Sourcing Data into R
CS9223/CS6513
Big Data Management and Analysis

Sources

- Programmatic
  - TextConnection
- External
  - Loading CSV
  - Connecting to sources
    - Databases mysql, mongo
    - Twitter and other RSS

textConnection

- Most suitable when you have data within the r script in constant quoted character format
- or from a string variable

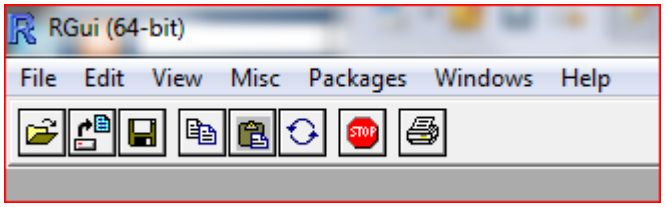
```
> t<-read.table(textConnection('
+ id  Source
+ 1     A10
+ 2     A32
+ 3     A10
+ 4     A25'),header=T)
> t
  id Source
1  1    A10
2  2    A32
3  3    A10
4  4    A25
>
```

```
> xstr<-'
+ id  Source
+ 1     A10
+ 2     A32
+ 3     A10
+ 4     A25'
> xstr
[1] "\nid  Source\n1     A10\n2     A32\n3     A10\n4     A25"
> t2<-read.table(textConnection(xstr),header=T)
> t2
  id Source
1  1    A10
2  2    A32
3  3    A10
4  4    A25
>
```

Loading data from CSV

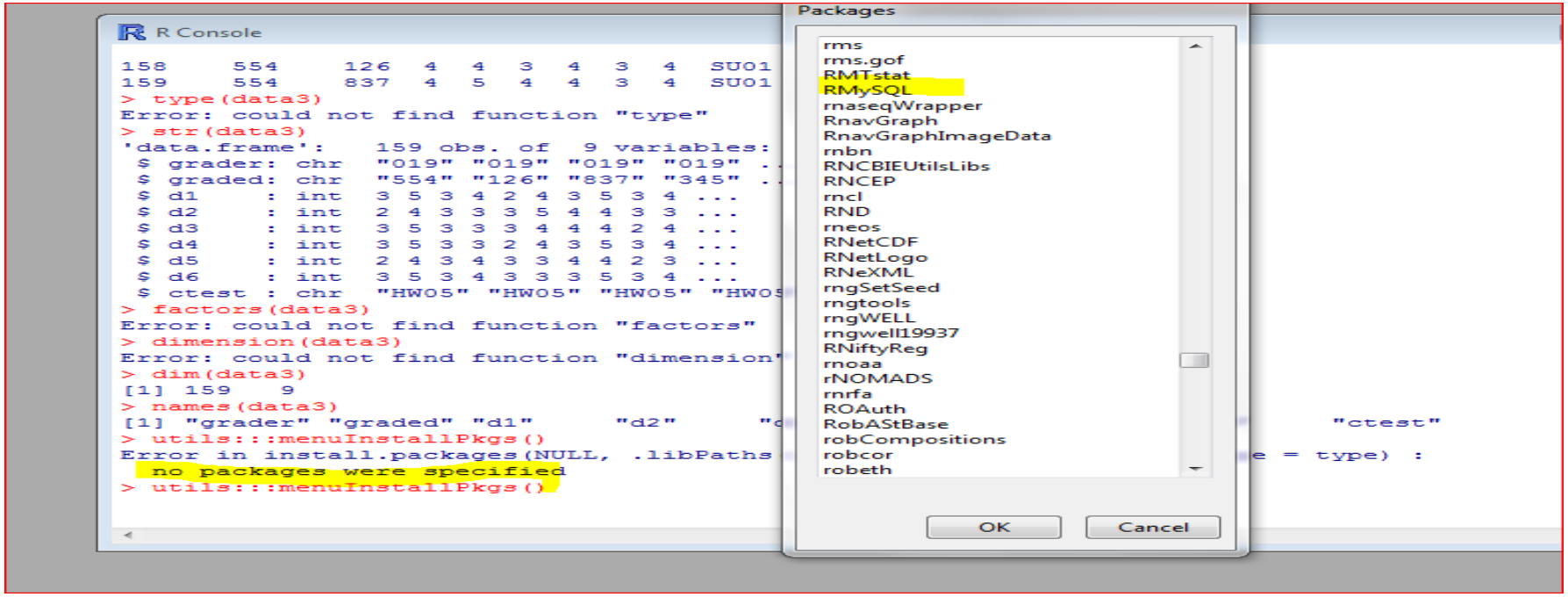
```
> sp2014dimrank<-read.csv("E:/poly/2014spring/grading/peer-eval-trend-by-hw-dim-coded.txt",header=FALSE,sep=",")
> str(sp20144dimrank)
Error in str(sp20144dimrank) : object 'sp20144dimrank' not found
> str(sp2014dimrank)
'data.frame':   65 obs. of  3 variables:
 $ V1: Factor w/ 14 levels "A","B","C","D",..: 1 2 3 4 5 6 7 8 9 10 ...
 $ V2: Factor w/ 5 levels "HW01","HW02",..: 1 1 1 1 1 1 1 1 1 1 ...
 $ V3: num  3.75 4.33 5 3.5 4.33 ...
> head(sp2014dimrank)
  V1   V2       V3
1  A HW01 3.750000
2  B HW01 4.333333
3  C HW01 5.000000
4  D HW01 3.500000
5  E HW01 4.333350
6  F HW01 3.666650
> tail(sp2014dimrank)
   V1   V2       V3
60  J HW05 5.000000
61  G HW05 3.166667
62  A HW05 3.666700
63  K HW05 3.250000
64  H HW05 4.416650
65  M HW05 4.333367
```

External Source:MySQL

- Many options – RMySQL
- R Version 3.1.2
- Package RMySQL version
- http://cran.r-project.org/web/packages/RMySQL/index.html
- http://cran.r-project.org/web/packages/RMySQL/RMySQL.pdf
- Download ->http://cran.r-project.org/bin/windows/contrib/3.1/RMySQL_0.10.1.zip
- And http://cran.at.r-project.org/bin/windows/contrib/3.2/DBI_0.3.1.zip
- Install the two downloaded packages using utils:::menuInstallLocal() on the command line or
- From the 

Packages menu.

RMySQL

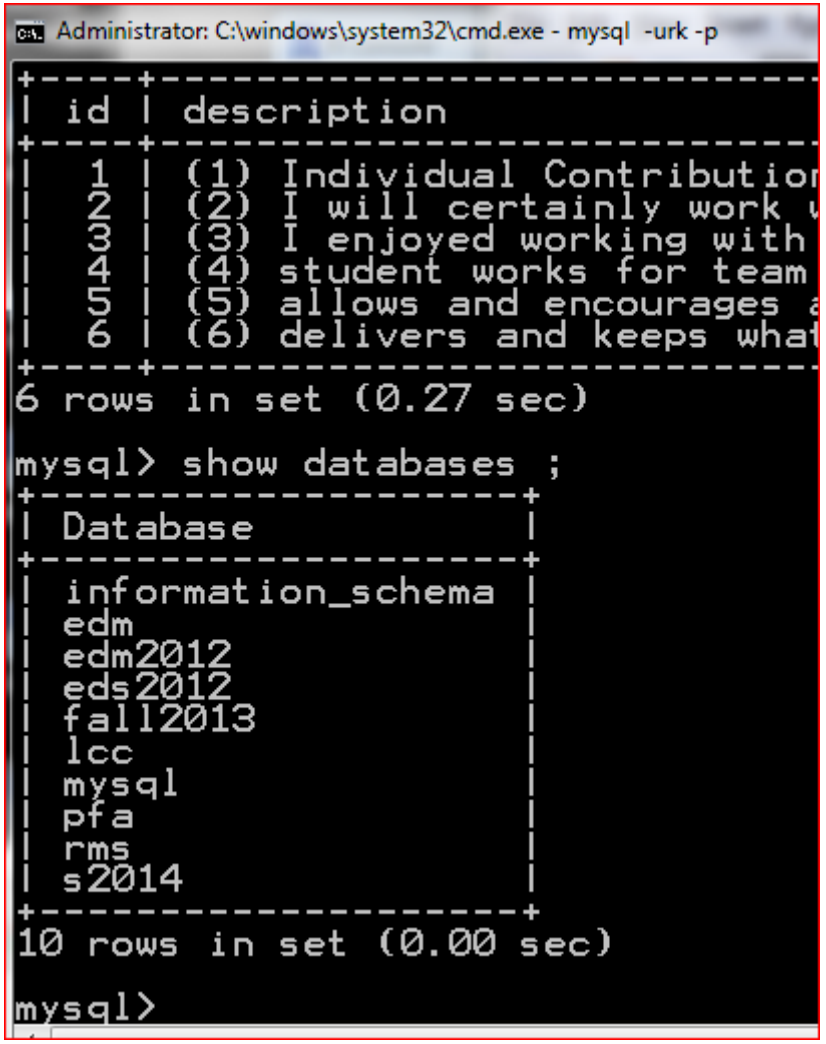


You can also install packages as shown above using menu

```
> require(RMySQL)
Loading required package: RMySQL
Loading required package: DBI
```

Then issue the require command.
Verify that both packages are loaded.

Step 1: First start a mysql session



Confirm u have a working MySql
Credentials
Hostname
Username
Password and
A database.

Test RMySQL

- Test simple queries

```
> con<-dbConnect(RMySQL::MySQL(),host="localhost",user="rk",password="[redacted]",dbname="s2014")
> res <- dbSendQuery(con,"select count(*) from rk10262014")
> data <-dbFetch(res)
> data
  count(*)
1        4
> res2 <- dbSendQuery(con,"select * from rk10262014")
> data2<-dbFetch(res2)
> data2
```

```
> data2
  product rank
1    eqty    2
2     opt    1
3     cds    1
4    swap    1
> res3 <- dbSendQuery(con,"select * from blind_sdenorm")
> data3<-dbFetch(res3)
> data3
    grader graded d1 d2 d3 d4 d5 d6 ctest
1      019    554  3  2  3  3  2  3  HW05
2      019    126  5  4  5  5  4  5  HW05
3      019    837  3  3  3  3  3  3  HW05
4      019    345  4  3  3  3  4  4  HW05
5      019    554  2  3  3  2  3  3  HW04
6      019    126  4  5  4  4  3  3  HW04
7      019    837  3  4  4  3  4  3  HW04
8      019    345  5  4  4  5  4  5  HW04
9      019    554  3  3  2  3  2  3  HW03
10     019    126  4  3  4  4  3  4  HW03
```

Retrieve data from MySQL

```
> str(data3)
'data.frame':   159 obs. of  9 variables:
 $ grader: chr  "019" "019" "019" "019" ...
 $ graded: chr  "554" "126" "837" "345" ...
 $ d1    : int  3 5 3 4 2 4 3 5 3 4 ...
 $ d2    : int  2 4 3 3 3 5 4 4 3 3 ...
 $ d3    : int  3 5 3 3 3 4 4 4 2 4 ...
 $ d4    : int  3 5 3 3 2 4 3 5 3 4 ...
 $ d5    : int  2 4 3 4 3 3 4 4 2 3 ...
 $ d6    : int  3 5 3 4 3 3 3 5 3 4 ...
 $ ctest : chr  "HW05" "HW05" "HW05" "HW05" ...
```

Summary: a data.frame is returned
The column names are names
The record count matches the record
Count of the resultset of the SQL query.

```
> dim(data3)
[1] 159   9
> names(data3)
[1] "grader" "graded" "d1"     "d2"     "d3"     "d4"     "d5"     "d6"     "ctest"
> utils:::menuInstallPkgs()
```

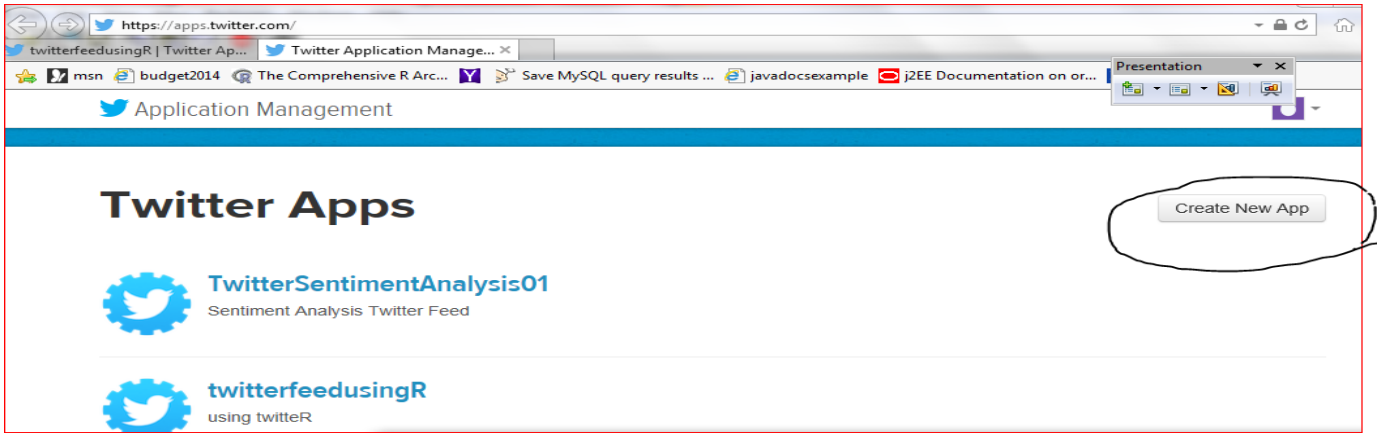
```
mysql> desc blind_sdenorm ;
+--------+------------+------+-----+---------+-------+
| Field  | Type       | Null | Key | Default | Extra |
+--------+------------+------+-----+---------+-------+
| grader | varchar(3) | YES  |     | NULL    |       |
| graded | varchar(3) | YES  |     | NULL    |       |
| d1     | int(11)    | YES  |     | NULL    |       |
| d2     | int(11)    | YES  |     | NULL    |       |
| d3     | int(11)    | YES  |     | NULL    |       |
| d4     | int(11)    | YES  |     | NULL    |       |
| d5     | int(11)    | YES  |     | NULL    |       |
| d6     | int(11)    | YES  |     | NULL    |       |
| ctest  | varchar(6) | YES  |     | NULL    |       |
+--------+------------+------+-----+---------+-------+
9 rows in set (0.04 sec)
```

Api driven Integration

- This technique would work for any service
- Get the necessary keys from the service
- Install the necessary package to interact with the service
- Write small/simple application to verify everything works
- Graduate and move on to bigger and smarter processing

twitter

- https://apps.twitter.com/



Locate and click on Create New App

Terminology may vary

This is specific to twitter.

Fill in the App Form

https://apps.twitter.com/app/new

Application Details

Name *

rkdsc

Your application name. This is used to attribute the source of a tweet and in user-facing authorization screens. 32 characters max.

Description *

Raman Kannan Data Science

Your application description, which will be shown in user-facing authorization screens. Between 10 and 200 characters max.

Website *

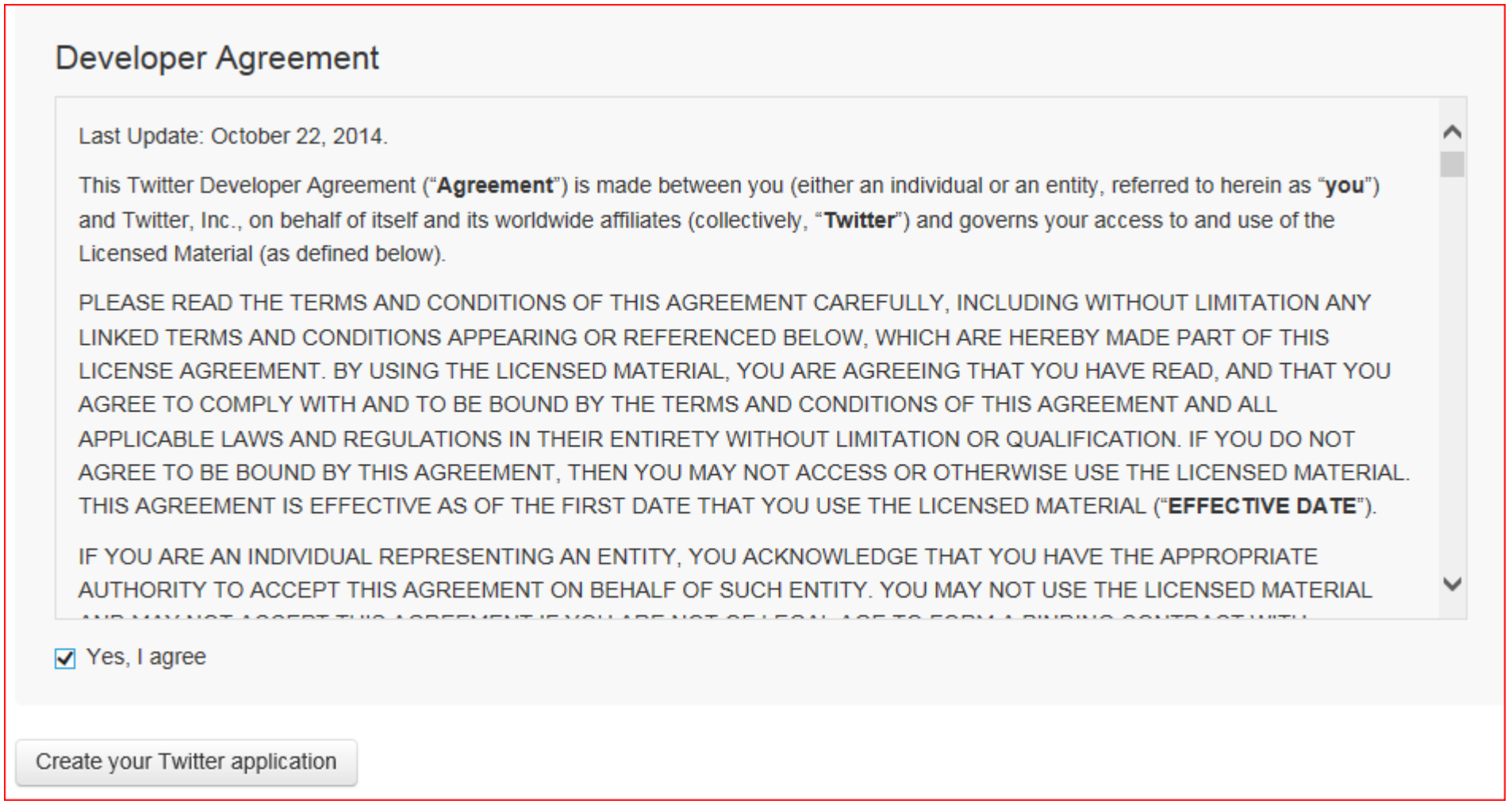
http://assetcorporation.net

Your application's publicly accessible home page, where users can go to download, make use of, or find out more information about your application. This fully-qualified URL is used in the source attribution for tweets created by your application and will be shown in user-facing authorization screens.
(If you don't have a URL yet, just put a placeholder here but remember to change it later.)

Callback URL

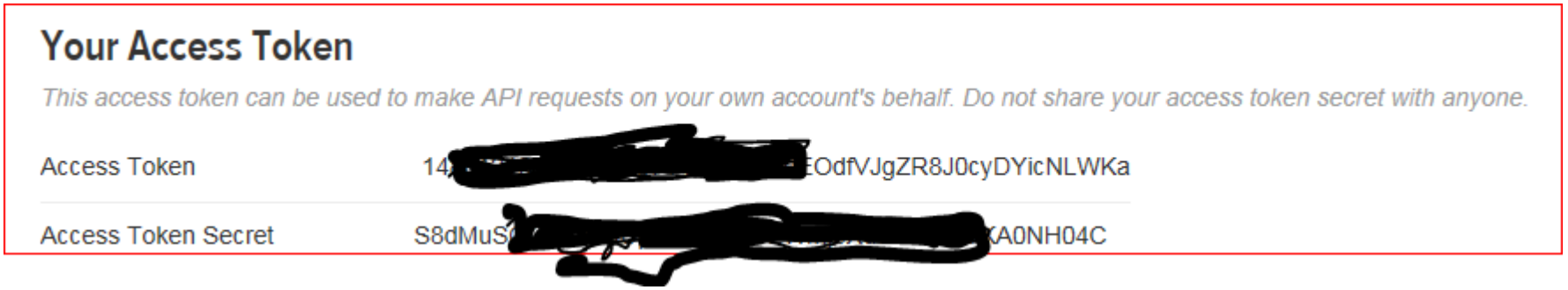
Where should we return after successfully authenticating? OAuth 1.0a applications should explicitly specify their oauth_callback URL on the request token step, regardless of the value given here. To restrict your application from using callbacks, leave this field blank.

Accept and Create



Create your Twitter Application...click on it...

Get your own APP tokens



It is all free to setup and easy. Once you have these 4 tokens...

twitter

- Install and load required package

```
> require(twitteR)
Loading required package: twitteR
```

Setup the keys and setup twitter_oauth as shown here using your keys

```
> api_key="[redacted]"
> api_secret="[redacted]"
> access_token_secret="[redacted]"
> access_token="[redacted]"
> access_token_secret="[redacted]"
> setup_twitter_oauth(api_key,api_secret,access_token,access_token_secret)
[1] "Using direct authentication"
```

Use

```
> setup_twitter_oauth(api_key,api_secret,access_token,access_token_secret)
[1] "Using direct authentication"
> user <- getUser("rk2153")
> user$getFollowersCount()
[1] 17
>
> user_followers <- user$getFollowers()
> followers_n <- length(user_followers)
```

Who follows you

```
> user_followers <- user$getFollowers()
> followers_n <- length(user_followers)
> followers_screennames <- vector()
> for (i in 1:followers_n) {
+   followers_screennames[i] <- user_followers[[i]]$screenName
+ }
>
```

```
>
> followers_n
[1] 17
> user_followers
$`344417583`
[1] "amc866"

$`267838599`
[1] "jbhomerassoc"

$`388642431`
[1] "sneekieneekie"

$`407185849`
```

What is being tweeted about your favorite topic?

```
> davos <- searchTwitter("davos",300)
> length(davos)
[1] 300
> davos[[1]]
[1] "SoylentHHH: RT @carlzimmer: The Earth's richest 80 people doubled their wealth between 2009 and 2014 &amp;amp; now own as much
> davos[[300]]
[1] "EvaDanickova: RT @LangBanks: RT if this makes you mad\n\nThe richest 1% will own more than 50% of the world's wealth by 201
>
```

Saving the tweets

- Convert to a data.frame
  - davos.df<-twListToDF(davos)
- Examine davos.df –> str(davos.df)
- head(davos.df)
- Export to a csv
  - write.csv(davos.df,”e:/poly/2015/spring/CS-DSC/davos.csv”,row.names=F)

More to follow on text analysis ….