IIT School of Applied Technology

ILLINOIS INSTITUTE OF TECHNOLOGY

information technology & management

529 Advanced Data Analytics

November 1, 3 2016

Weekly 11 Presentation

Week 10 Topic: Agenda

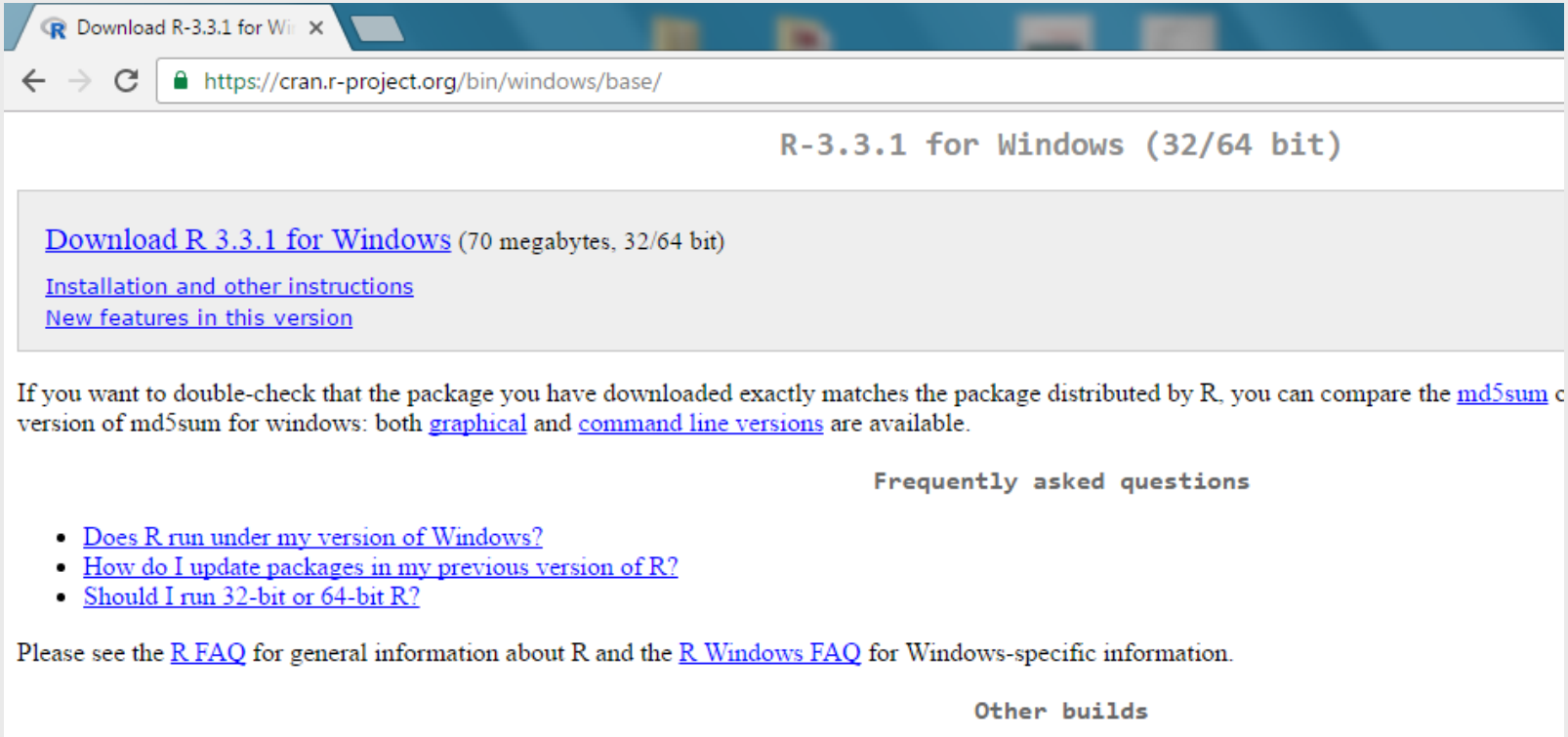
Sentiment Analysis of Tweets:

- Week 10:
  - Create a Dev account on Twitter
  - Store tweets in corpus/DF
  - Develop own sentiment scoring function
- Week 11: Visualize analytics in Tableau
- Week 12: Store tweets in Hadoop
- Week 13: Store tweets in MongoDB

- Final Exam update

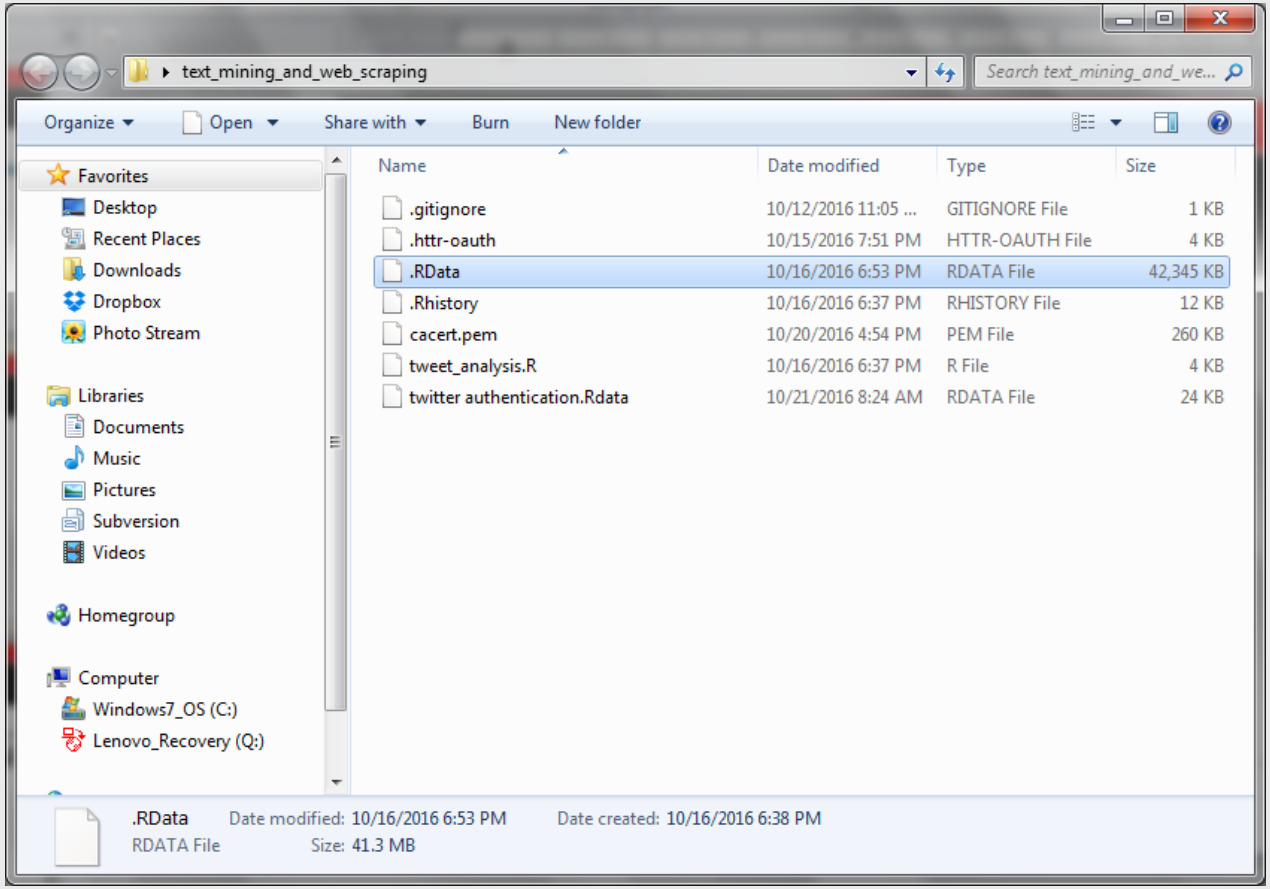
Week 10 Topic: R Version Needed

- Update your version of R to 3.2.5 or higher.
- Check your current version with ***R.Version()***



Week 10 Topic:
Set up your working directory

- Check your working directory with ***getwd()***
- Set your working directory with ***setwd("C:/Users/~~~~")***



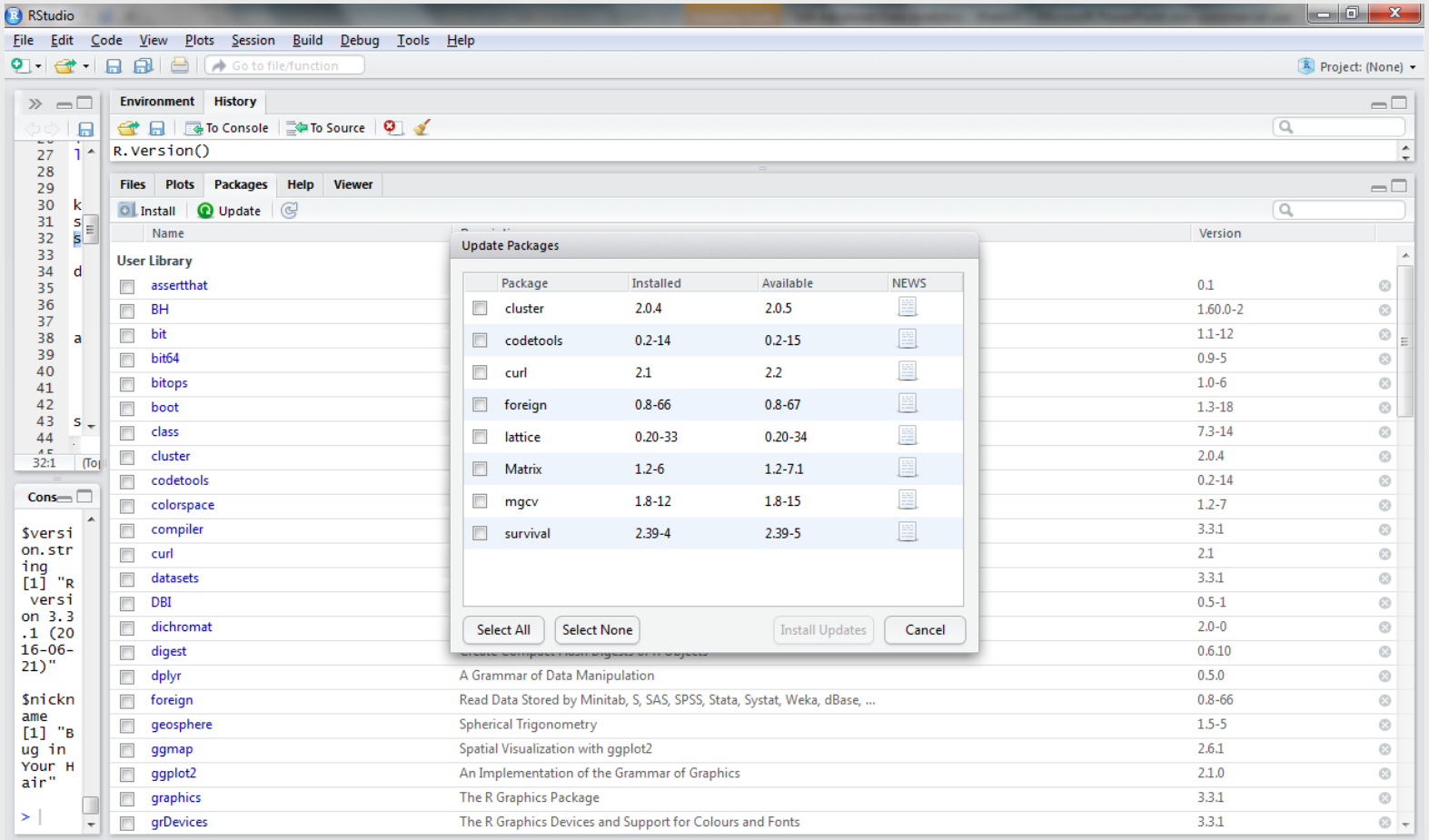
Week 10 Topic:
R Packages/Libraries Needed

- install.packages("twitteR")
- install.packages("httpuv")
- install.packages("ROAuth")
- install.packages("stringr")
- install.packages("tm")
- install.packages("ggmap")
- install.packages("dplyr")
- install.packages("plyr")
- install.packages("wordcloud")
- install.packages("openssl")

- library(twitteR)
- library(httpuv)
- library(ROAuth)
- library(RCurl)
- library(stringr)
- library(tm)
- library(ggmap)
- library(plyr)
- library(dplyr)
- library(wordcloud)
- library(openssl)

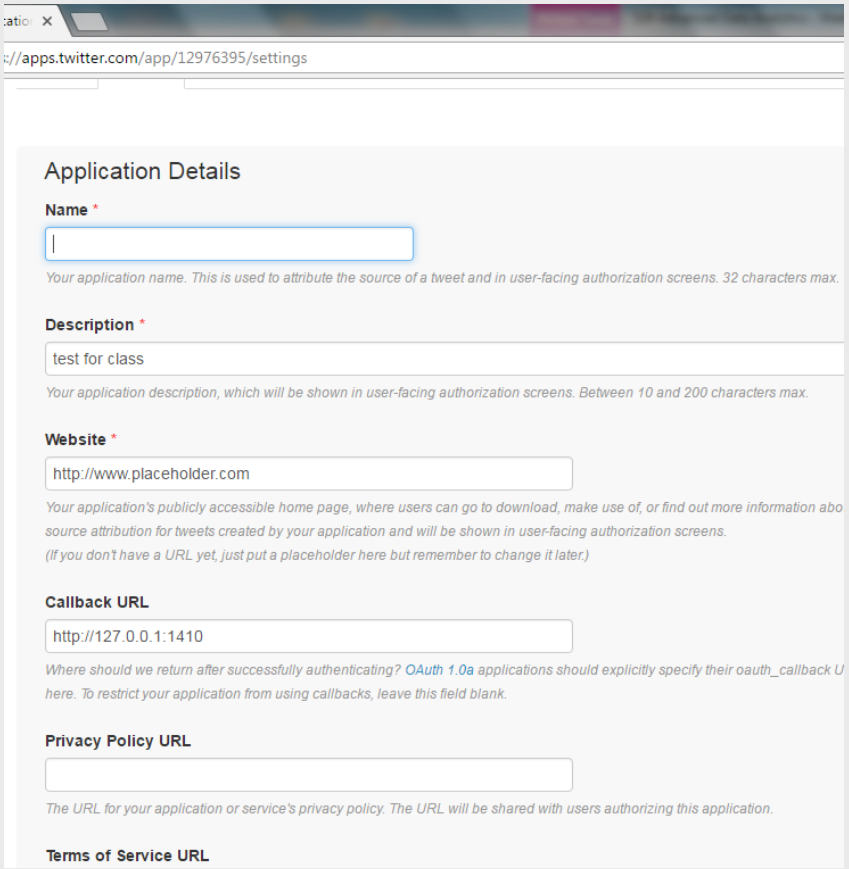
Week 10 Topic: Update R Packages/Libraries

- If you have packages installed previously, you can update packages:



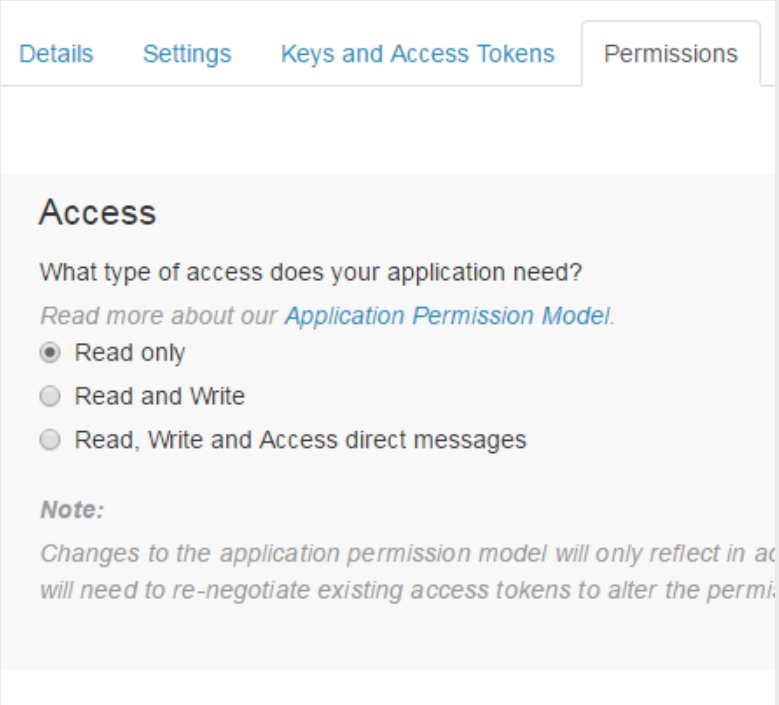
Week 10 Topic: Twitter Account/App set up

- In order to have access to Twitter data programmatically, one needs to create an app that interacts with the Twitter API.
- The first step is the registration of your app. In particular, you need to point your browser to ***https://apps.twitter.com/*** log-in to Twitter with a phone number (if you're not already logged in) and register a new application.
- Add the name and description of your app along with a website name. The website can be a test website.
- There's also a field for callback URL, but that's optional.



Week 10 Topic: Twitter Account/App set up (cont.)

- You will receive a *consumer key* and a *consumer secret*: these are application settings that should always be kept private.
- From the configuration page of your app, you can also require an access token and an access token secret. Similarly to the consumer keys, these strings must also be kept private: they provide the application access to Twitter on behalf of your account.
- The default permissions are read-only, which is all we need in our case, but if you decide to change your permission to provide writing features in your app, you must negotiate a new access token



Week 10 Topic:
Authenticate App w Twitter

Grab your API keys and access tokens from Twitter:

```
>setup_twitter_oauth(api_key, api_secret, access_token, access_token_secret)
```

Or

```
>authenticate <- OAuthFactory$new(
consumerKey=key, consumerSecret=secret,
requestURL="https://api.twitter.com/oauth/request_token",
accessURL="https://api.twitter.com/oauth/access_token",
authURL="https://api.twitter.com/oauth/authorize")
>setup_twitter_oauth(key, secret)
```

Save authentication:

```
>download.file(url="http://curl.haxx.se/ca/cacert.pem",
        destfile="C:/Users/sshin/Desktop/text_mining_and_web_scraping/cacert.pem",
        method="auto")
>save(authenticate, file="twitter authentication.Rdata")
```

Week 10 Topic:
Grab Tweets, Create Library, Store

- # Grab latest tweets for Donal Trump and Hillary Clinton:

```
tweets_trump <- searchTwitter('@realDonaldTrump', n=1500)

tweets_clinton <- searchTwitter('@HillaryClinton', n=1500)
```

- Loop over tweets and extract text library(plyr):

```
feed_trump = laply(tweets_trump, function(t) t$getText())

feed_clinton= laply(tweets_clinton, function(t) t$getText())
```

- Write to csv as needed:

```
write.csv(feed_trump, "donaldtrump.csv",row.names = F)
write.csv(feed_clinton, "hilarlaryclinton.csv",row.names = F)
```

Week 10 Topic:
Cleanse Tweets

Now you've got a bunch of text data for Trump and Clinton, so how do we decide what's a "good" tweet and a "bad" tweet? This is where we turned to the Hu and Liu Opinion Lexicon, a list of 6800 positive and negative words compiled by Bing Liu and Minqing Hu of the University of Illinois at Chicago.

- Unpack the Opinion Lexicon into your working directory.

```
# Read in dictionary of positive and negative works
yay = scan('opinion-lexicon-English/positive-words.txt', what='character', comment.char=';')
boo = scan('opinion-lexicon-English/negative-words.txt', what='character', comment.char=';')

# Add a few twitter-specific negative phrases
bad_text = c(boo, 'wtf', 'epicfail', 'douchebag')
good_text = c(yay, 'upgrade', ':)', '#iVoted', 'voted')
```

Week 10 Topic:
Scoring function

- Now, you've got your list of tweets and your list of opinionated words. The next thing to do is score the text of the tweets compared to how many of the "bad" and "good" words show up in each.
- For this we'll need a giant R function filled with lots of good gsub and match functions. Thanks to Jeff Breen for the function on which this was based:

```
score.sentiment = function(sentences, good_text, bad_text, .progress='none') {
require(plyr)
require(stringr)

# we got a vector of sentences. plyr will handle a list
# or a vector as an "l" for us
# we want a simple array of scores back, so we use
# "l" + "a" + "ply" = "laply":
, text=sentences) return(scores.df) }
```

Week 10 Topic:
Scoring function (cont.)

```
scores = laply(sentences, function(sentence, good_text, bad_text) {

# clean up sentences with R's regex-driven global substitute, gsub():
sentence = gsub('[[:punct:]]', '', sentence)
sentence = gsub('[[:cntrl:]]', '', sentence)
sentence = gsub('\ \d+', '', sentence)

#to remove emojis
sentence <- iconv(sentence, 'UTF-8', 'ASCII')

# and convert to lower case:
sentence = tolower(sentence)
```

Week 10 Topic:
Scoring function (cont.)

```
# split into words. str_split is in the stringr package
word.list = str_split(sentence, '\s+')

# sometimes a list() is one level of hierarchy too much
words = unlist(word.list)

# compare our words to the dictionaries of positive & negative terms
pos.matches = match(words, good_text)
neg.matches = match(words, bad_text)

# match() returns the position of the matched term or NA
# we just want a TRUE/FALSE:
pos.matches = !is.na(pos.matches)
neg.matches = !is.na(neg.matches)
)}
```

Week 10 Topic:
Scoring function (cont.)

```
# and conveniently enough, TRUE/FALSE will be treated as 1/0 by sum():
score = sum(pos.matches) - sum(neg.matches)
return(score)}, good_text, bad_text, .progress=.progress )

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

Week 10 Topic:
Calling and Plotting

```
# Call the function and return a data frame
feelthatrump <- score.sentiment(feed_trump, good_text, bad_text, .progress='text')
feelthaclinton <- score.sentiment(feed_clinton, good_text, bad_text, .progress='text')

# Nice little quick plot
qplot(factor(score), data=feelthatrump, geom="bar", xlab = "Sentiment Score")
qplot(factor(score), data=feelthaclinton, geom="bar", xlab = "Sentiment Score")
```

Week 10 Topic: Reference

- https://sites.google.com/site/miningtwitter/questions/sentiment/analysis:

basic analysis - Mining T

https://sites.google.com/site/miningtwitter/questions/sentiment/analysis

Mining twitter with R

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Mining Viz
References

GitHub

Basic Sentiment Analysis in R

sentiments

Breen's Approach

One option to perform sentiment analysis in R is by following what I call the *Breen's approach* named after Jeffrey Breen's seminal elucidating slides on twitter sentiment analysis with R
http://jeffreybreen.wordpress.com/2011/07/04/twitter-text-mining-r-slides/

The general idea is to calculate a *sentiment score* for each tweet so we can know how positive or negative is the posted message.
There are different ways to calculate such scores,
and you can even create your own formula.
We'll use a very simple yet useful approach to define our score formula

Score = Number of positive words - Number of negative words

If Score > 0, this means that the sentence has an overall 'positive opinion'
If Score < 0, this means that the sentence has an overall 'negative opinion'
If Score = 0, then the sentence is considered to be a 'neutral opinion'

In order to count the number of positive and negative words, we need a very important ingredient:
an opinion lexicon in english, which fortunately it is provided by Hu and Liu and it can be accessed from: http://www.cs.uic.edu/~liub/FBS/sentiment-analysis.html

Minqing Hu and Bing Liu. "Mining and Summarizing Customer Reviews." Proceedings of the ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD-2004), Aug 22-25, 2004, Seattle, Washington, USA,

Bing Liu, Minqing Hu and Junsheng Cheng. "Opinion Observer: Analyzing and Comparing Opinions on the Web." Proceedings of the 14th

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Week 10 Topic:
Week 10 Assignment

Develop your own sentiment analysis scoring function:

1) Customize/Augment/Update the “good text”, “bad text” repository with own research/list of words. Survey the tweets (in XLS or other) and determine words to be considered for either. Submit a table of “good” and “bad” words.
2) Determine additional levels of scoring e.g., more than just good and bad, weighting of words by importance, weighting of words by frequency etc. Submit scoring logic in a table.
3) Develop final scoring method and question. Submit the final scoring equation and function.
4) Share in discussion topic

Week 11 Topic: Agenda

Sentiment Analysis of Tweets:

- Week 10-11:
  - Create a Dev account on Twitter
  - Develop own sentiment scoring function
  - Score and plot results - On ~2k tweets
- Week 12: Visualize analytics in Tableau
  - Collect geo data for tweets
  - Store tweets in corpus
  - Plot in Tableau
- Week 13: Store tweets in Hadoop
  - Score and plot results - On ~10k tweets
- Week 14: Store tweets in MongoDB
  - Score and plot results - On ~10k tweets

Week 11 Topic: References

Use following examples as reference for the coming weeks:

NLP etc.:

- Unsupervised: http://stackoverflow.com/questions/3920759/unsupervised-sentiment-analysis
- NLP Tools: http://stackoverflow.com/questions/12299724/list-of-natural-language-processing-tools-in-regards-to-sentiment-analysis-whi?rq=1

Weeks 10-12:

- Donald Trump: https://www.r-bloggers.com/sentiment-analysis-on-donald-trump-using-r-and-tableau/
- Super Tuesday: https://www.r-bloggers.com/how-to-use-r-to-scrape-tweets-super-tuesday-2016/
- Jazz: https://jazzanalytics.wordpress.com/2016/09/12/sentiment-analysis-on-narendra-modi-using-r/
- Basic Sentiment Example: https://sites.google.com/site/miningtwitter/questions/sentiment/analysis

Week 11 Topic: References (cont.)

Weeks 10-12 (cont.):

- Vectorizing: http://stackoverflow.com/questions/25184076/using-scores-in-sentiment-analysis-with-r?rq=1
- Various packages: http://stackoverflow.com/questions/10233087/sentiment-analysis-using-r?rq=1
- Other word lists: http://stackoverflow.com/questions/1196133/seed-data-for-sentiment-analysis?rq=1
- Other approaches: http://stackoverflow.com/questions/4199441/best-algorithmic-approach-to-sentiment-analysis?rq=1
- Scoring by Sentence: https://blog.exploratory.io/twitter-sentiment-analysis-scoring-by-sentence-b4d455de3560#.c7ofvrcjn
- 3 lists example: http://analyzecore.com/2014/04/28/twitter-sentiment-analysis/
- https://sites.google.com/site/miningtwitter/basics/processing
- https://cran.r-project.org/web/packages/twitteR/twitteR.pdf

Week 11 Topic: Language References

Language:

- Phrase Structure Rules: https://en.wikipedia.org/wiki/Phrase_structure_rules
- Grammar Frameworks: https://en.wikipedia.org/wiki/Category:Grammar_frameworks

Presentations on sentiment analysis and datamining:

- http://condor.depaul.edu/ntomuro/courses/594/

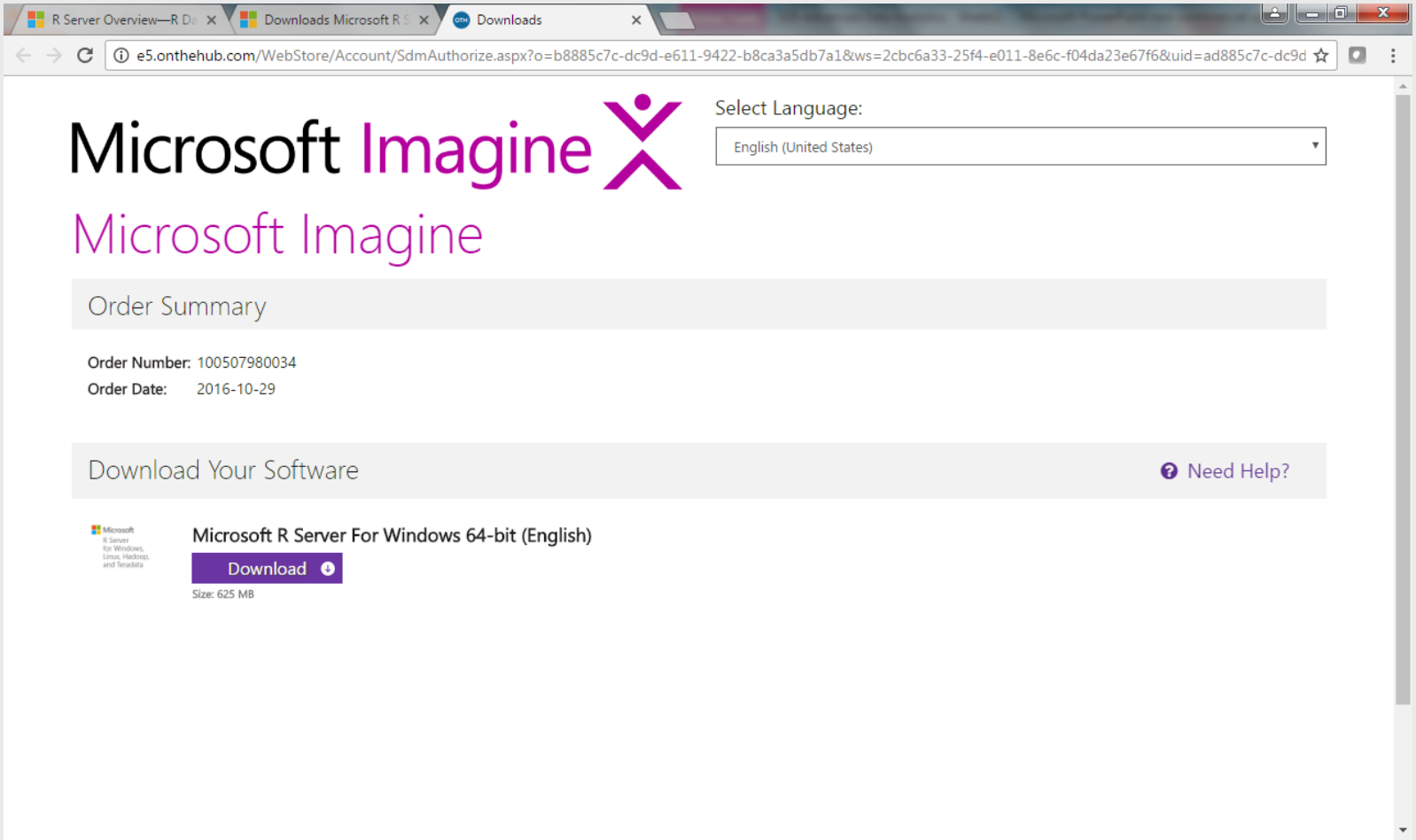
Book:

- Text Mining and Analysis: Practical Methods, Examples, and Case Studies Using SAS: http://proquestcombo.safaribooksonline.com/book/databases/sas/9781612907871

Just a fun app:

- http://emotify.accessible.ai/

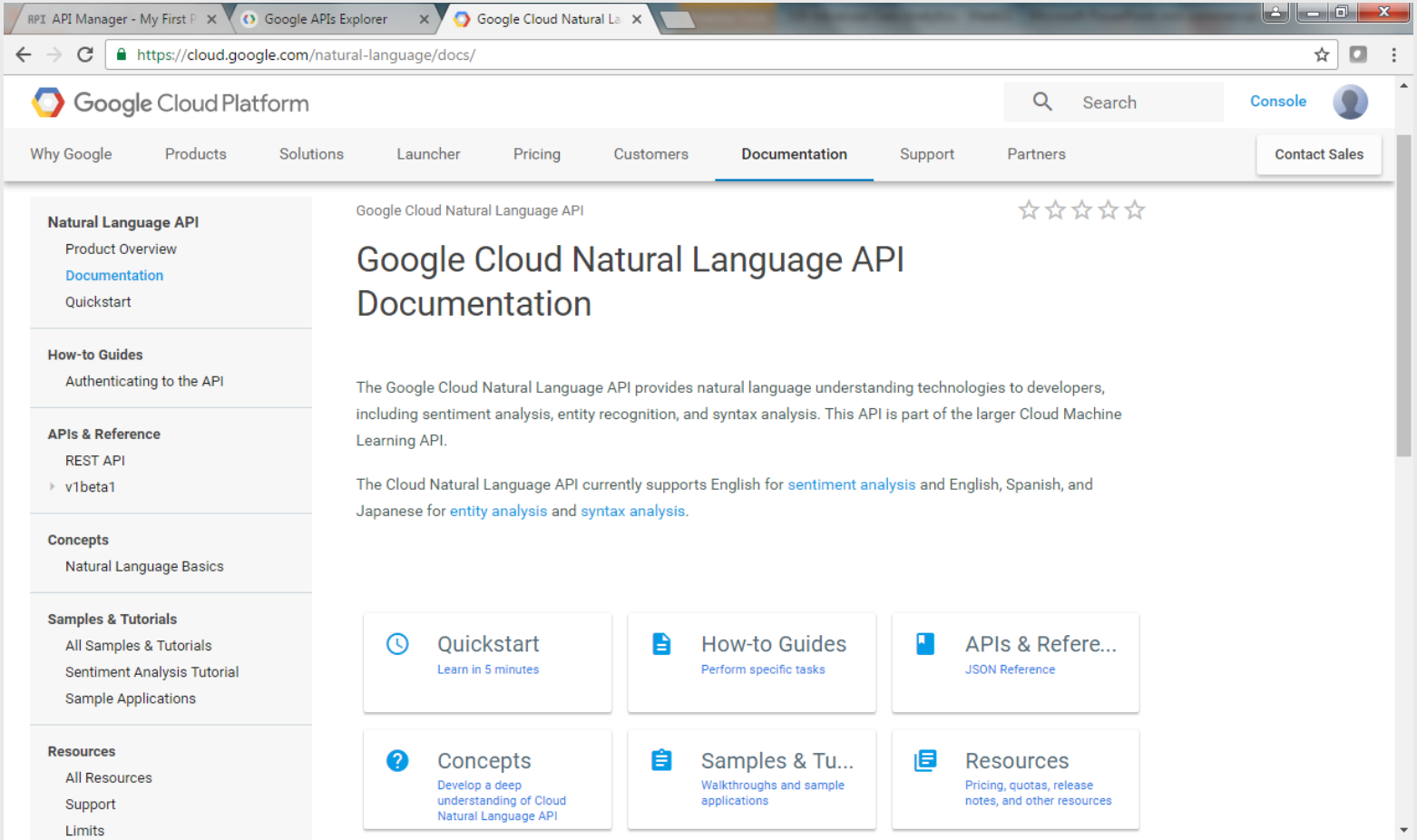
Week 11 Topic:
Microsoft Dreamspark – R Server



Week 11 Topic:
Free Trial - Google Natural Language API

CLOUD NATURAL LANGUAGE API BETA

https://cloud.google.com/natural-language/?utm_source=google&utm_medium=cpc&utm_campaign=2015-q2-cloud-na-gcp-bkws-freetrial-en&gclid=CPap-beU_s8CFQ6TaQod8dcAPg



Week 11 Topic: Developing Good R Code

https://cran.r-project.org/web/packages/rockchalk/vignettes/Rchaeology.pdf:

Rchaeology: Idioms of R Programming

Paul E. Johnson <pauljohn @ ku.edu>

February 24, 2016

This document was initiated on May 31, 2012. The newest copy will always be available at `http://pj.freefaculty.org/R` and as a vignette in the R package "rockchalk".

Rchaeology: The study of R programming by investigation of R source code. It is the effort to discern the programming strategies, idioms, and style of R programmers in order to better communicate with them.

Rchaeologist: One who practices Rchaeology.

These are Rcheological observations about the style and mannerisms of R programmers in their native habitats. Almost all of the insights here are gathered from the r-help and r-devel emails lists, the stackoverflow website pages for R, and the R source code itself. These are lessons from the "school of hard knocks."

How is this different from Rtips(`http://pj.freefaculty.org/R/Rtips.{pdf,html}`)?

1. This is oriented toward programming R, rather than using R.
2. It is more synthetic, aimed more at finding "what's right" rather than "what works."

Week 11 Topic: do.call, lapply, and map

http://stackoverflow.com/questions/10801750/whats-the-difference-between-lapply-and-do-call-in-r:

"In most simple words:

- ***lapply()*** applies a given function for each element in a list, so there will be several function calls.
- ***do.call()*** applies a given function to the list as a whole, so there is only one function call.

The best way to learn is to play around with the function examples in the R documentation."

- Do.call RDocumentaion: https://www.rdocumentation.org/packages/base/versions/3.3.1/topics/do.call
- lapply RDocumentation: https://www.rdocumentation.org/packages/base/versions/3.3.1/topics/lapply
- Map Rdocumentation: https://www.rdocumentation.org/packages/lambda.tools/versions/1.0.9/topics/map

Week 11 Topic: Understanding do.call

http://www.stat.berkeley.edu/~s133/Docall.html:

- R has an interesting function called do.call. This function allows you to call any R function, but instead of writing out the arguments one by one, you can use a list to hold the arguments of the function. While it may not seem useful on the surface, a simple example will help to show how powerful do.call is.
- Suppose we have three comma-separated text files that have information on the same three variables.
- It's easy to read each one in with read.csv, and then to call the rbind (combine by rows) function to make one big data frame. (Remember that rbind will only work if all the data frames being combined have the same variable names.)

```
> one = read.csv('1.csv')
> nrow(one)
[1] 21
> two = read.csv('2.csv')
> nrow(two)
[1] 25
> three = read.csv('3.csv')
> nrow(three)
[1] 27
> big = rbind(one,two,three)
> nrow(big)
[1] 73
```

Week 11 Topic: Understanding do.call (cont)

- But now suppose we have 20 csv files that we want to read and combine. We could do what we did with the three files, but, not only would it get tiring, there's a chance of making an error when we have to type so many commands.
- In the past, when we've had problems like this, sapply was able to help. Let's try it here, by writing a function that will take a number, create a filename by pasting .csv at the end, and reading in the data:

```
> allframes = sapply(1:20,function(x)read.csv(paste(x,'csv',sep='.')))
> head(allframes)
[,1]      [,2]      [,3]      [,4]      [,5]      [,6]      [,7]
a factor,21  factor,25  factor,27  factor,25  factor,27  factor,21  factor,24
b factor,21  factor,25  factor,27  factor,25  factor,27  factor,21  factor,24
x Numeric,21 Numeric,25 Numeric,27 Numeric,25 Numeric,27 Numeric,21 Numeric,24
y Numeric,21 Numeric,25 Numeric,27 Numeric,25 Numeric,27 Numeric,21 Numeric,24
[,8]      [,9]      [,10]     [,11]     [,12]     [,13]     [,14]
a factor,28  factor,23  factor,23  factor,22  factor,26  factor,24  factor,23
b factor,28  factor,23  factor,23  factor,22  factor,26  factor,24  factor,23
x Numeric,28 Numeric,23 Numeric,23 Numeric,22 Numeric,26 Numeric,24 Numeric,23
```

Week 11 Topic: Understanding do.call (cont)

- It will always return a list, the same length as its first argument, with each element of the list resulting in the function we passed to lapply operating on one element of the first argument.
- In our case, calling lapply instead of sapply will give us a list of length 20, where each element is the result of calling read.csv on one of the 20 files. This is where do.call comes in. Instead of having to pass 20 data frames to rbind, we can use do.call to pass all 20 of them to rbind, since they are in a list, and that's exactly what do.call is looking for.

```
> allframes = lapply(1:20,function(x)read.csv(paste(x,'csv',sep='.')))
> sapply(allframes,nrow)
[1] 21 25 27 25 27 21 24 28 23 23 22 26 24 23 25 29 28 30 27 29
> answer = do.call(rbind,allframes)
> nrow(answer)
[1] 507
```

We can combine all the data frames without storing them separately or passing them individually to rbind.

Week 11 Topic:
Get List of Tweets and Geo Locs

```
>N=2000 # tweets to request from each query
>S=200 # radius in miles
>lats=c(38.9,40.7,37.8,39,37.4,28,30,42.4,48,36,32.3,33.5,34.7,33.8,37.2,41.2,
46.8, 46.6,37.2,43,42.7,40.8,36.2,38.6,35.8,40.3,43.6,40.8,44.9,44.9)
>lons=c(-77,-74,-122,-105.5,-122,-82.5,-98,-71,-122,-115,-86.3,-112,-92.3,-
84.4,-93.3, -104.8,-100.8,-112, -93.3,-89,-84.5,-111.8,-86.8,-92.2,-78.6,-76.8,-
116.2,-98.7,-123,-93)
```

#cities=DC,New York,San Fransisco, Colorado, Mountainview, Tampa, Austin, Boston, Seatle,Vegas,Montgomery,Phoenix,Little Rock,Atlanta,Springfield, Cheyenne,Bisruk,Helena,Springfield,Madison,Lansing,Salt Lake City,Nashville, Jefferson City,Raleigh,Harrisburg,Boise,Lincoln,Salem,St. Paul

```
>donald=do.call(rbind,lapply(1:length(lats), function(i)
searchTwitter('Donald+Trump', lang="en",n=N, resultType="recent",
geocode=paste(lats[i],lons[i],paste0(S,"mi"), sep=","))))
```

Week 11 Topic: Get tweets into DF

```
>donaldlat=sapply(donald, function(x) as.numeric(x$getLatitude()))
>donaldlat=sapply(donaldlat, function(z) ifelse(length(z)==0,NA,z))
>donaldlon=sapply(donald, function(x) as.numeric(x$getLongitude()))
>donaldlon=sapply(donaldlon, function(z) ifelse(length(z)==0,NA,z))
>donalddate=lapply(donald, function(x) x$getCreated())
>donalddate=sapply(donalddate,function(x) strftime(x, format="%Y-%m-%d
%H:%M:%S",tz = "UTC")) donaldtext=sapply(donald, function(x) x$getText())
>donaldtext=unlist(donaldtext)
>isretweet=sapply(donald, function(x) x$getIsRetweet())
>retweeted=sapply(donald, function(x) x$getRetweeted()) >retweetcount=sapply(donald,
function(x) x$getRetweetCount()) >favoritecount=sapply(donald, function(x)
x$getFavoriteCount()) >favorited=sapply(donald, function(x) x$getFavorited())
```

```
>data=as.data.frame(cbind(tweet=donaldtext,date=donalddate,lat=donaldlat,lon=donaldlon,
isretweet=isretweet,retweeted=retweeted,
retweetcount=retweetcount,favoritecount=favoritecount,favorited=favorited))
```

Week 11 Topic: Examine the List

```
>length(donaldlon)
>write.csv(donaldlon, "donaldlon.csv",row.names = F)
>length(donaldlat)
>write.csv(donaldlat, "donaldlat.csv",row.names = F)
>length(donalddate)
>write.csv(donalddate, "donalddate.csv",row.names = F)
>length(donaldtext)
write.csv(donaldtext, "donaldtext.csv",row.names = F)


>ls()
```

Week 11 Topic: Using twListToDF

References:

- https://www.rdocumentation.org/packages/twitteR/versions/1.1.9/topics/twListToDF
- http://rfunction.com/archives/2002

```
 > library(twitteR)
Loading required package: RCurl
Loading required package: bitops
Loading required package: RJSONIO
> result <- userTimeline("BarackObama", n=3200)
> length(result)
[1] 2975
> tweet.df <- twListToDF(result)
> Created <- tweet.df$created
> counts <- table(as.Date(Created))[-1]
> dates <- as.Date(names(counts))
> # png("twitteR-BarackPosts.png", 650, 500)
> plot(dates, counts, type="h") > # dev.off()
```

Week 11 Topic: Corpus Word Cloud

```
# Create corpus
>corpus=Corpus(VectorSource(data$tweet))

# Convert to lower-case
>corpus=tm_map(corpus,tolower)

# Remove stopwords
>corpus=tm_map(corpus,function(x) removeWords(x,stopwords()))

# convert corpus to a Plain Text Document
>corpus=tm_map(corpus,PlainTextDocument)
>col=brewer.pal(6,"Dark2")
>wordcloud(corpus, min.freq=25, scale=c(5,2),rot.per = 0.25, random.color=T,
max.word=45, random.order=F,colors=col)
```

Week 11 Topic: SAS Enterprise Miner

https://support.sas.com/ondemand/emConfig.html

SAS OnDemand for Acad | support.sas.com | Java SE Runtime Environ

https://support.sas.com/ondemand/emConfig.html

Apps | Education | Data | STAC | Kx | Class | Books | Hadoop | R | SAS | Sentiment Analysis on | GitHub - cloudera/cdl | How-to: Analyze Twitt | Other bookmarks

Step Three: Install the recommended Java Runtime Environment and Java Web Start

Installing the recommended JRE will also install Java Web Start on your system.

1. Access the Java SE Downloads Web Site and then download a JRE from the 1.8 series that is either before Update 72 or is Update 73.
   For example, to download JRE 1.8.0_45, do the following:
   1. Open the Oracle Java Archive site.
   2. Click Java SE 8.
   3. Click Java SE Runtime Environment 8u45.
   4. Check the **Accept License Agreement** radio button to accept the Oracle Binary Code License Agreement for Java SE.
   5. Select **jre-8u45-windows-i586.exe** from the **Download** column of the table.
      You may be prompted to sign in to your Oracle Web account. If you do not have an account, you will be prompted to create one.
   6. Launch the download and select **Run** to begin the installation process.
2. (Optional) If you had to complete Step Two above, repeat this step to ensure that only the new JRE that you installed is selected.

Notes:

- Other JREs from the 1.7 and 1.8 series might also work.
- For more information, see SAS® 9.4 Support for Java Runtime Environments.

RETURN TO TOP

Starting *SAS® OnDemand for Academics: Enterprise Miner™*

After you have installed the recommended JRE (or if you want to test with a JRE that is already installed), you can start *SAS® OnDemand for Academics: Enterprise Miner™*.

In the future, you can simply start *SAS® OnDemand for Academics: Enterprise Miner™* any time that you want to use the application.

Note: If you experience problems starting the application, consider clearing your Java cache.

This type of file can harm your computer. Do you want to keep main.jnlp anyway? | Keep | Discard | Japan_US_GameR....pptx | TM-10-Sentiment....ppt | ACRE_Install.zip | Show all

Week 11 Topic:
Adjusting sentiment scoring for phrases

http://stackoverflow.com/questions/28545270/sentiment-score-for-sentence-in-r

Sentiment score for sent

stackoverflow.com/questions/28545270/sentiment-score-for-sentence-in-r

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1

I didn't look at the library you mentioned. This may now be what you want. I created a data frame with the positive and negative words. I assigned them a -/+ 1 value. I then assigned them a length value to sort on. This way the longest word/phrase is used first.

```
 sent <- data.frame(words = c("just right size", "love this quality",
                              "good quality", "very good quality", "i hate this notebook",
                              "great improvement", "notebook is not good"), user = c(1,2,3,4,
                              stringsAsFactors=F)

posWords <- c("great","improvement","love","great improvement","very good","good","right","v
negWords <- c("hate","bad","not good","horrible")

wordsDF<- data.frame(words = posWords, value = 1,stringsAsFactors=F)
wordsDF<- rbind(wordsDF,data.frame(words = negWords, value = -1))
wordsDF$lengths<-unlist(lapply(wordsDF$words, nchar))
wordsDF<-wordsDF[ order(-wordsDF[,3]),]


scoreSentence <- function(sentence){
  score<-0
  for(x in 1:nrow(wordsDF)){
    count<-length(grep(wordsDF[x,1],sentence))
    if(count){
      score<-score + (count * wordsDF[x,2])
      sentence<-sub(wordsDF[x,1],'',sentence)
    }
  }
  score
}

SentimentScore<- unlist(lapply(sent$words, scoreSentence))
cbind(sent, SentimentScore)
```

Output

```
                 words user SentimentScore
1      just right size    1              1
```

Hot Network Questions

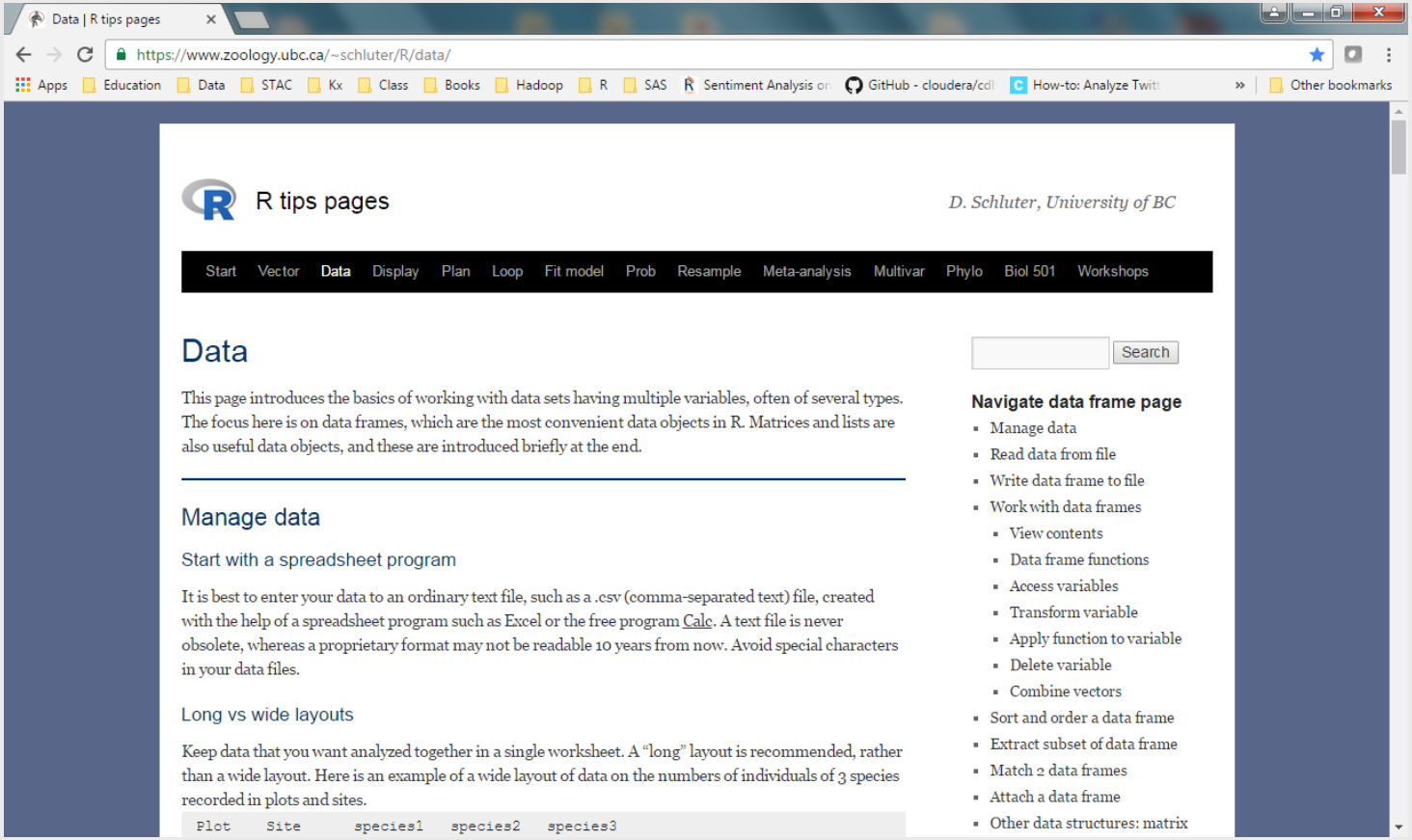
- proper oil for 1940's era aluminum ford engine
- Is there a name for the (anti-) pattern of passing parameters that will only be used several levels deep in the call chain?
- Most environmentally friendly mode of transport
- How much more than my mortgage should I charge for rent?
- If I receive written permission to use, without citing, a paper, is it plagiarism?
- Why didn't Japan attack the West Coast of the United States during World War II?
- Why is this C++ code faster than my hand-written assembly?
- Interlace strings
- Trick or Treat polyglot
- Client requesting admin work
- C++ Initialising fields directly vs initialisation list in default constructor
- Four color theorem disproof?
- Power cycling old hardware
- Why are spare wheels smaller than normal wheels?
- Does Dispel Magic end Spiritual Weapon?
- Were there any U.S. Presidents that were very unpopular when elected
- Is it accurate that the median is a score where 50% of the observations are above it and 50% are below it?

Week 11 Topic: Adjusting sentiment scoring code

```
sent <- data.frame(words = c("just right size", "love this quality", "good quality", "very good quality", "i hate this notebook", "great improvement", "notebook is not good"), user = c(1,2,3,4,5,6,7), stringsAsFactors=F)
posWords <- c("great","improvement","love","great improvement","very good","good","right","very")
negWords <- c("hate","bad","not good","horrible")

wordsDF<- data.frame(words = posWords, value = 1,stringsAsFactors=F)
wordsDF<- rbind(wordsDF,data.frame(words = negWords, value = -1))
wordsDF$lengths<-unlist(lapply(wordsDF$words, nchar))
wordsDF<-wordsDF[ order(-wordsDF[,3]),]

scoreSentence <- function(sentence){
score<-0
for(x in 1:nrow(wordsDF)){
count<-length(grep(wordsDF[x,1],sentence))
if(count){
score<-score + (count * wordsDF[x,2])
sentence<-sub(wordsDF[x,1],",sentence) } }
score }

SentimentScore<- unlist(lapply(sent$words, scoreSentence))
cbind(sent, SentimentScore)
```

Week 11 Topic:
R Tips

https://www.zoology.ubc.ca/~schluter/R/data/



Week 11 Topic: unlist()

http://rfunction.com/archives/2238

unlist | R Function of the

rfunction.com/archives/2238

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unlist

unlist(x)

Unlist a list of vectors into a single vector. This function will also unlist all lists within the list as well, but this setting may be turned off via additional options.

- x – Usually a list.

Example. Two examples are below. The first simple example takes a list of three vectors, each of length 1, and concatenates them. The second example takes a list where some of the items are themselves lists, and concatenates all vectors in the list tree.

Download the Code

```
> test1 <- list(5, "b", 12)
> unlist(test1)
[1] "5"  "b"  "12"
>
>
> test2 <- list(v1=5, v2=list(2983, 1890), v3=c(3, 119))
> test2
$v1
[1] 5

$v2
$v2[[1]]
[1] 2983

$v2[[2]]
[1] 1890
```

Week 11 Topic: nchar

https://stat.ethz.ch/R-manual/R-devel/library/base/html/nchar.html

R: Count the Number of

https://stat.ethz.ch/R-manual/R-devel/library/base/html/nchar.html

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nchar {base} R Documentation

Count the Number of Characters (or Bytes or Width)

Description

`nchar` takes a character vector as an argument and returns a vector whose elements contain the sizes of the corresponding elements of `x`.

`nzchar` is a fast way to find out if elements of a character vector are non-empty strings.

Usage

```
nchar(x, type = "chars", allowNA = FALSE, keepNA = NA)

nzchar(x, keepNA = FALSE)
```

Arguments

`x`
: character vector, or a vector to be coerced to a character vector. Giving a factor is an error.

`type`
: character string: partial matching to one of `c("bytes", "chars", "width")`. See 'Details'.

`allowNA`
: logical: should `NA` be returned for invalid multibyte strings or `"bytes"`-encoded strings (rather than throwing an error)?

`keepNA`
: logical: should `NA` be returned where ever `x` is `NA`? If false, `nchar()` returns `2`, as that is the number of printing characters used when strings are written to output, and `nzchar()` is `TRUE`. The default for `nchar()`, `NA`, means to use `keepNA = TRUE` unless `type` is `"width"`. Used to be (implicitly) hard coded to `FALSE` in R versions <= 3.2.0.

Details

The 'size' of a character string can be measured in one of three ways (corresponding to the `type` argument):

`bytes`

Week 11 Topic: order

http://www.cookbook-r.com/Manipulating_data/Sorting/#reverse-sort

Reverse sort

The overall order of the sort can be reversed with the argument `decreasing=TRUE`.

To reverse the direction of a particular column, the method depends on the data type:

- Numbers: put a `-` in front of the variable name, e.g. `df[ order(-df$weight), ]`.
- Factors: convert to integer and put a `-` in front of the variable name, e.g. `df[ order(-xtfrm(df$size)), ]`.
- Characters: there isn't a simple way to do this. One method is to convert to a factor first and then sort as above.

```
# Reverse sort by weight column. These all have the same effect:
arrange(df, -weight)                      # Use arrange from plyr package
df[ order(df$weight, decreasing=TRUE), ]  # Use built-in R functions
df[ order(-df$weight), ]                  # Use built-in R functions
#>   id weight   size
#> 2  2     27  large
#> 3  3     24 medium
#> 4  4     22  large
#> 1  1     20  small


# Sort by size (increasing), then by weight (decreasing)
arrange(df, size, -weight)         # Use arrange from plyr package
df[ order(df$size, -df$weight), ]  # Use built-in R functions
#>   id weight   size
#> 2  2     27  large
#> 4  4     22  large
#> 3  3     24 medium
#> 1  1     20  small


# Sort by size (decreasing), then by weight (increasing)
# The call to xtfrm() is needed for factors
arrange(df, -xtfrm(size), weight)         # Use arrange from plyr package
df[ order(-xtfrm(df$size), df$weight), ]  # Use built-in R functions
#>   id weight   size
#> 1  1     20  small
#> 3  3     24 medium
#> 4  4     22  large
#> 2  2     27  large
```

Week 11 Topic: sub

http://rfunction.com/archives/2354

sub, gsub | R Function of

rfunction.com/archives/2354

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sub, gsub

sub(pattern, replacement, x)

gsub(pattern, replacement, x)

Replace the first occurrence of a pattern with sub or replace all occurrences with gsub.

- pattern – A pattern to search for, which is assumed to be a regular expression. Use an additional argument fixed=TRUE to look for a pattern without using regular expressions.
- replacement – A character string to replace the occurrence (or occurrences for gsub) of pattern.
- x – A character vector to search for pattern. Each element will be searched separately.

Example. The simple example below does not make use of regular expressions.

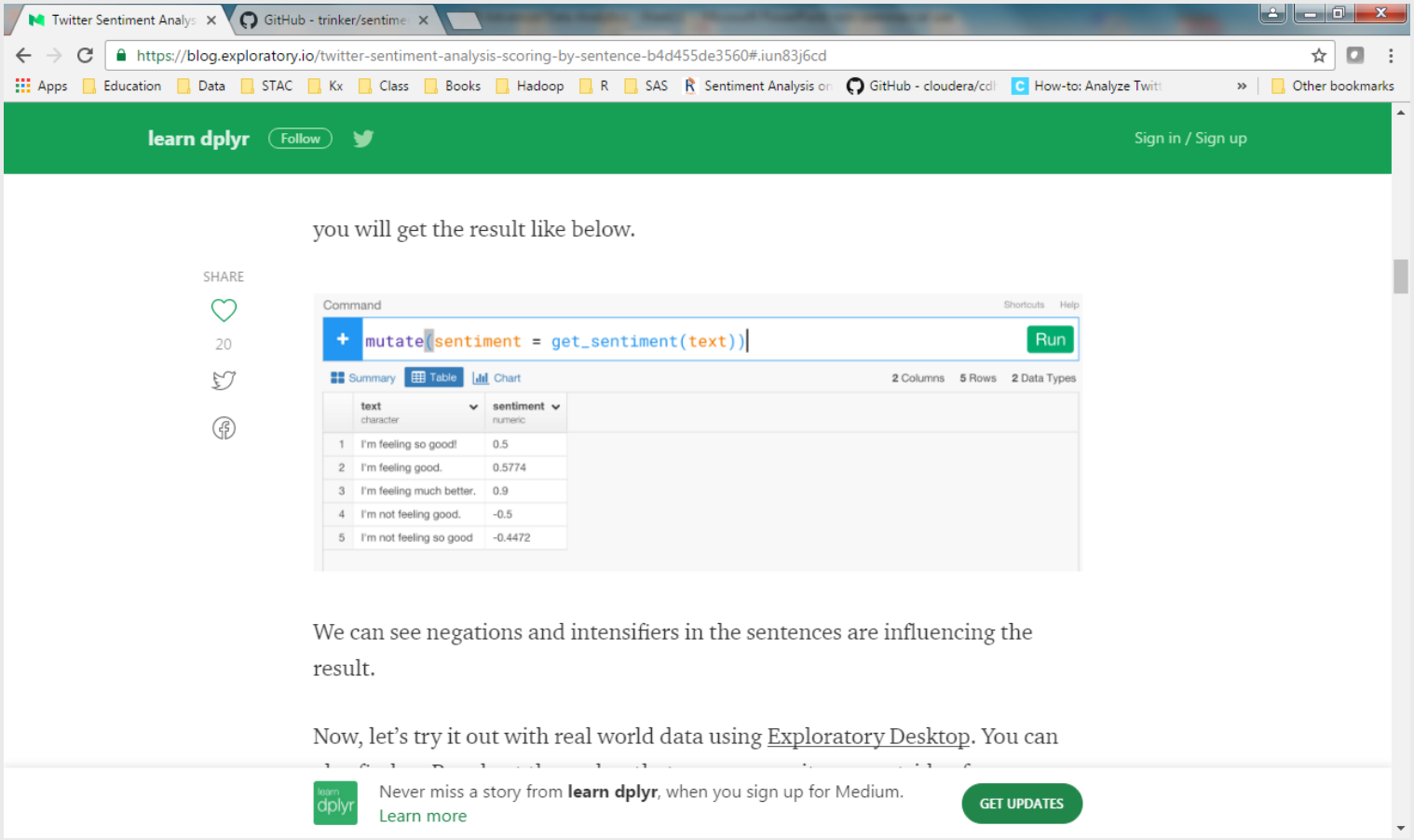
Download the Code

```
>
> x <- c("This is a sentence about axis",
+        "A second pattern is also listed here")
> sub("is", "XY", x)
[1] "ThXY is a sentence about axis"
[2] "A second pattern XY also listed here"
> gsub("is", "XY", x)
[1] "ThXY XY a sentence about axXY"
[2] "A second pattern XY also lXYted here"
>
```

Access Connections
HOME-732E-5
Status: Connected
Speed: 300.0 Mbps
IP address: 10.0.0.127
Intel(R) Centrino(R) Advanced-N 6250 AGN

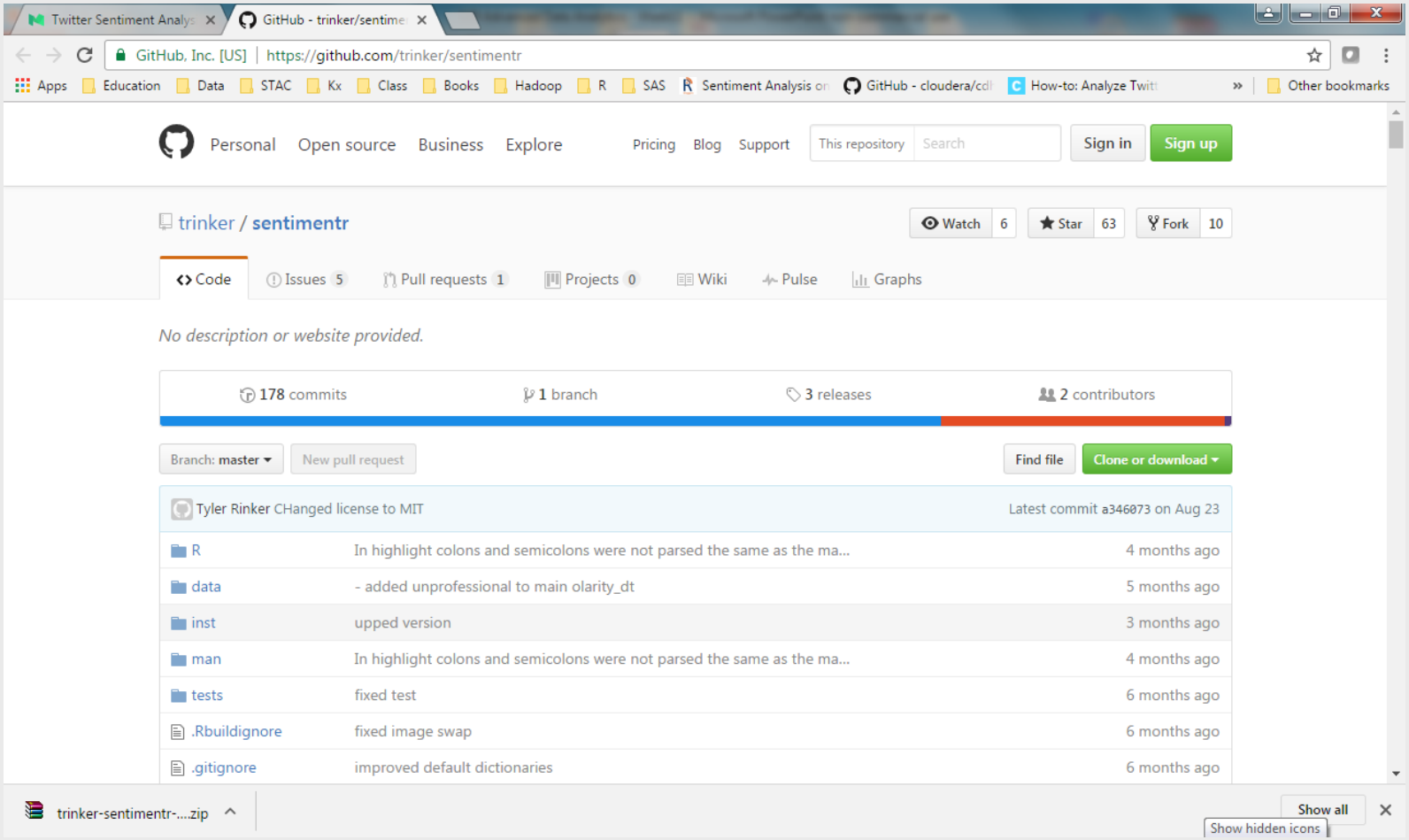
Week 11 Topic: Scoring by sentence

https://blog.exploratory.io/twitter-sentiment-analysis-scoring-by-sentence-b4d455de3560#.iun83j6cd



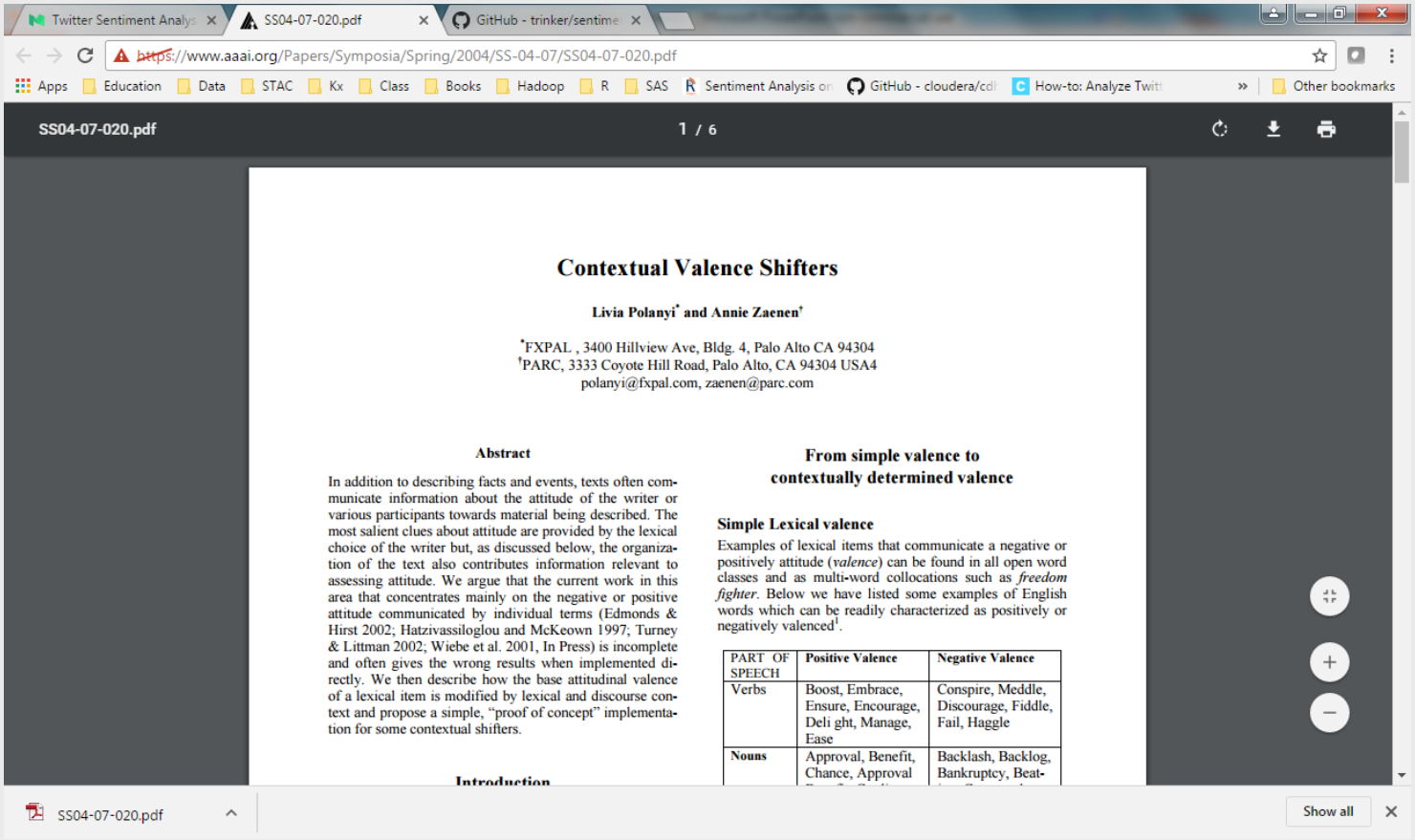
Week 11 Topic: Using sentimentr

https://github.com/trinker/sentimentr



Week 11 Topic: Contextual Valence Shifters

https://www.aaai.org/Papers/Symposia/Spring/2004/SS-04-07/SS04-07-020.pdf



Contextual Valence Shifters

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Abstract

In addition to describing facts and events, texts often communicate information about the attitude of the writer or various participants towards material being described. The most salient clues about attitude are provided by the lexical choice of the writer but, as discussed below, the organization of the text also contributes information relevant to assessing attitude. We argue that the current work in this area that concentrates mainly on the negative or positive attitude communicated by individual terms (Edmonds & Hirst 2002; Hatzivassiloglou and McKeown 1997; Turney & Littman 2002; Wiebe et al. 2001, In Press) is incomplete and often gives the wrong results when implemented directly. We then describe how the base attitudinal valence of a lexical item is modified by lexical and discourse context and propose a simple, "proof of concept" implementation for some contextual shifters.

Introduction

From simple valence to contextually determined valence

Simple Lexical valence

Examples of lexical items that communicate a negative or positively attitude (*valence*) can be found in all open word classes and as multi-word collocations such as *freedom fighter*. Below we have listed some examples of English words which can be readily characterized as positively or negatively valenced[1].

PART OF SPEECH	Positive Valence	Negative Valence
Verbs	Boost, Embrace, Ensure, Encourage, Deli ght, Manage, Ease	Conspire, Meddle, Discourage, Fiddle, Fail, Haggle
Nouns	Approval, Benefit, Chance, Approval	Backlash, Backlog, Bankruptcy, Beat-