

IS622 Week5 SparkR Confirmation and Stream Example

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Initial Setup

```
# Setup SparkR
Sys.setenv(SPARK_HOME="/home/james/Software/spark-1.4.1-bin-hadoop2.6")
library(SparkR, lib.loc = "/home/james/Software/spark-1.4.1-bin-hadoop2.6/R/lib")

##
## Attaching package: 'SparkR'
##
## The following object is masked from 'package:stats':
##
##     filter
##
## The following objects are masked from 'package:base':
##
##     intersect, sample, table

sc <- sparkR.init()
sqlContext <- sparkRSQL.init(sc)
```

Confirm SparkR is Working

The following code (from example blog post) proves SparkR and Spark work together:

```
# Read in textfile
setwd(Sys.getenv("SPARK_HOME"))
text_file <- SparkR:::textFile(sc, 'README.md')

# Show line counts
count(text_file)

# Read first line
take(text_file, 1)

# # Read all lines
# take(text_file, count(text_file))
#
# # Filter out and collect lines with word spark in it
# linesWithSpark <- SparkR:::filterRDD(text_file, function(line) {
#   grepl("Spark", line)
# })
# collect(linesWithSpark)
```

```
## [1] 98
## [[1]]
## [1] "# Apache Spark"
```

Week5 Description

As a simple exercise, decide what type of data you want to collect and count from the dataset and what significance the counting has. Discuss why you chose this dataset, what data you plan on filtering out of the dataset, and what you plan on counting. Assuming that you are unable to collect every record, what is your sampling methodology? Explain the significance of the counts for your specific example. Comment on another student's methodology. Is the methodology sound or not? Why? How can it be improved?

Like many other people, I wanted to work with twitter data. I will stream tweets from Twitter for the #politics hashtag. I will not be doing any filtering, just counting the usernames that get mentioned in the tweets. I do this by parsing each tweet and creating a df just full of usernames. I load this into R and use aggregation functions to find counts. In this case, I only stream 1000 tweets, so I am not continuously streaming in data (though I would like to know how to do that; we would need to batch data from the twitter package, and I assume we can just rbind to the spark dataframe as more data comes in)

Week5 Setup

Lets setup the twitterR module:

```
library(twitterR)

setup_twitter_oauth('yBMKyokT0Io0g9sXnCJ6ZZyYB',
                    'B9v58Sm06hRtHpYYoHpFVGb5BEpAUWAORIPumqfMMdM7NwemX4',
                    '16562593-mxuDGZWbfnT4Nxdq7gXQe3K1HkRrw8PWkzQp0Zs.jp',
                    'qaafVHWbQMlkZ97V9wIE8o7pJwQ0bIS91b1JHYEjCwMZd')
```

```
## [1] "Using direct authentication"
```

Streaming Data From Twitter

First we load some tweets from the #politics hashtag, to then be processed for what usernames each tweet mentions. We store all these names in a new dataframe, and then submit that dataframe to spark:

```
# Grab tweets and convert to df
tweets <- searchTwitter("#politics", n=1000)

# Function to take in tweet row and return list of usernames mentioned in tweet
getUsernames <- function(tweet) {
  content <- tweet$text
  usernames <- unlist(lapply(unlist(strsplit(content, " ")),
                             function(word) {
                               if (substr(word,1,1) == "@") {
                                 return(tolower(gsub("[:punct:]", "", word)))
                               }
                             }
                           ))
}
```

```

    }
  }
  usernames <- usernames[ !is.null(usernames) ]
  usernames
}

# Function to take in tweet row and return list of hashtags mentioned in tweet
# Same as above really, but filtering source hashtags (not sure why its not working)
getHashtags <- function(tweet) {
  content <- tweet$text
  hashtags <- unlist(lapply(unlist(strsplit(content, " ")),
    function(word) {
      if (substr(word,1,1) == "#" && word != "#politics") {
        return(tolower(gsub("[:punct:]", "", word)))
      }
    })
  )
  hashtags <- hashtags[ !is.null(hashtags) ]
  hashtags
}

# Pull out user names from tweets
usernames <- unlist(lapply(tweets, getUsernames))
usernames.df <- data.frame(username=usernames)

# Pull out user names from tweets
hashtags <- unlist(lapply(tweets, getHashtags))
hashtags.df <- data.frame(hashtag=hashtags)

# Create spark data frame from this list of users
usernames.sdf <- createDataFrame(sqlContext, usernames.df)
hashtags.sdf <- createDataFrame(sqlContext, hashtags.df)

```

Now we will do some simple aggregation, counting the number of usernames seen in the stream:

```

# This URL helped understand these functions: https://spark.apache.org/docs/latest/sparkr.html
username_results <- summarize(group_by(usernames.sdf, usernames.sdf$username), counts=n(usernames.sdf$username))
collect(arrange(username_results, desc(username_results$counts)))

```

```

##           username counts
## 1    jerusalempost     46
## 2    fingersflying     15
## 3           hcp520     14
## 4         politician     13
## 5    peebleskrystin     12
## 6         melvinroll     11
## 7          youtube     10
## 8           filth       9
## 9         paigeantoin     9
## 10    hippocratesnow     8
## 11                    8
## 12         ricksanorum     6
## 13          srpolitics     6
## 14    stateofglobe      6

```

## 15	johnavlon	5
## 16	realdonaldtrump	5
## 17	stellaskid	5
## 18	newtgingrich	5
## 19	420	5
## 20	davidaxelrod	5
## 21	opposingviews	5
## 22	alexcast	5
## 23	teamsantorumfl	4
## 24	politico	4
## 25	wendycarrillo	4
## 26	animalrightsjen	4
## 27	amznfavorites	4
## 28	ktumulty	4
## 29	rickwombat	4
## 30	thecamelsnose	3
## 31	garylindberg	3
## 32	intelmm	3
## 33	mrmikeyreid	3
## 34	berniesanders	3
## 35	newsfusionapps	3
## 36	rachelmstone	3
## 37	c5hardtop1999	3
## 38	sojourners	3
## 39	realbencarson	3
## 40	drmartyfox	3
## 41	wef3	3
## 42	gop	3
## 43	oximityfreiheit	3
## 44	scottiemcclue	3
## 45	espuelasvox	3
## 46	sethrogen	3
## 47	drudgereport	3
## 48	rameshraoaks	3
## 49	skypapers	2
## 50	osborneink	2
## 51	zakraton	2
## 52	tuitpoliticsus	2
## 53	anonnewsint	2
## 54	jefftippett	2
## 55	tnpolitics	2
## 56	chuckludwig	2
## 57	badnewslive	2
## 58	alissamarie	2
## 59	rjoustra	2
## 60	docjjk	2
## 61	bbcworld	2
## 62	michaelbti	2
## 63	stingo100	2
## 64	itvnews	2
## 65	norleansdaily	2
## 66	bbcnews	2
## 67	georgewillf	2
## 68	rawstory	2

## 69	hillaryclinton	2
## 70	skynews	2
## 71	rollcall	2
## 72	psychicnatalie	2
## 73	myshelthorpe	2
## 74	reppaulryan	2
## 75	culturalpaths	2
## 76	kanyewest	2
## 77	bakednotfried1	2
## 78	bbcscotlandnews	2
## 79	otiose94	2
## 80	danhannanmep	2
## 81	mterry337	2
## 82	thinkprogress	2
## 83	barber1956	2
## 84	politicsnews1	1
## 85	obamagames	1
## 86	todayngr	1
## 87	notporc	1
## 88	oximityspanish	1
## 89	danscavino	1
## 90	stevechapman13	1
## 91	beenasarwar	1
## 92	jxjs12	1
## 93	mssociety	1
## 94	kofibartels	1
## 95	getthedailydirt	1
## 96	verminsupreme	1
## 97	justintrudeau	1
## 98	goldentalon	1
## 99	freeforfrndz	1
## 100	oyez	1
## 101	gideonstrauss	1
## 102	billkeller2014	1
## 103	histatters	1
## 104	goldengatenews	1
## 105	thehermancain	1
## 106	realdona	1
## 107	larell718	1
## 108	northernrailorg	1
## 109	hughcurran	1
## 110	mytraceelements	1
## 111	sackheads	1
## 112	xantreaston	1
## 113	jxstanford	1
## 114	theweek	1
## 115	jayson7590	1
## 116	paulfincher2	1
## 117	zainawb	1
## 118	oximity	1
## 119	womenworldnews1	1
## 120	kemalchp62	1
## 121	rcparticles	1
## 122	ldyguin	1

## 123	stirringtrouble	1
## 124	krauthammer	1
## 125	kathleenwynne	1
## 126	canada	1
## 127	tdbeadles	1
## 128	democratichub	1
## 129	lylden	1
## 130	playboybpac	1
## 131	honestsea	1
## 132	fuqyousafzai	1
## 133	politicalwire	1
## 134	srcorrespondent	1
## 135	paulmonaghan	1
## 136	sensanders	1
## 137	huffpostedu	1
## 138	potus	1
## 139	oximitymigrants	1
## 140	cyrccyr	1
## 141	victorymeldrew	1
## 142	marcorubio	1
## 143	theriotimes	1
## 144	mikemacck	1
## 145	whatjmothinks	1
## 146	presstv	1
## 147	macphersonrant	1
## 148	salon	1
## 149	waxchinadoll	1
## 150	opennworld	1
## 151	mmessner	1
## 152	nprpolitics	1
## 153	berksfoundation	1
## 154	dorothylucey	1
## 155	teamsantorumvt	1
## 156	refinery29	1
## 157	ademcc	1
## 158	shensational	1
## 159	guardian	1
## 160	uoregonnews	1
## 161	philosophytube	1
## 162	motherfeather	1
## 163	maggienyt	1
## 164	rwneilljr	1
## 165	ringoffireradio	1
## 166	pajaropolitico	1
## 167	m0nica10	1
## 168	truthdigcartoon	1
## 169	kansascitydnews	1
## 170	gfestbatman	1
## 171	phcjam	1
## 172	dennisblair	1
## 173	sheetsnakisha	1
## 174	rcwmap	1
## 175	lewisjpereleman	1
## 176	sheerazraza	1

```
## 177      jerrysaltz      1
## 178    shannamalcolm    1
## 179          tzimas      1
## 180      tunstallasc      1
## 181    jacoboliver12      1
## 182          cspanwj      1
## 183      etmanheart      1
## 184      dannycare      1
## 185 thinkingOutloud      1
## 186      leigh4dnw      1
## 187      twitter\n2      1
## 188      bradbannon      1
## 189          pfw41      1
## 190      razarumi      1
## 191          la      1
## 192    edwarderikson      1
## 193      joebiden      1
## 194    arlingtonsteve      1
## 195 opinion8tdbitch      1
## 196      telegraph      1
## 197      jefeuropa      1
## 198      markjohn1      1
## 199      twitrbugs      1
## 200    joehildebrand      1
## 201    denisebuchman      1
## 202      mackiebe      1
## 203      huffpostpol      1
## 204    mybatonrouge      1
## 205          ctvw5      1
## 206          msnbme      1
## 207      mermatwd      1
```

Lets count the number of hashtags seen in the stream:

```
# This URL helped understand these functions: https://spark.apache.org/docs/latest/sparkr.html
hashtag_results <- summarize(group_by(hashtags.sdf, hashtags.sdf$hashtag), counts=n(hashtags.sdf$hashtag),
collect(arrange(hashtag_results, desc(hashtag_results$counts)))
```

```
##
## 1          politics    358
## 2           news      160
## 3        feedly       71
## 4        health       47
## 5          tcot        26
## 6          fox        26
## 7          gop        25
## 8    entertainment    24
## 9    wakeupamerica    21
## 10         syria       21
## 11        intelmm      20
## 12         osint       20
## 13         iran       19
## 14         ccot        19
```

## 15	us	18
## 16	republican	18
## 17	donaldtrump	17
## 18	money	17
## 19	theneeds	17
## 20	iraq	16
## 21	finance	16
## 22	yemen	16
## 23	election2016	16
## 24	dem	16
## 25	yahooanswers	15
## 26	gov	15
## 27	fashion	15
## 28	london	15
## 29	info	14
## 30	norcross	14
## 31	usa	13
## 32	campaign	12
## 33	todaysoffice	12
## 34	atlanta	12
## 35	pjnet	12
## 36	atl	12
## 37		12
## 38	newsfeed	11
## 39	voting	11
## 40	eu	11
## 41	teaparty	10
## 42	teens	10
## 43	twitter	10
## 44	success	10
## 45	california	10
## 46	loveyou	9
## 47	beyou	9
## 48	neverconform	9
## 49	prophecy	9
## 50	knowyou	9
## 51	lastdays	9
## 52	world	8
## 53	thin	8
## 54	conservatives	8
## 55	tv	7
## 56	trump	7
## 57	quotes	7
## 58	government	7
## 59	rt	7
## 60	religion	7
## 61	roh3	6
## 62	awesome	6
## 63	bbc	6
## 64	jfb	6
## 65	elections	6
## 66	tfb	6
## 67	roh3smantibatam	6
## 68	democrat	6

## 69	scotus	6
## 70	gratitude	6
## 71	constitution	6
## 72	alrasyid448iturasya	6
## 73	satire	6
## 74	israel	6
## 75	socialmedia	6
## 76	education	6
## 77	jamescarville	5
## 78	oprah	5
## 79	instagram	5
## 80	comedy	5
## 81	leisure	5
## 82	immigration	5
## 83	worldnews	5
## 84	mccarthy	5
## 85	research	5
## 86	india	5
## 87	texas	5
## 88	cabbagefirst	5
## 89	weed	5
## 90	obama	5
## 91	history	5
## 92	tlot	5
## 93	pokolee	4
## 94	legalization	4
## 95	medicalmari	4
## 96	featured	4
## 97	art	4
## 98	isis	4
## 99	achedin	4
## 100	asmsg	4
## 101	jeb2016	4
## 102	hillary2016	4
## 103	cannabis	4
## 104	trendsng	4
## 105	republicans	4
## 106	uniteblue	4
## 107	medicine	4
## 108	lol	4
## 109	report	4
## 110	h	4
## 111	auspol	4
## 112	women	4
## 113	insiders	4
## 114	bencarson	4
## 115	democrats	4
## 116	politicon	4
## 117	dreamers	3
## 118	tntweeters	3
## 119	cnn	3
## 120	military	3
## 121	feelthebern	3
## 122	p2	3

## 123	millionmanmarch	3
## 124	he	3
## 125	fash	3
## 126	uk	3
## 127	fiscalcliff	3
## 128	un	3
## 129	nwo	3
## 130	america	3
## 131	enter	3
## 132	pimp	3
## 133	turkey	3
## 134	experience	3
## 135	life	3
## 136	potus	3
## 137	articlegt	3
## 138	mediaite	3
## 139	zombies	3
## 140	birthcontrol	3
## 141	aweso	3
## 142	uslatino	3
## 143	airforce	3
## 144	cdnpoli	3
## 145	reddit	3
## 146	awe	3
## 147	trump2016	3
## 148	culture	3
## 149	2a	3
## 150	economics	3
## 151	politicsnews	3
## 152	police	2
## 153	selfesteem	2
## 154	foxnews	2
## 155	geoffreyhowe	2
## 156	reuters	2
## 157	facts\ninformation	2
## 158	rick2016	2
## 159	rnc	2
## 160	hnn	2
## 161	newspapers	2
## 162	freedom	2
## 163	pabudget	2
## 164	politica	2
## 165	rnr	2
## 166	governor	2
## 167	risk	2
## 168	cameron	2
## 169	science	2
## 170	landeshauptmannndrjosefp\xfchringer	2
## 171	funny	2
## 172	berks	2
## 173	cops	2
## 174	communist	2
## 175	hl	2
## 176	berniesanders	2

## 177	baltimore	2
## 178	canada	2
## 179	quickpolls	2
## 180	truth	2
## 181	breaking	2
## 182	rainbowdash	2
## 183	merkel	2
## 184	knowledge	2
## 185	trends	2
## 186	refugee	2
## 187	socialism	2
## 188	latest	2
## 189	bencarsons	2
## 190	e	2
## 191	washington	2
## 192	radio	2
## 193	maturity	2
## 194	l	2
## 195	,@+	2
## 196	fun	2
## 197	famous	2
## 198	heal	2
## 199	politics\nhubertleitenbauer	2
## 200	oregon	2
## 201	2012	2
## 202	entertain	2
## 203	2016	2
## 204	blacktwitter	2
## 205	dems	2
## 206	germany	2
## 207	politicomics	2
## 208	recap\nhttpcovgdpivctt\nworld	2
## 209	washingtonpost	2
## 210	feelth	2
## 211	climate	2
## 212	free	2
## 213	fightfor15	2
## 214	lifelessons	2
## 215	harrisburg	2
## 216	guncontrol	2
## 217	water	2
## 218	people	2
## 219	fineart	2
## 220	faithfamilyfreedom	2
## 221	europe	2
## 222	entert	2
## 223	election	2
## 224	corporate	2
## 225	morningjoe	2
## 226	nonprofits	2
## 227	readingpa	2
## 228	abcnews	2
## 229	twitart	2
## 230	ohio	1

## 231	feelings	1
## 232	jews	1
## 233	iowa	1
## 234	jedi	1
## 235	euronews	1
## 236	congress	1
## 237	promises	1
## 238	hubbahubba	1
## 239	celebrity	1
## 240	friendship	1
## 241	poli	1
## 242	freesoko	1
## 243	entertai	1
## 244	euco2015	1
## 245	industry	1
## 246	inforefront	1
## 247	voterregistration	1
## 248	hewillfixeverything	1
## 249	wakeupamericawhats	1
## 250	presidency	1
## 251	fed	1
## 252	sermon	1
## 253	dlxn42	1
## 254	protest	1
## 255	gaymarriage	1
## 256	politics\nchicklit\nhttptcoaepa8msm5x	1
## 257	losangeles	1
## 258	politics\nhttptcoet5plbpt9v	1
## 259	campaigning	1
## 260	change	1
## 261	humanity	1
## 262	commentary	1
## 263	teachers	1
## 264	justintrudeau	1
## 265	legendgt	1
## 266	legalizedit	1
## 267	campaign2016	1
## 268	sticker	1
## 269	japan	1
## 270	dollar	1
## 271	ptsd	1
## 272	ms	1
## 273	viral\n	1
## 274	death	1
## 275	buhari	1
## 276	propaganda	1
## 277	nih	1
## 278	sturvs	1
## 279	time	1
## 280	polit	1
## 281	gmo	1
## 282	redemption	1
## 283	edu	1
## 284	sacramento	1

## 285	mexico	1
## 286	budget	1
## 287	war	1
## 288	losdejojugar	1
## 289	spoof	1
## 290	noicisiamo	1
## 291	ankaraexplosionsleavemorethan80dead	1
## 292	politicallycorrect	1
## 293	trump4prez	1
## 294	nh	1
## 295	makeprogress	1
## 296	actress	1
## 297	investment	1
## 298	nj	1
## 299	carlyfiorina	1
## 300	latinos	1
## 301	offers	1
## 302	opinions	1
## 303	media	1
## 304	organization	1
## 305	electio	1
## 306	rob	1
## 307	communism	1
## 308	headlines	1
## 309	digital	1
## 310	left	1
## 311	spins	1
## 312	conspiracy	1
## 313	balanced	1
## 314	newmotorvoter	1
## 315	goldoutofhiding	1
## 316	googletrenderer	1
## 317	bitcoin	1
## 318	tits	1
## 319	circus	1
## 320	australia	1
## 321	murdered	1
## 322	legalit\	1
## 323	truthtazer	1
## 324	ria	1
## 325	parliament	1
## 326	getintheknow	1
## 327	askingthehardquestions	1
## 328	lies	1
## 329	florida	1
## 330	politicalrevolution	1
## 331	motivation	1
## 332	tonyblair	1
## 333	law	1
## 334	british	1
## 335	asahifa	1
## 336	healt	1
## 337	instapolitics	1
## 338	artists	1

## 339	idaho	1
## 340	capitalism	1
## 341	brazil	1
## 342	worship	1
## 343	ebook	1
## 344	bus	1
## 345	davidcameron	1
## 346	mix	1
## 347	conflict	1
## 348	whynot	1
## 349	antiterrorism	1
## 350	wars	1
## 351	beepbeep	1
## 352	hillaryclinton	1
## 353	salutations\nhttpcoxb24ifuyoa	1
## 354	seattle	1
## 355	facebook	1
## 356	summer	1
## 357	singles	1
## 358	stories	1
## 359	yyc	1
## 360	thisiswhatdemocracylookslike	1
## 361	getonthebus	1
## 362	marcorubio	1
## 363	jesus	1
## 364	justice	1
## 365	sunshine	1
## 366	a	1
## 367	cdc	1
## 368	ferguson	1
## 369	forexample	1
## 370	anahuac	1
## 371	behavior	1
## 372	hearing	1
## 373	is	1
## 374	amaechi	1
## 375	nra	1
## 376	pc	1
## 377	moralcrisis	1
## 378	pd	1
## 379	rude	1
## 380	benghazi	1
## 381	freedomcaucusfraud	1
## 382	waronchristians	1
## 383	blacklivesmatter	1
## 384	tweegram	1
## 385	quote	1
## 386	politics\n\nrestore	1
## 387	cdn	1
## 388	maddow	1
## 389	abovethelaw	1
## 390	mynumber	1
## 391	dtla	1
## 392	chilling	1

## 393	responsibility	1
## 394	bbcsp	1
## 395	bombing	1
## 396	crises	1
## 397	deception	1
## 398	brownnose	1
## 399	po	1
## 400	advice	1
## 401	entertainme	1
## 402	notmoslim	1
## 403	allconfused	1
## 404	intense	1
## 405	lowexpectations	1
## 406	scifi	1
## 407	zanda	1
## 408	commoncore	1
## 409	middleeast	1
## 410	u	1
## 411	albums	1
## 412	lpc	1
## 413	firm	1
## 414	interfluence	1
## 415	libspill	1
## 416	pnw	1
## 417	z	1
## 418	browerreport	1
## 419	humanrights	1
## 420	political	1
## 421	music	1
## 422	ulisse	1
## 423	georgia	1
## 424	cancun	1
## 425	ankarablast	1
## 426	blondehairdontcare	1
## 427	politicsamppsychics	1
## 428	labour	1
## 429	alamieyeseigha	1
## 430	afghanistan	1
## 431	booze	1
## 432	securitycontrol	1
## 433	usury	1
## 434	misconceptions	1
## 435	film	1
## 436	economy	1
## 437	trum	1
## 438	parenting	1
## 439	refugeecrisis	1
## 440	realclearpolitics	1
## 441	for	1
## 442	beliefs	1
## 443	rwnj	1
## 444	philosophy	1
## 445	drugs	1
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## 494	familydrama	1
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## 496	clintonnation	1
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## 499	nolega	1
## 500	acapulco	1

## 501	racialharmony	1
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## 504	goldoutofhiding\n	1
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## 508	thinkbigsundaywithmarsha	1
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## 510	offended	1
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## 535	snp	1
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