 0 0 0 0 0 0 0 0 0 0 0	218 0 0 0 0 2 235 0 0 0 2 2 0 0 0 2 1 1 2 2 0 0 0 0 0 0 0 0 0 0 0 0 0	219 0 1 0 0 3 236 0 0 0 0 253 0 0 0 0 253 0 0 0 0 0 0 0 0 0 0 0 0 0	220 0 0 0 0 0 1 237 0 0 0 0 0 0 0 0 0 0 1 254 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1	221 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2222 0 0 0 0 2 239 0 0 0 0 0 0 0 0 0 0 0 0 0	223 0 0 0 0 0 0 240 0 0 0 0 0 0 0 0 0 0 0 0 0	224 0 0 0 0 0 0 241 0 0 0 0 0 0 0 0 0 0 0 0 0	225 0 0 0 0 0 242 0 0 0 0 0 1 259 0 0 0 0 1 227 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	226 0 0 0 0 1 243 0 0 0 0 1 260 0 0 0 0 277 0	2277 0 0 0 0 0 0 0 0 0 0 0 0 0	228 0 0 0 0 1 245 0 0 0 0 0 0 0 0 0 0 0 0 0	229 0 0 0 0 2 246 1 2 0 0 1 0 2 263 0 0 0 2 288 0 0 0 0 0 0 0 0 0 0 0 0 0	230 0 0 0 0 0 0 247 0 0 0 0 0 1 264 0 0 0 0 287 1 0 0 0 0 0 0 0 0 0 0 0 0 0	231 0 0 0 0 0 248 0 0 0 0 2 265 0 0 0 0 2 282 1	232 0 0 0 0 4 249 0 0 0 0 4 266 0 0 0 0 283 0

	can competit	0	0	0 4	0	0	0	0	0	0	1 1	0	0	0	0	0 1	0	0
##	00	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300
##	basebal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	big	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
##	broadcast	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
##	busi	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
##	can	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	competit	0	2	0	0	1	1	1	0	1	3	4	0	0	4	1	3	0
##		301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317
##	basebal	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
##	big	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	broadcast	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	busi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	can	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
##	competit	0	1	0	0	0	2	1	0	1	0	0	2	1	1	2	4	1
##		318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334
## ##	basebal	0	0	1	0	0	0 2	0	0	0	0	0	0	0	0	0	0	0
##	big broadcast	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
##	busi	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
##	can	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0
##	competit	0	3	2	1	0	0	0	2	1	1	1	1	2	2	0	0	0
##	competit	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351
##	basebal	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
##	big	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	broadcast	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	busi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	can	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	4
##	competit	2	1	4	1	0	0	1	0	1	1	2	0	2	2	0	0	0
##		352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368
##	basebal	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	big	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
##	broadcast	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	busi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	can	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 3	0
##	competit	0			372	_	_	-	_	-	-	_	_	_	_		_	-
	basebal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	big	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1
	broadcast	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	busi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	can	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	competit	0	1	0	1	0	0	0	0	0	1	0	0	3	0	0	0	0
##		386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402
##	basebal	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
##	big	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0
##	broadcast	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	busi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	can	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	competit	1	0	0	2	0	1	0	3	1	2	0	0	0	1	2	1	0
##							408			411				415			418	419
	basebal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
##	big	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

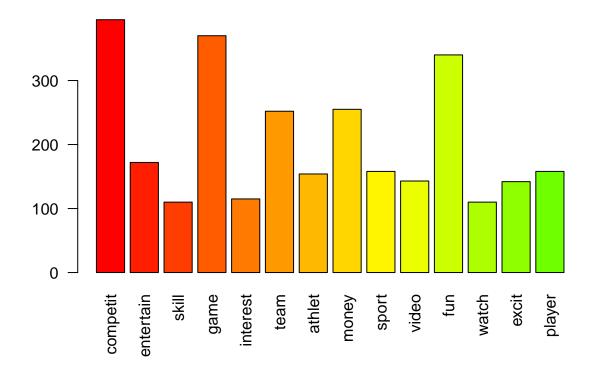
```
## broadcast
               0
                   0
                            0
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## busi
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## can
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                                                             3
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## competit
                   1
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                            2
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##
             420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436
## basebal
               0
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## big
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## broadcast
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## can
## competit
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                                                                                  1
             437 438 439 440 441 442 443 444 445 446 447 448 449 450
##
                                        0
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                                                0
                                                             0
## basebal
               0
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                       1
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                                                                     1
                                0
               0
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                        0
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                                                0
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                                                             1
                                                                 0
                                                                     0
## big
## broadcast
               0
                   0
                       0
                            0
                                0
                                    0
                                        0
                                            0
                                                0
                                                     0
                                                         0
                                                             0
                                                                 0
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## busi
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                            0
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                                    0
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                                            0
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                                                         0
                                                            0
                                                                 0
                                                                     0
## can
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                            0
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                                    0
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                                                0
                                                     0
                                                         0
                                                             0
                                                                 0
                                                                     3
## competit
                                            0
                                                                     0
```

```
dim(word1)
```

```
## [1] 692 450
```

```
write.table(word1, file='wordfreq_trimmed.csv', sep=',')
```

Visualization



```
# Word cloud
library(wordcloud)
```

Loading required package: RColorBrewer

