Module8L2

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# Additional packages needed

* If necessary install the followings packages.

install.packages("splitstackshape");  
install.packages("tm");  
install.packages("stringr"); install.packages("wordcloud"); install.packages("plyr");

library(tm)

## Loading required package: NLP

library(splitstackshape)

## Warning: package 'splitstackshape' was built under R version 3.2.5

## Loading required package: data.table

## Warning: package 'data.table' was built under R version 3.2.4

library(stringr)

## Warning: package 'stringr' was built under R version 3.2.4

library(wordcloud)

## Warning: package 'wordcloud' was built under R version 3.2.5

## Loading required package: RColorBrewer

library(plyr)

## Warning: package 'plyr' was built under R version 3.2.4

# Assingment

Create regular expressions for the patterns below:

\***Match any of the following punctuation characters in the ASCII table: !"#$%&'()+,**

ascii<-c("$","!","}","#","^","\*","&")  
grep("[\\!|\"|\\#|\\$|\\%|\\&|\\'|\\(|\\)|\\+|\\,]",ascii)

## [1] 1 2 4 7

\***Create one regular expression to match all common misspellings of calendar**

commonMisSpellings<-c("calendar","calender","calandar","calander","colander")  
grep("c[a|o]l[e|a]nd[a|e]r",commonMisSpellings)

## [1] 1 2 3 4 5

\***Create one regular expression to match any character except line breaks.**

Quote <- c("You have brains in your head.",  
 " You have feet in your shoes.")  
grep("([\\w\\s\\d[:punct:]])\n",Quote)

## integer(0)

\***You need to validate a ZIP code (U.S. postal code), allowing both the five-digit and nine-digit (called ZIP+4) formats. The regex should match 02115 and 02115-5515, but not 2115, 2115-5515, 21155515,021155515, etc.**

validateZipcode<- function(zip){  
 if(length(grep("^\\d{5}([\\-]\\d{4})?$",zip))==0){  
 print("Invalid zip")  
 }else{  
 print("Valid zip")  
 }  
 }  
validateZipcode("02215-2113")

## [1] "Valid zip"

validateZipcode("022152113")

## [1] "Invalid zip"

\***You need to validate a legit any password for your website. Passwords have the following complexity requirements: Length between 8 and 32 characters, ASCII visible and space characters only, One or more uppercase letters, One or more lowercase letters, One or more special characters (ASCII punctuation)**

validatePassword <- function(passwd){  
 if(nchar(passwd)>=8 & nchar(passwd)<=32){  
 if(length(grep("[^\\x00\\x08\\x0B\\x0C\\x0E-\\x1F]\*",passwd))==0){  
 print("Invalid password: password can only have printable characters")  
 }else if(length(grep("[A-Z]",passwd))==0){  
 print("Invalid password: Atleast 1 uppercase letter is required")  
 }else if(length(grep("[a-z]",passwd))==0){  
 print("Invalid password: Atleast 1 lowercase letter is required")  
 }else if(length(grep("[[:punct:]]",passwd))==0){  
 print("Invalid password: Atleast 1 special character is required")  
 }else{  
 print("This is a Valid password")  
 }  
 }else{  
 print("Incorrect password: make sure that you password is more than 8 characters and less than 32.")  
 }  
}  
  
validatePassword("zap")

## [1] "Incorrect password: make sure that you password is more than 8 characters and less than 32."

validatePassword("computer")

## [1] "Invalid password: Atleast 1 uppercase letter is required"

validatePassword("Computer")

## [1] "Invalid password: Atleast 1 special character is required"

validatePassword("COMPUTER")

## [1] "Invalid password: Atleast 1 lowercase letter is required"

validatePassword("C@mputer")

## [1] "This is a Valid password"

\***Load the file M08\_tweets.csv (it is online at '**[**http://nikbearbrown.com/YouTube/MachineLearning/M08/M08\_tweets.csv**](http://nikbearbrown.com/YouTube/MachineLearning/M08/M08_tweets.csv)**')**

data\_url <- 'http://nikbearbrown.com/YouTube/MachineLearning/M08/M08\_tweets.csv'  
twitter <- read.csv(url(data\_url),stringsAsFactors=F)  
colnames(twitter)<-"X"

\***Do the following:** **Extract a list of the top 9 users (e.g. @NikBearBrown)**

twi<-cSplit(twitter, "X", " ")  
names<-sapply(1:34, function(i) (text=paste0("X\_",i)))   
setnames(twi,colnames(twi),names)  
  
t<-grep("^\\@",sapply(1:34, function(i) eval(parse(text=paste0("twi$X\_",i)))),value=T)  
  
head(sort(table(t),decreasing=T),9)

## t  
## @YouTube @InfoDuniaBahasa @JuegoDeTronosTM: @HoodieAllen:   
## 1409 1392 575 484   
## @FreakingTrue: @ @NickiDaily: @DarkestDungeon:   
## 436 429 308 273   
## @SincerelyTumblr:   
## 244

Extract a list of the top 9 hashtags (e.g. #Bear)

t<-grep("^\\#",sapply(1:34, function(i) eval(parse(text=paste0("twi$X\_",i)))),value=T)  
  
head(sort(table(t),decreasing=T),9)

## t  
## #gamedev #indiedev #gameinsight #KCA #GameDev   
## 9030 4399 1592 691 648   
## #bigdata #BigData #indiegame #iPad   
## 644 607 575 559

Find the top 5 most positve tweets and Negative tweets

#Load data  
data\_url <- 'http://nikbearbrown.com/YouTube/MachineLearning/M08/M08\_tweets.csv'  
twitter <- read.csv(url(data\_url),stringsAsFactors=F)  
# reduce the data  
Twitter <- twitter[1:500,]  
  
# Positive tweets   
PosTweet <- grep("great", Twitter)  
Twitter[PosTweet]

## [1] "Witness the devastation of the #bombs, great for #exploring fast! #terraria #gamedev http://t.co/p2DVQq9323"   
## [2] "I want to quote @drewsharp now: \"What a great \_\_\_\_\_ game.\""   
## [3] "RT @nbamark: Whatever happens this is one great game!!"   
## [4] "RT @halifaxscb: Just over 30 minutes to go until the @UCupHFX final. Going to be a great game. #UCupHFX #CISHockey http://t.co/mUFzyogL38"   
## [5] "I'm having a great week. My social media game clouted right now."   
## [6] "Come on @michiganstateu! #GetIt #BigTenChampionship #OT We hope this great game is a foreshadow of #MarchMadness2015 #NCAA tourney"   
## [7] "Hell of a game. MSU had plenty of opportunities to win but too many dumb mistakes. Still, they looked great all tournament long."   
## [8] "That's 2 trophies not unlocked for me now in The Binding of Isaac. Really want them patched in, this game's great but tough #ps4 #isaac"   
## [9] "@iTeshia It's a great game, very popular here . we have rugby Union &amp; Rugby League different sports, Rugby Union is the original game."  
## [10] "@chase\_hoff Nah. This is a great pre-tournament game and solid win."

# Negative tweets  
NegTweet <- grep("fuck", Twitter)  
Twitter[NegTweet]

## [1] "RT @48ozs: My \"push people away\" game is strong as fuck"   
## [2] "RT @48ozs: My \"push people away\" game is strong as fuck"   
## [3] "RT @48ozs: My \"push people away\" game is strong as fuck"   
## [4] "RT @GreyTheTick: EA: Here's a fucking idea for you. Just throw out a game that's completely insensitive/sexist/racist/all of the above."  
## [5] "Thank you Boatright for being a fucking hot head and losing the game for us."   
## [6] "RT @48ozs: My \"push people away\" game is strong as fuck"   
## [7] "RT \_\_BugattiDreams: I will always support underground and indie artists. fuck the rap game"   
## [8] "State fucking can't finish a game good job guys that's why you won't make a run"   
## [9] "RT @48ozs: My \"push people away\" game is strong as fuck"   
## [10] "Bro dead ass fuck this game MSU always fuckin chokes in OT"   
## [11] "RT @Messerli\_Bryce: If you're watching anything other than this game, fuck you"   
## [12] "@AliceRoseBurton but I don't beg, I just meme harder than every motherfucker in the game http://t.co/ChHRfDX4CF"

Create a world cloud of 100 related tweets

#Twitter\_hash <- str\_extract\_all(Twitter, "@\\w+")  
#Tweetdata <- Twitter\_hash  
  
Tweetdata.clean <- Corpus(VectorSource(Twitter))  
Tweetdata.clean <- tm\_map(Tweetdata.clean, stripWhitespace)  
Tweetdata.clean<- tm\_map(Tweetdata.clean, content\_transformer(tolower))  
Tweetdata.clean<- tm\_map(Tweetdata.clean, removePunctuation)  
Tweetdata.clean <- tm\_map(Tweetdata.clean, removeWords, stopwords("english"))  
inspect(Tweetdata.clean)

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# Document Term Matrix  
  
dtm <- DocumentTermMatrix(Tweetdata.clean)  
dtm2 <- as.matrix(dtm)  
frequency <- colSums(dtm2)  
frequency <- sort(frequency, decreasing=TRUE)  
V <- sort(rowSums(dtm2), decreasing = TRUE)  
myNames <- names(V)  
data <- data.frame(word = myNames, freq = V)  
wordcloud(data$word, data$freq, min.freq=5)

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 331 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 105 could not be  
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## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 175 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 353 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 77 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 164 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 73 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 93 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 47 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 238 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 442 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 158 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 142 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 296 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 220 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 383 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 276 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 457 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 372 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 38 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 55 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 133 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 338 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 81 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 60 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 437 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 242 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 232 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 183 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 96 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 310 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 485 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 498 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 266 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 440 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 248 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 390 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 61 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 249 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 155 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 79 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 45 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 398 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 356 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 385 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 57 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 378 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 441 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 255 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 340 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 74 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 346 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 90 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 200 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 478 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 75 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 333 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 382 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 257 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 304 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 431 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 467 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 499 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 489 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 329 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 274 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 279 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 87 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 363 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 43 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 31 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 301 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 327 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 422 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 362 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 291 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 148 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 50 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 222 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 86 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 463 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 374 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 376 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 392 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 204 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 320 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 456 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 328 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 309 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 387 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 479 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 199 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 488 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 76 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 146 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 412 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 393 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 492 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 360 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 302 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 294 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 84 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 53 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 261 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 433 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 225 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 460 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 187 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 59 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 389 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 80 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 423 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 209 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 131 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 284 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 172 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 439 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 410 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 280 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 136 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 16 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 317 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 20 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 92 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 140 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 62 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 82 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 169 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 173 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 227 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 149 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 190 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 8 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 111 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 269 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 480 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 19 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 325 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 483 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 234 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 171 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 153 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 233 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 364 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 469 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 98 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 400 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 293 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 212 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 246 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 316 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 102 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 446 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 312 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 285 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 215 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 48 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 10 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 335 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 121 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 347 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 470 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 428 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 70 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 375 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 184 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 23 could not be  
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## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 445 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 482 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 34 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 170 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 421 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 344 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 64 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 494 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 292 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 180 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 314 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 367 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 297 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 341 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 162 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 206 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 127 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 268 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 379 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 106 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 432 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 425 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 486 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 145 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 299 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 7 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 369 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 15 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 217 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 300 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 97 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 336 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 339 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 251 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 464 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 307 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 117 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 165 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 101 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 370 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 103 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 354 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 56 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 193 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 495 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 94 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 267 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 177 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 350 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 228 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 256 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 99 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 419 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 240 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 247 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 277 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 167 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 403 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 287 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 44 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 110 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 159 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 179 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 381 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 401 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 319 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 67 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 365 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 474 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 395 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 461 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 326 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 69 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 459 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 202 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 120 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 271 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 207 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 185 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 262 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 226 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 63 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 176 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 168 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 471 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 241 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 166 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 253 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 306 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 451 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 116 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 196 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 289 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 450 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 417 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 405 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 386 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 66 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 119 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 366 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 408 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 89 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 424 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 208 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 281 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 221 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 114 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 444 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 243 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 161 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 118 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 275 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 278 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 54 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 151 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 260 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 191 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 100 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 203 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 107 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 135 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 78 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 49 could not be  
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## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 124 could not be  
## fit on page. It will not be plotted.

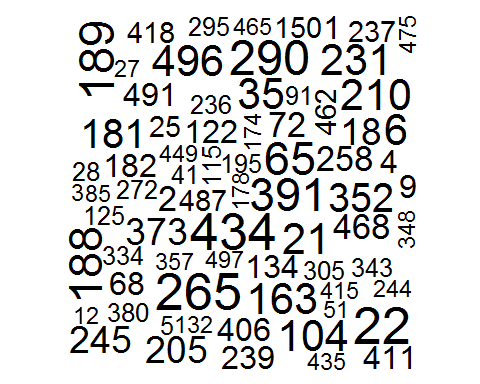
## Warning in wordcloud(data$word, data$freq, min.freq = 5): 377 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 332 could not be  
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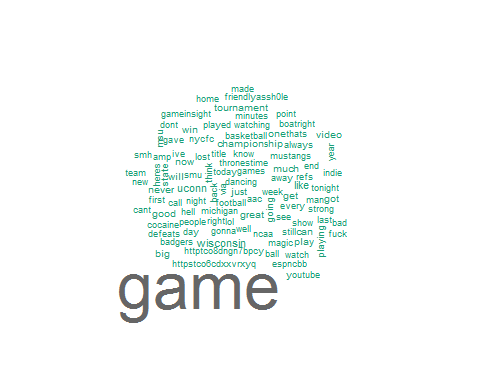
## Warning in wordcloud(data$word, data$freq, min.freq = 5): 466 could not be  
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## Warning in wordcloud(data$word, data$freq, min.freq = 5): 355 could not be  
## fit on page. It will not be plotted.

## Warning in wordcloud(data$word, data$freq, min.freq = 5): 315 could not be  
## fit on page. It will not be plotted.



words<-names(frequency)  
wordcloud(words[1:100], frequency[1:100], colors=brewer.pal(8, "Dark2"))



\***Which tweets could be classified as game development?**

gamedev<-(grep("\\#gamedev",twitter$X,value=T))  
head(gamedev)

## [1] "Witness the devastation of the #bombs, great for #exploring fast! #terraria #gamedev http://t.co/p2DVQq9323"   
## [2] "RT @AV\_metaldemon: Here's a trailer video thingy for my #7DRL game: https://t.co/Axz7G63Eqz #gamedev cc @Enichan"   
## [3] "RT @JoeCreates: Going to try to animate that smoke. http://t.co/rKrM1TNNSc #pixelart #gamedev http://t.co/lw3TG84XsL"   
## [4] "#TRPSGAME #gamedev #indiedev #b3d #alldev http://t.co/uOAXRPswlR"   
## [5] "@akanimh We'd love for you to play the demo too! Let us know what you think: http://t.co/b6cGuG7QYO #indiedev #gamedev"  
## [6] "RT @LTP\_ATS: More gross shaders on low poly critters #gamedev http://t.co/pyhw8oForu"