

RCode

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Saturday, June 13, 2015

```
set.seed(1234)
setwd("C:/Users/Viseth Sean/Dropbox/2015 Summer/DataRobot")

library(leaps)
```

```
## Warning: package 'leaps' was built under R version 3.1.3
```

```
library(glmnet)
```

```
## Warning: package 'glmnet' was built under R version 3.1.3
```

```
## Loading required package: Matrix
## Loaded glmnet 1.9-8
```

```
library(pls)
```

```
## Warning: package 'pls' was built under R version 3.1.3
```

```
##
## Attaching package: 'pls'
##
## The following object is masked from 'package:stats':
##
##     loadings
```

```
mydata = read.csv("OnlineNewsPopularity.csv")
dim(mydata)
```

```
## [1] 39644    61
```

```
names(mydata)
```

```
## [1] "url" "timedelta"
## [3] "n_tokens_title" "n_tokens_content"
## [5] "n_unique_tokens" "n_non_stop_words"
## [7] "n_non_stop_unique_tokens" "num_hrefs"
## [9] "num_self_hrefs" "num_imgs"
## [11] "num_videos" "average_token_length"
## [13] "num_keywords" "data_channel_is_lifestyle"
## [15] "data_channel_is_entertainment" "data_channel_is_bus"
## [17] "data_channel_is_socmed" "data_channel_is_tech"
## [19] "data_channel_is_world" "kw_min_min"
## [21] "kw_max_min" "kw_avg_min"
```

```
## [23] "kw_min_max"          "kw_max_max"
## [25] "kw_avg_max"          "kw_min_avg"
## [27] "kw_max_avg"          "kw_avg_avg"
## [29] "self_reference_min_shares" "self_reference_max_shares"
## [31] "self_reference_avg_shares" "weekday_is_monday"
## [33] "weekday_is_tuesday"    "weekday_is_wednesday"
## [35] "weekday_is_thursday"   "weekday_is_friday"
## [37] "weekday_is_saturday"   "weekday_is_sunday"
## [39] "is_weekend"           "LDA_00"
## [41] "LDA_01"               "LDA_02"
## [43] "LDA_03"               "LDA_04"
## [45] "global_subjectivity"   "global_sentiment_polarity"
## [47] "global_rate_positive_words" "global_rate_negative_words"
## [49] "rate_positive_words"   "rate_negative_words"
## [51] "avg_positive_polarity" "min_positive_polarity"
## [53] "max_positive_polarity" "avg_negative_polarity"
## [55] "min_negative_polarity" "max_negative_polarity"
## [57] "title_subjectivity"    "title_sentiment_polarity"
## [59] "abs_title_subjectivity" "abs_title_sentiment_polarity"
## [61] "shares"
```

```
sum(is.na(mydata))
```

```
## [1] 0
```

```
#remove string column, and other irrelevant/duplicate columns
```

```
mydata$url <- NULL
mydata$LDA_00 <- NULL
mydata$LDA_01 <- NULL
mydata$LDA_02 <- NULL
mydata$LDA_03 <- NULL
mydata$LDA_04 <- NULL
mydata$title_subjectivity <- NULL
mydata$title_sentiment_polarity <- NULL
mydata$weekday_is_saturday <- NULL
mydata$weekday_is_sunday <- NULL
```

```
#Sampling data
```

```
train = sample(dim(mydata)[1], 5000)
mytrain = mydata[train, ]
mytest = mydata[-train, ]
test = sample(dim(mytest)[1], 1000)
#1000 observations for testing
mytest1 = mytest[test, ]
```

```
#Find correlation between predictors and response
```

```
cor(mytrain)
```

```
##                                timedelta n_tokens_title
## timedelta                    1.0000000000 -0.2331466831
## n_tokens_title                -0.2331466831  1.0000000000
## n_tokens_content              -0.0753022242  0.0017182283
## n_unique_tokens               0.1989917746 -0.0184177918
```

## n_non_stop_words	0.1377972824	-0.0195408432
## n_non_stop_unique_tokens	0.1825128216	-0.0113484382
## num_hrefs	-0.0128366765	-0.0617131087
## num_self_hrefs	0.0707928327	-0.0480388708
## num_imgs	-0.0322745714	-0.0077993211
## num_videos	-0.0158044372	0.0586116600
## average_token_length	0.1169475791	-0.0441928206
## num_keywords	0.0392061519	-0.0007841846
## data_channel_is_lifestyle	0.0513430785	-0.0843741354
## data_channel_is_entertainment	-0.0585134153	0.1409804326
## data_channel_is_bus	0.0776495705	-0.0272684321
## data_channel_is_socmed	0.0562872313	-0.1020165288
## data_channel_is_tech	0.0791926418	-0.0277041663
## data_channel_is_world	-0.1601367729	0.0382660369
## kw_min_min	0.5838001873	-0.1196362967
## kw_max_min	0.0242083309	-0.0047059021
## kw_avg_min	0.1090665756	-0.0256953578
## kw_min_max	-0.0882043217	0.0120866840
## kw_max_max	-0.6329579362	0.1278577130
## kw_avg_max	-0.4856129181	0.1240963567
## kw_min_avg	-0.1595914521	0.0033913310
## kw_max_avg	-0.0480931115	0.0057762660
## kw_avg_avg	-0.1532841512	0.0125453555
## self_reference_min_shares	-0.0104571384	0.0191267637
## self_reference_max_shares	-0.0162554265	0.0254009925
## self_reference_avg_shares	-0.0183294042	0.0284817938
## weekday_is_monday	-0.0123959014	0.0117874126
## weekday_is_tuesday	-0.0122280126	0.0054312976
## weekday_is_wednesday	0.0215179913	0.0108067578
## weekday_is_thursday	0.0003483076	0.0060111300
## weekday_is_friday	-0.0047163321	0.0021308438
## is_weekend	0.0071638898	-0.0405009995
## global_subjectivity	0.1044586299	-0.0423183062
## global_sentiment_polarity	0.1499128049	-0.0637040061
## global_rate_positive_words	0.2156634854	-0.0754429235
## global_rate_negative_words	0.0040843482	0.0148823610
## rate_positive_words	0.1960073983	-0.0529170587
## rate_negative_words	-0.0867066816	0.0432240239
## avg_positive_polarity	0.0912315402	-0.0106512903
## min_positive_polarity	0.0359237909	0.0152711157
## max_positive_polarity	0.0737706932	-0.0015637536
## avg_negative_polarity	0.0271024025	-0.0412178988
## min_negative_polarity	0.0883728629	-0.0275650242
## max_negative_polarity	-0.0601130562	-0.0187962021
## abs_title_subjectivity	0.0089085308	-0.1325706435
## abs_title_sentiment_polarity	0.0101742677	0.0269343376
## shares	0.0103569561	0.0260431962
##	n_tokens_content	n_unique_tokens
## timedelta	-0.0753022242	0.1989917746
## n_tokens_title	0.0017182283	-0.0184177918
## n_tokens_content	1.0000000000	-0.3882548009
## n_unique_tokens	-0.3882548009	1.0000000000
## n_non_stop_words	0.2035115009	0.6890961669
## n_non_stop_unique_tokens	-0.2164550550	0.9405865952

## num_hrefs	0.4072455811	-0.0945228048
## num_self_hrefs	0.3028253058	-0.0514015367
## num_imgs	0.3932742400	-0.2434904503
## num_videos	0.1087140181	0.0183892066
## average_token_length	0.1632965542	0.6665833944
## num_keywords	0.0689004198	-0.0968147052
## data_channel_is_lifestyle	0.0422378319	-0.0128357677
## data_channel_is_entertainment	0.0852331990	0.0043438659
## data_channel_is_bus	-0.0123473450	0.0428692931
## data_channel_is_socmed	0.0399349052	0.0003039244
## data_channel_is_tech	0.0022805173	0.0234588511
## data_channel_is_world	0.0559137614	-0.0708935379
## kw_min_min	-0.0609604279	0.0744499342
## kw_max_min	0.0032574028	-0.0002008551
## kw_avg_min	-0.0054780534	0.0139709320
## kw_min_max	-0.0142056311	-0.0095542297
## kw_max_max	0.0683839563	-0.0884002000
## kw_avg_max	-0.0768053152	-0.0525631747
## kw_min_avg	-0.0008770344	-0.0476730101
## kw_max_avg	-0.0210696924	-0.0017081815
## kw_avg_avg	-0.0630407159	-0.0284398675
## self_reference_min_shares	-0.0353727076	0.0526585973
## self_reference_max_shares	0.0116091987	0.0372568138
## self_reference_avg_shares	-0.0203763361	0.0547528173
## weekday_is_monday	-0.0112512366	0.0234576771
## weekday_is_tuesday	-0.0245538227	0.0042082956
## weekday_is_wednesday	-0.0258866649	0.0068889645
## weekday_is_thursday	0.0052022584	-0.0052031481
## weekday_is_friday	-0.0019639470	0.0188847086
## is_weekend	0.0664205574	-0.0520701229
## global_subjectivity	0.1285459887	0.4942705695
## global_sentiment_polarity	0.0154812146	0.1857912546
## global_rate_positive_words	0.1383967853	0.3078431791
## global_rate_negative_words	0.1432339674	0.1710929878
## rate_positive_words	0.0919408510	0.4697483007
## rate_negative_words	0.1151451334	0.1948298387
## avg_positive_polarity	0.1330390050	0.4389413532
## min_positive_polarity	-0.2493062423	0.3988205277
## max_positive_polarity	0.4032827243	0.1871073245
## avg_negative_polarity	-0.1344334684	-0.2312516020
## min_negative_polarity	-0.4494689516	0.0089440011
## max_negative_polarity	0.2214077718	-0.3272607100
## abs_title_subjectivity	-0.0122945716	0.0067294091
## abs_title_sentiment_polarity	0.0419911622	-0.0204216573
## shares	-0.0077618196	0.0059783728
##	n_non_stop_words	n_non_stop_unique_tokens
## timedelta	0.1377972824	0.182512822
## n_tokens_title	-0.0195408432	-0.011348438
## n_tokens_content	0.2035115009	-0.216455055
## n_unique_tokens	0.6890961669	0.940586595
## n_non_stop_words	1.0000000000	0.770190696
## n_non_stop_unique_tokens	0.7701906962	1.000000000
## num_hrefs	0.1768062473	-0.095084505
## num_self_hrefs	0.1578324314	-0.019215908

## num_imgs	0.0135147477	-0.296969242
## num_videos	0.0245766689	0.014801849
## average_token_length	0.9471400447	0.709534392
## num_keywords	-0.0375659398	-0.099229534
## data_channel_is_lifestyle	0.0219855046	0.010121213
## data_channel_is_entertainment	0.0081954670	-0.005137387
## data_channel_is_bus	0.0629985669	0.076584694
## data_channel_is_socmed	0.0383840513	0.015428647
## data_channel_is_tech	0.0868987617	0.055063646
## data_channel_is_world	-0.0043700719	-0.023848464
## kw_min_min	0.0229329393	0.067637392
## kw_max_min	0.0055737342	0.001581818
## kw_avg_min	0.0155206904	0.017540648
## kw_min_max	-0.0369685892	-0.013860682
## kw_max_max	-0.0289154694	-0.078943945
## kw_avg_max	-0.1553540053	-0.096930380
## kw_min_avg	-0.0697385306	-0.079828910
## kw_max_avg	-0.0218464367	-0.028171871
## kw_avg_avg	-0.1079576193	-0.097053985
## self_reference_min_shares	0.0334350461	0.042964920
## self_reference_max_shares	0.0414496461	0.034651719
## self_reference_avg_sharess	0.0416544494	0.046740089
## weekday_is_monday	0.0126143143	0.020720431
## weekday_is_tuesday	-0.0042207904	0.002016339
## weekday_is_wednesday	-0.0042085710	0.007572651
## weekday_is_thursday	0.0002226042	-0.001882133
## weekday_is_friday	0.0164215113	0.022373268
## is_weekend	-0.0212713617	-0.054631842
## global_subjectivity	0.6755452376	0.523017986
## global_sentiment_polarity	0.2216446629	0.188277289
## global_rate_positive_words	0.4132879219	0.361359773
## global_rate_negative_words	0.2761482314	0.215925713
## rate_positive_words	0.6423438849	0.513433904
## rate_negative_words	0.3311702708	0.232033683
## avg_positive_polarity	0.5974935774	0.469353046
## min_positive_polarity	0.2311858212	0.310806660
## max_positive_polarity	0.5468756003	0.296114134
## avg_negative_polarity	-0.3626430337	-0.256509631
## min_negative_polarity	-0.3204934545	-0.106385535
## max_negative_polarity	-0.2041752215	-0.253674529
## abs_title_subjectivity	0.0119130266	0.015281590
## abs_title_sentiment_polarity	-0.0061528649	-0.037566769
## shares	-0.0221001906	-0.008331834
##	num_hrefs num_self_hrefs num_imgs	
## timedelta	-0.012836676 0.0707928327	-3.227457e-02
## n_tokens_title	-0.061713109 -0.0480388708	-7.799321e-03
## n_tokens_content	0.407245581 0.3028253058	3.932742e-01
## n_unique_tokens	-0.094522805 -0.0514015367	-2.434905e-01
## n_non_stop_words	0.176806247 0.1578324314	1.351475e-02
## n_non_stop_unique_tokens	-0.095084505 -0.0192159079	-2.969692e-01
## num_hrefs	1.000000000 0.3963352737	2.920915e-01
## num_self_hrefs	0.396335274 1.0000000000	2.341576e-01
## num_imgs	0.292091518 0.2341576405	1.000000e+00
## num_videos	0.098983790 0.0549839415	-5.533724e-02

## average_token_length	0.228150273	0.1290291174	3.367396e-02
## num_keywords	0.140039831	0.0885412535	8.251708e-02
## data_channel_is_lifestyle	0.038513170	-0.0532266377	8.371950e-03
## data_channel_is_entertainment	0.001949940	0.0243807701	1.285007e-01
## data_channel_is_bus	-0.068191363	-0.0506959923	-1.422559e-01
## data_channel_is_socmed	0.033906597	0.0696506441	-2.094607e-02
## data_channel_is_tech	-0.052066357	0.1996323460	-1.666323e-02
## data_channel_is_world	-0.029352400	-0.1419582615	-1.144398e-01
## kw_min_min	-0.065840819	-0.0217509286	-4.961576e-02
## kw_max_min	0.019130399	0.0124377889	1.711198e-02
## kw_avg_min	0.004142287	-0.0007290694	5.559052e-05
## kw_min_max	-0.005134476	-0.0250614524	1.307264e-02
## kw_max_max	0.072220403	0.0281071248	5.993615e-02
## kw_avg_max	-0.004741462	-0.0439513442	1.733768e-02
## kw_min_avg	0.076904180	0.0508682705	9.851094e-02
## kw_max_avg	0.082417495	0.0399161735	6.341134e-02
## kw_avg_avg	0.131774707	0.0279990779	1.489600e-01
## self_reference_min_shares	-0.006243240	-0.0286151202	5.329367e-04
## self_reference_max_shares	0.073117733	0.1022404632	2.848248e-02
## self_reference_avg_sharess	0.031612167	0.0182935778	1.055065e-02
## weekday_is_monday	-0.009052430	-0.0040346748	-2.379731e-02
## weekday_is_tuesday	-0.016729620	-0.0185633877	-2.525060e-02
## weekday_is_wednesday	-0.043390780	-0.0247214302	-3.750664e-02
## weekday_is_thursday	-0.013136411	0.0007521185	1.403998e-02
## weekday_is_friday	0.006443319	-0.0192849277	-1.126869e-03
## is_weekend	0.087131582	0.0730294063	8.369885e-02
## global_subjectivity	0.225345890	0.1269154627	7.871771e-02
## global_sentiment_polarity	0.099185255	0.1011789899	2.460538e-02
## global_rate_positive_words	0.065372425	0.1348147166	-2.280814e-02
## global_rate_negative_words	0.041701865	0.0154456112	3.070518e-02
## rate_positive_words	0.106115885	0.1495086559	-1.752952e-02
## rate_negative_words	0.067730579	-0.0069806986	3.674481e-02
## avg_positive_polarity	0.209753356	0.1207873035	9.428170e-02
## min_positive_polarity	-0.061841833	-0.0687751646	-2.094639e-02
## max_positive_polarity	0.287414858	0.2003674790	1.519426e-01
## avg_negative_polarity	-0.156208969	-0.0592871999	-7.997658e-02
## min_negative_polarity	-0.255601025	-0.1208458856	-1.403797e-01
## max_negative_polarity	0.049901700	0.0368096838	4.063038e-02
## abs_title_subjectivity	0.008900798	0.0083799826	-2.851765e-02
## abs_title_sentiment_polarity	0.080939221	0.0006072708	7.766450e-02
## shares	0.065162172	-0.0088350376	6.207259e-02
##	num_videos	average_token_length	
## timedelta	-0.015804437	0.116947579	
## n_tokens_title	0.058611660	-0.044192821	
## n_tokens_content	0.108714018	0.163296554	
## n_unique_tokens	0.018389207	0.666583394	
## n_non_stop_words	0.024576669	0.947140045	
## n_non_stop_unique_tokens	0.014801849	0.709534392	
## num_hrefs	0.098983790	0.228150273	
## num_self_hrefs	0.054983941	0.129029117	
## num_imgs	-0.055337239	0.033673964	
## num_videos	1.000000000	-0.001643900	
## average_token_length	-0.001643900	1.000000000	
## num_keywords	-0.037656268	-0.019954142	

## data_channel_is_lifestyle	-0.052629923	0.015078285
## data_channel_is_entertainment	0.165060622	-0.034730602
## data_channel_is_bus	-0.082643391	0.062252472
## data_channel_is_socmed	-0.004628201	0.023552358
## data_channel_is_tech	-0.097711212	0.030194686
## data_channel_is_world	-0.089067543	0.076229142
## kw_min_min	0.001762139	0.005685941
## kw_max_min	-0.014449341	0.009134987
## kw_avg_min	-0.021532658	0.016238407
## kw_min_max	0.043793137	-0.033673862
## kw_max_max	0.008965238	-0.010831456
## kw_avg_max	0.147625095	-0.139668185
## kw_min_avg	0.068363112	-0.075839016
## kw_max_avg	0.053019425	-0.019573747
## kw_avg_avg	0.104047139	-0.103815398
## self_reference_min_shares	-0.003552461	0.028048967
## self_reference_max_shares	0.073876155	0.038592567
## self_reference_avg_sharess	0.051703765	0.038200689
## weekday_is_monday	0.009718234	0.008773063
## weekday_is_tuesday	0.028258263	-0.008269611
## weekday_is_wednesday	-0.006441306	-0.003375361
## weekday_is_thursday	-0.034900283	0.004341283
## weekday_is_friday	0.006812926	0.014968264
## is_weekend	-0.003492851	-0.016503703
## global_subjectivity	0.084868364	0.616585294
## global_sentiment_polarity	-0.042854670	0.189827232
## global_rate_positive_words	0.083226714	0.343987376
## global_rate_negative_words	0.206783606	0.234063226
## rate_positive_words	-0.050894589	0.597675697
## rate_negative_words	0.090233458	0.326855028
## avg_positive_polarity	0.100657026	0.546997090
## min_positive_polarity	-0.012870797	0.227065064
## max_positive_polarity	0.121275873	0.480134214
## avg_negative_polarity	-0.123832862	-0.328569332
## min_negative_polarity	-0.156715578	-0.280946031
## max_negative_polarity	0.042778296	-0.202807707
## abs_title_subjectivity	-0.025696526	0.024496288
## abs_title_sentiment_polarity	0.096001033	-0.017905200
## shares	0.013004776	-0.034185287
##	num_keywords	data_channel_is_lifestyle
## timedelta	0.0392061519	0.0513430785
## n_tokens_title	-0.0007841846	-0.0843741354
## n_tokens_content	0.0689004198	0.0422378319
## n_unique_tokens	-0.0968147052	-0.0128357677
## n_non_stop_words	-0.0375659398	0.0219855046
## n_non_stop_unique_tokens	-0.0992295336	0.0101212134
## num_hrefs	0.1400398313	0.0385131699
## num_self_hrefs	0.0885412535	-0.0532266377
## num_imgs	0.0825170836	0.0083719497
## num_videos	-0.0376562679	-0.0526299231
## average_token_length	-0.0199541418	0.0150782851
## num_keywords	1.0000000000	0.1477419742
## data_channel_is_lifestyle	0.1477419742	1.0000000000
## data_channel_is_entertainment	-0.0776553649	-0.1117195023

## data_channel_is_bus	-0.1748060201	-0.1052278602
## data_channel_is_socmed	-0.0895356746	-0.0580774691
## data_channel_is_tech	0.1386656423	-0.1162370555
## data_channel_is_world	0.0254827556	-0.1208628204
## kw_min_min	0.0008751899	0.0332445531
## kw_max_min	0.0634031004	0.0392160118
## kw_avg_min	0.0449793223	0.0384537771
## kw_min_max	-0.2525959500	-0.0261376276
## kw_max_max	0.0030979751	-0.0458567926
## kw_avg_max	-0.3082959830	-0.1335992042
## kw_min_avg	-0.2540746672	-0.0236472823
## kw_max_avg	0.0960426510	0.0566278816
## kw_avg_avg	0.0254346062	0.0569612394
## self_reference_min_shares	-0.0089022306	0.0143070240
## self_reference_max_shares	0.0116877130	-0.0138648665
## self_reference_avg_sharess	0.0024614678	-0.0020844524
## weekday_is_monday	-0.0247402462	-0.0037068664
## weekday_is_tuesday	-0.0195228265	-0.0157923618
## weekday_is_wednesday	-0.0455347671	0.0052933232
## weekday_is_thursday	-0.0069363798	-0.0216344924
## weekday_is_friday	0.0097180480	0.0016239880
## is_weekend	0.0997595994	0.0384203153
## global_subjectivity	0.0248317007	0.0481796649
## global_sentiment_polarity	0.0846354235	0.0780444444
## global_rate_positive_words	0.0612632151	0.0593313801
## global_rate_negative_words	-0.0592054929	-0.0141710245
## rate_positive_words	0.0390233651	0.0539559391
## rate_negative_words	-0.0901920752	-0.0417601545
## avg_positive_polarity	0.0122285115	0.0561397537
## min_positive_polarity	-0.0396034880	-0.0195678313
## max_positive_polarity	0.0534902021	0.0769569231
## avg_negative_polarity	0.0287972049	0.0016790609
## min_negative_polarity	0.0093266726	-0.0069110561
## max_negative_polarity	0.0396069928	0.0000979169
## abs_title_subjectivity	-0.0176859639	0.0229673308
## abs_title_sentiment_polarity	0.0111667879	0.0104064472
## shares	0.0147153602	-0.0014670577
##	data_channel_is_entertainment	
## timedelta		-0.0585134153
## n_tokens_title		0.1409804326
## n_tokens_content		0.0852331990
## n_unique_tokens		0.0043438659
## n_non_stop_words		0.0081954670
## n_non_stop_unique_tokens		-0.0051373873
## num_hrefs		0.0019499403
## num_self_hrefs		0.0243807701
## num_imgs		0.1285007146
## num_videos		0.1650606222
## average_token_length		-0.0347306021
## num_keywords		-0.0776553649
## data_channel_is_lifestyle		-0.1117195023
## data_channel_is_entertainment		1.0000000000
## data_channel_is_bus		-0.2067570845
## data_channel_is_socmed		-0.1141135832

## data_channel_is_tech	-0.2283885148	
## data_channel_is_world	-0.2374774544	
## kw_min_min	-0.0247614205	
## kw_max_min	-0.0299898592	
## kw_avg_min	-0.0340867584	
## kw_min_max	0.0024037271	
## kw_max_max	0.0207749078	
## kw_avg_max	-0.0589143562	
## kw_min_avg	0.0204581489	
## kw_max_avg	-0.0088111372	
## kw_avg_avg	-0.0008268491	
## self_reference_min_shares	-0.0245802116	
## self_reference_max_shares	-0.0220627953	
## self_reference_avg_sharess	-0.0272727455	
## weekday_is_monday	0.0146276568	
## weekday_is_tuesday	-0.0080875297	
## weekday_is_wednesday	0.0002643386	
## weekday_is_thursday	-0.0057712984	
## weekday_is_friday	0.0114041805	
## is_weekend	-0.0124159583	
## global_subjectivity	0.0244305688	
## global_sentiment_polarity	-0.0415805908	
## global_rate_positive_words	0.0363914814	
## global_rate_negative_words	0.1127182636	
## rate_positive_words	-0.0348921859	
## rate_negative_words	0.0521526187	
## avg_positive_polarity	0.0519223321	
## min_positive_polarity	-0.0162151992	
## max_positive_polarity	0.0810216411	
## avg_negative_polarity	-0.1373794418	
## min_negative_polarity	-0.1183956637	
## max_negative_polarity	-0.0202753382	
## abs_title_subjectivity	-0.0547766655	
## abs_title_sentiment_polarity	0.0313439808	
## shares	-0.0393591165	
##	data_channel_is_bus	data_channel_is_socmed
## timedelta	0.077649571	0.0562872313
## n_tokens_title	-0.027268432	-0.1020165288
## n_tokens_content	-0.012347345	0.0399349052
## n_unique_tokens	0.042869293	0.0003039244
## n_non_stop_words	0.062998567	0.0383840513
## n_non_stop_unique_tokens	0.076584694	0.0154286471
## num_hrefs	-0.068191363	0.0339065967
## num_self_hrefs	-0.050695992	0.0696506441
## num_imgs	-0.142255945	-0.0209460679
## num_videos	-0.082643391	-0.0046282009
## average_token_length	0.062252472	0.0235523583
## num_keywords	-0.174806020	-0.0895356746
## data_channel_is_lifestyle	-0.105227860	-0.0580774691
## data_channel_is_entertainment	-0.206757085	-0.1141135832
## data_channel_is_bus	1.000000000	-0.1074828292
## data_channel_is_socmed	-0.107482829	1.0000000000
## data_channel_is_tech	-0.215117631	-0.1187279448
## data_channel_is_world	-0.223678443	-0.1234528371

## kw_min_min	0.032608436	0.0263342915
## kw_max_min	-0.021447796	0.0330909436
## kw_avg_min	-0.002496943	0.0586508548
## kw_min_max	0.042572901	0.0470637980
## kw_max_max	-0.026767375	-0.0265675808
## kw_avg_max	0.174616952	-0.0572292351
## kw_min_avg	-0.005008283	0.0351669425
## kw_max_avg	-0.025932799	0.0241112139
## kw_avg_avg	-0.059541691	0.0331991845
## self_reference_min_shares	-0.001847699	0.0329909168
## self_reference_max_shares	0.005190129	0.0319395100
## self_reference_avg_sharess	0.003301057	0.0267612452
## weekday_is_monday	0.004242486	-0.0195536536
## weekday_is_tuesday	0.002417772	-0.0155901487
## weekday_is_wednesday	0.017211610	0.0159894033
## weekday_is_thursday	0.026633188	0.0109141159
## weekday_is_friday	0.004306485	0.0051545201
## is_weekend	-0.061396305	0.0033438966
## global_subjectivity	-0.022756043	0.0366562364
## global_sentiment_polarity	0.070964289	0.0868618491
## global_rate_positive_words	0.076084120	0.0989004219
## global_rate_negative_words	-0.074403102	-0.0165079404
## rate_positive_words	0.118135196	0.0835156353
## rate_negative_words	-0.074757985	-0.0597534686
## avg_positive_polarity	0.004692545	0.0280571078
## min_positive_polarity	-0.047255938	-0.0660727865
## max_positive_polarity	0.008221400	0.0500454696
## avg_negative_polarity	0.059059806	0.0172757841
## min_negative_polarity	0.053998464	0.0043391383
## max_negative_polarity	-0.007177991	0.0082889713
## abs_title_subjectivity	0.018578484	0.0123585740
## abs_title_sentiment_polarity	-0.060051672	0.0304507754
## shares	-0.012175263	0.0085925503
##	data_channel_is_tech	data_channel_is_world
## timedelta	0.0791926418	-0.1601367729
## n_tokens_title	-0.0277041663	0.0382660369
## n_tokens_content	0.0022805173	0.0559137614
## n_unique_tokens	0.0234588511	-0.0708935379
## n_non_stop_words	0.0868987617	-0.0043700719
## n_non_stop_unique_tokens	0.0550636465	-0.0238484640
## num_hrefs	-0.0520663565	-0.0293523999
## num_self_hrefs	0.1996323460	-0.1419582615
## num_imgs	-0.0166632311	-0.1144397770
## num_videos	-0.0977112116	-0.0890675428
## average_token_length	0.0301946862	0.0762291424
## num_keywords	0.1386656423	0.0254827556
## data_channel_is_lifestyle	-0.1162370555	-0.1208628204
## data_channel_is_entertainment	-0.2283885148	-0.2374774544
## data_channel_is_bus	-0.2151176313	-0.2236784434
## data_channel_is_socmed	-0.1187279448	-0.1234528371
## data_channel_is_tech	1.0000000000	-0.2470802275
## data_channel_is_world	-0.2470802275	1.0000000000
## kw_min_min	0.0332942062	-0.0603811121
## kw_max_min	0.0228852796	-0.0227108854

## kw_avg_min	0.0182131349	-0.0332004574	
## kw_min_max	-0.0574358576	-0.0644104002	
## kw_max_max	-0.0272479544	0.0643060465	
## kw_avg_max	-0.1557454032	-0.1289326725	
## kw_min_avg	-0.0414826586	-0.1448846348	
## kw_max_avg	-0.0664477825	-0.0772966677	
## kw_avg_avg	-0.1218826636	-0.2287730706	
## self_reference_min_shares	0.0082087890	-0.0415212456	
## self_reference_max_shares	0.0289461099	-0.0458578069	
## self_reference_avg_sharess	0.0211390628	-0.0439872173	
## weekday_is_monday	0.0005089896	0.0051210548	
## weekday_is_tuesday	0.0154429496	0.0042311028	
## weekday_is_wednesday	0.0099009901	-0.0153921472	
## weekday_is_thursday	0.0003094824	0.0069476694	
## weekday_is_friday	-0.0274405037	-0.0010456251	
## is_weekend	-0.0018091572	0.0006376433	
## global_subjectivity	0.0535713245	-0.1662142014	
## global_sentiment_polarity	0.1339833315	-0.2278347986	
## global_rate_positive_words	0.0895862575	-0.2422374292	
## global_rate_negative_words	-0.1015174179	0.0093201145	
## rate_positive_words	0.1706426750	-0.1532197040	
## rate_negative_words	-0.1125866098	0.1837327146	
## avg_positive_polarity	0.0106435572	-0.1432490481	
## min_positive_polarity	0.0331483069	-0.0522591944	
## max_positive_polarity	0.0262322513	-0.1166324146	
## avg_negative_polarity	0.1160068885	0.0269225411	
## min_negative_polarity	0.1291018115	-0.0664824263	
## max_negative_polarity	0.0030453028	0.0784806489	
## abs_title_subjectivity	-0.0143917406	0.0385926578	
## abs_title_sentiment_polarity	-0.0266907354	-0.0723617566	
## shares	-0.0258027886	-0.0563942011	
##	kw_min_min	kw_max_min	kw_avg_min
## timedelta	0.5838001873	0.0242083309	1.090666e-01
## n_tokens_title	-0.1196362967	-0.0047059021	-2.569536e-02
## n_tokens_content	-0.0609604279	0.0032574028	-5.478053e-03
## n_unique_tokens	0.0744499342	-0.0002008551	1.397093e-02
## n_non_stop_words	0.0229329393	0.0055737342	1.552069e-02
## n_non_stop_unique_tokens	0.0676373921	0.0015818178	1.754065e-02
## num_hrefs	-0.0658408186	0.0191303994	4.142287e-03
## num_self_hrefs	-0.0217509286	0.0124377889	-7.290694e-04
## num_imgs	-0.0496157635	0.0171119812	5.559052e-05
## num_videos	0.0017621390	-0.0144493412	-2.153266e-02
## average_token_length	0.0056859406	0.0091349866	1.623841e-02
## num_keywords	0.0008751899	0.0634031004	4.497932e-02
## data_channel_is_lifestyle	0.0332445531	0.0392160118	3.845378e-02
## data_channel_is_entertainment	-0.0247614205	-0.0299898592	-3.408676e-02
## data_channel_is_bus	0.0326084357	-0.0214477957	-2.496943e-03
## data_channel_is_socmed	0.0263342915	0.0330909436	5.865085e-02
## data_channel_is_tech	0.0332942062	0.0228852796	1.821313e-02
## data_channel_is_world	-0.0603811121	-0.0227108854	-3.320046e-02
## kw_min_min	1.0000000000	0.0162841991	9.979199e-02
## kw_max_min	0.0162841991	1.0000000000	9.532846e-01
## kw_avg_min	0.0997919947	0.9532845577	1.000000e+00
## kw_min_max	-0.0629822866	-0.0346613969	-4.945738e-02

## kw_max_max	-0.8509574090	-0.0052954316	-8.742943e-02
## kw_avg_max	-0.5071512457	-0.0432438983	-1.126080e-01
## kw_min_avg	-0.1338882255	-0.0046447853	-2.995756e-02
## kw_max_avg	-0.0692052294	0.4945828429	4.695876e-01
## kw_avg_avg	-0.1747523032	0.4204159205	4.004405e-01
## self_reference_min_shares	-0.0205515032	0.0314010303	2.646444e-02
## self_reference_max_shares	-0.0398254724	0.0234376218	1.544166e-02
## self_reference_avg_sharess	-0.0362285490	0.0270801210	1.995959e-02
## weekday_is_monday	0.0020852031	0.0031565771	-4.363196e-03
## weekday_is_tuesday	-0.0334927576	-0.0232805547	-2.006844e-02
## weekday_is_wednesday	0.0226159130	0.0075528538	4.860514e-03
## weekday_is_thursday	-0.0067764250	-0.0079745492	-4.737195e-03
## weekday_is_friday	0.0014590007	0.0139821410	2.022677e-02
## is_weekend	0.0158242450	0.0089032350	6.607576e-03
## global_subjectivity	0.0159948742	0.0074474690	1.106881e-02
## global_sentiment_polarity	0.0573646859	0.0281862750	3.717495e-02
## global_rate_positive_words	0.0993769700	0.0122707881	2.919077e-02
## global_rate_negative_words	-0.0084526261	-0.0200814092	-1.730453e-02
## rate_positive_words	0.0672213382	0.0216143300	3.393145e-02
## rate_negative_words	-0.0570287883	-0.0203567337	-2.436054e-02
## avg_positive_polarity	-0.0028985605	0.0072845788	8.478060e-03
## min_positive_polarity	-0.0168936246	-0.0104568200	-1.529922e-02
## max_positive_polarity	-0.0141542657	0.0275645845	2.686242e-02
## avg_negative_polarity	0.0382131735	-0.0002632077	5.313851e-03
## min_negative_polarity	0.0613660409	0.0129607381	2.024287e-02
## max_negative_polarity	-0.0238253494	-0.0134475306	-1.674589e-02
## abs_title_subjectivity	0.0091517847	-0.0009086285	8.358435e-03
## abs_title_sentiment_polarity	0.0016269762	0.0075663565	7.150846e-04
## shares	0.0176925610	0.0146616929	8.654902e-03
##	kw_min_max	kw_max_max	kw_avg_max
## timedelta	-0.0882043217	-0.6329579362	-0.4856129181
## n_tokens_title	0.0120866840	0.1278577130	0.1240963567
## n_tokens_content	-0.0142056311	0.0683839563	-0.0768053152
## n_unique_tokens	-0.0095542297	-0.0884002000	-0.0525631747
## n_non_stop_words	-0.0369685892	-0.0289154694	-0.1553540053
## n_non_stop_unique_tokens	-0.0138606818	-0.0789439447	-0.0969303804
## num_hrefs	-0.0051344764	0.0722204028	-0.0047414617
## num_self_hrefs	-0.0250614524	0.0281071248	-0.0439513442
## num_imgs	0.0130726367	0.0599361476	0.0173376767
## num_videos	0.0437931371	0.0089652376	0.1476250952
## average_token_length	-0.0336738623	-0.0108314560	-0.1396681851
## num_keywords	-0.2525959500	0.0030979751	-0.3082959830
## data_channel_is_lifestyle	-0.0261376276	-0.0458567926	-0.1335992042
## data_channel_is_entertainment	0.0024037271	0.0207749078	-0.0589143562
## data_channel_is_bus	0.0425729014	-0.0267673751	0.1746169522
## data_channel_is_socmed	0.0470637980	-0.0265675808	-0.0572292351
## data_channel_is_tech	-0.0574358576	-0.0272479544	-0.1557454032
## data_channel_is_world	-0.0644104002	0.0643060465	-0.1289326725
## kw_min_min	-0.0629822866	-0.8509574090	-0.5071512457
## kw_max_min	-0.0346613969	-0.0052954316	-0.0432438983
## kw_avg_min	-0.0494573766	-0.0874294338	-0.1126079998
## kw_min_max	1.0000000000	0.0670483503	0.4030018814
## kw_max_max	0.0670483503	1.0000000000	0.5650597005
## kw_avg_max	0.4030018814	0.5650597005	1.0000000000

## kw_min_avg	0.3487828638	0.1524175188	0.3997332282
## kw_max_avg	0.0134071011	0.0843388103	0.1244973019
## kw_avg_avg	0.1536754341	0.2152565520	0.3997738016
## self_reference_min_shares	0.0760083359	0.0212510440	0.0722680212
## self_reference_max_shares	0.0405738367	0.0399569138	0.1049473795
## self_reference_avg_sharess	0.0610135582	0.0371470867	0.1033658132
## weekday_is_monday	-0.0116755082	-0.0082771920	-0.0040919855
## weekday_is_tuesday	0.0172350370	0.0232373641	0.0420400586
## weekday_is_wednesday	0.0036021469	-0.0294699308	-0.0108992097
## weekday_is_thursday	0.0081758408	0.0189510385	-0.0018008793
## weekday_is_friday	-0.0105976664	0.0009826594	0.0080098827
## is_weekend	-0.0092191385	-0.0055066302	-0.0370116474
## global_subjectivity	-0.0162448660	-0.0208908225	-0.0509607161
## global_sentiment_polarity	-0.0061538358	-0.0734524957	-0.0751078409
## global_rate_positive_words	-0.0218006307	-0.1120817199	-0.1109054389
## global_rate_negative_words	-0.0086681396	0.0166044265	0.0102268300
## rate_positive_words	-0.0158733294	-0.0828957007	-0.1498702776
## rate_negative_words	-0.0219359813	0.0696138867	0.0102066725
## avg_positive_polarity	-0.0190246078	-0.0046419674	-0.0348073575
## min_positive_polarity	0.0059329767	0.0054668888	0.0359072763
## max_positive_polarity	-0.0242781881	0.0066851379	-0.0771208633
## avg_negative_polarity	-0.0015819438	-0.0370332897	-0.0422570303
## min_negative_polarity	0.0041050471	-0.0651097749	-0.0065647177
## max_negative_polarity	-0.0190762594	0.0300543893	-0.0281837776
## abs_title_subjectivity	-0.0111562457	-0.0247666077	0.0008772137
## abs_title_sentiment_polarity	0.0010497592	0.0004085149	0.0264953259
## shares	-0.0004804804	0.0109654366	0.0582019038
## kw_min_avg		kw_max_avg	kw_avg_avg
## timedelta	-0.1595914521	-0.0480931115	-0.1532841512
## n_tokens_title	0.0033913310	0.0057762660	0.0125453555
## n_tokens_content	-0.0008770344	-0.0210696924	-0.0630407159
## n_unique_tokens	-0.0476730101	-0.0017081815	-0.0284398675
## n_non_stop_words	-0.0697385306	-0.0218464367	-0.1079576193
## n_non_stop_unique_tokens	-0.0798289096	-0.0281718715	-0.0970539846
## num_hrefs	0.0769041801	0.0824174954	0.1317747065
## num_self_hrefs	0.0508682705	0.0399161735	0.0279990779
## num_imgs	0.0985109355	0.0634113367	0.1489599620
## num_videos	0.0683631123	0.0530194253	0.1040471394
## average_token_length	-0.0758390160	-0.0195737473	-0.1038153980
## num_keywords	-0.2540746672	0.0960426510	0.0254346062
## data_channel_is_lifestyle	-0.0236472823	0.0566278816	0.0569612394
## data_channel_is_entertainment	0.0204581489	-0.0088111372	-0.0008268491
## data_channel_is_bus	-0.0050082826	-0.0259327994	-0.0595416909
## data_channel_is_socmed	0.0351669425	0.0241112139	0.0331991845
## data_channel_is_tech	-0.0414826586	-0.0664477825	-0.1218826636
## data_channel_is_world	-0.1448846348	-0.0772966677	-0.2287730706
## kw_min_min	-0.1338882255	-0.0692052294	-0.1747523032
## kw_max_min	-0.0046447853	0.4945828429	0.4204159205
## kw_avg_min	-0.0299575633	0.4695875978	0.4004404555
## kw_min_max	0.3487828638	0.0134071011	0.1536754341
## kw_max_max	0.1524175188	0.0843388103	0.2152565520
## kw_avg_max	0.3997332282	0.1244973019	0.3997738016
## kw_min_avg	1.0000000000	0.0667783409	0.4056486509
## kw_max_avg	0.0667783409	1.0000000000	0.8425361323

## kw_avg_avg	0.4056486509	0.8425361323	1.0000000000
## self_reference_min_shares	0.0342928857	0.1058237554	0.1244169596
## self_reference_max_shares	0.0586606279	0.2622302029	0.2424235269
## self_reference_avg_sharess	0.0554426093	0.1953321133	0.1999356844
## weekday_is_monday	-0.0102799977	-0.0141645254	-0.0236265410
## weekday_is_tuesday	-0.0037557074	-0.0168150924	-0.0016105253
## weekday_is_wednesday	-0.0320537109	-0.0008513439	-0.0230348343
## weekday_is_thursday	-0.0181943836	0.0086540748	-0.0036948794
## weekday_is_friday	0.0049527751	-0.0020944551	0.0013603412
## is_weekend	0.0677863814	0.0281987576	0.0571122405
## global_subjectivity	0.0136180169	0.0395185883	0.0662121606
## global_sentiment_polarity	-0.0037932852	0.0279921169	0.0225346141
## global_rate_positive_words	-0.0126803901	0.0093279150	-0.0046840731
## global_rate_negative_words	0.0203231632	-0.0044552740	0.0185588668
## rate_positive_words	-0.0637673167	-0.0070153671	-0.0787527714
## rate_negative_words	0.0002609955	-0.0158745319	-0.0241711371
## avg_positive_polarity	0.0118519572	0.0345436126	0.0481209224
## min_positive_polarity	0.0260838913	0.0161986096	0.0537256817
## max_positive_polarity	-0.0064527538	0.0194728427	0.0041189518
## avg_negative_polarity	-0.0237419379	-0.0544759136	-0.0842449870
## min_negative_polarity	-0.0146091992	-0.0202448169	-0.0261530515
## max_negative_polarity	-0.0134102572	-0.0452164943	-0.0574801609
## abs_title_subjectivity	-0.0176816692	-0.0091759687	-0.0189712179
## abs_title_sentiment_polarity	0.0615976675	0.0351097959	0.0805435562
## shares	0.0556368041	0.0739943944	0.1372852259
##	self_reference_min_shares		
## timedelta		-0.0104571384	
## n_tokens_title		0.0191267637	
## n_tokens_content		-0.0353727076	
## n_unique_tokens		0.0526585973	
## n_non_stop_words		0.0334350461	
## n_non_stop_unique_tokens		0.0429649205	
## num_hrefs		-0.0062432398	
## num_self_hrefs		-0.0286151202	
## num_imgs		0.0005329367	
## num_videos		-0.0035524615	
## average_token_length		0.0280489665	
## num_keywords		-0.0089022306	
## data_channel_is_lifestyle		0.0143070240	
## data_channel_is_entertainment		-0.0245802116	
## data_channel_is_bus		-0.0018476985	
## data_channel_is_socmed		0.0329909168	
## data_channel_is_tech		0.0082087890	
## data_channel_is_world		-0.0415212456	
## kw_min_min		-0.0205515032	
## kw_max_min		0.0314010303	
## kw_avg_min		0.0264644413	
## kw_min_max		0.0760083359	
## kw_max_max		0.0212510440	
## kw_avg_max		0.0722680212	
## kw_min_avg		0.0342928857	
## kw_max_avg		0.1058237554	
## kw_avg_avg		0.1244169596	
## self_reference_min_shares		1.0000000000	

## self_reference_max_shares	0.5035408121
## self_reference_avg_sharess	0.7812565394
## weekday_is_monday	-0.0004193085
## weekday_is_tuesday	0.0294921041
## weekday_is_wednesday	-0.0145815191
## weekday_is_thursday	-0.0186541752
## weekday_is_friday	0.0100179212
## is_weekend	-0.0057653591
## global_subjectivity	0.0518867300
## global_sentiment_polarity	-0.0036221732
## global_rate_positive_words	-0.0100038574
## global_rate_negative_words	-0.0053918367
## rate_positive_words	0.0218528843
## rate_negative_words	0.0106096762
## avg_positive_polarity	0.0323122865
## min_positive_polarity	0.0288226380
## max_positive_polarity	0.0023622477
## avg_negative_polarity	-0.0520831099
## min_negative_polarity	-0.0065797153
## max_negative_polarity	-0.0562819799
## abs_title_subjectivity	0.0061263565
## abs_title_sentiment_polarity	0.0040376877
## shares	0.0629132883
##	self_reference_max_shares
## timedelta	-0.016255427
## n_tokens_title	0.025400993
## n_tokens_content	0.011609199
## n_unique_tokens	0.037256814
## n_non_stop_words	0.041449646
## n_non_stop_unique_tokens	0.034651719
## num_hrefs	0.073117733
## num_self_hrefs	0.102240463
## num_imgs	0.028482477
## num_videos	0.073876155
## average_token_length	0.038592567
## num_keywords	0.011687713
## data_channel_is_lifestyle	-0.013864867
## data_channel_is_entertainment	-0.022062795
## data_channel_is_bus	0.005190129
## data_channel_is_socmed	0.031939510
## data_channel_is_tech	0.028946110
## data_channel_is_world	-0.045857807
## kw_min_min	-0.039825472
## kw_max_min	0.023437622
## kw_avg_min	0.015441655
## kw_min_max	0.040573837
## kw_max_max	0.039956914
## kw_avg_max	0.104947380
## kw_min_avg	0.058660628
## kw_max_avg	0.262230203
## kw_avg_avg	0.242423527
## self_reference_min_shares	0.503540812
## self_reference_max_shares	1.000000000
## self_reference_avg_sharess	0.912047890

## weekday_is_monday	-0.011383288	
## weekday_is_tuesday	0.012812187	
## weekday_is_wednesday	0.017170597	
## weekday_is_thursday	-0.022557776	
## weekday_is_friday	0.013288020	
## is_weekend	-0.010354683	
## global_subjectivity	0.055324932	
## global_sentiment_polarity	-0.008297666	
## global_rate_positive_words	-0.004427104	
## global_rate_negative_words	0.002734080	
## rate_positive_words	0.018422747	
## rate_negative_words	0.023824975	
## avg_positive_polarity	0.028337838	
## min_positive_polarity	0.011117756	
## max_positive_polarity	0.015699044	
## avg_negative_polarity	-0.053170287	
## min_negative_polarity	-0.035004213	
## max_negative_polarity	-0.032097290	
## abs_title_subjectivity	0.001675672	
## abs_title_sentiment_polarity	0.002689006	
## shares	0.049720604	
##	self_reference_avg_sharess	weekday_is_monday
## timedelta	-0.0183294042	-0.0123959014
## n_tokens_title	0.0284817938	0.0117874126
## n_tokens_content	-0.0203763361	-0.0112512366
## n_unique_tokens	0.0547528173	0.0234576771
## n_non_stop_words	0.0416544494	0.0126143143
## n_non_stop_unique_tokens	0.0467400892	0.0207204306
## num_hrefs	0.0316121674	-0.0090524298
## num_self_hrefs	0.0182935778	-0.0040346748
## num_imgs	0.0105506502	-0.0237973080
## num_videos	0.0517037648	0.0097182342
## average_token_length	0.0382006885	0.0087730632
## num_keywords	0.0024614678	-0.0247402462
## data_channel_is_lifestyle	-0.0020844524	-0.0037068664
## data_channel_is_entertainment	-0.0272727455	0.0146276568
## data_channel_is_bus	0.0033010570	0.0042424857
## data_channel_is_socmed	0.0267612452	-0.0195536536
## data_channel_is_tech	0.0211390628	0.0005089896
## data_channel_is_world	-0.0439872173	0.0051210548
## kw_min_min	-0.0362285490	0.0020852031
## kw_max_min	0.0270801210	0.0031565771
## kw_avg_min	0.0199595894	-0.0043631957
## kw_min_max	0.0610135582	-0.0116755082
## kw_max_max	0.0371470867	-0.0082771920
## kw_avg_max	0.1033658132	-0.0040919855
## kw_min_avg	0.0554426093	-0.0102799977
## kw_max_avg	0.1953321133	-0.0141645254
## kw_avg_avg	0.1999356844	-0.0236265410
## self_reference_min_shares	0.7812565394	-0.0004193085
## self_reference_max_shares	0.9120478903	-0.0113832879
## self_reference_avg_sharess	1.0000000000	-0.0071348890
## weekday_is_monday	-0.0071348890	1.0000000000
## weekday_is_tuesday	0.0217082879	-0.2155911073

## weekday_is_wednesday	0.0102756085	-0.2201434020
## weekday_is_thursday	-0.0230265826	-0.2085709743
## weekday_is_friday	0.0123963004	-0.1841741876
## is_weekend	-0.0157642074	-0.1781044720
## global_subjectivity	0.0586153335	0.0167658856
## global_sentiment_polarity	-0.0086888488	-0.0237007208
## global_rate_positive_words	-0.0115427870	-0.0193760385
## global_rate_negative_words	-0.0008122921	0.0101977289
## rate_positive_words	0.0196148329	-0.0085538906
## rate_negative_words	0.0225871304	0.0246842226
## avg_positive_polarity	0.0319369643	0.0043286266
## min_positive_polarity	0.0262952106	0.0209932902
## max_positive_polarity	0.0062903700	0.0031799642
## avg_negative_polarity	-0.0551890354	-0.0197816975
## min_negative_polarity	-0.0205867464	-0.0020146576
## max_negative_polarity	-0.0507274525	-0.0326609122
## abs_title_subjectivity	0.0046191589	0.0069627725
## abs_title_sentiment_polarity	0.0024545538	-0.0052247763
## shares	0.0626244686	0.0192581378
##	weekday_is_tuesday	weekday_is_wednesday
## timedelta	-1.222801e-02	0.0215179913
## n_tokens_title	5.431298e-03	0.0108067578
## n_tokens_content	-2.455382e-02	-0.0258866649
## n_unique_tokens	4.208296e-03	0.0068889645
## n_non_stop_words	-4.220790e-03	-0.0042085710
## n_non_stop_unique_tokens	2.016339e-03	0.0075726514
## num_hrefs	-1.672962e-02	-0.0433907796
## num_self_hrefs	-1.856339e-02	-0.0247214302
## num_imgs	-2.525060e-02	-0.0375066447
## num_videos	2.825826e-02	-0.0064413058
## average_token_length	-8.269611e-03	-0.0033753610
## num_keywords	-1.952283e-02	-0.0455347671
## data_channel_is_lifestyle	-1.579236e-02	0.0052933232
## data_channel_is_entertainment	-8.087530e-03	0.0002643386
## data_channel_is_bus	2.417772e-03	0.0172116101
## data_channel_is_socmed	-1.559015e-02	0.0159894033
## data_channel_is_tech	1.544295e-02	0.0099009901
## data_channel_is_world	4.231103e-03	-0.0153921472
## kw_min_min	-3.349276e-02	0.0226159130
## kw_max_min	-2.328055e-02	0.0075528538
## kw_avg_min	-2.006844e-02	0.0048605145
## kw_min_max	1.723504e-02	0.0036021469
## kw_max_max	2.323736e-02	-0.0294699308
## kw_avg_max	4.204006e-02	-0.0108992097
## kw_min_avg	-3.755707e-03	-0.0320537109
## kw_max_avg	-1.681509e-02	-0.0008513439
## kw_avg_avg	-1.610525e-03	-0.0230348343
## self_reference_min_shares	2.949210e-02	-0.0145815191
## self_reference_max_shares	1.281219e-02	0.0171705972
## self_reference_avg_share	2.170829e-02	0.0102756085
## weekday_is_monday	-2.155911e-01	-0.2201434020
## weekday_is_tuesday	1.000000e+00	-0.2327099953
## weekday_is_wednesday	-2.327100e-01	1.0000000000
## weekday_is_thursday	-2.204770e-01	-0.2251324327

## weekday_is_friday	-1.946875e-01	-0.1987984331
## is_weekend	-1.882713e-01	-0.1922467552
## global_subjectivity	-2.532250e-03	-0.0257502980
## global_sentiment_polarity	-1.159219e-05	0.0095518825
## global_rate_positive_words	-2.161318e-02	-0.0044045025
## global_rate_negative_words	-6.994407e-03	-0.0105243156
## rate_positive_words	6.224031e-04	0.0020346851
## rate_negative_words	-5.501952e-03	-0.0072269684
## avg_positive_polarity	1.249373e-02	-0.0028761583
## min_positive_polarity	1.584444e-02	0.0046741868
## max_positive_polarity	9.486839e-03	-0.0178395178
## avg_negative_polarity	1.982767e-02	0.0173709667
## min_negative_polarity	1.325881e-02	0.0171030136
## max_negative_polarity	2.865064e-02	-0.0056494391
## abs_title_subjectivity	-2.513653e-03	0.0047885458
## abs_title_sentiment_polarity	2.522168e-02	-0.0215879684
## shares	-1.158944e-02	-0.0211466845
##	weekday_is_thursday	weekday_is_friday
## timedelta	0.0003483076	-0.0047163321
## n_tokens_title	0.0060111300	0.0021308438
## n_tokens_content	0.0052022584	-0.0019639470
## n_unique_tokens	-0.0052031481	0.0188847086
## n_non_stop_words	0.0002226042	0.0164215113
## n_non_stop_unique_tokens	-0.0018821331	0.0223732677
## num_hrefs	-0.0131364110	0.0064433190
## num_self_hrefs	0.0007521185	-0.0192849277
## num_imgs	0.0140399832	-0.0011268686
## num_videos	-0.0349002833	0.0068129264
## average_token_length	0.0043412827	0.0149682637
## num_keywords	-0.0069363798	0.0097180480
## data_channel_is_lifestyle	-0.0216344924	0.0016239880
## data_channel_is_entertainment	-0.0057712984	0.0114041805
## data_channel_is_bus	0.0266331884	0.0043064851
## data_channel_is_socmed	0.0109141159	0.0051545201
## data_channel_is_tech	0.0003094824	-0.0274405037
## data_channel_is_world	0.0069476694	-0.0010456251
## kw_min_min	-0.0067764250	0.0014590007
## kw_max_min	-0.0079745492	0.0139821410
## kw_avg_min	-0.0047371951	0.0202267736
## kw_min_max	0.0081758408	-0.0105976664
## kw_max_max	0.0189510385	0.0009826594
## kw_avg_max	-0.0018008793	0.0080098827
## kw_min_avg	-0.0181943836	0.0049527751
## kw_max_avg	0.0086540748	-0.0020944551
## kw_avg_avg	-0.0036948794	0.0013603412
## self_reference_min_shares	-0.0186541752	0.0100179212
## self_reference_max_shares	-0.0225577756	0.0132880201
## self_reference_avg_share	-0.0230265826	0.0123963004
## weekday_is_monday	-0.2085709743	-0.1841741876
## weekday_is_tuesday	-0.2204769710	-0.1946875261
## weekday_is_wednesday	-0.2251324327	-0.1987984331
## weekday_is_thursday	1.0000000000	-0.1883480609
## weekday_is_friday	-0.1883480609	1.0000000000
## is_weekend	-0.1821407895	-0.1608355719

## global_subjectivity	-0.0162632849	0.0235957717
## global_sentiment_polarity	-0.0102378272	0.0025984013
## global_rate_positive_words	-0.0157655522	0.0130826379
## global_rate_negative_words	-0.0108176792	-0.0029123362
## rate_positive_words	-0.0016860083	0.0240375854
## rate_negative_words	0.0023254827	-0.0111690215
## avg_positive_polarity	-0.0300053164	0.0107753234
## min_positive_polarity	-0.0120272994	-0.0106745355
## max_positive_polarity	-0.0161753415	-0.0001652829
## avg_negative_polarity	0.0109369109	-0.0165337609
## min_negative_polarity	0.0031300059	-0.0054572563
## max_negative_polarity	0.0121035612	-0.0191900356
## abs_title_subjectivity	0.0143390213	0.0253204750
## abs_title_sentiment_polarity	-0.0148029520	-0.0362460524
## shares	0.0104352598	-0.0046106403
##	is_weekend	global_subjectivity
## timedelta	0.0071638898	0.104458630
## n_tokens_title	-0.0405009995	-0.042318306
## n_tokens_content	0.0664205574	0.128545989
## n_unique_tokens	-0.0520701229	0.494270570
## n_non_stop_words	-0.0212713617	0.675545238
## n_non_stop_unique_tokens	-0.0546318419	0.523017986
## num_hrefs	0.0871315818	0.225345890
## num_self_hrefs	0.0730294063	0.126915463
## num_imgs	0.0836988463	0.078717706
## num_videos	-0.0034928508	0.084868364
## average_token_length	-0.0165037031	0.616585294
## num_keywords	0.0997595994	0.024831701
## data_channel_is_lifestyle	0.0384203153	0.048179665
## data_channel_is_entertainment	-0.0124159583	0.024430569
## data_channel_is_bus	-0.0613963046	-0.022756043
## data_channel_is_socmed	0.0033438966	0.036656236
## data_channel_is_tech	-0.0018091572	0.053571325
## data_channel_is_world	0.0006376433	-0.166214201
## kw_min_min	0.0158242450	0.015994874
## kw_max_min	0.0089032350	0.007447469
## kw_avg_min	0.0066075764	0.011068810
## kw_min_max	-0.0092191385	-0.016244866
## kw_max_max	-0.0055066302	-0.020890822
## kw_avg_max	-0.0370116474	-0.050960716
## kw_min_avg	0.0677863814	0.013618017
## kw_max_avg	0.0281987576	0.039518588
## kw_avg_avg	0.0571122405	0.066212161
## self_reference_min_shares	-0.0057653591	0.051886730
## self_reference_max_shares	-0.0103546827	0.055324932
## self_reference_avg_share	-0.0157642074	0.058615334
## weekday_is_monday	-0.1781044720	0.016765886
## weekday_is_tuesday	-0.1882713289	-0.002532250
## weekday_is_wednesday	-0.1922467552	-0.025750298
## weekday_is_thursday	-0.1821407895	-0.016263285
## weekday_is_friday	-0.1608355719	0.023595772
## is_weekend	1.0000000000	0.008139263
## global_subjectivity	0.0081392633	1.000000000
## global_sentiment_polarity	0.0237945836	0.335922880

## global_rate_positive_words	0.0551789149	0.477189113
## global_rate_negative_words	0.0239540772	0.248436439
## rate_positive_words	-0.0164024643	0.505311513
## rate_negative_words	-0.0036724133	0.135842301
## avg_positive_polarity	0.0067553455	0.615794001
## min_positive_polarity	-0.0221657609	0.210928056
## max_positive_polarity	0.0244957432	0.525902863
## avg_negative_polarity	-0.0161510448	-0.448082747
## min_negative_polarity	-0.0305270137	-0.356165039
## max_negative_polarity	0.0159403748	-0.215023480
## abs_title_subjectivity	-0.0522491002	-0.007346459
## abs_title_sentiment_polarity	0.0555696306	0.106269819
## shares	0.0095256619	0.054294640
##	global_sentiment_polarity	
## timedelta	1.499128e-01	
## n_tokens_title	-6.370401e-02	
## n_tokens_content	1.548121e-02	
## n_unique_tokens	1.857913e-01	
## n_non_stop_words	2.216447e-01	
## n_non_stop_unique_tokens	1.882773e-01	
## num_hrefs	9.918525e-02	
## num_self_hrefs	1.011790e-01	
## num_imgs	2.460538e-02	
## num_videos	-4.285467e-02	
## average_token_length	1.898272e-01	
## num_keywords	8.463542e-02	
## data_channel_is_lifestyle	7.804444e-02	
## data_channel_is_entertainment	-4.158059e-02	
## data_channel_is_bus	7.096429e-02	
## data_channel_is_socmed	8.686185e-02	
## data_channel_is_tech	1.339833e-01	
## data_channel_is_world	-2.278348e-01	
## kw_min_min	5.736469e-02	
## kw_max_min	2.818628e-02	
## kw_avg_min	3.717495e-02	
## kw_min_max	-6.153836e-03	
## kw_max_max	-7.345250e-02	
## kw_avg_max	-7.510784e-02	
## kw_min_avg	-3.793285e-03	
## kw_max_avg	2.799212e-02	
## kw_avg_avg	2.253461e-02	
## self_reference_min_shares	-3.622173e-03	
## self_reference_max_shares	-8.297666e-03	
## self_reference_avg_share	-8.688849e-03	
## weekday_is_monday	-2.370072e-02	
## weekday_is_tuesday	-1.159219e-05	
## weekday_is_wednesday	9.551882e-03	
## weekday_is_thursday	-1.023783e-02	
## weekday_is_friday	2.598401e-03	
## is_weekend	2.379458e-02	
## global_subjectivity	3.359229e-01	
## global_sentiment_polarity	1.000000e+00	
## global_rate_positive_words	5.595065e-01	
## global_rate_negative_words	-4.651416e-01	

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## rate_positive_words          7.178811e-01
## rate_negative_words         -6.351337e-01
## avg_positive_polarity        5.042075e-01
## min_positive_polarity        1.016230e-01
## max_positive_polarity        4.296596e-01
## avg_negative_polarity        2.158711e-01
## min_negative_polarity        2.813681e-01
## max_negative_polarity        -5.853660e-02
## abs_title_subjectivity       -3.293091e-02
## abs_title_sentiment_polarity 6.987716e-02
## shares                       -1.682236e-04
##                               global_rate_positive_words
## timedelta                     0.2156634854
## n_tokens_title                -0.0754429235
## n_tokens_content              0.1383967853
## n_unique_tokens               0.3078431791
## n_non_stop_words              0.4132879219
## n_non_stop_unique_tokens      0.3613597732
## num_hrefs                     0.0653724250
## num_self_hrefs                0.1348147166
## num_imgs                     -0.0228081381
## num_videos                    0.0832267141
## average_token_length          0.3439873761
## num_keywords                  0.0612632151
## data_channel_is_lifestyle      0.0593313801
## data_channel_is_entertainment  0.0363914814
## data_channel_is_bus           0.0760841201
## data_channel_is_socmed        0.0989004219
## data_channel_is_tech          0.0895862575
## data_channel_is_world         -0.2422374292
## kw_min_min                    0.0993769700
## kw_max_min                    0.0122707881
## kw_avg_min                    0.0291907731
## kw_min_max                    -0.0218006307
## kw_max_max                    -0.1120817199
## kw_avg_max                    -0.1109054389
## kw_min_avg                    -0.0126803901
## kw_max_avg                    0.0093279150
## kw_avg_avg                    -0.0046840731
## self_reference_min_shares      -0.0100038574
## self_reference_max_shares      -0.0044271038
## self_reference_avg_sharess     -0.0115427870
## weekday_is_monday             -0.0193760385
## weekday_is_tuesday            -0.0216131836
## weekday_is_wednesday          -0.0044045025
## weekday_is_thursday           -0.0157655522
## weekday_is_friday              0.0130826379
## is_weekend                    0.0551789149
## global_subjectivity            0.4771891128
## global_sentiment_polarity      0.5595064968
## global_rate_positive_words     1.0000000000
## global_rate_negative_words     0.1272655641
## rate_positive_words            0.6272265716
## rate_negative_words            -0.3085029857

```

## avg_positive_polarity	0.3378840375
## min_positive_polarity	-0.1055789895
## max_positive_polarity	0.4956518822
## avg_negative_polarity	-0.1568537667
## min_negative_polarity	-0.1355821448
## max_negative_polarity	-0.0825737932
## abs_title_subjectivity	-0.1530979400
## abs_title_sentiment_polarity	0.1198173856
## shares	0.0009670952
##	global_rate_negative_words
## timedelta	0.0040843482
## n_tokens_title	0.0148823610
## n_tokens_content	0.1432339674
## n_unique_tokens	0.1710929878
## n_non_stop_words	0.2761482314
## n_non_stop_unique_tokens	0.2159257126
## num_hrefs	0.0417018649
## num_self_hrefs	0.0154456112
## num_imgs	0.0307051822
## num_videos	0.2067836061
## average_token_length	0.2340632257
## num_keywords	-0.0592054929
## data_channel_is_lifestyle	-0.0141710245
## data_channel_is_entertainment	0.1127182636
## data_channel_is_bus	-0.0744031019
## data_channel_is_socmed	-0.0165079404
## data_channel_is_tech	-0.1015174179
## data_channel_is_world	0.0093201145
## kw_min_min	-0.0084526261
## kw_max_min	-0.0200814092
## kw_avg_min	-0.0173045316
## kw_min_max	-0.0086681396
## kw_max_max	0.0166044265
## kw_avg_max	0.0102268300
## kw_min_avg	0.0203231632
## kw_max_avg	-0.0044552740
## kw_avg_avg	0.0185588668
## self_reference_min_shares	-0.0053918367
## self_reference_max_shares	0.0027340795
## self_reference_avg_share	-0.0008122921
## weekday_is_monday	0.0101977289
## weekday_is_tuesday	-0.0069944068
## weekday_is_wednesday	-0.0105243156
## weekday_is_thursday	-0.0108176792
## weekday_is_friday	-0.0029123362
## is_weekend	0.0239540772
## global_subjectivity	0.2484364388
## global_sentiment_polarity	-0.4651416221
## global_rate_positive_words	0.1272655641
## global_rate_negative_words	1.0000000000
## rate_positive_words	-0.3878597115
## rate_negative_words	0.7873475622
## avg_positive_polarity	0.2049209968
## min_positive_polarity	0.0580842964

## max_positive_polarity	0.2119015857	
## avg_negative_polarity	-0.3571455463	
## min_negative_polarity	-0.5040449875	
## max_negative_polarity	0.0910119880	
## abs_title_subjectivity	-0.0573624495	
## abs_title_sentiment_polarity	0.0780140517	
## shares	0.0236344118	
##	rate_positive_words	rate_negative_words
## timedelta	0.1960073983	-0.0867066816
## n_tokens_title	-0.0529170587	0.0432240239
## n_tokens_content	0.0919408510	0.1151451334
## n_unique_tokens	0.4697483007	0.1948298387
## n_non_stop_words	0.6423438849	0.3311702708
## n_non_stop_unique_tokens	0.5134339041	0.2320336826
## num_hrefs	0.1061158851	0.0677305789
## num_self_hrefs	0.1495086559	-0.0069806986
## num_imgs	-0.0175295207	0.0367448083
## num_videos	-0.0508945887	0.0902334581
## average_token_length	0.5976756970	0.3268550278
## num_keywords	0.0390233651	-0.0901920752
## data_channel_is_lifestyle	0.0539559391	-0.0417601545
## data_channel_is_entertainment	-0.0348921859	0.0521526187
## data_channel_is_bus	0.1181351959	-0.0747579852
## data_channel_is_socmed	0.0835156353	-0.0597534686
## data_channel_is_tech	0.1706426750	-0.1125866098
## data_channel_is_world	-0.1532197040	0.1837327146
## kw_min_min	0.0672213382	-0.0570287883
## kw_max_min	0.0216143300	-0.0203567337
## kw_avg_min	0.0339314544	-0.0243605353
## kw_min_max	-0.0158733294	-0.0219359813
## kw_max_max	-0.0828957007	0.0696138867
## kw_avg_max	-0.1498702776	0.0102066725
## kw_min_avg	-0.0637673167	0.0002609955
## kw_max_avg	-0.0070153671	-0.0158745319
## kw_avg_avg	-0.0787527714	-0.0241711371
## self_reference_min_shares	0.0218528843	0.0106096762
## self_reference_max_shares	0.0184227469	0.0238249751
## self_reference_avg_share	0.0196148329	0.0225871304
## weekday_is_monday	-0.0085538906	0.0246842226
## weekday_is_tuesday	0.0006224031	-0.0055019524
## weekday_is_wednesday	0.0020346851	-0.0072269684
## weekday_is_thursday	-0.0016860083	0.0023254827
## weekday_is_friday	0.0240375854	-0.0111690215
## is_weekend	-0.0164024643	-0.0036724133
## global_subjectivity	0.5053115129	0.1358423007
## global_sentiment_polarity	0.7178810849	-0.6351337216
## global_rate_positive_words	0.6272265716	-0.3085029857
## global_rate_negative_words	-0.3878597115	0.7873475622
## rate_positive_words	1.0000000000	-0.5104432435
## rate_negative_words	-0.5104432435	1.0000000000
## avg_positive_polarity	0.4146623781	0.1598715047
## min_positive_polarity	0.0560823241	0.1903425565
## max_positive_polarity	0.4536002229	0.0551404610
## avg_negative_polarity	-0.0489047956	-0.3466727666

## min_negative_polarity	0.0879587582	-0.4678804448
## max_negative_polarity	-0.2166841455	0.0376874209
## abs_title_subjectivity	-0.0206550597	0.0387956952
## abs_title_sentiment_polarity	-0.0018622230	-0.0046107820
## shares	-0.0223942070	0.0027743635
##	avg_positive_polarity	min_positive_polarity
## timedelta	0.091231540	0.035923791
## n_tokens_title	-0.010651290	0.015271116
## n_tokens_content	0.133039005	-0.249306242
## n_unique_tokens	0.438941353	0.398820528
## n_non_stop_words	0.597493577	0.231185821
## n_non_stop_unique_tokens	0.469353046	0.310806660
## num_hrefs	0.209753356	-0.061841833
## num_self_hrefs	0.120787304	-0.068775165
## num_imgs	0.094281705	-0.020946395
## num_videos	0.100657026	-0.012870797
## average_token_length	0.546997090	0.227065064
## num_keywords	0.012228512	-0.039603488
## data_channel_is_lifestyle	0.056139754	-0.019567831
## data_channel_is_entertainment	0.051922332	-0.016215199
## data_channel_is_bus	0.004692545	-0.047255938
## data_channel_is_socmed	0.028057108	-0.066072786
## data_channel_is_tech	0.010643557	0.033148307
## data_channel_is_world	-0.143249048	-0.052259194
## kw_min_min	-0.002898560	-0.016893625
## kw_max_min	0.007284579	-0.010456820
## kw_avg_min	0.008478060	-0.015299217
## kw_min_max	-0.019024608	0.005932977
## kw_max_max	-0.004641967	0.005466889
## kw_avg_max	-0.034807358	0.035907276
## kw_min_avg	0.011851957	0.026083891
## kw_max_avg	0.034543613	0.016198610
## kw_avg_avg	0.048120922	0.053725682
## self_reference_min_shares	0.032312286	0.028822638
## self_reference_max_shares	0.028337838	0.011117756
## self_reference_avg_share	0.031936964	0.026295211
## weekday_is_monday	0.004328627	0.020993290
## weekday_is_tuesday	0.012493726	0.015844438
## weekday_is_wednesday	-0.002876158	0.004674187
## weekday_is_thursday	-0.030005316	-0.012027299
## weekday_is_friday	0.010775323	-0.010674535
## is_weekend	0.006755346	-0.022165761
## global_subjectivity	0.615794001	0.210928056
## global_sentiment_polarity	0.504207462	0.101622968
## global_rate_positive_words	0.337884037	-0.105578990
## global_rate_negative_words	0.204920997	0.058084296
## rate_positive_words	0.414662378	0.056082324
## rate_negative_words	0.159871505	0.190342556
## avg_positive_polarity	1.000000000	0.474321014
## min_positive_polarity	0.474321014	1.000000000
## max_positive_polarity	0.695243076	0.024695604
## avg_negative_polarity	-0.278009435	-0.058318767
## min_negative_polarity	-0.237684246	0.087291985
## max_negative_polarity	-0.138567549	-0.174899672

## abs_title_subjectivity	0.012576463	0.016372755
## abs_title_sentiment_polarity	0.113465117	0.001233162
## shares	0.033336075	0.020857948
##	max_positive_polarity	avg_negative_polarity
## timedelta	0.0737706932	0.0271024025
## n_tokens_title	-0.0015637536	-0.0412178988
## n_tokens_content	0.4032827243	-0.1344334684
## n_unique_tokens	0.1871073245	-0.2312516020
## n_non_stop_words	0.5468756003	-0.3626430337
## n_non_stop_unique_tokens	0.2961141344	-0.2565096313
## num_hrefs	0.2874148578	-0.1562089692
## num_self_hrefs	0.2003674790	-0.0592871999
## num_imgs	0.1519426453	-0.0799765760
## num_videos	0.1212758726	-0.1238328617
## average_token_length	0.4801342140	-0.3285693322
## num_keywords	0.0534902021	0.0287972049
## data_channel_is_lifestyle	0.0769569231	0.0016790609
## data_channel_is_entertainment	0.0810216411	-0.1373794418
## data_channel_is_bus	0.0082213999	0.0590598064
## data_channel_is_socmed	0.0500454696	0.0172757841
## data_channel_is_tech	0.0262322513	0.1160068885
## data_channel_is_world	-0.1166324146	0.0269225411
## kw_min_min	-0.0141542657	0.0382131735
## kw_max_min	0.0275645845	-0.0002632077
## kw_avg_min	0.0268624172	0.0053138508
## kw_min_max	-0.0242781881	-0.0015819438
## kw_max_max	0.0066851379	-0.0370332897
## kw_avg_max	-0.0771208633	-0.0422570303
## kw_min_avg	-0.0064527538	-0.0237419379
## kw_max_avg	0.0194728427	-0.0544759136
## kw_avg_avg	0.0041189518	-0.0842449870
## self_reference_min_shares	0.0023622477	-0.0520831099
## self_reference_max_shares	0.0156990438	-0.0531702867
## self_reference_avg_share	0.0062903700	-0.0551890354
## weekday_is_monday	0.0031799642	-0.0197816975
## weekday_is_tuesday	0.0094868390	0.0198276733
## weekday_is_wednesday	-0.0178395178	0.0173709667
## weekday_is_thursday	-0.0161753415	0.0109369109
## weekday_is_friday	-0.0001652829	-0.0165337609
## is_weekend	0.0244957432	-0.0161510448
## global_subjectivity	0.5259028626	-0.4480827469
## global_sentiment_polarity	0.4296595820	0.2158710724
## global_rate_positive_words	0.4956518822	-0.1568537667
## global_rate_negative_words	0.2119015857	-0.3571455463
## rate_positive_words	0.4536002229	-0.0489047956
## rate_negative_words	0.0551404610	-0.3466727666
## avg_positive_polarity	0.6952430763	-0.2780094345
## min_positive_polarity	0.0246956038	-0.0583187666
## max_positive_polarity	1.0000000000	-0.2730366688
## avg_negative_polarity	-0.2730366688	1.0000000000
## min_negative_polarity	-0.3646803715	0.7455188795
## max_negative_polarity	-0.0058885033	0.5790259020
## abs_title_subjectivity	-0.0290330399	-0.0178326183
## abs_title_sentiment_polarity	0.1059841837	-0.0955383364

## shares	0.0185726464	-0.0459353199
##	min_negative_polarity	max_negative_polarity
## timedelta	0.088372863	-0.0601130562
## n_tokens_title	-0.027565024	-0.0187962021
## n_tokens_content	-0.449468952	0.2214077718
## n_unique_tokens	0.008944001	-0.3272607100
## n_non_stop_words	-0.320493455	-0.2041752215
## n_non_stop_unique_tokens	-0.106385535	-0.2536745288
## num_hrefs	-0.255601025	0.0499017002
## num_self_hrefs	-0.120845886	0.0368096838
## num_imgs	-0.140379704	0.0406303803
## num_videos	-0.156715578	0.0427782958
## average_token_length	-0.280946031	-0.2028077066
## num_keywords	0.009326673	0.0396069928
## data_channel_is_lifestyle	-0.006911056	0.0000979169
## data_channel_is_entertainment	-0.118395664	-0.0202753382
## data_channel_is_bus	0.053998464	-0.0071779910
## data_channel_is_socmed	0.004339138	0.0082889713
## data_channel_is_tech	0.129101811	0.0030453028
## data_channel_is_world	-0.066482426	0.0784806489
## kw_min_min	0.061366041	-0.0238253494
## kw_max_min	0.012960738	-0.0134475306
## kw_avg_min	0.020242866	-0.0167458851
## kw_min_max	0.004105047	-0.0190762594
## kw_max_max	-0.065109775	0.0300543893
## kw_avg_max	-0.006564718	-0.0281837776
## kw_min_avg	-0.014609199	-0.0134102572
## kw_max_avg	-0.020244817	-0.0452164943
## kw_avg_avg	-0.026153052	-0.0574801609
## self_reference_min_shares	-0.006579715	-0.0562819799
## self_reference_max_shares	-0.035004213	-0.0320972899
## self_reference_avg_share	-0.020586746	-0.0507274525
## weekday_is_monday	-0.002014658	-0.0326609122
## weekday_is_tuesday	0.013258806	0.0286506441
## weekday_is_wednesday	0.017103014	-0.0056494391
## weekday_is_thursday	0.003130006	0.0121035612
## weekday_is_friday	-0.005457256	-0.0191900356
## is_weekend	-0.030527014	0.0159403748
## global_subjectivity	-0.356165039	-0.2150234799
## global_sentiment_polarity	0.281368090	-0.0585365988
## global_rate_positive_words	-0.135582145	-0.0825737932
## global_rate_negative_words	-0.504044988	0.0910119880
## rate_positive_words	0.087958758	-0.2166841455
## rate_negative_words	-0.467880445	0.0376874209
## avg_positive_polarity	-0.237684246	-0.1385675488
## min_positive_polarity	0.087291985	-0.1748996716
## max_positive_polarity	-0.364680371	-0.0058885033
## avg_negative_polarity	0.745518879	0.5790259020
## min_negative_polarity	1.000000000	0.0744475987
## max_negative_polarity	0.074447599	1.0000000000
## abs_title_subjectivity	0.002124945	-0.0174817348
## abs_title_sentiment_polarity	-0.086755128	-0.0198759295
## shares	-0.035917269	-0.0178775787
##	abs_title_subjectivity	

## timedelta	0.0089085308	
## n_tokens_title	-0.1325706435	
## n_tokens_content	-0.0122945716	
## n_unique_tokens	0.0067294091	
## n_non_stop_words	0.0119130266	
## n_non_stop_unique_tokens	0.0152815896	
## num_hrefs	0.0089007983	
## num_self_hrefs	0.0083799826	
## num_imgs	-0.0285176492	
## num_videos	-0.0256965259	
## average_token_length	0.0244962877	
## num_keywords	-0.0176859639	
## data_channel_is_lifestyle	0.0229673308	
## data_channel_is_entertainment	-0.0547766655	
## data_channel_is_bus	0.0185784836	
## data_channel_is_socmed	0.0123585740	
## data_channel_is_tech	-0.0143917406	
## data_channel_is_world	0.0385926578	
## kw_min_min	0.0091517847	
## kw_max_min	-0.0009086285	
## kw_avg_min	0.0083584345	
## kw_min_max	-0.0111562457	
## kw_max_max	-0.0247666077	
## kw_avg_max	0.0008772137	
## kw_min_avg	-0.0176816692	
## kw_max_avg	-0.0091759687	
## kw_avg_avg	-0.0189712179	
## self_reference_min_shares	0.0061263565	
## self_reference_max_shares	0.0016756720	
## self_reference_avg_share	0.0046191589	
## weekday_is_monday	0.0069627725	
## weekday_is_tuesday	-0.0025136529	
## weekday_is_wednesday	0.0047885458	
## weekday_is_thursday	0.0143390213	
## weekday_is_friday	0.0253204750	
## is_weekend	-0.0522491002	
## global_subjectivity	-0.0073464590	
## global_sentiment_polarity	-0.0329309083	
## global_rate_positive_words	-0.1530979400	
## global_rate_negative_words	-0.0573624495	
## rate_positive_words	-0.0206550597	
## rate_negative_words	0.0387956952	
## avg_positive_polarity	0.0125764629	
## min_positive_polarity	0.0163727554	
## max_positive_polarity	-0.0290330399	
## avg_negative_polarity	-0.0178326183	
## min_negative_polarity	0.0021249454	
## max_negative_polarity	-0.0174817348	
## abs_title_subjectivity	1.0000000000	
## abs_title_sentiment_polarity	-0.4058888238	
## shares	-0.0108444756	
##	abs_title_sentiment_polarity	shares
## timedelta	0.0101742677	0.0103569561
## n_tokens_title	0.0269343376	0.0260431962

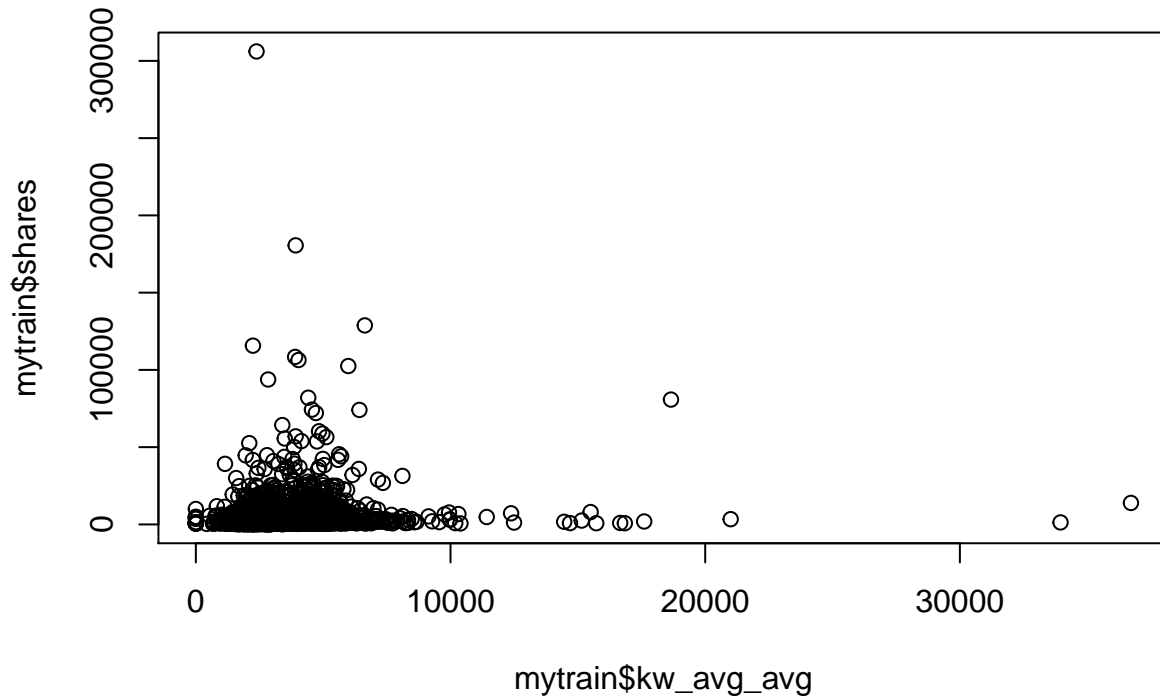
## n_tokens_content	0.0419911622	-0.0077618196
## n_unique_tokens	-0.0204216573	0.0059783728
## n_non_stop_words	-0.0061528649	-0.0221001906
## n_non_stop_unique_tokens	-0.0375667695	-0.0083318345
## num_hrefs	0.0809392212	0.0651621721
## num_self_hrefs	0.0006072708	-0.0088350376
## num_imgs	0.0776644999	0.0620725920
## num_videos	0.0960010330	0.0130047761
## average_token_length	-0.0179052002	-0.0341852871
## num_keywords	0.0111667879	0.0147153602
## data_channel_is_lifestyle	0.0104064472	-0.0014670577
## data_channel_is_entertainment	0.0313439808	-0.0393591165
## data_channel_is_bus	-0.0600516716	-0.0121752627
## data_channel_is_socmed	0.0304507754	0.0085925503
## data_channel_is_tech	-0.0266907354	-0.0258027886
## data_channel_is_world	-0.0723617566	-0.0563942011
## kw_min_min	0.0016269762	0.0176925610
## kw_max_min	0.0075663565	0.0146616929
## kw_avg_min	0.0007150846	0.0086549023
## kw_min_max	0.0010497592	-0.0004804804
## kw_max_max	0.0004085149	0.0109654366
## kw_avg_max	0.0264953259	0.0582019038
## kw_min_avg	0.0615976675	0.0556368041
## kw_max_avg	0.0351097959	0.0739943944
## kw_avg_avg	0.0805435562	0.1372852259
## self_reference_min_shares	0.0040376877	0.0629132883
## self_reference_max_shares	0.0026890064	0.0497206042
## self_reference_avg_shares	0.0024545538	0.0626244686
## weekday_is_monday	-0.0052247763	0.0192581378
## weekday_is_tuesday	0.0252216814	-0.0115894395
## weekday_is_wednesday	-0.0215879684	-0.0211466845
## weekday_is_thursday	-0.0148029520	0.0104352598
## weekday_is_friday	-0.0362460524	-0.0046106403
## is_weekend	0.0555696306	0.0095256619
## global_subjectivity	0.1062698189	0.0542946397
## global_sentiment_polarity	0.0698771644	-0.0001682236
## global_rate_positive_words	0.1198173856	0.0009670952
## global_rate_negative_words	0.0780140517	0.0236344118
## rate_positive_words	-0.0018622230	-0.0223942070
## rate_negative_words	-0.0046107820	0.0027743635
## avg_positive_polarity	0.1134651173	0.0333360751
## min_positive_polarity	0.0012331620	0.0208579478
## max_positive_polarity	0.1059841837	0.0185726464
## avg_negative_polarity	-0.0955383364	-0.0459353199
## min_negative_polarity	-0.0867551278	-0.0359172691
## max_negative_polarity	-0.0198759295	-0.0178775787
## abs_title_subjectivity	-0.405888238	-0.0108444756
## abs_title_sentiment_polarity	1.0000000000	0.0555392837
## shares	0.0555392837	1.0000000000

```
#mytrain = subset(mytrain, kw_avg_avg < 15000)
```

```
#the most correlated variable (only 0.135)
```

```
#try to plot it against response to see true relationship
```

```
plot(mytrain$shares-mytrain$kw_avg_avg)
```



```
#seems like small amount of data is outlier (kw_avg_avg >= 10000) which can affect regression line; so  
mytrain = mytrain[mytrain$kw_avg_avg < 10000,]  
nrow(mytrain)
```

```
## [1] 4982
```

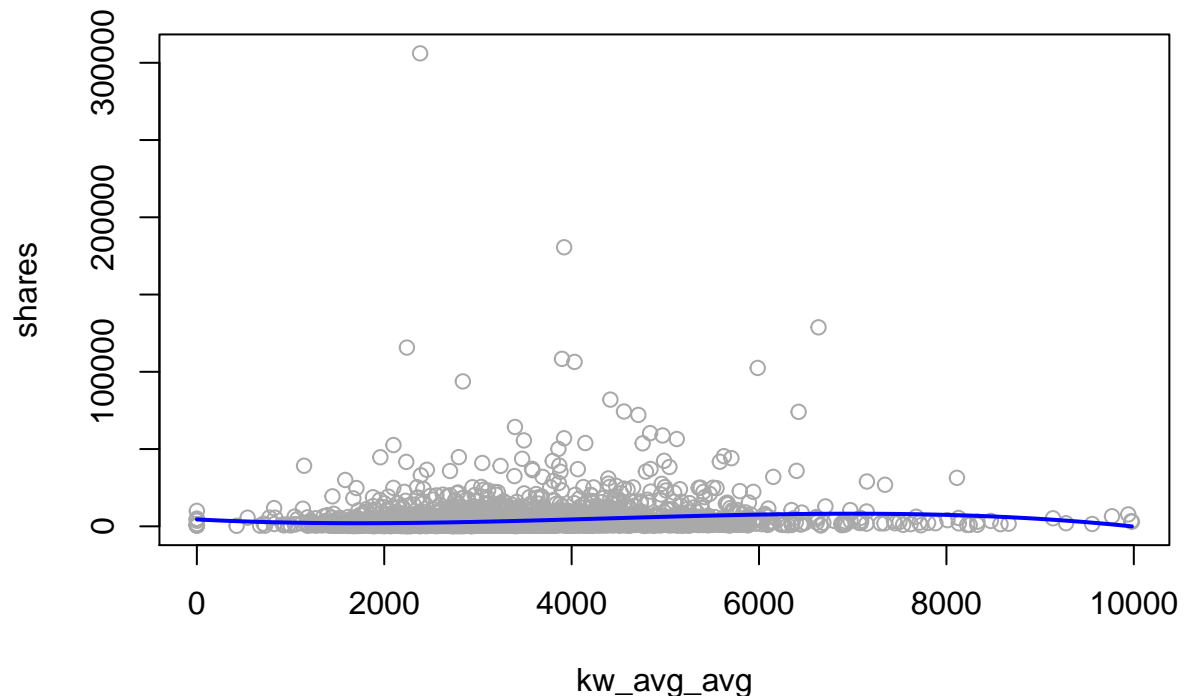
```
attach(mytrain)
```

```
#Linear Regression with the most correlated variable (only 0.135)  
plot(shares~kw_avg_avg, data = mytrain, col="darkgrey")  
kw_avg_avg.range = range(mytrain$kw_avg_avg)  
kw_avg_avg.grid = seq(from=kw_avg_avg.range[1], to=kw_avg_avg.range[2])  
lm.fit = lm(shares~poly(kw_avg_avg, 10), data=mytrain)  
summary(lm.fit)
```

```
##  
## Call:  
## lm(formula = shares ~ poly(kw_avg_avg, 10), data = mytrain)  
##  
## Residuals:  
##      Min       1Q   Median       3Q      Max
```

```
## -8311 -1894 -1256 -254 303924
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      3267.8      115.8  28.230 < 2e-16 ***
## poly(kw_avg_avg, 10)1  88412.5      8170.5  10.821 < 2e-16 ***
## poly(kw_avg_avg, 10)2  -5109.9      8170.5  -0.625  0.5317
## poly(kw_avg_avg, 10)3 -38679.7      8170.5  -4.734 2.26e-06 ***
## poly(kw_avg_avg, 10)4   4580.8      8170.5   0.561  0.5751
## poly(kw_avg_avg, 10)5  15549.9      8170.5   1.903  0.0571 .
## poly(kw_avg_avg, 10)6    449.7      8170.5   0.055  0.9561
## poly(kw_avg_avg, 10)7   8841.2      8170.5   1.082  0.2793
## poly(kw_avg_avg, 10)8  -1557.2      8170.5  -0.191  0.8489
## poly(kw_avg_avg, 10)9 -10767.7      8170.5  -1.318  0.1876
## poly(kw_avg_avg, 10)10 -4070.1      8170.5  -0.498  0.6184
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 8170 on 4971 degrees of freedom
## Multiple R-squared:  0.02873,    Adjusted R-squared:  0.02677
## F-statistic: 14.7 on 10 and 4971 DF,  p-value: < 2.2e-16
```

```
#P-value shows that degree 3 is the best
lm.fit = lm(shares~poly(kw_avg_avg, 3), data=mytrain)
lm.pred = predict(lm.fit, data.frame(kw_avg_avg=kw_avg_avg.grid))
lines(kw_avg_avg.grid, lm.pred, col="blue", lwd=2)
```



```
lm.pred.test = predict(lm.fit, mytest1)
sqrt(mean(mytest1$shares - lm.pred.test)^2)
```

```
## [1] 225.4126
```

```
# Try other method to reduce number of predictors
```

```
# Forward subset
```

```
nv = ncol(mytrain)
```

```
regfit.full=regsubsets(shares~., mytrain, nvmax = nv-1, really.big=T, method = "forward")
```

```
## Warning in leaps.setup(x, y, wt = wt, nbest = nbest, nvmax = nvmax,
```

```
## force.in = force.in, : 1 linear dependencies found
```

```
## Reordering variables and trying again:
```

```
reg.summary=summary(regfit.full)
```

```
reg.summary
```

```
## Subset selection object
```

```
## Call: regsubsets.formula(shares ~ ., mytrain, nvmax = nv - 1, really.big = T,
```

```
## method = "forward")
```

```
## 50 Variables (and intercept)
```

```
##
```

	Forced in	Forced out
timedelta	FALSE	FALSE
n_tokens_title	FALSE	FALSE
n_tokens_content	FALSE	FALSE
n_unique_tokens	FALSE	FALSE
n_non_stop_words	FALSE	FALSE
n_non_stop_unique_tokens	FALSE	FALSE
num_hrefs	FALSE	FALSE
num_self_hrefs	FALSE	FALSE
num_imgs	FALSE	FALSE
num_videos	FALSE	FALSE
average_token_length	FALSE	FALSE
num_keywords	FALSE	FALSE
data_channel_is_lifestyle	FALSE	FALSE
data_channel_is_entertainment	FALSE	FALSE
data_channel_is_bus	FALSE	FALSE
data_channel_is_socmed	FALSE	FALSE
data_channel_is_tech	FALSE	FALSE
data_channel_is_world	FALSE	FALSE
kw_min_min	FALSE	FALSE
kw_max_min	FALSE	FALSE
kw_avg_min	FALSE	FALSE
kw_min_max	FALSE	FALSE
kw_max_max	FALSE	FALSE
kw_avg_max	FALSE	FALSE
kw_min_avg	FALSE	FALSE
kw_max_avg	FALSE	FALSE
kw_avg_avg	FALSE	FALSE
self_reference_min_shares	FALSE	FALSE

```

## self_reference_max_shares      FALSE      FALSE
## self_reference_avg_sharess     FALSE      FALSE
## weekday_is_monday              FALSE      FALSE
## weekday_is_tuesday             FALSE      FALSE
## weekday_is_wednesday           FALSE      FALSE
## weekday_is_thursday            FALSE      FALSE
## weekday_is_friday              FALSE      FALSE
## global_subjectivity            FALSE      FALSE
## global_sentiment_polarity       FALSE      FALSE
## global_rate_positive_words     FALSE      FALSE
## global_rate_negative_words     FALSE      FALSE
## rate_positive_words            FALSE      FALSE
## rate_negative_words            FALSE      FALSE
## avg_positive_polarity           FALSE      FALSE
## min_positive_polarity           FALSE      FALSE
## max_positive_polarity           FALSE      FALSE
## avg_negative_polarity           FALSE      FALSE
## min_negative_polarity           FALSE      FALSE
## max_negative_polarity           FALSE      FALSE
## abs_title_subjectivity          FALSE      FALSE
## abs_title_sentiment_polarity    FALSE      FALSE
## is_weekend                     FALSE      FALSE
## 1 subsets of each size up to 49
## Selection Algorithm: forward
##      timedelta n_tokens_title n_tokens_content n_unique_tokens
## 1  ( 1 ) " "      " "      " "      " "
## 2  ( 1 ) " "      " "      " "      " "
## 3  ( 1 ) " "      " "      " "      " "
## 4  ( 1 ) " "      " "      " "      " "
## 5  ( 1 ) " "      " "      " "      " "
## 6  ( 1 ) " "      " "      " "      " "
## 7  ( 1 ) " "      "*"      " "      " "
## 8  ( 1 ) " "      "*"      " "      " "
## 9  ( 1 ) " "      "*"      " "      " "
## 10 ( 1 ) " "      "*"      " "      " "
## 11 ( 1 ) " "      "*"      " "      " "
## 12 ( 1 ) " "      "*"      " "      " "
## 13 ( 1 ) " "      "*"      " "      " "
## 14 ( 1 ) " "      "*"      " "      " "
## 15 ( 1 ) " "      "*"      " "      " "
## 16 ( 1 ) " "      "*"      " "      " "
## 17 ( 1 ) " "      "*"      " "      " "
## 18 ( 1 ) " "      "*"      " "      " "
## 19 ( 1 ) "*"      "*"      " "      " "
## 20 ( 1 ) "*"      "*"      " "      " "
## 21 ( 1 ) "*"      "*"      " "      " "
## 22 ( 1 ) "*"      "*"      " "      " "
## 23 ( 1 ) "*"      "*"      " "      " "
## 24 ( 1 ) "*"      "*"      " "      " "
## 25 ( 1 ) "*"      "*"      " "      " "
## 26 ( 1 ) "*"      "*"      " "      " "
## 27 ( 1 ) "*"      "*"      " "      " "
## 28 ( 1 ) "*"      "*"      " "      " "
## 29 ( 1 ) "*"      "*"      " "      " "

```


## 30	(1)	"*"	"*"	" "	" "
## 31	(1)	"*"	"*"	" "	" "
## 32	(1)	"*"	"*"	" "	" "
## 33	(1)	"*"	"*"	" "	" "
## 34	(1)	"*"	"*"	" "	" "
## 35	(1)	"*"	"*"	" "	" "
## 36	(1)	"*"	"*"	" "	" "
## 37	(1)	"*"	"*"	" "	"*"
## 38	(1)	"*"	"*"	" "	"*"
## 39	(1)	"*"	"*"	" "	"*"
## 40	(1)	"*"	"*"	" "	"*"
## 41	(1)	"*"	"*"	" "	"*"
## 42	(1)	"*"	"*"	" "	"*"
## 43	(1)	"*"	"*"	" "	"*"
## 44	(1)	"*"	"*"	" "	"*"
## 45	(1)	"*"	"*"	" "	"*"
## 46	(1)	"*"	"*"	" "	"*"
## 47	(1)	"*"	"*"	"*"	"*"
## 48	(1)	"*"	"*"	"*"	"*"
## 49	(1)	"*"	"*"	"*"	"*"
##		n_non_stop_words	n_non_stop_unique_tokens	num_hrefs	
## 1	(1)	" "	" "	" "	
## 2	(1)	" "	" "	" "	
## 3	(1)	" "	" "	" "	
## 4	(1)	" "	" "	"*"	
## 5	(1)	" "	" "	"*"	
## 6	(1)	" "	" "	"*"	
## 7	(1)	" "	" "	"*"	
## 8	(1)	" "	" "	"*"	
## 9	(1)	" "	" "	"*"	
## 10	(1)	" "	" "	"*"	
## 11	(1)	" "	" "	"*"	
## 12	(1)	" "	" "	"*"	
## 13	(1)	" "	"*"	"*"	
## 14	(1)	" "	"*"	"*"	
## 15	(1)	" "	"*"	"*"	
## 16	(1)	" "	"*"	"*"	
## 17	(1)	" "	"*"	"*"	
## 18	(1)	" "	"*"	"*"	
## 19	(1)	" "	"*"	"*"	
## 20	(1)	" "	"*"	"*"	
## 21	(1)	" "	"*"	"*"	
## 22	(1)	" "	"*"	"*"	
## 23	(1)	" "	"*"	"*"	
## 24	(1)	"*"	"*"	"*"	
## 25	(1)	"*"	"*"	"*"	
## 26	(1)	"*"	"*"	"*"	
## 27	(1)	"*"	"*"	"*"	
## 28	(1)	"*"	"*"	"*"	
## 29	(1)	"*"	"*"	"*"	
## 30	(1)	"*"	"*"	"*"	
## 31	(1)	"*"	"*"	"*"	
## 32	(1)	"*"	"*"	"*"	
## 33	(1)	"*"	"*"	"*"	

## 34	(1)	"*	"*	"*
## 35	(1)	"*	"*	"*
## 36	(1)	"*	"*	"*
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## 38	(1)	"*	"*	"*
## 39	(1)	"*	"*	"*
## 40	(1)	"*	"*	"*
## 41	(1)	"*	"*	"*
## 42	(1)	"*	"*	"*
## 43	(1)	"*	"*	"*
## 44	(1)	"*	"*	"*
## 45	(1)	"*	"*	"*
## 46	(1)	"*	"*	"*
## 47	(1)	"*	"*	"*
## 48	(1)	"*	"*	"*
## 49	(1)	"*	"*	"*
##		num_self_hrefs	num_imgs	num_videos
## 1	(1)	" "	" "	" "
## 2	(1)	" "	" "	" "
## 3	(1)	" "	" "	" "
## 4	(1)	" "	" "	" "
## 5	(1)	" "	" "	" "
## 6	(1)	" "	" "	" "
## 7	(1)	" "	" "	" "
## 8	(1)	" "	" "	" "
## 9	(1)	" "	" "	" "
## 10	(1)	" "	" "	" "
## 11	(1)	" "	" "	" "
## 12	(1)	" "	" "	"*
## 13	(1)	" "	" "	"*
## 14	(1)	" "	" "	"*
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## 26	(1)	"*	" "	"*
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## 30	(1)	"*	"*	"*
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## 35	(1)	"*	"*	"*
## 36	(1)	"*	"*	"*
## 37	(1)	"*	"*	"*

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## 38 ( 1 ) "*"          "*"          "*"          "*"
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## 47 ( 1 ) "*"          "*"          "*"          "*"
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## 49 ( 1 ) "*"          "*"          "*"          "*"
##
##          num_keywords data_channel_is_lifestyle
## 1 ( 1 ) " "          " "
## 2 ( 1 ) " "          " "
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## 42 ( 1 ) " " "*"
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##
## data_channel_is_entertainment data_channel_is_bus
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```

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## 46 ( 1 ) "*" "*"
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##      data_channel_is_socmed data_channel_is_tech
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## 49 ( 1 ) "*" "*"

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##		data_channel_is_world	kw_min_min	kw_max_min	kw_avg_min	
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## 48	(1)	"*"	"*"	"*"	"*"	"*"
## 49	(1)	"*"	"*"	"*"	"*"	"*"
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## 5	(1)	"*"	"*"	" "	" "	" "
## 6	(1)	"*"	"*"	" "	" "	" "
## 7	(1)	"*"	"*"	" "	" "	" "

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##
## self_reference_avg_shares weekday_is_monday weekday_is_tuesday
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##	weekday_is_wednesday	weekday_is_thursday	weekday_is_friday	
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## 39	(1)	" "	"*"	"*"
## 40	(1)	" "	"*"	"*"
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## 42	(1)	" "	"*"	"*"
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## 47	(1)	" "	"*"	"*"
## 48	(1)	" "	"*"	"*"
## 49	(1)	" "	"*"	"*"
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## 4	(1)	" "	" "	
## 5	(1)	" "	" "	
## 6	(1)	" "	" "	
## 7	(1)	" "	" "	
## 8	(1)	" "	" "	
## 9	(1)	" "	" "	
## 10	(1)	" "	" "	
## 11	(1)	" "	" "	
## 12	(1)	" "	" "	
## 13	(1)	" "	" "	
## 14	(1)	" "	" "	
## 15	(1)	" "	" "	
## 16	(1)	" "	" "	
## 17	(1)	" "	" "	
## 18	(1)	" "	" "	
## 19	(1)	" "	" "	
## 20	(1)	" "	" "	
## 21	(1)	"*"	" "	
## 22	(1)	"*"	" "	
## 23	(1)	"*"	" "	

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## 26	(1)	"*"	" "	" "
## 27	(1)	"*"	" "	" "
## 28	(1)	"*"	" "	" "
## 29	(1)	"*"	"*"	" "
## 30	(1)	"*"	"*"	" "
## 31	(1)	"*"	"*"	" "
## 32	(1)	"*"	"*"	" "
## 33	(1)	"*"	"*"	" "
## 34	(1)	"*"	"*"	" "
## 35	(1)	"*"	"*"	" "
## 36	(1)	"*"	"*"	" "
## 37	(1)	"*"	"*"	" "
## 38	(1)	"*"	"*"	" "
## 39	(1)	"*"	"*"	" "
## 40	(1)	"*"	"*"	" "
## 41	(1)	"*"	"*"	" "
## 42	(1)	"*"	"*"	" "
## 43	(1)	"*"	"*"	" "
## 44	(1)	"*"	"*"	" "
## 45	(1)	"*"	"*"	" "
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## 47	(1)	"*"	"*"	" "
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##		rate_positive_words	rate_negative_words	avg_positive_polarity
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## 5	(1)	" "	" "	" "
## 6	(1)	" "	" "	" "
## 7	(1)	" "	" "	" "
## 8	(1)	" "	" "	" "
## 9	(1)	" "	" "	" "
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## 40	(1)	" "	"*"	"*"
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## 45	(1)	" "	"*"	"*"
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## 47	(1)	" "	"*"	"*"
## 48	(1)	"*"	"*"	"*"
## 49	(1)	"*"	"*"	"*"
##		min_positive_polarity	max_positive_polarity	
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## 3	(1)	" "	" "	
## 4	(1)	" "	" "	
## 5	(1)	" "	" "	
## 6	(1)	" "	" "	
## 7	(1)	" "	" "	
## 8	(1)	" "	" "	
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## 26	(1)	" "	" "	
## 27	(1)	" "	" "	
## 28	(1)	" "	" "	
## 29	(1)	" "	" "	
## 30	(1)	" "	" "	
## 31	(1)	" "	"*"	

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##      avg_negative_polarity min_negative_polarity
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## 35 ( 1 ) " " "*"

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## 36	(1)	" "	"*"
## 37	(1)	" "	"*"
## 38	(1)	" "	"*"
## 39	(1)	"*"	"*"
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## 41	(1)	"*"	"*"
## 42	(1)	"*"	"*"
## 43	(1)	"*"	"*"
## 44	(1)	"*"	"*"
## 45	(1)	"*"	"*"
## 46	(1)	"*"	"*"
## 47	(1)	"*"	"*"
## 48	(1)	"*"	"*"
## 49	(1)	"*"	"*"
##		max_negative_polarity	abs_title_subjectivity
## 1	(1)	" "	" "
## 2	(1)	" "	" "
## 3	(1)	" "	" "
## 4	(1)	" "	" "
## 5	(1)	" "	" "
## 6	(1)	" "	" "
## 7	(1)	" "	" "
## 8	(1)	" "	" "
## 9	(1)	" "	" "
## 10	(1)	" "	" "
## 11	(1)	" "	" "
## 12	(1)	" "	" "
## 13	(1)	" "	" "
## 14	(1)	" "	" "
## 15	(1)	" "	" "
## 16	(1)	" "	" "
## 17	(1)	" "	" "
## 18	(1)	" "	" "
## 19	(1)	" "	" "
## 20	(1)	" "	" "
## 21	(1)	" "	" "
## 22	(1)	" "	" "
## 23	(1)	" "	" "
## 24	(1)	" "	" "
## 25	(1)	" "	" "
## 26	(1)	" "	" "
## 27	(1)	" "	" "
## 28	(1)	" "	" "
## 29	(1)	" "	" "
## 30	(1)	" "	" "
## 31	(1)	" "	" "
## 32	(1)	" "	" "
## 33	(1)	" "	"*"
## 34	(1)	" "	"*"
## 35	(1)	" "	"*"
## 36	(1)	" "	"*"
## 37	(1)	" "	"*"
## 38	(1)	" "	"*"
## 39	(1)	" "	"*"

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## 40 ( 1 ) "*" "*"
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## 49 ( 1 ) "*" "*"
##
##      abs_title_sentiment_polarity
## 1 ( 1 ) " "
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## 42 ( 1 ) "*"
## 43 ( 1 ) "*"

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## 44 ( 1 ) "*"
## 45 ( 1 ) "*"
## 46 ( 1 ) "*"
## 47 ( 1 ) "*"
## 48 ( 1 ) "*"
## 49 ( 1 ) "*"

```

```
par(mfrow=c(2,2))
plot(reg.summary$rss,xlab="Number of Variables",ylab="RSS",type="l")

plot(reg.summary$adjr2,xlab="Number of Variables",ylab=" Adjusted RSq",type="l")
max_adjr2=which.max(reg.summary$adjr2)
max_adjr2

```

```
## [1] 22

```

```
points(max_adjr2,reg.summary$adjr2[max_adjr2], col ="red",cex =2, pch =20)

plot(reg.summary$cp,xlab="Number of Variables",ylab="Cp",type="l")
min_cp=which.min(reg.summary$cp)
min_cp

```

```
## [1] 20

```

```
points(min_cp,reg.summary$cp[min_cp],col="red",cex=2,pch=20)

min_bic=which.min(reg.summary$bic)
min_bic

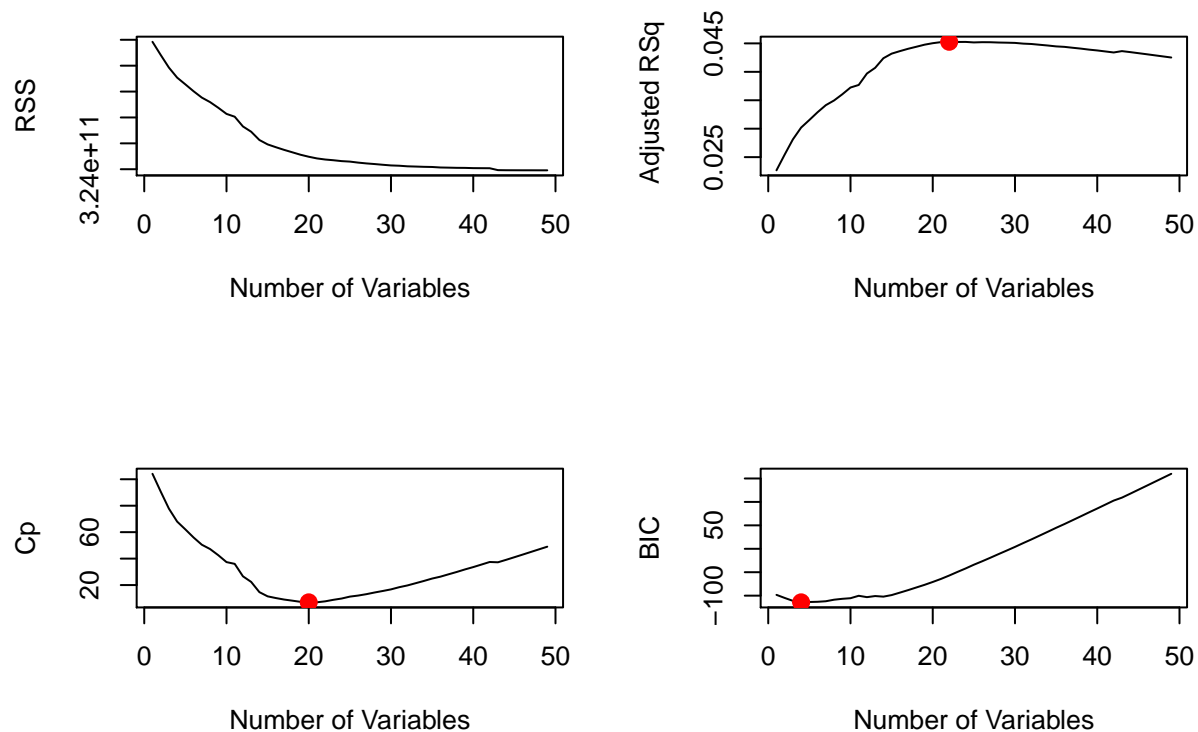
```

```
## [1] 4

```

```
plot(reg.summary$bic,xlab="Number of Variables",ylab="BIC",type="l")
points(min_bic,reg.summary$bic[min_bic],col="red",cex=2,pch=20)

```



```
#Backward
regfit.full=regsubsets(shares~., mytrain, nvmax = nv-1, really.big=T, method = "backward")
```

```
## Warning in leaps.setup(x, y, wt = wt, nbest = nbest, nvmax = nvmax,
## force.in = force.in, : 1 linear dependencies found
```

```
## Reordering variables and trying again:
```

```
reg.summary=summary(regfit.full)
reg.summary
```

```
## Subset selection object
## Call: regsubsets.formula(shares ~ ., mytrain, nvmax = nv - 1, really.big = T,
## method = "backward")
## 50 Variables (and intercept)
##
```

	Forced in	Forced out
timedelta	FALSE	FALSE
n_tokens_title	FALSE	FALSE
n_tokens_content	FALSE	FALSE
n_unique_tokens	FALSE	FALSE
n_non_stop_words	FALSE	FALSE
n_non_stop_unique_tokens	FALSE	FALSE
num_hrefs	FALSE	FALSE
num_self_hrefs	FALSE	FALSE

## num_imgs	FALSE	FALSE
## num_videos	FALSE	FALSE
## average_token_length	FALSE	FALSE
## num_keywords	FALSE	FALSE
## data_channel_is_lifestyle	FALSE	FALSE
## data_channel_is_entertainment	FALSE	FALSE
## data_channel_is_bus	FALSE	FALSE
## data_channel_is_socmed	FALSE	FALSE
## data_channel_is_tech	FALSE	FALSE
## data_channel_is_world	FALSE	FALSE
## kw_min_min	FALSE	FALSE
## kw_max_min	FALSE	FALSE
## kw_avg_min	FALSE	FALSE
## kw_min_max	FALSE	FALSE
## kw_max_max	FALSE	FALSE
## kw_avg_max	FALSE	FALSE
## kw_min_avg	FALSE	FALSE
## kw_max_avg	FALSE	FALSE
## kw_avg_avg	FALSE	FALSE
## self_reference_min_shares	FALSE	FALSE
## self_reference_max_shares	FALSE	FALSE
## self_reference_avg_sharess	FALSE	FALSE
## weekday_is_monday	FALSE	FALSE
## weekday_is_tuesday	FALSE	FALSE
## weekday_is_wednesday	FALSE	FALSE
## weekday_is_thursday	FALSE	FALSE
## weekday_is_friday	FALSE	FALSE
## global_subjectivity	FALSE	FALSE
## global_sentiment_polarity	FALSE	FALSE
## global_rate_positive_words	FALSE	FALSE
## global_rate_negative_words	FALSE	FALSE
## rate_positive_words	FALSE	FALSE
## rate_negative_words	FALSE	FALSE
## avg_positive_polarity	FALSE	FALSE
## min_positive_polarity	FALSE	FALSE
## max_positive_polarity	FALSE	FALSE
## avg_negative_polarity	FALSE	FALSE
## min_negative_polarity	FALSE	FALSE
## max_negative_polarity	FALSE	FALSE
## abs_title_subjectivity	FALSE	FALSE
## abs_title_sentiment_polarity	FALSE	FALSE
## is_weekend	FALSE	FALSE
## 1 subsets of each size up to 49		
## Selection Algorithm: backward		
##	timedelta	n_tokens_title n_tokens_content n_unique_tokens
## 1 (1)	" "	" "
## 2 (1)	" "	" "
## 3 (1)	" "	" "
## 4 (1)	" "	" "
## 5 (1)	" "	" "
## 6 (1)	" "	" "
## 7 (1)	" "	" "
## 8 (1)	" "	" "
## 9 (1)	" "	" "

## 10	(1)	" "	"*"	" "	" "
## 11	(1)	" "	"*"	" "	" "
## 12	(1)	" "	"*"	" "	" "
## 13	(1)	" "	"*"	" "	" "
## 14	(1)	" "	"*"	" "	" "
## 15	(1)	" "	"*"	" "	" "
## 16	(1)	" "	"*"	" "	" "
## 17	(1)	" "	"*"	" "	" "
## 18	(1)	" "	"*"	" "	" "
## 19	(1)	"*"	"*"	" "	" "
## 20	(1)	"*"	"*"	" "	" "
## 21	(1)	"*"	"*"	" "	" "
## 22	(1)	"*"	"*"	" "	" "
## 23	(1)	"*"	"*"	" "	" "
## 24	(1)	"*"	"*"	" "	" "
## 25	(1)	"*"	"*"	" "	" "
## 26	(1)	"*"	"*"	" "	" "
## 27	(1)	"*"	"*"	" "	" "
## 28	(1)	"*"	"*"	" "	" "
## 29	(1)	"*"	"*"	" "	" "
## 30	(1)	"*"	"*"	" "	" "
## 31	(1)	"*"	"*"	" "	" "
## 32	(1)	"*"	"*"	" "	" "
## 33	(1)	"*"	"*"	" "	" "
## 34	(1)	"*"	"*"	" "	" "
## 35	(1)	"*"	"*"	" "	" "
## 36	(1)	"*"	"*"	" "	" "
## 37	(1)	"*"	"*"	" "	" "
## 38	(1)	"*"	"*"	" "	" "
## 39	(1)	"*"	"*"	" "	" "
## 40	(1)	"*"	"*"	" "	" "
## 41	(1)	"*"	"*"	" "	" "
## 42	(1)	"*"	"*"	" "	"*"
## 43	(1)	"*"	"*"	" "	"*"
## 44	(1)	"*"	"*"	" "	"*"
## 45	(1)	"*"	"*"	" "	"*"
## 46	(1)	"*"	"*"	" "	"*"
## 47	(1)	"*"	"*"	"*"	"*"
## 48	(1)	"*"	"*"	"*"	"*"
## 49	(1)	"*"	"*"	"*"	"*"
##		n_non_stop_words	n_non_stop_unique_tokens	num_hrefs	
## 1	(1)	" "	" "	" "	" "
## 2	(1)	" "	" "	" "	" "
## 3	(1)	" "	" "	" "	" "
## 4	(1)	" "	" "	" "	" "
## 5	(1)	" "	" "	" "	"*"
## 6	(1)	" "	" "	" "	"*"
## 7	(1)	" "	"*"	" "	"*"
## 8	(1)	" "	"*"	" "	"*"
## 9	(1)	" "	"*"	" "	"*"
## 10	(1)	" "	"*"	" "	"*"
## 11	(1)	" "	"*"	" "	"*"
## 12	(1)	" "	"*"	" "	"*"
## 13	(1)	" "	"*"	" "	"*"

## 14	(1)	" "	"*"	"*"
## 15	(1)	" "	"*"	"*"
## 16	(1)	" "	"*"	"*"
## 17	(1)	" "	"*"	"*"
## 18	(1)	" "	"*"	"*"
## 19	(1)	" "	"*"	"*"
## 20	(1)	" "	"*"	"*"
## 21	(1)	" "	"*"	"*"
## 22	(1)	" "	"*"	"*"
## 23	(1)	" "	"*"	"*"
## 24	(1)	" "	"*"	"*"
## 25	(1)	" "	"*"	"*"
## 26	(1)	"*"	"*"	"*"
## 27	(1)	"*"	"*"	"*"
## 28	(1)	"*"	"*"	"*"
## 29	(1)	"*"	"*"	"*"
## 30	(1)	"*"	"*"	"*"
## 31	(1)	"*"	"*"	"*"
## 32	(1)	"*"	"*"	"*"
## 33	(1)	"*"	"*"	"*"
## 34	(1)	"*"	"*"	"*"
## 35	(1)	"*"	"*"	"*"
## 36	(1)	"*"	"*"	"*"
## 37	(1)	"*"	"*"	"*"
## 38	(1)	"*"	"*"	"*"
## 39	(1)	"*"	"*"	"*"
## 40	(1)	"*"	"*"	"*"
## 41	(1)	"*"	"*"	"*"
## 42	(1)	"*"	"*"	"*"
## 43	(1)	"*"	"*"	"*"
## 44	(1)	"*"	"*"	"*"
## 45	(1)	"*"	"*"	"*"
## 46	(1)	"*"	"*"	"*"
## 47	(1)	"*"	"*"	"*"
## 48	(1)	"*"	"*"	"*"
## 49	(1)	"*"	"*"	"*"

##		num_self_hrefs	num_imgs	num_videos	average_token_length
## 1	(1)	" "	" "	" "	" "
## 2	(1)	" "	" "	" "	" "
## 3	(1)	" "	" "	" "	" "
## 4	(1)	" "	" "	" "	"*"
## 5	(1)	" "	" "	" "	"*"
## 6	(1)	" "	" "	" "	"*"
## 7	(1)	" "	" "	" "	"*"
## 8	(1)	" "	"*"	" "	"*"
## 9	(1)	" "	"*"	" "	"*"
## 10	(1)	" "	"*"	" "	"*"
## 11	(1)	"*"	"*"	" "	"*"
## 12	(1)	"*"	"*"	" "	"*"
## 13	(1)	"*"	"*"	" "	"*"
## 14	(1)	"*"	"*"	" "	"*"
## 15	(1)	"*"	"*"	" "	"*"
## 16	(1)	"*"	"*"	" "	"*"
## 17	(1)	"*"	"*"	" "	"*"

## 18	(1)	"*"	"*"	" "	"*"
## 19	(1)	"*"	"*"	" "	"*"
## 20	(1)	"*"	"*"	" "	"*"
## 21	(1)	"*"	"*"	" "	"*"
## 22	(1)	"*"	"*"	" "	"*"
## 23	(1)	"*"	"*"	" "	"*"
## 24	(1)	"*"	"*"	" "	"*"
## 25	(1)	"*"	"*"	" "	"*"
## 26	(1)	"*"	"*"	" "	"*"
## 27	(1)	"*"	"*"	" "	"*"
## 28	(1)	"*"	"*"	" "	"*"
## 29	(1)	"*"	"*"	" "	"*"
## 30	(1)	"*"	"*"	" "	"*"
## 31	(1)	"*"	"*"	" "	"*"
## 32	(1)	"*"	"*"	" "	"*"
## 33	(1)	"*"	"*"	" "	"*"
## 34	(1)	"*"	"*"	" "	"*"
## 35	(1)	"*"	"*"	" "	"*"
## 36	(1)	"*"	"*"	" "	"*"
## 37	(1)	"*"	"*"	" "	"*"
## 38	(1)	"*"	"*"	" "	"*"
## 39	(1)	"*"	"*"	" "	"*"
## 40	(1)	"*"	"*"	" "	"*"
## 41	(1)	"*"	"*"	" "	"*"
## 42	(1)	"*"	"*"	" "	"*"
## 43	(1)	"*"	"*"	" "	"*"
## 44	(1)	"*"	"*"	" "	"*"
## 45	(1)	"*"	"*"	" "	"*"
## 46	(1)	"*"	"*"	" "	"*"
## 47	(1)	"*"	"*"	" "	"*"
## 48	(1)	"*"	"*"	" "	"*"
## 49	(1)	"*"	"*"	" "	"*"
##		num_keywords	data_channel_is_lifestyle		
## 1	(1)	" "	" "		
## 2	(1)	" "	" "		
## 3	(1)	" "	" "		
## 4	(1)	" "	" "		
## 5	(1)	" "	" "		
## 6	(1)	" "	" "		
## 7	(1)	" "	" "		
## 8	(1)	" "	" "		
## 9	(1)	" "	" "		
## 10	(1)	" "	" "		
## 11	(1)	" "	" "		
## 12	(1)	" "	" "		
## 13	(1)	" "	" "		
## 14	(1)	" "	" "		
## 15	(1)	" "	" "		
## 16	(1)	" "	" "		
## 17	(1)	" "	" "		
## 18	(1)	" "	" "		
## 19	(1)	" "	" "		
## 20	(1)	" "	"*"		
## 21	(1)	" "	"*"		

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## 22 ( 1 ) " " "*"
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## 47 ( 1 ) "*" "*"
## 48 ( 1 ) "*" "*"
## 49 ( 1 ) "*" "*"
##
## data_channel_is_entertainment data_channel_is_bus
## 1 ( 1 ) " " " "
## 2 ( 1 ) " " " "
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## 5 ( 1 ) " " " "
## 6 ( 1 ) "*" " "
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## 24 ( 1 ) "*" " "
## 25 ( 1 ) "*" " "

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## 26 ( 1 ) "*" " "
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## 37 ( 1 ) "*" "*"
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## 39 ( 1 ) "*" "*"
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## 42 ( 1 ) "*" "*"
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## 44 ( 1 ) "*" "*"
## 45 ( 1 ) "*" "*"
## 46 ( 1 ) "*" "*"
## 47 ( 1 ) "*" "*"
## 48 ( 1 ) "*" "*"
## 49 ( 1 ) "*" "*"
##
## data_channel_is_socmed data_channel_is_tech
## 1 ( 1 ) " " " "
## 2 ( 1 ) " " " "
## 3 ( 1 ) " " " "
## 4 ( 1 ) " " " "
## 5 ( 1 ) " " " "
## 6 ( 1 ) " " " "
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## 24 ( 1 ) " " " "
## 25 ( 1 ) " " "*"
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## 28 ( 1 ) " " "*"
## 29 ( 1 ) " " "*"

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## 30 ( 1 ) " " "*"
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## 41 ( 1 ) "*" "*"
## 42 ( 1 ) "*" "*"
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## 46 ( 1 ) "*" "*"
## 47 ( 1 ) "*" "*"
## 48 ( 1 ) "*" "*"
## 49 ( 1 ) "*" "*"
##      data_channel_is_world kw_min_min kw_max_min kw_avg_min
## 1 ( 1 ) " " " " " "
## 2 ( 1 ) " " " " " "
## 3 ( 1 ) " " " " " "
## 4 ( 1 ) " " " " " "
## 5 ( 1 ) " " " " " "
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## 24 ( 1 ) " " "*" "*" "*"
## 25 ( 1 ) " " "*" "*" "*"
## 26 ( 1 ) " " "*" "*" "*"
## 27 ( 1 ) "*" "*" "*" "*"
## 28 ( 1 ) "*" "*" "*" "*"
## 29 ( 1 ) "*" "*" "*" "*"
## 30 ( 1 ) "*" "*" "*" "*"
## 31 ( 1 ) "*" "*" "*" "*"
## 32 ( 1 ) "*" "*" "*" "*"
## 33 ( 1 ) "*" "*" "*"

```

## 34	(1)	"*"	"*"	"*"	"*"	
## 35	(1)	"*"	"*"	"*"	"*"	
## 36	(1)	"*"	"*"	"*"	"*"	
## 37	(1)	"*"	"*"	"*"	"*"	
## 38	(1)	"*"	"*"	"*"	"*"	
## 39	(1)	"*"	"*"	"*"	"*"	
## 40	(1)	"*"	"*"	"*"	"*"	
## 41	(1)	"*"	"*"	"*"	"*"	
## 42	(1)	"*"	"*"	"*"	"*"	
## 43	(1)	"*"	"*"	"*"	"*"	
## 44	(1)	"*"	"*"	"*"	"*"	
## 45	(1)	"*"	"*"	"*"	"*"	
## 46	(1)	"*"	"*"	"*"	"*"	
## 47	(1)	"*"	"*"	"*"	"*"	
## 48	(1)	"*"	"*"	"*"	"*"	
## 49	(1)	"*"	"*"	"*"	"*"	
##		kw_min_max	kw_max_max	kw_avg_max	kw_min_avg	kw_max_avg
## 1	(1)	" "	" "	" "	" "	" "
## 2	(1)	" "	" "	" "	" "	" "
## 3	(1)	" "	" "	" "	" "	" "
## 4	(1)	" "	" "	" "	" "	" "
## 5	(1)	" "	" "	" "	" "	" "
## 6	(1)	" "	" "	" "	" "	" "
## 7	(1)	" "	" "	" "	" "	" "
## 8	(1)	" "	" "	" "	" "	" "
## 9	(1)	" "	" "	" "	" "	" "
## 10	(1)	" "	" "	" "	" "	" "
## 11	(1)	" "	" "	" "	" "	" "
## 12	(1)	"*"	" "	" "	" "	" "
## 13	(1)	"*"	" "	" "	" "	" "
## 14	(1)	"*"	" "	" "	" "	"*"
## 15	(1)	"*"	" "	" "	"*"	"*"
## 16	(1)	"*"	"*"	" "	"*"	"*"
## 17	(1)	"*"	"*"	" "	"*"	"*"
## 18	(1)	"*"	"*"	" "	"*"	"*"
## 19	(1)	"*"	"*"	" "	"*"	"*"
## 20	(1)	"*"	"*"	" "	"*"	"*"
## 21	(1)	"*"	"*"	" "	"*"	"*"
## 22	(1)	"*"	"*"	" "	"*"	"*"
## 23	(1)	"*"	"*"	" "	"*"	"*"
## 24	(1)	"*"	"*"	" "	"*"	"*"
## 25	(1)	"*"	"*"	" "	"*"	"*"
## 26	(1)	"*"	"*"	" "	"*"	"*"
## 27	(1)	"*"	"*"	" "	"*"	"*"
## 28	(1)	"*"	"*"	" "	"*"	"*"
## 29	(1)	"*"	"*"	" "	"*"	"*"
## 30	(1)	"*"	"*"	" "	"*"	"*"
## 31	(1)	"*"	"*"	" "	"*"	"*"
## 32	(1)	"*"	"*"	" "	"*"	"*"
## 33	(1)	"*"	"*"	"*"	"*"	"*"
## 34	(1)	"*"	"*"	"*"	"*"	"*"
## 35	(1)	"*"	"*"	"*"	"*"	"*"
## 36	(1)	"*"	"*"	"*"	"*"	"*"
## 37	(1)	"*"	"*"	"*"	"*"	"*"

## 38	(1)	"*"	"*"	"*"	"*"	"*"
## 39	(1)	"*"	"*"	"*"	"*"	"*"
## 40	(1)	"*"	"*"	"*"	"*"	"*"
## 41	(1)	"*"	"*"	"*"	"*"	"*"
## 42	(1)	"*"	"*"	"*"	"*"	"*"
## 43	(1)	"*"	"*"	"*"	"*"	"*"
## 44	(1)	"*"	"*"	"*"	"*"	"*"
## 45	(1)	"*"	"*"	"*"	"*"	"*"
## 46	(1)	"*"	"*"	"*"	"*"	"*"
## 47	(1)	"*"	"*"	"*"	"*"	"*"
## 48	(1)	"*"	"*"	"*"	"*"	"*"
## 49	(1)	"*"	"*"	"*"	"*"	"*"
##		kw_avg_avg	self_reference_min_shares	self_reference_max_shares		
## 1	(1)	"*"	" "	" "		
## 2	(1)	"*"	"*"	" "		
## 3	(1)	"*"	"*"	" "		
## 4	(1)	"*"	"*"	" "		
## 5	(1)	"*"	"*"	" "		
## 6	(1)	"*"	"*"	" "		
## 7	(1)	"*"	"*"	" "		
## 8	(1)	"*"	"*"	" "		
## 9	(1)	"*"	"*"	" "		
## 10	(1)	"*"	"*"	" "		
## 11	(1)	"*"	"*"	" "		
## 12	(1)	"*"	"*"	" "		
## 13	(1)	"*"	"*"	" "		
## 14	(1)	"*"	"*"	" "		
## 15	(1)	"*"	"*"	" "		
## 16	(1)	"*"	"*"	" "		
## 17	(1)	"*"	"*"	" "		
## 18	(1)	"*"	"*"	" "		
## 19	(1)	"*"	"*"	" "		
## 20	(1)	"*"	"*"	" "		
## 21	(1)	"*"	"*"	" "		
## 22	(1)	"*"	"*"	" "		
## 23	(1)	"*"	"*"	" "		
## 24	(1)	"*"	"*"	" "		
## 25	(1)	"*"	"*"	" "		
## 26	(1)	"*"	"*"	" "		
## 27	(1)	"*"	"*"	" "		
## 28	(1)	"*"	"*"	" "		
## 29	(1)	"*"	"*"	" "		
## 30	(1)	"*"	"*"	" "		
## 31	(1)	"*"	"*"	" "		
## 32	(1)	"*"	"*"	" "		
## 33	(1)	"*"	"*"	" "		
## 34	(1)	"*"	"*"	" "		
## 35	(1)	"*"	"*"	" "		
## 36	(1)	"*"	"*"	"*"		
## 37	(1)	"*"	"*"	"*"		
## 38	(1)	"*"	"*"	"*"		
## 39	(1)	"*"	"*"	"*"		
## 40	(1)	"*"	"*"	"*"		
## 41	(1)	"*"	"*"	"*"		

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## 42 ( 1 ) "*"          "*"          "*"
## 43 ( 1 ) "*"          "*"          "*"
## 44 ( 1 ) "*"          "*"          "*"
## 45 ( 1 ) "*"          "*"          "*"
## 46 ( 1 ) "*"          "*"          "*"
## 47 ( 1 ) "*"          "*"          "*"
## 48 ( 1 ) "*"          "*"          "*"
## 49 ( 1 ) "*"          "*"          "*"
##      self_reference_avg_shares weekday_is_monday weekday_is_tuesday
## 1 ( 1 ) " "              " "              " "
## 2 ( 1 ) " "              " "              " "
## 3 ( 1 ) " "              " "              " "
## 4 ( 1 ) " "              " "              " "
## 5 ( 1 ) " "              " "              " "
## 6 ( 1 ) " "              " "              " "
## 7 ( 1 ) " "              " "              " "
## 8 ( 1 ) " "              " "              " "
## 9 ( 1 ) " "              " "              " "
## 10 ( 1 ) " "             " "              " "
## 11 ( 1 ) " "             " "              " "
## 12 ( 1 ) " "             " "              " "
## 13 ( 1 ) " "             " "              " "
## 14 ( 1 ) " "             " "              " "
## 15 ( 1 ) " "             " "              " "
## 16 ( 1 ) " "             " "              " "
## 17 ( 1 ) " "             "*"              " "
## 18 ( 1 ) " "             "*"              " "
## 19 ( 1 ) " "             "*"              " "
## 20 ( 1 ) " "             "*"              " "
## 21 ( 1 ) " "             "*"              " "
## 22 ( 1 ) " "             "*"              " "
## 23 ( 1 ) " "             "*"              " "
## 24 ( 1 ) " "             "*"              " "
## 25 ( 1 ) " "             "*"              " "
## 26 ( 1 ) " "             "*"              " "
## 27 ( 1 ) " "             "*"              " "
## 28 ( 1 ) " "             "*"              " "
## 29 ( 1 ) " "             "*"              " "
## 30 ( 1 ) " "             "*"              " "
## 31 ( 1 ) " "             "*"              " "
## 32 ( 1 ) " "             "*"              " "
## 33 ( 1 ) " "             "*"              " "
## 34 ( 1 ) " "             "*"              " "
## 35 ( 1 ) " "             "*"              " "
## 36 ( 1 ) " "             "*"              " "
## 37 ( 1 ) "*"             "*"              " "
## 38 ( 1 ) "*"             "*"              " "
## 39 ( 1 ) "*"             "*"              " "
## 40 ( 1 ) "*"             "*"              " "
## 41 ( 1 ) "*"             "*"              " "
## 42 ( 1 ) "*"             "*"              " "
## 43 ( 1 ) "*"             "*"              " "
## 44 ( 1 ) "*"             "*"              "*"
## 45 ( 1 ) "*"             "*"              "*"

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## 46	(1)	"*"	"*"	"*"
## 47	(1)	"*"	"*"	"*"
## 48	(1)	"*"	"*"	"*"
## 49	(1)	"*"	"*"	"*"
##		weekday_is_wednesday	weekday_is_thursday	weekday_is_friday
## 1	(1)	" "	" "	" "
## 2	(1)	" "	" "	" "
## 3	(1)	" "	" "	" "
## 4	(1)	" "	" "	" "
## 5	(1)	" "	" "	" "
## 6	(1)	" "	" "	" "
## 7	(1)	" "	" "	" "
## 8	(1)	" "	" "	" "
## 9	(1)	" "	" "	" "
## 10	(1)	" "	" "	" "
## 11	(1)	" "	" "	" "
## 12	(1)	" "	" "	" "
## 13	(1)	" "	" "	" "
## 14	(1)	" "	" "	" "
## 15	(1)	" "	" "	" "
## 16	(1)	" "	" "	" "
## 17	(1)	" "	" "	" "
## 18	(1)	" "	" "	" "
## 19	(1)	" "	" "	" "
## 20	(1)	" "	" "	" "
## 21	(1)	" "	" "	" "
## 22	(1)	" "	" "	" "
## 23	(1)	" "	" "	" "
## 24	(1)	" "	"*"	" "
## 25	(1)	" "	"*"	" "
## 26	(1)	" "	"*"	" "
## 27	(1)	" "	"*"	" "
## 28	(1)	" "	"*"	" "
## 29	(1)	" "	"*"	" "
## 30	(1)	" "	"*"	" "
## 31	(1)	" "	"*"	" "
## 32	(1)	" "	"*"	" "
## 33	(1)	" "	"*"	" "
## 34	(1)	" "	"*"	" "
## 35	(1)	" "	"*"	" "
## 36	(1)	" "	"*"	" "
## 37	(1)	" "	"*"	" "
## 38	(1)	" "	"*"	" "
## 39	(1)	" "	"*"	" "
## 40	(1)	" "	"*"	" "
## 41	(1)	" "	"*"	" "
## 42	(1)	" "	"*"	" "
## 43	(1)	" "	"*"	" "
## 44	(1)	" "	"*"	" "
## 45	(1)	" "	"*"	" "
## 46	(1)	"*"	"*"	" "
## 47	(1)	"*"	"*"	" "
## 48	(1)	"*"	"*"	" "
## 49	(1)	"*"	"*"	"*"

##		is_weekend	global_subjectivity	global_sentiment_polarity
## 1	(1)	" "	" "	" "
## 2	(1)	" "	" "	" "
## 3	(1)	" "	"*"	" "
## 4	(1)	" "	"*"	" "
## 5	(1)	" "	"*"	" "
## 6	(1)	" "	"*"	" "
## 7	(1)	" "	"*"	" "
## 8	(1)	" "	"*"	" "
## 9	(1)	" "	"*"	" "
## 10	(1)	" "	"*"	" "
## 11	(1)	" "	"*"	" "
## 12	(1)	" "	"*"	" "
## 13	(1)	" "	"*"	" "
## 14	(1)	" "	"*"	" "
## 15	(1)	" "	"*"	" "
## 16	(1)	" "	"*"	" "
## 17	(1)	" "	"*"	" "
## 18	(1)	" "	"*"	" "
## 19	(1)	" "	"*"	" "
## 20	(1)	" "	"*"	" "
## 21	(1)	" "	"*"	" "
## 22	(1)	" "	"*"	" "
## 23	(1)	" "	"*"	" "
## 24	(1)	" "	"*"	" "
## 25	(1)	" "	"*"	" "
## 26	(1)	" "	"*"	" "
## 27	(1)	" "	"*"	" "
## 28	(1)	" "	"*"	" "
## 29	(1)	" "	"*"	" "
## 30	(1)	" "	"*"	"*"
## 31	(1)	" "	"*"	"*"
## 32	(1)	" "	"*"	"*"
## 33	(1)	" "	"*"	"*"
## 34	(1)	" "	"*"	"*"
## 35	(1)	" "	"*"	"*"
## 36	(1)	" "	"*"	"*"
## 37	(1)	" "	"*"	"*"
## 38	(1)	" "	"*"	"*"
## 39	(1)	" "	"*"	"*"
## 40	(1)	" "	"*"	"*"
## 41	(1)	" "	"*"	"*"
## 42	(1)	" "	"*"	"*"
## 43	(1)	" "	"*"	"*"
## 44	(1)	" "	"*"	"*"
## 45	(1)	" "	"*"	"*"
## 46	(1)	" "	"*"	"*"
## 47	(1)	" "	"*"	"*"
## 48	(1)	" "	"*"	"*"
## 49	(1)	" "	"*"	"*"
##		global_rate_positive_words	global_rate_negative_words	
## 1	(1)	" "	" "	
## 2	(1)	" "	" "	
## 3	(1)	" "	" "	

## 4	(1)	" "	" "
## 5	(1)	" "	" "
## 6	(1)	" "	" "
## 7	(1)	" "	" "
## 8	(1)	" "	" "
## 9	(1)	" "	" "
## 10	(1)	" "	" "
## 11	(1)	" "	" "
## 12	(1)	" "	" "
## 13	(1)	" "	" "
## 14	(1)	" "	" "
## 15	(1)	" "	" "
## 16	(1)	" "	" "
## 17	(1)	" "	" "
## 18	(1)	" "	" "
## 19	(1)	" "	" "
## 20	(1)	" "	" "
## 21	(1)	"*"	" "
## 22	(1)	"*"	" "
## 23	(1)	"*"	" "
## 24	(1)	"*"	" "
## 25	(1)	"*"	" "
## 26	(1)	"*"	" "
## 27	(1)	"*"	" "
## 28	(1)	"*"	" "
## 29	(1)	"*"	" "
## 30	(1)	"*"	" "
## 31	(1)	"*"	" "
## 32	(1)	"*"	" "
## 33	(1)	"*"	" "
## 34	(1)	"*"	" "
## 35	(1)	"*"	"*"
## 36	(1)	"*"	"*"
## 37	(1)	"*"	"*"
## 38	(1)	"*"	"*"
## 39	(1)	"*"	"*"
## 40	(1)	"*"	"*"
## 41	(1)	"*"	"*"
## 42	(1)	"*"	"*"
## 43	(1)	"*"	"*"
## 44	(1)	"*"	"*"
## 45	(1)	"*"	"*"
## 46	(1)	"*"	"*"
## 47	(1)	"*"	"*"
## 48	(1)	"*"	"*"
## 49	(1)	"*"	"*"
##		rate_positive_words	rate_negative_words avg_positive_polarity
## 1	(1)	" "	" "
## 2	(1)	" "	" "
## 3	(1)	" "	" "
## 4	(1)	" "	" "
## 5	(1)	" "	" "
## 6	(1)	" "	" "
## 7	(1)	" "	" "

## 8	(1)	" "	" "	" "
## 9	(1)	" "	" "	" "
## 10	(1)	" "	" "	" "
## 11	(1)	" "	" "	" "
## 12	(1)	" "	" "	" "
## 13	(1)	" "	" "	" "
## 14	(1)	" "	" "	" "
## 15	(1)	" "	" "	" "
## 16	(1)	" "	" "	" "
## 17	(1)	" "	" "	" "
## 18	(1)	" "	" "	" "
## 19	(1)	" "	" "	" "
## 20	(1)	" "	" "	" "
## 21	(1)	" "	" "	" "
## 22	(1)	" "	" "	" "
## 23	(1)	" "	" "	" "
## 24	(1)	" "	" "	" "
## 25	(1)	" "	" "	" "
## 26	(1)	" "	" "	" "
## 27	(1)	" "	" "	" "
## 28	(1)	" "	" "	" "
## 29	(1)	" "	"*"	" "
## 30	(1)	" "	"*"	" "
## 31	(1)	" "	"*"	" "
## 32	(1)	" "	"*"	" "
## 33	(1)	" "	"*"	" "
## 34	(1)	" "	"*"	" "
## 35	(1)	" "	"*"	" "
## 36	(1)	" "	"*"	" "
## 37	(1)	" "	"*"	" "
## 38	(1)	" "	"*"	" "
## 39	(1)	" "	"*"	" "
## 40	(1)	" "	"*"	" "
## 41	(1)	" "	"*"	"*"
## 42	(1)	" "	"*"	"*"
## 43	(1)	" "	"*"	"*"
## 44	(1)	" "	"*"	"*"
## 45	(1)	" "	"*"	"*"
## 46	(1)	" "	"*"	"*"
## 47	(1)	" "	"*"	"*"
## 48	(1)	"*"	"*"	"*"
## 49	(1)	"*"	"*"	"*"
##		min_positive_polarity	max_positive_polarity	
## 1	(1)	" "	" "	
## 2	(1)	" "	" "	
## 3	(1)	" "	" "	
## 4	(1)	" "	" "	
## 5	(1)	" "	" "	
## 6	(1)	" "	" "	
## 7	(1)	" "	" "	
## 8	(1)	" "	" "	
## 9	(1)	" "	" "	
## 10	(1)	" "	" "	
## 11	(1)	" "	" "	

## 12	(1)	" "	" "
## 13	(1)	" "	" "
## 14	(1)	" "	" "
## 15	(1)	" "	" "
## 16	(1)	" "	" "
## 17	(1)	" "	" "
## 18	(1)	" "	" "
## 19	(1)	" "	" "
## 20	(1)	" "	" "
## 21	(1)	" "	" "
## 22	(1)	" "	" "
## 23	(1)	" "	" "
## 24	(1)	" "	" "
## 25	(1)	" "	" "
## 26	(1)	" "	" "
## 27	(1)	" "	" "
## 28	(1)	" "	" "
## 29	(1)	" "	" "
## 30	(1)	" "	" "
## 31	(1)	" "	"*"
## 32	(1)	" "	"*"
## 33	(1)	" "	"*"
## 34	(1)	" "	"*"
## 35	(1)	" "	"*"
## 36	(1)	" "	"*"
## 37	(1)	" "	"*"
## 38	(1)	" "	"*"
## 39	(1)	" "	"*"
## 40	(1)	" "	"*"
## 41	(1)	" "	"*"
## 42	(1)	" "	"*"
## 43	(1)	" "	"*"
## 44	(1)	" "	"*"
## 45	(1)	"*"	"*"
## 46	(1)	"*"	"*"
## 47	(1)	"*"	"*"
## 48	(1)	"*"	"*"
## 49	(1)	"*"	"*"
##		avg_negative_polarity	min_negative_polarity
## 1	(1)	" "	" "
## 2	(1)	" "	" "
## 3	(1)	" "	" "
## 4	(1)	" "	" "
## 5	(1)	" "	" "
## 6	(1)	" "	" "
## 7	(1)	" "	" "
## 8	(1)	" "	" "
## 9	(1)	" "	" "
## 10	(1)	" "	" "
## 11	(1)	" "	" "
## 12	(1)	" "	" "
## 13	(1)	" "	" "
## 14	(1)	" "	" "
## 15	(1)	" "	" "

## 16	(1)	" "	" "
## 17	(1)	" "	" "
## 18	(1)	" "	"*"
## 19	(1)	" "	"*"
## 20	(1)	" "	"*"
## 21	(1)	" "	"*"
## 22	(1)	" "	"*"
## 23	(1)	" "	"*"
## 24	(1)	" "	"*"
## 25	(1)	" "	"*"
## 26	(1)	" "	"*"
## 27	(1)	" "	"*"
## 28	(1)	" "	"*"
## 29	(1)	" "	"*"
## 30	(1)	" "	"*"
## 31	(1)	" "	"*"
## 32	(1)	" "	"*"
## 33	(1)	" "	"*"
## 34	(1)	" "	"*"
## 35	(1)	" "	"*"
## 36	(1)	" "	"*"
## 37	(1)	" "	"*"
## 38	(1)	" "	"*"
## 39	(1)	"*"	"*"
## 40	(1)	"*"	"*"
## 41	(1)	"*"	"*"
## 42	(1)	"*"	"*"
## 43	(1)	"*"	"*"
## 44	(1)	"*"	"*"
## 45	(1)	"*"	"*"
## 46	(1)	"*"	"*"
## 47	(1)	"*"	"*"
## 48	(1)	"*"	"*"
## 49	(1)	"*"	"*"
##		max_negative_polarity	abs_title_subjectivity
## 1	(1)	" "	" "
## 2	(1)	" "	" "
## 3	(1)	" "	" "
## 4	(1)	" "	" "
## 5	(1)	" "	" "
## 6	(1)	" "	" "
## 7	(1)	" "	" "
## 8	(1)	" "	" "
## 9	(1)	" "	" "
## 10	(1)	" "	" "
## 11	(1)	" "	" "
## 12	(1)	" "	" "
## 13	(1)	" "	" "
## 14	(1)	" "	" "
## 15	(1)	" "	" "
## 16	(1)	" "	" "
## 17	(1)	" "	" "
## 18	(1)	" "	" "
## 19	(1)	" "	" "

```

## 20 ( 1 ) " " " "
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## 42 ( 1 ) "*" "*"
## 43 ( 1 ) "*" "*"
## 44 ( 1 ) "*" "*"
## 45 ( 1 ) "*" "*"
## 46 ( 1 ) "*" "*"
## 47 ( 1 ) "*" "*"
## 48 ( 1 ) "*" "*"
## 49 ( 1 ) "*" "*"
##
##      abs_title_sentiment_polarity
## 1 ( 1 ) " "
## 2 ( 1 ) " "
## 3 ( 1 ) " "
## 4 ( 1 ) " "
## 5 ( 1 ) " "
## 6 ( 1 ) " "
## 7 ( 1 ) " "
## 8 ( 1 ) " "
## 9 ( 1 ) " "
## 10 ( 1 ) " "
## 11 ( 1 ) " "
## 12 ( 1 ) " "
## 13 ( 1 ) "*"
## 14 ( 1 ) "*"
## 15 ( 1 ) "*"
## 16 ( 1 ) "*"
## 17 ( 1 ) "*"
## 18 ( 1 ) "*"
## 19 ( 1 ) "*"
## 20 ( 1 ) "*"
## 21 ( 1 ) "*"
## 22 ( 1 ) "*"
## 23 ( 1 ) "*"

```

```
## 24 ( 1 ) "*"
## 25 ( 1 ) "*"
## 26 ( 1 ) "*"
## 27 ( 1 ) "*"
## 28 ( 1 ) "*"
## 29 ( 1 ) "*"
## 30 ( 1 ) "*"
## 31 ( 1 ) "*"
## 32 ( 1 ) "*"
## 33 ( 1 ) "*"
## 34 ( 1 ) "*"
## 35 ( 1 ) "*"
## 36 ( 1 ) "*"
## 37 ( 1 ) "*"
## 38 ( 1 ) "*"
## 39 ( 1 ) "*"
## 40 ( 1 ) "*"
## 41 ( 1 ) "*"
## 42 ( 1 ) "*"
## 43 ( 1 ) "*"
## 44 ( 1 ) "*"
## 45 ( 1 ) "*"
## 46 ( 1 ) "*"
## 47 ( 1 ) "*"
## 48 ( 1 ) "*"
## 49 ( 1 ) "*"
```

```
par(mfrow=c(2,2))
plot(reg.summary$rss,xlab="Number of Variables",ylab="RSS",type="l")

plot(reg.summary$adjr2,xlab="Number of Variables",ylab=" Adjusted RSq",type="l")
max_adj2=which.max(reg.summary$adjr2)
max_adj2
```

```
## [1] 26
```

```
points(max_adj2,reg.summary$adjr2[max_adj2], col ="red",cex =2, pch =20)

plot(reg.summary$cp,xlab="Number of Variables",ylab="Cp",type="l")
min_cp=which.min(reg.summary$cp)
min_cp
```

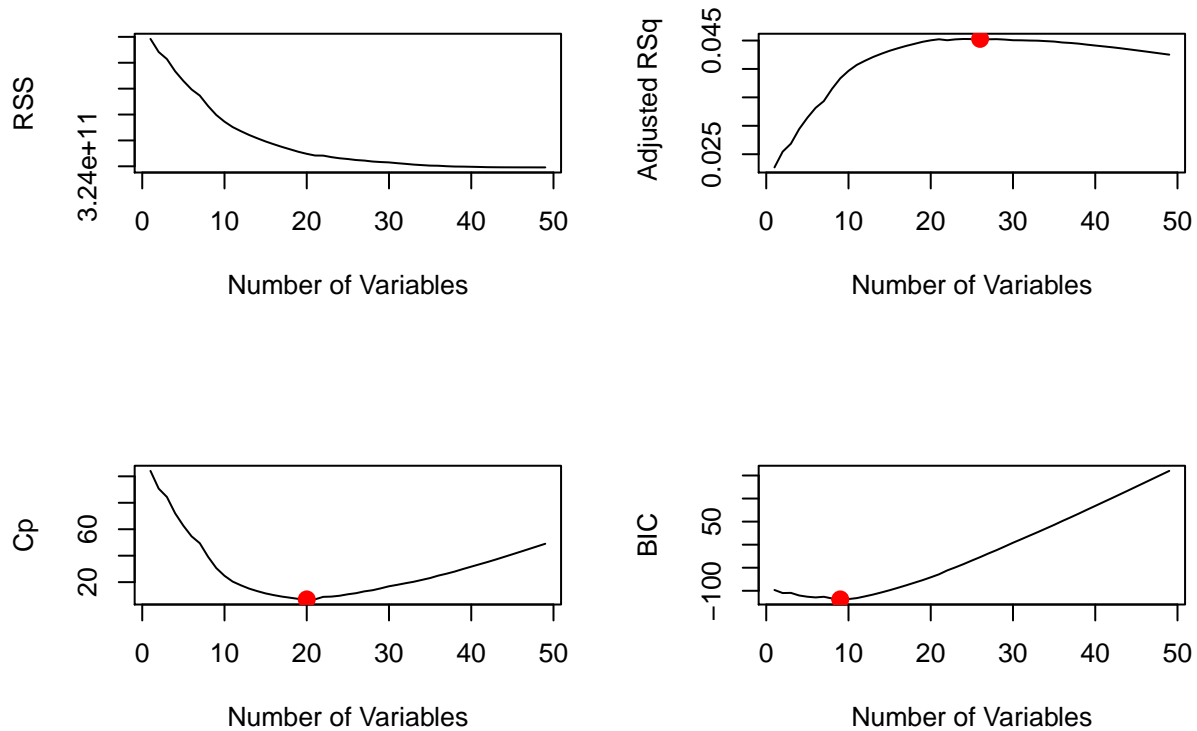
```
## [1] 20
```

```
points(min_cp,reg.summary$cp[min_cp],col="red",cex=2,pch=20)

min_bic=which.min(reg.summary$bic)
min_bic
```

```
## [1] 9
```

```
plot(reg.summary$bic,xlab="Number of Variables",ylab="BIC",type="l")
points(min_bic,reg.summary$bic[min_bic],col="red",cex=2,pch=20)
```



```
#Try Linear Regression with selected variables in accordance to appropriate number of predictors from F
mylm1 = lm(shares~timedelta+n_tokens_title+kw_avg_avg+global_subjectivity+n_unique_tokens+n_non_stop_words)
summary(mylm1)
```

```
##
## Call:
## lm(formula = shares ~ timedelta + n_tokens_title + kw_avg_avg +
##      global_subjectivity + n_unique_tokens + n_non_stop_words,
##      data = mytrain)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -8953  -2234  -1258   -97  303676
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -2067.6648  1051.9200  -1.966  0.04940 *
## timedelta      1.8568    0.5807   3.198  0.00139 **
## n_tokens_title  151.7075    57.8900   2.621  0.00880 **
## kw_avg_avg      1.1020    0.1143   9.638 < 2e-16 ***
## global_subjectivity 5747.2241 1391.0616  4.132 3.66e-05 ***
## n_unique_tokens   423.9804 1182.2366  0.359  0.71989
```

```
## n_non_stop_words      -3183.6651  1134.6809  -2.806  0.00504 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 8165 on 4975 degrees of freedom
## Multiple R-squared:  0.0293, Adjusted R-squared:  0.02813
## F-statistic: 25.03 on 6 and 4975 DF,  p-value: < 2.2e-16
```

```
#confint(myml1)
myml1.pred = predict(myml1, mytest1)
sqrt(mean((mytest1$shares - myml1.pred)^2))
```

```
## [1] 5004.456
```

```
myml2 = lm(shares~kw_avg_avg+global_subjectivity, data=mytrain)
summary(myml2)
```

```
##
## Call:
## lm(formula = shares ~ kw_avg_avg + global_subjectivity, data = mytrain)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -9056   -2142   -1326    -236   303861
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -1570.4909    541.8428  -2.898  0.00377 **
## kw_avg_avg         1.1268     0.1071  10.520 < 2e-16 ***
## global_subjectivity 3034.7128    994.0148   3.053  0.00228 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 8181 on 4979 degrees of freedom
## Multiple R-squared:  0.0247, Adjusted R-squared:  0.02431
## F-statistic: 63.06 on 2 and 4979 DF,  p-value: < 2.2e-16
```

```
myml2.pred = predict(myml2, mytest1)
sqrt(mean((mytest1$shares - myml2.pred)^2))
```

```
## [1] 4982.424
```

```
myml.1 = lm(shares~poly(timedelta+n_tokens_title+kw_avg_avg+global_subjectivity+n_unique_tokens+n_non_s
myml.2 = lm(shares~poly(timedelta+n_tokens_title+kw_avg_avg+global_subjectivity+n_unique_tokens+n_non_s
myml.3 = lm(shares~poly(timedelta+n_tokens_title+kw_avg_avg+global_subjectivity+n_unique_tokens+n_non_s
myml.4 = lm(shares~poly(timedelta+n_tokens_title+kw_avg_avg+global_subjectivity+n_unique_tokens+n_non_s
myml.5 = lm(shares~poly(timedelta+n_tokens_title+kw_avg_avg+global_subjectivity+n_unique_tokens+n_non_s
myml.6 = lm(shares~poly(timedelta+n_tokens_title+kw_avg_avg+global_subjectivity+n_unique_tokens+n_non_s
myml.7 = lm(shares~poly(timedelta+n_tokens_title+kw_avg_avg+global_subjectivity+n_unique_tokens+n_non_s
myml.8 = lm(shares~poly(timedelta+n_tokens_title+kw_avg_avg+global_subjectivity+n_unique_tokens+n_non_s
myml.9 = lm(shares~poly(timedelta+n_tokens_title+kw_avg_avg+global_subjectivity+n_unique_tokens+n_non_s
myml.10 = lm(shares~poly(timedelta+n_tokens_title+kw_avg_avg+global_subjectivity+n_unique_tokens+n_non_s
anova(myml.1, myml.2, myml.3, myml.4, myml.5, myml.6, myml.7, myml.8, myml.9, myml.10)
```

```
## Analysis of Variance Table
##
## Model 1: shares ~ poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity +
##   n_unique_tokens + n_non_stop_words, 1)
## Model 2: shares ~ poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity +
##   n_unique_tokens + n_non_stop_words, 2)
## Model 3: shares ~ poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity +
##   n_unique_tokens + n_non_stop_words, 3)
## Model 4: shares ~ poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity +
##   n_unique_tokens + n_non_stop_words, 4)
## Model 5: shares ~ poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity +
##   n_unique_tokens + n_non_stop_words, 5)
## Model 6: shares ~ poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity +
##   n_unique_tokens + n_non_stop_words, 6)
## Model 7: shares ~ poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity +
##   n_unique_tokens + n_non_stop_words, 7)
## Model 8: shares ~ poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity +
##   n_unique_tokens + n_non_stop_words, 8)
## Model 9: shares ~ poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity +
##   n_unique_tokens + n_non_stop_words, 9)
## Model 10: shares ~ poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity +
##   n_unique_tokens + n_non_stop_words, 10)
##      Res.Df    RSS Df Sum of Sq      F    Pr(>F)
## 1      4980 3.3327e+11
## 2      4979 3.3318e+11  1    92062835  1.3800    0.2402
## 3      4978 3.3203e+11  1 1151835568 17.2655 3.305e-05 ***
## 4      4977 3.3199e+11  1   34197092  0.5126    0.4740
## 5      4976 3.3187e+11  1  127391421  1.9095    0.1671
## 6      4975 3.3183e+11  1   36399049  0.5456    0.4602
## 7      4974 3.3178e+11  1   50464981  0.7564    0.3845
## 8      4973 3.3177e+11  1    7476599  0.1121    0.7378
## 9      4972 3.3164e+11  1  130940924  1.9627    0.1613
## 10     4971 3.3163e+11  1   11396348  0.1708    0.6794
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
summary(mylm.3)
```

```
##
## Call:
## lm(formula = shares ~ poly(timedelta + n_tokens_title + kw_avg_avg +
##   global_subjectivity + n_unique_tokens + n_non_stop_words,
##   3), data = mytrain)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -7637   -1959   -1239    -285   303563
##
## Coefficients:
##
## (Intercept)
## poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity + n_unique_tokens + n_non_stop_words, 3)
## poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity + n_unique_tokens + n_non_stop_words, 2)
## poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity + n_unique_tokens + n_non_stop_words, 1)
```

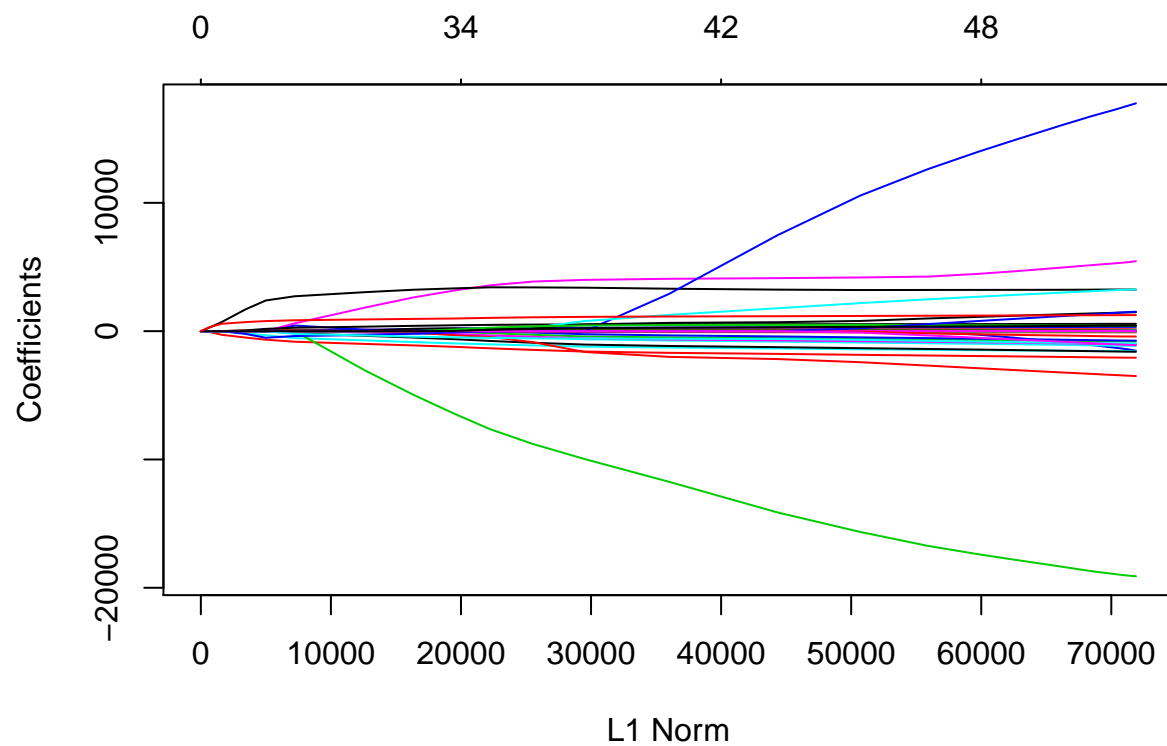
```
##
## (Intercept)
## poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity + n_unique_tokens + n_non_stop_wo
## poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity + n_unique_tokens + n_non_stop_wo
## poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity + n_unique_tokens + n_non_stop_wo
##
## (Intercept)
## poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity + n_unique_tokens + n_non_stop_wo
## poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity + n_unique_tokens + n_non_stop_wo
## poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity + n_unique_tokens + n_non_stop_wo
##
## (Intercept)
## poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity + n_unique_tokens + n_non_stop_wo
## poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity + n_unique_tokens + n_non_stop_wo
## poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity + n_unique_tokens + n_non_stop_wo
##
## (Intercept)
## poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity + n_unique_tokens + n_non_stop_wo
## poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity + n_unique_tokens + n_non_stop_wo
## poly(timedelta + n_tokens_title + kw_avg_avg + global_subjectivity + n_unique_tokens + n_non_stop_wo
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 8167 on 4978 degrees of freedom
## Multiple R-squared:  0.02819,    Adjusted R-squared:  0.02761
## F-statistic: 48.14 on 3 and 4978 DF,  p-value: < 2.2e-16
```

```
mylm.3.pred = predict(mylm.3, mytest1)
sqrt(mean((mytest1$shares - mylm.3.pred)^2))
```

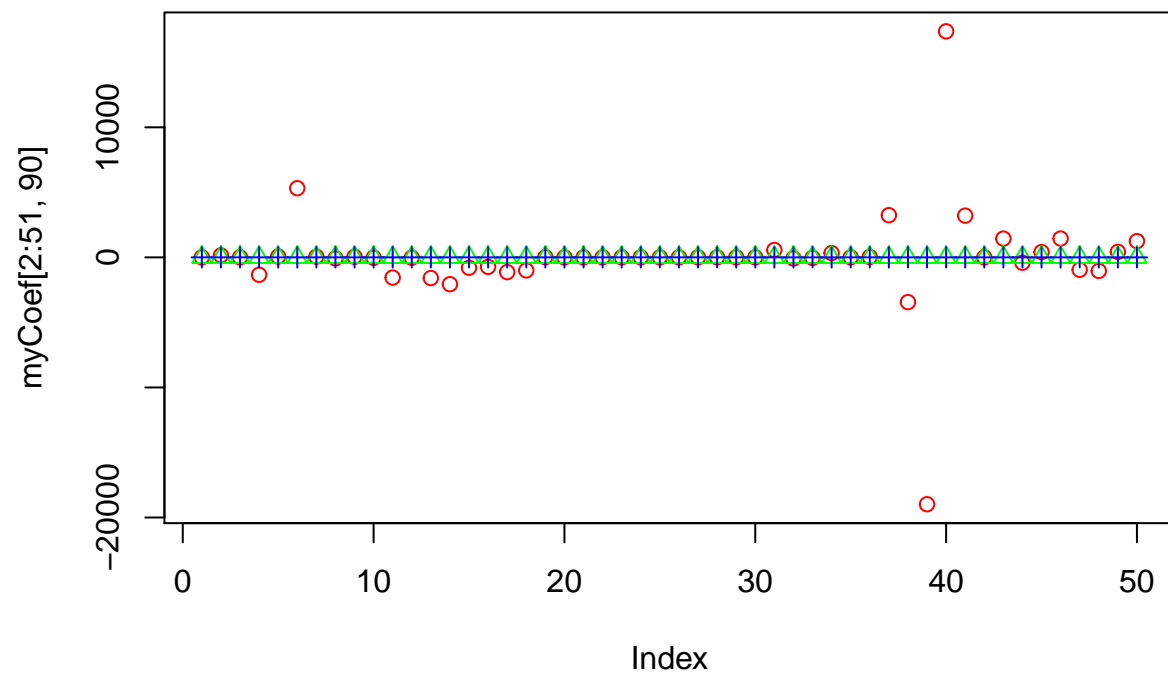
```
## [1] 8620.366
```

```
#Lasso
x=model.matrix(shares~.,mytrain)[,-1]
y=mytrain$shares
xtest = model.matrix(shares~.,mytest1)[,-1]
ytest = mytest1$shares

par(mfrow=c(1,1))
mylambda=10^seq(10,-2,length=100)
lasso.mod=glmnet(x,y,alpha=1,lambda=mylambda)
plot(lasso.mod)
```

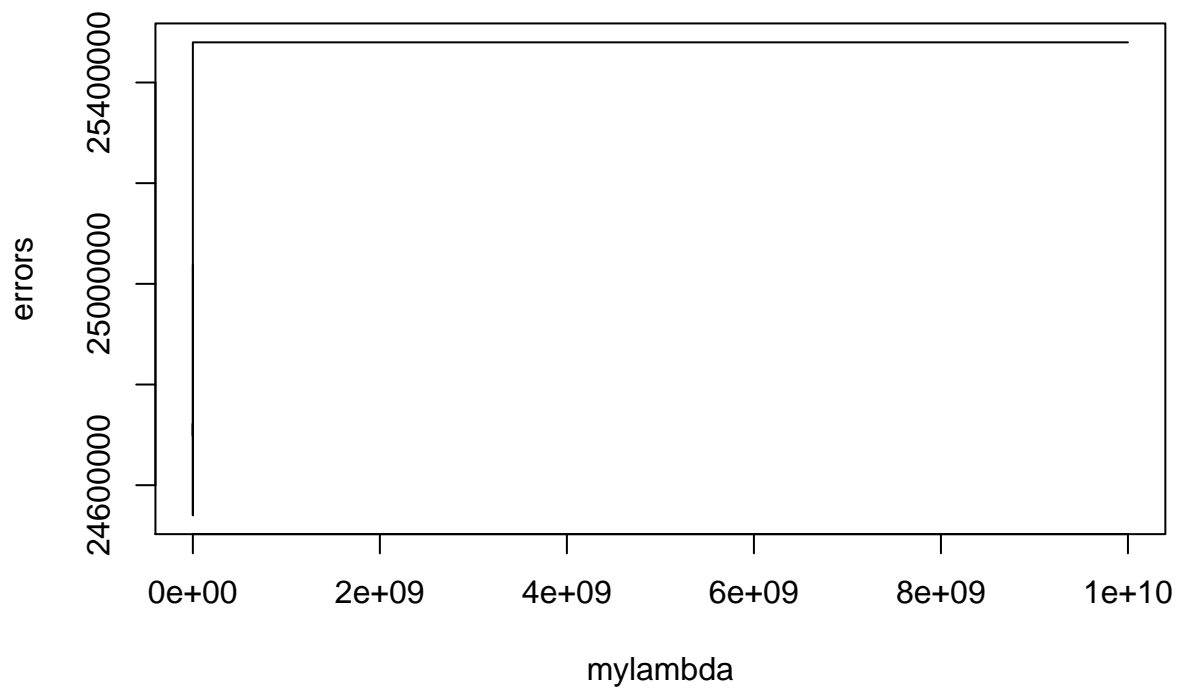



```
myCoef = coef(lasso.mod)
myPredict = predict(lasso.mod, newx=xtest)
# Plot the coefficients
plot(myCoef[2:51,90],col='red',pch=1)
points(myCoef[2:51,10],col='green',pch=2)
points(myCoef[2:51,1],col='blue',pch=3)
```



```
errors = NULL
for (i in 1:100) {
  errors[i] = mean( (ytest - myPredict[,i])^2 )
}

plot(mylambda,errors,type='l')
```



```
myCoef[,which.min(errors)]
```

```
##              (Intercept)              timedelta
##      -4.496473e+02          0.000000e+00
##      n_tokens_title      n_tokens_content
##      4.195576e+01          0.000000e+00
##      n_unique_tokens      n_non_stop_words
##      0.000000e+00          0.000000e+00
##      n_non_stop_unique_tokens      num_hrefs
##      0.000000e+00          1.805987e+01
##      num_self_hrefs      num_imgs
##      -2.935089e-01          1.230282e+01
##      num_videos      average_token_length
##      0.000000e+00          -1.806864e+02
##      num_keywords      data_channel_is_lifestyle
##      0.000000e+00          0.000000e+00
##      data_channel_is_entertainment      data_channel_is_bus
##      -5.012128e+02          0.000000e+00
##      data_channel_is_socmed      data_channel_is_tech
##      0.000000e+00          0.000000e+00
##      data_channel_is_world      kw_min_min
##      0.000000e+00          3.327977e+00
##      kw_max_min      kw_avg_min
##      0.000000e+00          0.000000e+00
##      kw_min_max      kw_max_max
```

```
##          -7.752412e-04          0.000000e+00
##          kw_avg_max          kw_min_avg
##          0.000000e+00          0.000000e+00
##          kw_max_avg          kw_avg_avg
##          0.000000e+00          9.298904e-01
## self_reference_min_shares self_reference_max_shares
##          1.510194e-02          0.000000e+00
## self_reference_avg_sharess weekday_is_monday
##          0.000000e+00          6.131553e+01
##          weekday_is_tuesday weekday_is_wednesday
##          0.000000e+00          0.000000e+00
##          weekday_is_thursday weekday_is_friday
##          0.000000e+00          0.000000e+00
##          is_weekend          global_subjectivity
##          0.000000e+00          1.704357e+03
##          global_sentiment_polarity global_rate_positive_words
##          0.000000e+00          0.000000e+00
##          global_rate_negative_words rate_positive_words
##          0.000000e+00          0.000000e+00
##          rate_negative_words          avg_positive_polarity
##          0.000000e+00          0.000000e+00
##          min_positive_polarity          max_positive_polarity
##          0.000000e+00          0.000000e+00
##          avg_negative_polarity          min_negative_polarity
##          -2.179654e+02          0.000000e+00
##          max_negative_polarity          abs_title_subjectivity
##          0.000000e+00          0.000000e+00
##          abs_title_sentiment_polarity
##          7.060636e+02
```

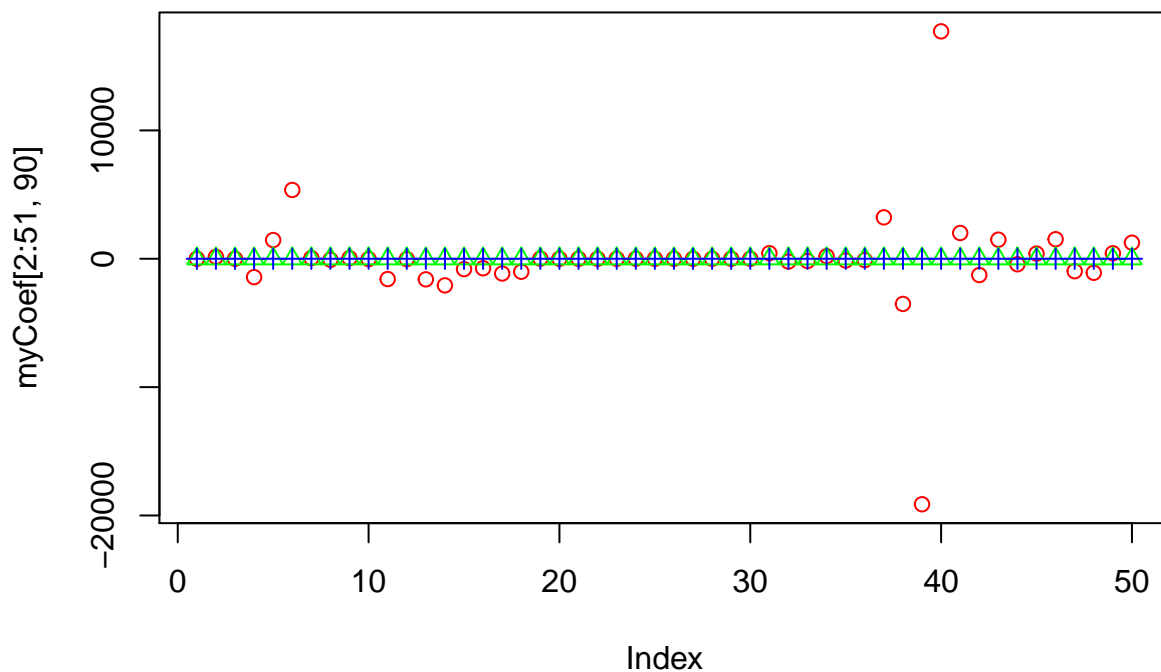
```
mylambda[which.min(errors)]
```

```
## [1] 174.7528
```

```
#Ridge
ridge.mod=glmnet(x,y,alpha=0,lambda=mylambda)
dim(coef(ridge.mod))
```

```
## [1] 51 100
```

```
myCoef = coef(ridge.mod)
# Plot the coefficients
plot(myCoef[2:51,90],col='red',pch=1)
points(myCoef[2:51,10],col='green',pch=2)
points(myCoef[2:51,1],col='blue',pch=3)
```



```
ridge.mod$lambda[50]
```

```
## [1] 11497.57
```

```
coef(ridge.mod)[,50]
```

```
##              (Intercept)              timedelta
##              7.962003e+02              3.710735e-01
##              n_tokens_title              n_tokens_content
##              4.970197e+01              -8.305890e-02
##              n_unique_tokens              n_non_stop_words
##              2.706605e+02              -4.806124e+02
##              n_non_stop_unique_tokens              num_hrefs
##              1.031699e+02              1.715444e+01
##              num_self_hrefs              num_imgs
##              -2.141254e+01              1.852553e+01
##              num_videos              average_token_length
##              -2.342060e-01              -1.726058e+02
##              num_keywords              data_channel_is_lifestyle
##              2.065564e+01              -1.725690e+02
##              data_channel_is_entertainment              data_channel_is_bus
##              -4.713247e+02              -1.207579e+02
##              data_channel_is_socmed              data_channel_is_tech
##              5.719468e+01              -1.782134e+02
```

```
##      data_channel_is_world      kw_min_min
##      -3.138115e+02      1.874140e+00
##      kw_max_min      kw_avg_min
##      1.582232e-02      4.834149e-02
##      kw_min_max      kw_max_max
##      -1.253529e-03      4.064242e-05
##      kw_avg_max      kw_min_avg
##      7.862214e-04      7.156927e-02
##      kw_max_avg      kw_avg_avg
##      4.205008e-02      3.360658e-01
##      self_reference_min_shares      self_reference_max_shares
##      8.834398e-03      5.426545e-04
##      self_reference_avg_shareess      weekday_is_monday
##      3.872929e-03      1.903638e+02
##      weekday_is_tuesday      weekday_is_wednesday
##      -9.272472e+01      -1.214002e+02
##      weekday_is_thursday      weekday_is_friday
##      7.834730e+01      -4.538004e+01
##      is_weekend      global_subjectivity
##      2.059935e+00      1.280895e+03
##      global_sentiment_polarity      global_rate_positive_words
##      -1.060916e+02      -1.968334e+03
##      global_rate_negative_words      rate_positive_words
##      2.917640e+03      -2.868509e+02
##      rate_negative_words      avg_positive_polarity
##      -1.764612e+02      6.283645e+02
##      min_positive_polarity      max_positive_polarity
##      5.121704e+02      1.443395e+02
##      avg_negative_polarity      min_negative_polarity
##      -6.035992e+02      -2.359057e+02
##      max_negative_polarity      abs_title_subjectivity
##      -1.728953e+02      1.594331e+00
##      abs_title_sentiment_polarity
##      6.563326e+02
```

```
sqrt(sum(coef(ridge.mod)[-1,50]^2))
```

```
## [1] 4065.396
```

```
predict(ridge.mod,s=50,type="coefficients")[1:nv,]
```

```
##      (Intercept)      timedelta
##      -2.987017e+03      1.339711e+00
##      n_tokens_title      n_tokens_content
##      1.518498e+02      1.496012e-02
##      n_unique_tokens      n_non_stop_words
##      -5.716593e+02      9.559490e+02
##      n_non_stop_unique_tokens      num_hrefs
##      4.638935e+03      5.075261e+01
##      num_self_hrefs      num_imgs
##      -7.755186e+01      4.507625e+01
##      num_videos      average_token_length
##      -2.679754e+01      -1.466425e+03
```

```

##          num_keywords      data_channel_is_lifestyle
##          -2.238393e+01      -1.528139e+03
## data_channel_is_entertainment      data_channel_is_bus
##          -2.012341e+03      -7.736570e+02
##      data_channel_is_socmed      data_channel_is_tech
##          -6.850385e+02      -1.081050e+03
##      data_channel_is_world      kw_min_min
##          -9.784578e+02      1.104036e+01
##          kw_max_min      kw_avg_min
##          2.376340e-01      -1.450509e+00
##          kw_min_max      kw_max_max
##          -4.236166e-03      2.632084e-03
##          kw_avg_max      kw_min_avg
##          -1.137408e-03      -1.916788e-01
##          kw_max_avg      kw_avg_avg
##          -1.166966e-01      1.294893e+00
##      self_reference_min_shares      self_reference_max_shares
##          1.670817e-02      -8.065578e-03
##      self_reference_avg_shareess      weekday_is_monday
##          1.482165e-02      4.321013e+02
##          weekday_is_tuesday      weekday_is_wednesday
##          -2.164692e+02      -1.727158e+02
##          weekday_is_thursday      weekday_is_friday
##          1.935188e+02      -1.349799e+02
##          is_weekend      global_subjectivity
##          -1.043112e+02      3.269330e+03
##      global_sentiment_polarity      global_rate_positive_words
##          -3.287495e+03      -1.820595e+04
##      global_rate_negative_words      rate_positive_words
##          1.607455e+04      1.802423e+03
##          rate_negative_words      avg_positive_polarity
##          -1.205628e+03      1.394580e+03
##          min_positive_polarity      max_positive_polarity
##          -4.205896e+02      4.392234e+02
##          avg_negative_polarity      min_negative_polarity
##          1.277531e+03      -9.251994e+02
##          max_negative_polarity      abs_title_subjectivity
##          -8.895729e+02      4.156343e+02
##      abs_title_sentiment_polarity
##          1.239648e+03

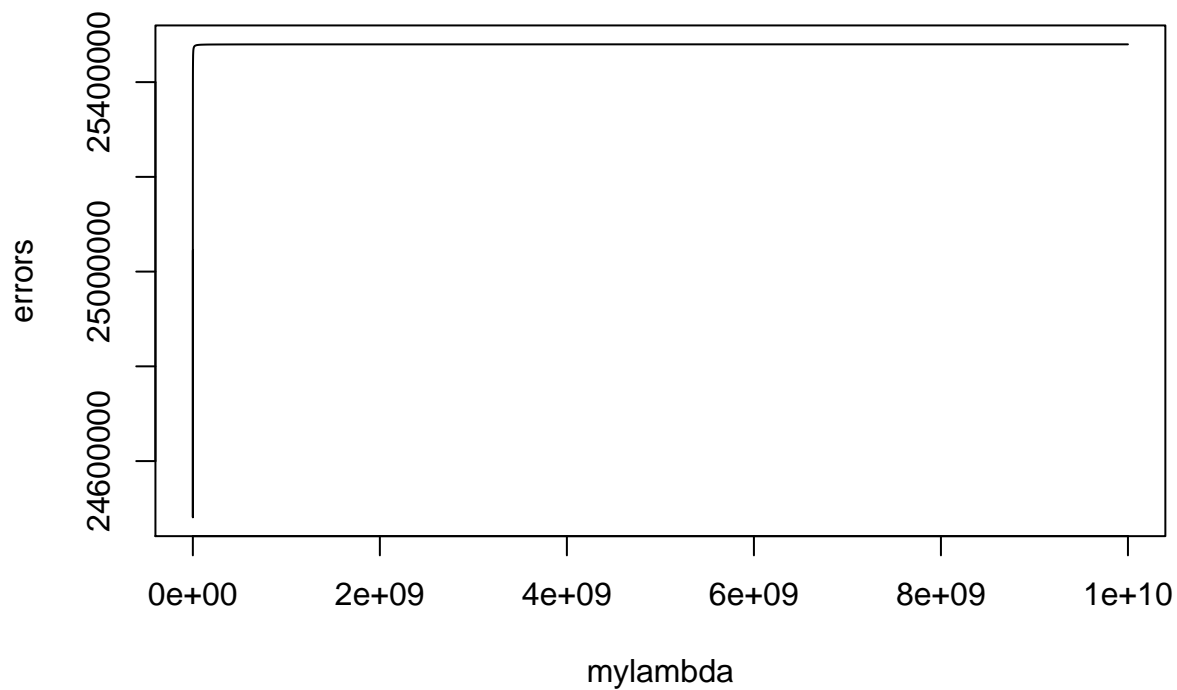
```

```

myPredict = predict(ridge.mod, newx=xtest)
errors = NULL
for (i in 1:100) {
  errors[i] = mean( (ytest - myPredict[,i])^2 )
}

plot(mylambda,errors,type='l')

```



```
myCoef[,which.min(errors)]
```

```
##              (Intercept)              timedelta
##          5.045183e+02          4.511800e-01
##          n_tokens_title          n_tokens_content
##          5.981986e+01          -9.245683e-02
##          n_unique_tokens          n_non_stop_words
##          3.598188e+02          -5.549374e+02
##          n_non_stop_unique_tokens          num_hrefs
##          1.945201e+02          1.995495e+01
##          num_self_hrefs          num_imgs
##          -2.633867e+01          2.114630e+01
##          num_videos          average_token_length
##          -1.631935e+00          -2.113948e+02
##          num_keywords          data_channel_is_lifestyle
##          2.214264e+01          -2.309834e+02
##          data_channel_is_entertainment          data_channel_is_bus
##          -5.702562e+02          -1.454191e+02
##          data_channel_is_socmed          data_channel_is_tech
##          5.276698e+01          -2.096855e+02
##          data_channel_is_world          kw_min_min
##          -3.535432e+02          2.304484e+00
##          kw_max_min          kw_avg_min
##          1.536391e-02          2.980033e-02
##          kw_min_max          kw_max_max
```



```
##          -1.605363e-03          7.335709e-05
##          kw_avg_max          kw_min_avg
##          8.601223e-04          7.123372e-02
##          kw_max_avg          kw_avg_avg
##          4.251588e-02          3.831005e-01
## self_reference_min_shares self_reference_max_shares
##          1.010332e-02          3.067573e-04
## self_reference_avg_sharess weekday_is_monday
##          4.156842e-03          2.209922e+02
##          weekday_is_tuesday weekday_is_wednesday
##          -1.072358e+02          -1.342767e+02
##          weekday_is_thursday weekday_is_friday
##          9.218440e+01          -5.376373e+01
##          is_weekend          global_subjectivity
##          -7.354574e+00          1.489956e+03
##          global_sentiment_polarity global_rate_positive_words
##          -1.699423e+02          -2.552063e+03
##          global_rate_negative_words rate_positive_words
##          3.130016e+03          -3.092710e+02
##          rate_negative_words          avg_positive_polarity
##          -2.383505e+02          6.818303e+02
##          min_positive_polarity          max_positive_polarity
##          5.151251e+02          1.655545e+02
##          avg_negative_polarity          min_negative_polarity
##          -6.413075e+02          -2.678397e+02
##          max_negative_polarity          abs_title_subjectivity
##          -1.410344e+02          2.428293e+01
##          abs_title_sentiment_polarity
##          7.388490e+02
```

```
mylambda[which.min(errors)]
```

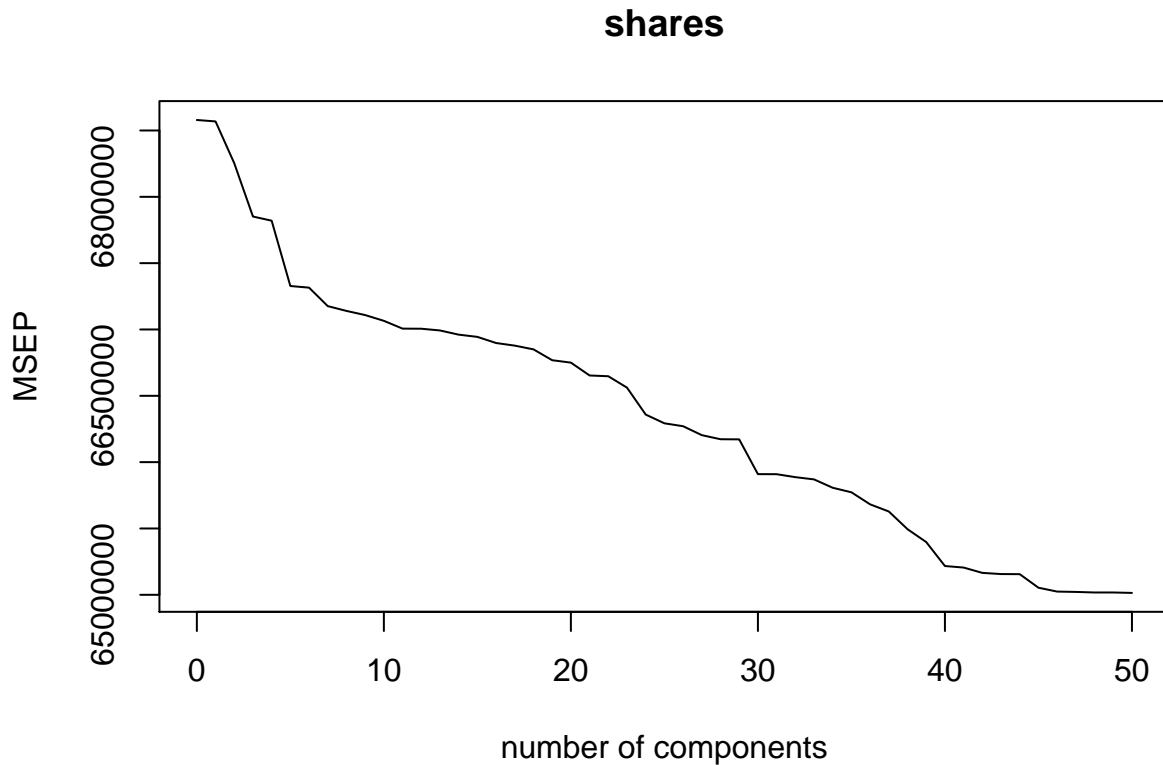
```
## [1] 8697.49
```

```
#PCR
pcr.fit=pcr(shares~., data=mytrain, scale=TRUE)
summary(pcr.fit)
```

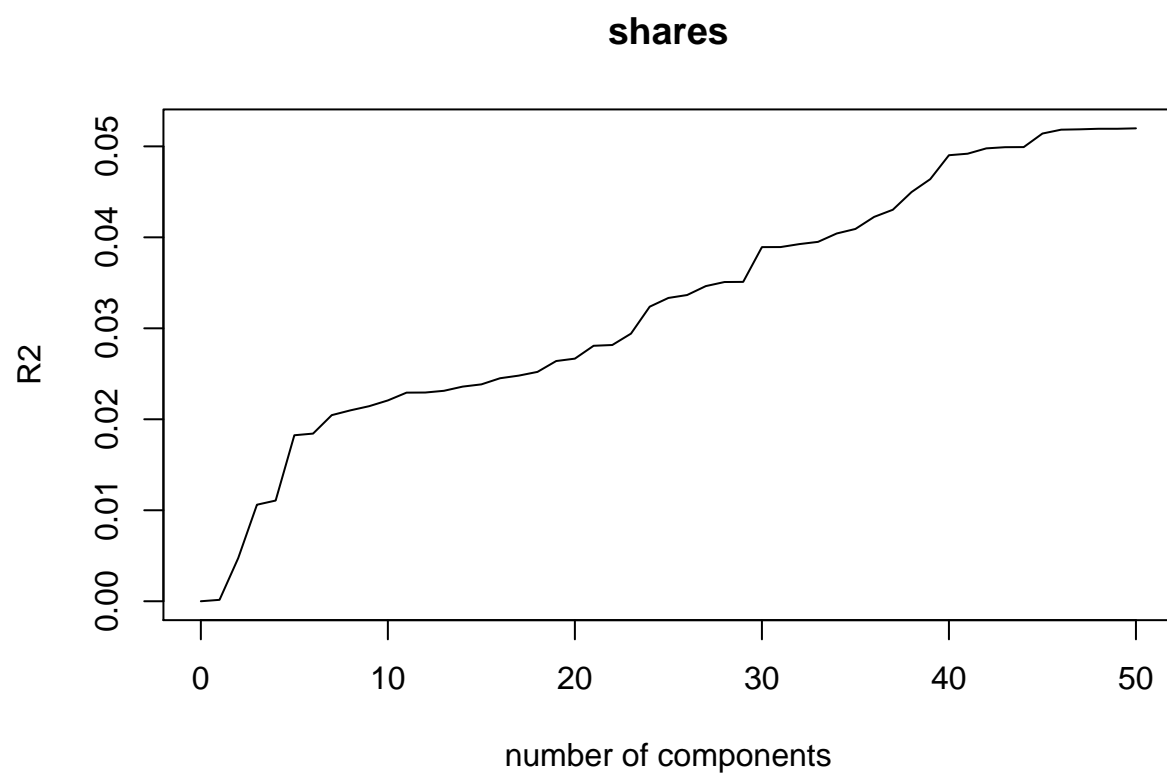
```
## Data:      X dimension: 4982 50
## Y dimension: 4982 1
## Fit method: svdpc
## Number of components considered: 50
## TRAINING: % variance explained
##          1 comps 2 comps 3 comps 4 comps 5 comps 6 comps 7 comps
## X          12.57969 20.5361 27.050 33.044 38.213 42.927 46.780
## shares     0.01534 0.4749 1.061 1.107 1.825 1.843 2.046
##          8 comps 9 comps 10 comps 11 comps 12 comps 13 comps 14 comps
## X          49.961 52.871 55.737 58.338 60.905 63.372 65.803
## shares     2.098 2.144 2.207 2.293 2.294 2.313 2.359
##          15 comps 16 comps 17 comps 18 comps 19 comps 20 comps
## X          68.212 70.567 72.87 75.133 77.30 79.319
## shares     2.384 2.451 2.48 2.521 2.64 2.667
##          21 comps 22 comps 23 comps 24 comps 25 comps 26 comps
```

## X	81.229	83.067	84.736	86.372	87.720	89.013
## shares	2.808	2.816	2.942	3.238	3.334	3.366
##	27 comps	28 comps	29 comps	30 comps	31 comps	32 comps
## X	90.176	91.270	92.33	93.332	94.280	95.167
## shares	3.464	3.509	3.51	3.893	3.893	3.926
##	33 comps	34 comps	35 comps	36 comps	37 comps	38 comps
## X	95.98	96.702	97.341	97.858	98.290	98.664
## shares	3.95	4.042	4.092	4.224	4.303	4.498
##	39 comps	40 comps	41 comps	42 comps	43 comps	44 comps
## X	98.950	99.171	99.366	99.515	99.638	99.751
## shares	4.639	4.903	4.919	4.978	4.991	4.992
##	45 comps	46 comps	47 comps	48 comps	49 comps	50 comps
## X	99.840	99.925	99.970	100.000	100.000	100.000
## shares	5.141	5.183	5.187	5.193	5.193	5.198

```
validationplot(pcr.fit, val.type="MSEP")
```



```
validationplot(pcr.fit, val.type='R2')
```

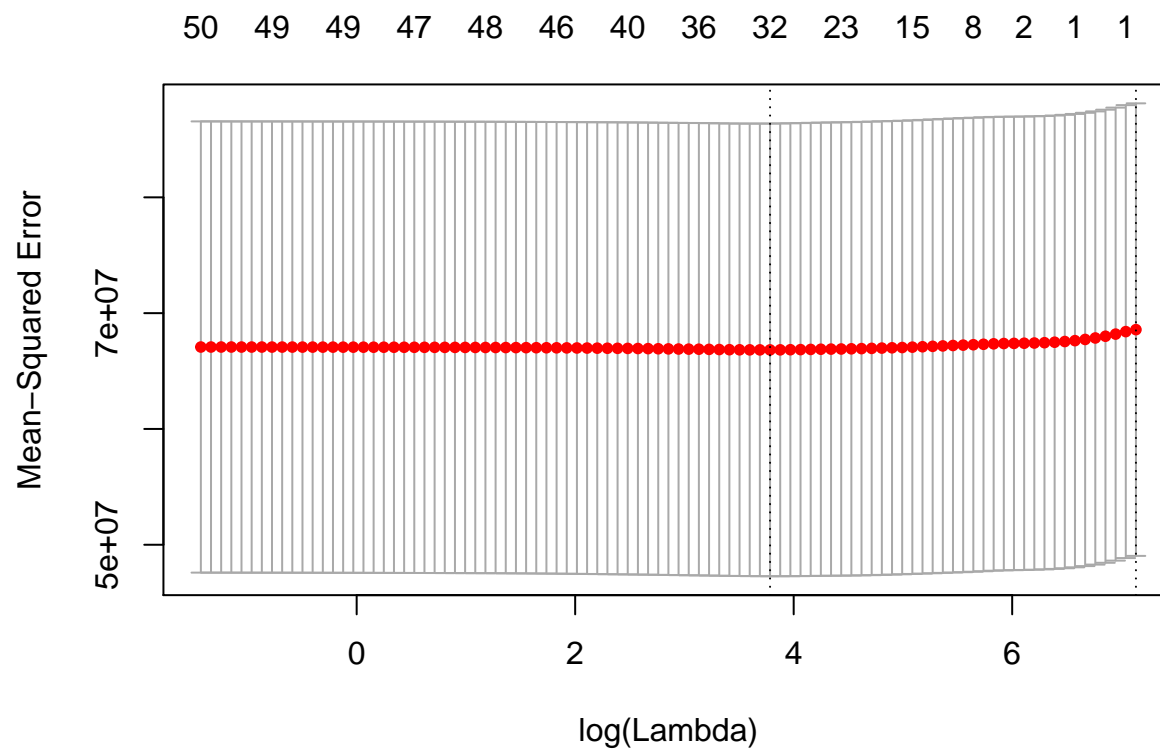


```
#####(b) try methods with 10-fold Cross Validation#####
```

```
#Lasso
```

```
cv.lasso = cv.glmnet(x, y, type.measure = "mse")
```

```
plot(cv.lasso)
```



```
coef(cv.lasso)
```

```
## 51 x 1 sparse Matrix of class "dgCMatrix"
##                                1
## (Intercept)                   3267.784
## timedelta                      .
## n_tokens_title                  .
## n_tokens_content                 .
## n_unique_tokens                  .
## n_non_stop_words                 .
## n_non_stop_unique_tokens         .
## num_hrefs                       .
## num_self_hrefs                   .
## num_imgs                        .
## num_videos                      .
## average_token_length             .
## num_keywords                     .
## data_channel_is_lifestyle         .
## data_channel_is_entertainment    .
## data_channel_is_bus              .
## data_channel_is_socmed           .
## data_channel_is_tech             .
## data_channel_is_world            .
## kw_min_min                      .
## kw_max_min                      .
## kw_avg_min                      .
```

```

## kw_min_max .
## kw_max_max .
## kw_avg_max .
## kw_min_avg .
## kw_max_avg .
## kw_avg_avg .
## self_reference_min_shares .
## self_reference_max_shares .
## self_reference_avg_shares .
## weekday_is_monday .
## weekday_is_tuesday .
## weekday_is_wednesday .
## weekday_is_thursday .
## weekday_is_friday .
## is_weekend .
## global_subjectivity .
## global_sentiment_polarity .
## global_rate_positive_words .
## global_rate_negative_words .
## rate_positive_words .
## rate_negative_words .
## avg_positive_polarity .
## min_positive_polarity .
## max_positive_polarity .
## avg_negative_polarity .
## min_negative_polarity .
## max_negative_polarity .
## abs_title_subjectivity .
## abs_title_sentiment_polarity .

```

```
cv.lasso$cvm[cv.lasso$lambda == cv.lasso$lambda.1se]
```

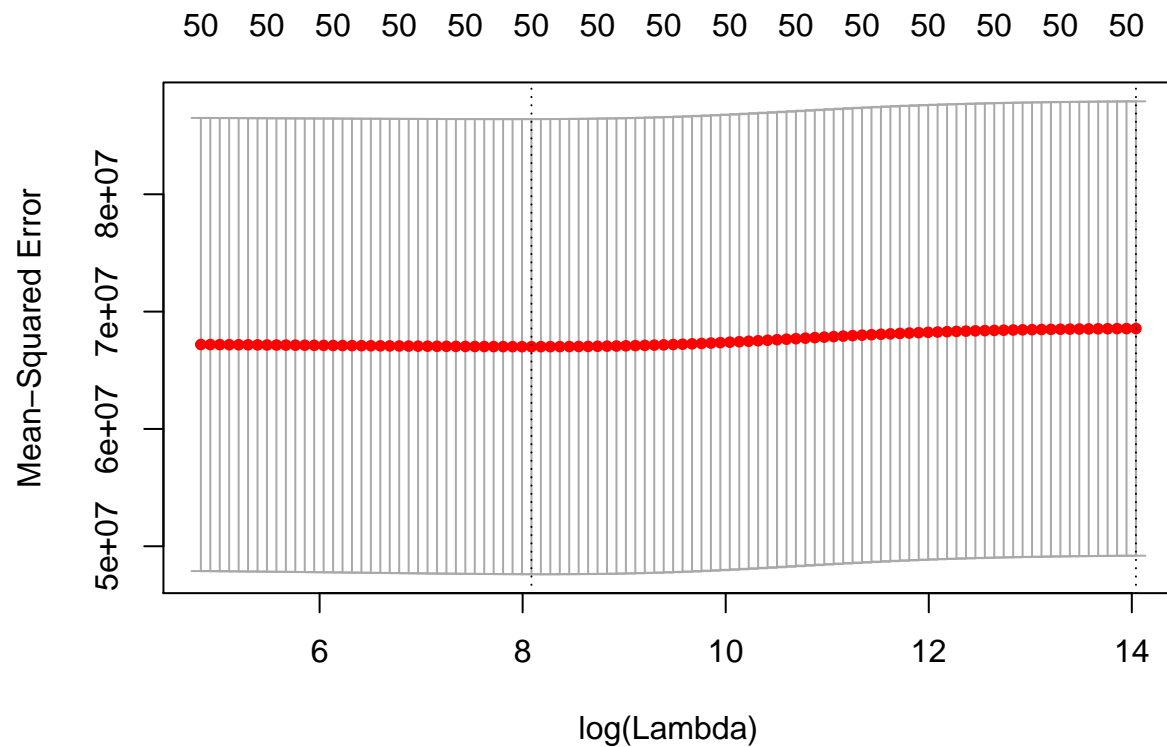
```
## [1] 68576460
```

```
#Ridge
```

```

cv.ridge = cv.glmnet(x, y, type.measure = "mse", alpha = 0)
plot(cv.ridge)

```



```
coef(cv.ridge)
```

```
## 51 x 1 sparse Matrix of class "dgCMatrix"
##                                1
## (Intercept)                   3.267784e+03
## timedelta                     3.913191e-37
## n_tokens_title                 1.042834e-34
## n_tokens_content              -1.110852e-37
## n_unique_tokens               2.106498e-34
## n_non_stop_words              -1.094411e-33
## n_non_stop_unique_tokens      -5.098729e-34
## num_hrefs                     5.190540e-35
## num_self_hrefs                -2.372719e-35
## num_imgs                      6.259745e-35
## num_videos                    2.935343e-35
## average_token_length          -3.360575e-34
## num_keywords                  7.612208e-35
## data_channel_is_lifestyle     -1.255838e-35
## data_channel_is_entertainment -8.416069e-34
## data_channel_is_bus           -3.730599e-34
## data_channel_is_socmed        3.008439e-34
## data_channel_is_tech          -5.319860e-34
## data_channel_is_world         -1.156910e-33
## kw_min_min                    2.285216e-36
## kw_max_min                    1.397219e-37
```

```
## kw_avg_min          6.686828e-37
## kw_min_max         -5.240950e-41
## kw_max_max          4.137896e-40
## kw_avg_max          3.487618e-39
## kw_min_avg          4.227488e-37
## kw_max_avg          2.219244e-37
## kw_avg_avg          1.165336e-36
## self_reference_min_shares 2.938421e-38
## self_reference_max_shares 7.857036e-39
## self_reference_avg_sharess 1.859427e-38
## weekday_is_monday    4.533051e-34
## weekday_is_tuesday  -2.356105e-34
## weekday_is_wednesday -4.322063e-34
## weekday_is_thursday  1.530887e-34
## weekday_is_friday    -8.929554e-35
## is_weekend           2.356836e-34
## global_subjectivity  3.932591e-33
## global_sentiment_polarity 1.651302e-34
## global_rate_positive_words -8.794229e-34
## global_rate_negative_words 1.624429e-32
## rate_positive_words  -9.847345e-34
## rate_negative_words   1.131542e-34
## avg_positive_polarity  2.855513e-33
## min_positive_polarity  2.518466e-33
## max_positive_polarity  7.196194e-34
## avg_negative_polarity  -2.926762e-33
## min_negative_polarity  -1.009092e-33
## max_negative_polarity  -1.497088e-33
## abs_title_subjectivity -3.586889e-34
## abs_title_sentiment_polarity 2.156121e-33
```

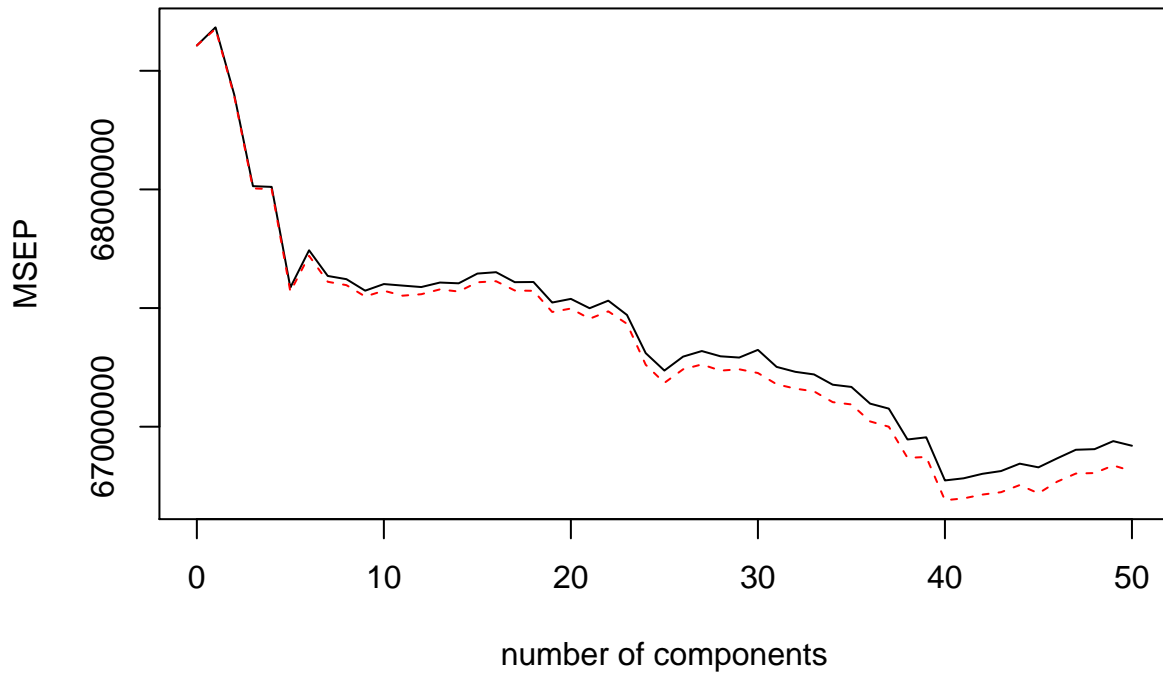
```
cv.ridge$cvm[cv.ridge$lambda == cv.ridge$lambda.1se]
```

```
## [1] 68558654
```

```
#PCR
```

```
pcr.fit=pcr(shares ~ ., data = mytrain,scale=TRUE,validation = "CV")
validationplot(pcr.fit,val.type="MSEP")
```

shares



```
summary(pcr.fit)
```

```
## Data:      X dimension: 4982 50
## Y dimension: 4982 1
## Fit method: svdpc
## Number of components considered: 50
##
## VALIDATION: RMSEP
## Cross-validated using 10 random segments.
##      (Intercept)  1 comps  2 comps  3 comps  4 comps  5 comps  6 comps
## CV              8283    8288    8270    8247    8247    8221    8231
## adjCV           8283    8287    8270    8246    8246    8220    8229
##      7 comps  8 comps  9 comps 10 comps 11 comps 12 comps 13 comps
## CV          8224    8223    8220    8222    8222    8221    8222
## adjCV        8223    8222    8219    8220    8219    8219    8221
##      14 comps 15 comps 16 comps 17 comps 18 comps 19 comps
## CV          8222    8225    8225    8222    8223    8217
## adjCV        8220    8222    8223    8220    8220    8215
##      20 comps 21 comps 22 comps 23 comps 24 comps 25 comps
## CV          8218    8216    8218    8214    8204    8200
## adjCV        8216    8213    8215    8212    8201    8197
##      26 comps 27 comps 28 comps 29 comps 30 comps 31 comps
## CV          8203    8205    8203    8203    8205    8201
## adjCV        8200    8201    8200    8200    8199    8196
##      32 comps 33 comps 34 comps 35 comps 36 comps 37 comps
```



```

## CV      8199      8199      8196      8196      8191      8190
## adjCV    8195      8194      8192      8191      8187      8185
##      38 comps  39 comps  40 comps  41 comps  42 comps  43 comps
## CV      8182      8183      8172      8172      8173      8174
## adjCV    8177      8178      8166      8167      8168      8168
##      44 comps  45 comps  46 comps  47 comps  48 comps  49 comps
## CV      8176      8175      8177      8179      8180      8182
## adjCV    8170      8168      8171      8173      8173      8175
##      50 comps
## CV      8180
## adjCV    8174
##
## TRAINING: % variance explained
##      1 comps  2 comps  3 comps  4 comps  5 comps  6 comps  7 comps
## X      12.57969 20.5361 27.050 33.044 38.213 42.927 46.780
## shares  0.01534 0.4749 1.061 1.107 1.825 1.843 2.046
##      8 comps  9 comps 10 comps 11 comps 12 comps 13 comps 14 comps
## X      49.961 52.871 55.737 58.338 60.905 63.372 65.803
## shares  2.098 2.144 2.207 2.293 2.294 2.313 2.359
##      15 comps 16 comps 17 comps 18 comps 19 comps 20 comps
## X      68.212 70.567 72.87 75.133 77.30 79.319
## shares  2.384 2.451 2.48 2.521 2.64 2.667
##      21 comps 22 comps 23 comps 24 comps 25 comps 26 comps
## X      81.229 83.067 84.736 86.372 87.720 89.013
## shares  2.808 2.816 2.942 3.238 3.334 3.366
##      27 comps 28 comps 29 comps 30 comps 31 comps 32 comps
## X      90.176 91.270 92.33 93.332 94.280 95.167
## shares  3.464 3.509 3.51 3.893 3.893 3.926
##      33 comps 34 comps 35 comps 36 comps 37 comps 38 comps
## X      95.98 96.702 97.341 97.858 98.290 98.664
## shares  3.95 4.042 4.092 4.224 4.303 4.498
##      39 comps 40 comps 41 comps 42 comps 43 comps 44 comps
## X      98.950 99.171 99.366 99.515 99.638 99.751
## shares  4.639 4.903 4.919 4.978 4.991 4.992
##      45 comps 46 comps 47 comps 48 comps 49 comps 50 comps
## X      99.840 99.925 99.970 100.000 100.000 100.000
## shares  5.141 5.183 5.187 5.193 5.193 5.198

```