

# classifier

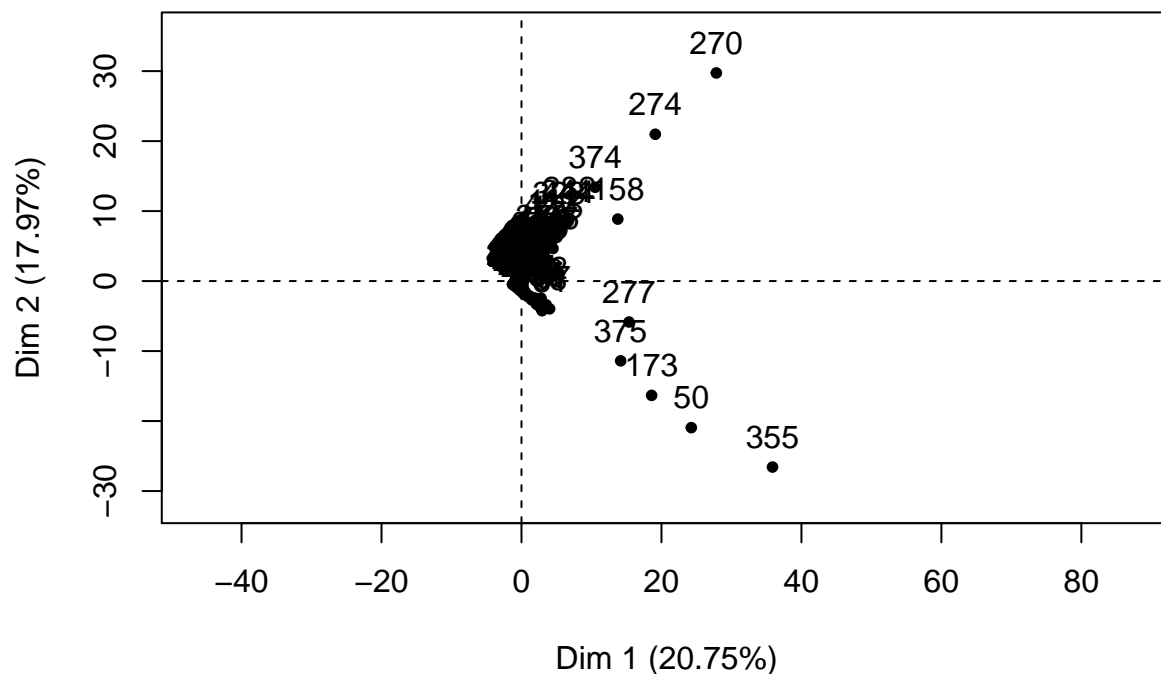
```
# library(caret)
library(knitr)
# library(e1071)
library(FactoMineR) #for PCA
library(MASS) # for stepwise
library(caTools) # for sample
library(DAAG) # for cv

## Loading required package: lattice
##
## Attaching package: 'DAAG'
##
## The following object is masked from 'package:MASS':
##
##      hills

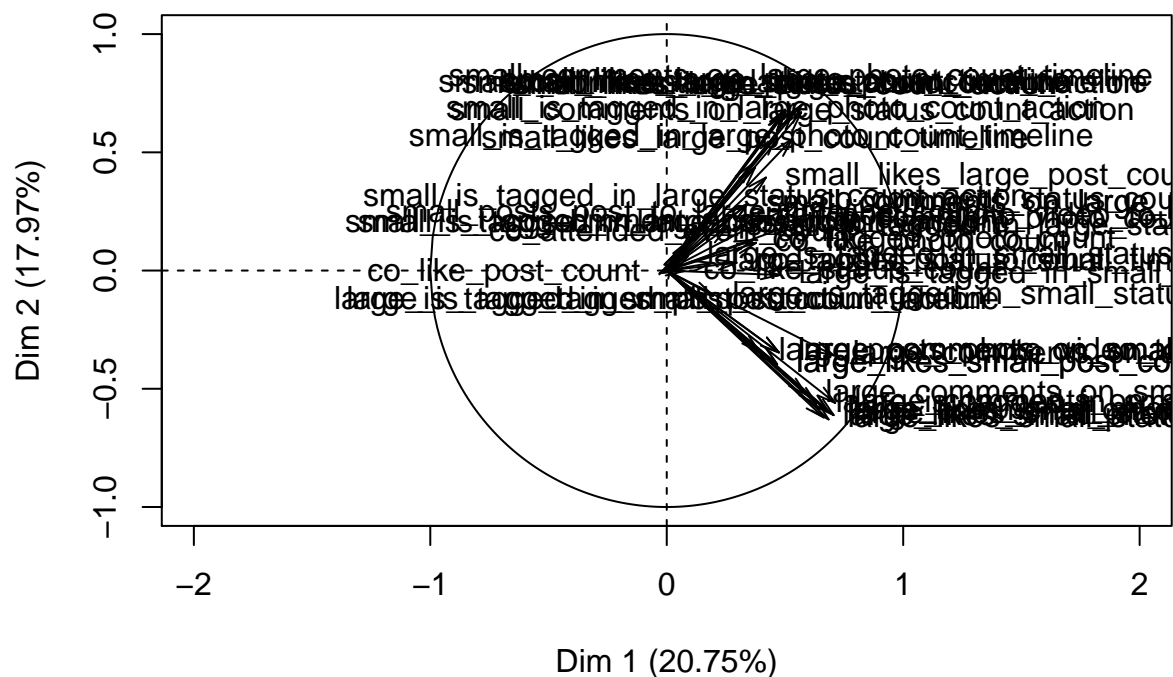
data = read.csv("/Users/yihuifu/GitHub/FB NoUse/ego_alter.csv",header = TRUE,sep = ",")
friended = data[,55]
friended = factor(friended)
x = data[,0:50] # Remove names and ids
new_data = cbind(x,friended)
# summary(new_data)

pca = PCA(x)
```

Individuals factor map (PCA)



```
## Warning in arrows(0, 0, coord.var[v, 1], coord.var[v, 2], length = 0.1, :
## zero-length arrow is of indeterminate angle and so skipped
```



```
##          eigenvalue percentage of variance
## comp 1  9.750894e+00      2.074658e+01
## comp 2  8.444943e+00      1.796796e+01
## comp 3  4.617337e+00      9.824122e+00
## comp 4  2.971970e+00      6.323340e+00
## comp 5  2.413280e+00      5.134637e+00
## comp 6  1.926525e+00      4.098990e+00
## comp 7  1.836554e+00      3.907562e+00
## comp 8  1.621146e+00      3.449248e+00
## comp 9  1.387590e+00      2.952320e+00
## comp 10 1.282460e+00      2.728638e+00
## comp 11 1.137808e+00      2.420867e+00
## comp 12 1.011510e+00      2.152149e+00
## comp 13 9.955679e-01      2.118230e+00
## comp 14 9.094168e-01      1.934929e+00
## comp 15 8.896083e-01      1.892784e+00
## comp 16 7.771604e-01      1.653533e+00
```

## comp 17	7.143252e-01	1.519841e+00
## comp 18	6.118030e-01	1.301709e+00
## comp 19	5.645815e-01	1.201237e+00
## comp 20	4.924438e-01	1.047753e+00
## comp 21	4.373362e-01	9.305026e-01
## comp 22	4.071027e-01	8.661759e-01
## comp 23	3.519043e-01	7.487325e-01
## comp 24	3.209081e-01	6.827832e-01
## comp 25	2.792195e-01	5.940840e-01
## comp 26	2.226316e-01	4.736842e-01
## comp 27	2.063245e-01	4.389884e-01
## comp 28	1.535099e-01	3.266169e-01
## comp 29	1.065366e-01	2.266736e-01
## comp 30	7.750801e-02	1.649107e-01
## comp 31	2.693222e-02	5.730260e-02
## comp 32	2.142727e-02	4.558993e-02
## comp 33	7.949117e-03	1.691302e-02
## comp 34	5.861736e-03	1.247178e-02
## comp 35	4.361017e-03	9.278760e-03
## comp 36	3.881254e-03	8.257988e-03
## comp 37	2.852639e-03	6.069446e-03
## comp 38	2.741356e-03	5.832672e-03
## comp 39	1.988518e-03	4.230889e-03
## comp 40	1.149952e-03	2.446707e-03
## comp 41	8.113375e-04	1.726250e-03
## comp 42	1.383203e-04	2.942986e-04
## comp 43	9.228788e-29	1.963572e-28
## comp 44	2.103502e-29	4.475537e-29
## comp 45	1.455633e-29	3.097092e-29
## comp 46	7.110492e-30	1.512871e-29
## comp 47	4.631576e-30	9.854418e-30
## comp 48	1.614879e-31	3.435914e-31
## comp 49	4.517702e-32	9.612131e-32
## comp 50	2.116843e-32	4.503921e-32
##	cumulative percentage of variance	
## comp 1		20.74658
## comp 2		38.71455
## comp 3		48.53867
## comp 4		54.86201
## comp 5		59.99665
## comp 6		64.09564
## comp 7		68.00320
## comp 8		71.45245
## comp 9		74.40477
## comp 10		77.13340
## comp 11		79.55427
## comp 12		81.70642
## comp 13		83.82465
## comp 14		85.75958
## comp 15		87.65236
## comp 16		89.30589
## comp 17		90.82574
## comp 18		92.12744
## comp 19		93.32868

## comp 20	94.37643
## comp 21	95.30694
## comp 22	96.17311
## comp 23	96.92184
## comp 24	97.60463
## comp 25	98.19871
## comp 26	98.67240
## comp 27	99.11138
## comp 28	99.43800
## comp 29	99.66467
## comp 30	99.82959
## comp 31	99.88689
## comp 32	99.93248
## comp 33	99.94939
## comp 34	99.96186
## comp 35	99.97114
## comp 36	99.97940
## comp 37	99.98547
## comp 38	99.99130
## comp 39	99.99553
## comp 40	99.99798
## comp 41	99.99971
## comp 42	100.00000
## comp 43	100.00000
## comp 44	100.00000
## comp 45	100.00000
## comp 46	100.00000
## comp 47	100.00000
## comp 48	100.00000
## comp 49	100.00000
## comp 50	100.00000

pca\$var\$contrib

##	Dim.1	Dim.2
## small_likes_large_post_count_timeline	1.433729e+00	2.259126e+00
## large_is_tagged_in_small_status_count_action	8.181495e-02	4.314722e-02
## small_comments_on_large_post_count_timeline	1.193601e+00	9.384151e-01
## small_is_tagged_in_large_post_count_timeline	2.284305e-02	8.085714e-02
## small_is_tagged_in_large_post_count_action	2.284305e-02	8.085714e-02
## large_is_tagged_in_small_post_count_timeline	0.000000e+00	7.703720e-32
## small_comments_on_large_status_count_timeline	2.938837e+00	5.349675e+00
## co_like_post_count	9.415136e-03	1.612354e-03
## large_posts_photo_video_to_small_timeline_count	1.578846e+00	1.405891e+00
## large_comments_on_small_post_count_timeline	2.306936e+00	1.420558e+00
## small_is_tagged_in_large_status_count_timeline	6.677494e-01	3.907031e-01
## large_comments_on_small_post_count_action	2.306936e+00	1.420558e+00
## large_is_tagged_in_small_post_count_action	4.276424e-48	6.842278e-47
## co_comment_status_count	3.252518e+00	1.011430e+00
## large_is_tagged_in_small_status_count_timeline	3.969346e-01	1.354987e-01
## co_like_photo_count	1.465785e+00	1.623619e-01
## large_likes_small_post_count_action	2.237209e+00	1.861894e+00
## small_comments_on_large_photo_count_action	3.315883e+00	5.308597e+00
## co_tagged_post_count	9.495568e-64	2.430865e-61

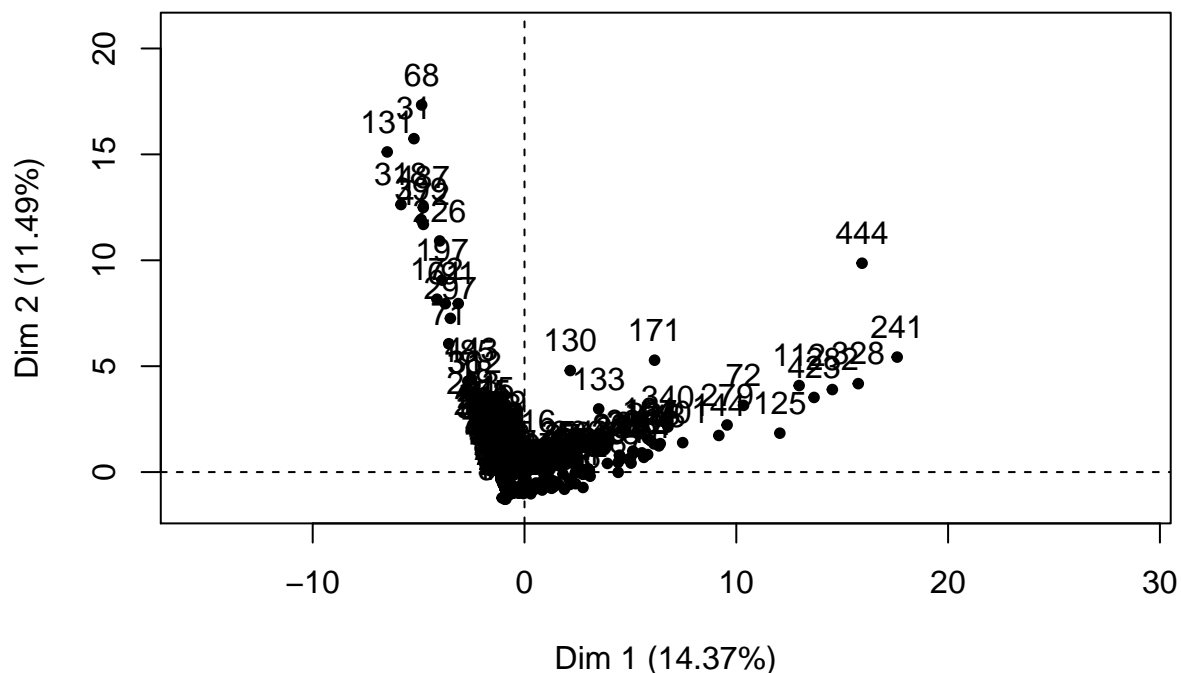
## large_likes_small_status_count_action	5.113580e+00	4.431805e+00
## small_posts_post_to_large_timeline_count	8.339369e-02	1.816898e-01
## small_likes_large_photo_count_action	2.569994e+00	5.255232e+00
## large_comments_on_small_status_count_timeline	3.568371e+00	3.256699e+00
## co_attended_event_count	5.026358e-03	2.380440e-02
## small_comments_on_large_photo_count_timeline	3.297697e+00	5.775624e+00
## small_posts_photo_video_to_large_timeline_count	7.362744e-01	6.042773e-01
## large_posts_post_to_small_timeline_count	3.733383e-01	1.257688e-02
## small_is_tagged_in_large_status_count_action	1.544091e-01	4.288840e-01
## large_is_tagged_in_small_photo_count_action	2.335765e+00	4.224938e-03
## co_tagged_status_count	8.960030e-01	1.273041e-02
## large_likes_small_post_count_timeline	2.237209e+00	1.861894e+00
## small_likes_large_post_count_action	1.807635e+00	1.833399e+00
## large_likes_small_status_count_timeline	4.807534e+00	4.694361e+00
## small_likes_large_photo_count_timeline	2.567490e+00	5.488114e+00
## large_likes_small_photo_count_action	4.773923e+00	4.217180e+00
## co_comment_photo_count	3.520250e+00	5.438991e-01
## small_comments_on_large_post_count_action	1.193601e+00	9.384151e-01
## small_likes_large_status_count_timeline	2.599680e+00	5.409827e+00
## large_comments_on_small_photo_count_action	5.206413e+00	3.711454e+00
## large_comments_on_small_status_count_action	5.109989e+00	1.524881e+00
## co_like_status_count	5.686789e-02	5.959603e-05
## large_comments_on_small_photo_count_timeline	4.817404e+00	4.244298e+00
## small_is_tagged_in_large_photo_count_action	2.195158e+00	3.766149e+00
## large_likes_small_photo_count_timeline	4.510516e+00	4.569269e+00
## co_comment_post_count	3.731368e-02	8.520116e-02
## large_is_tagged_in_small_photo_count_timeline	4.113318e+00	3.766679e+00
## co_tagged_photo_count	1.372959e+00	1.972311e-01
## small_comments_on_large_status_count_action	2.889052e+00	3.660680e+00
## small_likes_large_status_count_action	2.511388e+00	5.259800e+00
## small_is_tagged_in_large_photo_count_timeline	1.306568e+00	2.368479e+00
##	Dim.3	Dim.4
## small_likes_large_post_count_timeline	3.188308e+00	1.952575e+00
## large_is_tagged_in_small_status_count_action	2.389268e-01	3.289604e-01
## small_comments_on_large_post_count_timeline	1.007907e+01	1.834685e+00
## small_is_tagged_in_large_post_count_timeline	7.030557e-01	6.776536e-01
## small_is_tagged_in_large_post_count_action	7.030557e-01	6.776536e-01
## large_is_tagged_in_small_post_count_timeline	3.081488e-31	3.728600e-29
## small_comments_on_large_status_count_timeline	4.033699e-01	6.162855e-01
## co_like_post_count	2.233299e-04	6.909578e-05
## large_posts_photo_video_to_small_timeline_count	2.410145e-01	1.867544e+00
## large_comments_on_small_post_count_timeline	2.665083e+00	9.082816e+00
## small_is_tagged_in_large_status_count_timeline	8.068975e+00	1.820612e-01
## large_comments_on_small_post_count_action	2.665083e+00	9.082816e+00
## large_is_tagged_in_small_post_count_action	0.000000e+00	4.701977e-36
## co_comment_status_count	1.847098e+00	1.747306e-02
## large_is_tagged_in_small_status_count_timeline	3.812572e+00	1.186720e+01
## co_like_photo_count	8.692385e-01	2.264023e-01
## large_likes_small_post_count_action	1.858421e+00	9.310630e+00
## small_comments_on_large_photo_count_action	1.227842e+00	7.020838e-01
## co_tagged_post_count	0.000000e+00	0.000000e+00
## large_likes_small_status_count_action	4.086798e-01	9.091595e-01
## small_posts_post_to_large_timeline_count	1.048160e+00	4.514841e+00
## small_likes_large_photo_count_action	1.593011e+00	5.277370e-01

## large_comments_on_small_status_count_timeline	3.887169e-01	1.732063e-01
## co_attended_event_count	7.423072e-02	5.805475e-04
## small_comments_on_large_photo_count_timeline	1.028680e+00	4.527552e-01
## small_posts_photo_video_to_large_timeline_count	8.012793e+00	6.921005e+00
## large_posts_post_to_small_timeline_count	6.698174e-01	5.725819e+00
## small_is_tagged_in_large_status_count_action	1.089498e+00	1.431336e-03
## large_is_tagged_in_small_photo_count_action	5.830109e+00	7.948214e+00
## co_tagged_status_count	1.479355e+01	6.130126e-01
## large_likes_small_post_count_timeline	1.858421e+00	9.310630e+00
## small_likes_large_post_count_action	2.061155e+00	1.742896e+00
## large_likes_small_status_count_timeline	6.526111e-01	6.931169e-01
## small_likes_large_photo_count_timeline	1.553701e+00	4.192503e-01
## large_likes_small_photo_count_action	7.869794e-01	1.079991e+00
## co_comment_photo_count	1.347755e+00	1.503943e-02
## small_comments_on_large_post_count_action	1.007907e+01	1.834685e+00
## small_likes_large_status_count_timeline	3.189878e-01	3.415786e-01
## large_comments_on_small_photo_count_action	8.825481e-01	1.121030e+00
## large_comments_on_small_status_count_action	6.230995e-01	8.591601e-02
## co_like_status_count	1.064992e+00	1.798220e+00
## large_comments_on_small_photo_count_timeline	7.808729e-01	1.206229e+00
## small_is_tagged_in_large_photo_count_action	1.351287e+00	1.679038e-01
## large_likes_small_photo_count_timeline	7.236462e-01	1.039194e+00
## co_comment_post_count	5.348229e-01	8.447229e-01
## large_is_tagged_in_small_photo_count_timeline	5.279049e-01	9.330727e-01
## co_tagged_photo_count	2.680652e-01	2.627396e-01
## small_comments_on_large_status_count_action	1.645644e-01	5.842069e-01
## small_likes_large_status_count_action	4.558029e-01	3.048799e-01
## small_is_tagged_in_large_photo_count_timeline	4.551279e-01	3.102720e-05
##	Dim.5	
## small_likes_large_post_count_timeline	1.332666e-03	
## large_is_tagged_in_small_status_count_action	9.880451e-01	
## small_comments_on_large_post_count_timeline	1.087963e+00	
## small_is_tagged_in_large_post_count_timeline	2.345245e+01	
## small_is_tagged_in_large_post_count_action	2.345245e+01	
## large_is_tagged_in_small_post_count_timeline	5.085659e-32	
## small_comments_on_large_status_count_timeline	6.058991e-01	
## co_like_post_count	1.174759e-02	
## large_posts_photo_video_to_small_timeline_count	1.890457e-03	
## large_comments_on_small_post_count_timeline	1.602579e-02	
## small_is_tagged_in_large_status_count_timeline	5.914822e+00	
## large_comments_on_small_post_count_action	1.602579e-02	
## large_is_tagged_in_small_post_count_action	1.232595e-30	
## co_comment_status_count	1.939567e-01	
## large_is_tagged_in_small_status_count_timeline	1.905412e-02	
## co_like_photo_count	4.183801e-01	
## large_likes_small_post_count_action	2.787964e-03	
## small_comments_on_large_photo_count_action	4.366524e-02	
## co_tagged_post_count	0.000000e+00	
## large_likes_small_status_count_action	3.961355e-02	
## small_posts_post_to_large_timeline_count	1.314132e+00	
## small_likes_large_photo_count_action	3.315889e-01	
## large_comments_on_small_status_count_timeline	6.545966e-02	
## co_attended_event_count	1.565020e+00	
## small_comments_on_large_photo_count_timeline	1.198217e-01	

```
## small_posts_photo_video_to_large_timeline_count 5.663482e+00
## large_posts_post_to_small_timeline_count      1.379319e+00
## small_is_tagged_in_large_status_count_action  1.508074e+01
## large_is_tagged_in_small_photo_count_action   4.482399e+00
## co_tagged_status_count                        3.476268e+00
## large_likes_small_post_count_timeline         2.787964e-03
## small_likes_large_post_count_action           9.742229e-02
## large_likes_small_status_count_timeline       9.586769e-02
## small_likes_large_photo_count_timeline        4.311598e-01
## large_likes_small_photo_count_action          5.330728e-02
## co_comment_photo_count                       2.585211e-01
## small_comments_on_large_post_count_action     1.087963e+00
## small_likes_large_status_count_timeline       1.675304e-01
## large_comments_on_small_photo_count_action    5.763072e-02
## large_comments_on_small_status_count_action   3.705995e-05
## co_like_status_count                        2.123602e+00
## large_comments_on_small_photo_count_timeline  9.448312e-02
## small_is_tagged_in_large_photo_count_action   1.958081e-01
## large_likes_small_photo_count_timeline        5.468303e-02
## co_comment_post_count                       2.476817e+00
## large_is_tagged_in_small_photo_count_timeline 4.167281e-02
## co_tagged_photo_count                       7.051066e-01
## small_comments_on_large_status_count_action   1.228114e+00
## small_likes_large_status_count_action         1.805073e-01
## small_is_tagged_in_large_photo_count_timeline 9.026313e-01
```

```
new_x = x[c(-270,-274,-374,-158,-277,-375,-173,-50,-355),] # remove outliers
pca2 = PCA(new_x)
```

## Individuals factor map (PCA)







## comp 13	1.307590e+00	2.842587e+00
## comp 14	1.233157e+00	2.680775e+00
## comp 15	1.122679e+00	2.440607e+00
## comp 16	1.080609e+00	2.349150e+00
## comp 17	9.967430e-01	2.166833e+00
## comp 18	9.441761e-01	2.052557e+00
## comp 19	8.977656e-01	1.951664e+00
## comp 20	8.508869e-01	1.849754e+00
## comp 21	7.861316e-01	1.708982e+00
## comp 22	7.228873e-01	1.571494e+00
## comp 23	6.591404e-01	1.432914e+00
## comp 24	6.343108e-01	1.378936e+00
## comp 25	5.793637e-01	1.259486e+00
## comp 26	5.428632e-01	1.180137e+00
## comp 27	4.759589e-01	1.034693e+00
## comp 28	4.496525e-01	9.775053e-01
## comp 29	2.910995e-01	6.328250e-01
## comp 30	9.384572e-02	2.040124e-01
## comp 31	7.521899e-02	1.635196e-01
## comp 32	4.424438e-02	9.618344e-02
## comp 33	2.486197e-02	5.404777e-02
## comp 34	2.348796e-02	5.106078e-02
## comp 35	1.412500e-02	3.070652e-02
## comp 36	1.208213e-02	2.626550e-02
## comp 37	6.676887e-03	1.451497e-02
## comp 38	5.136735e-03	1.116682e-02
## comp 39	2.731461e-03	5.937959e-03
## comp 40	2.171719e-04	4.721128e-04
## comp 41	2.140316e-28	4.652861e-28
## comp 42	1.729557e-28	3.759907e-28
## comp 43	4.792493e-29	1.041846e-28
## comp 44	3.291046e-29	7.154448e-29
## comp 45	2.198393e-29	4.779115e-29
## comp 46	3.427713e-30	7.451549e-30
## comp 47	3.556052e-32	7.730547e-32
## comp 48	3.556052e-32	7.730547e-32
## comp 49	3.556052e-32	7.730547e-32
## comp 50	1.016611e-32	2.210023e-32
##	cumulative percentage of variance	
## comp 1		14.37200
## comp 2		25.86321
## comp 3		32.74225
## comp 4		37.84174
## comp 5		42.68664
## comp 6		47.38840
## comp 7		51.76372
## comp 8		55.83902
## comp 9		59.60760
## comp 10		63.29891
## comp 11		66.68780
## comp 12		69.83121
## comp 13		72.67380
## comp 14		75.35457
## comp 15		77.79518

```
## comp 16      80.14433
## comp 17      82.31116
## comp 18      84.36372
## comp 19      86.31538
## comp 20      88.16514
## comp 21      89.87412
## comp 22      91.44561
## comp 23      92.87853
## comp 24      94.25747
## comp 25      95.51695
## comp 26      96.69709
## comp 27      97.73178
## comp 28      98.70929
## comp 29      99.34211
## comp 30      99.54612
## comp 31      99.70964
## comp 32      99.80583
## comp 33      99.85988
## comp 34      99.91094
## comp 35      99.94164
## comp 36      99.96791
## comp 37      99.98242
## comp 38      99.99359
## comp 39      99.99953
## comp 40     100.00000
## comp 41     100.00000
## comp 42     100.00000
## comp 43     100.00000
## comp 44     100.00000
## comp 45     100.00000
## comp 46     100.00000
## comp 47     100.00000
## comp 48     100.00000
## comp 49     100.00000
## comp 50     100.00000
```

```
pca2$var$contrib
```

```
##              Dim.1      Dim.2
## small_likes_large_post_count_timeline 2.302413e+00 2.896338e-02
## large_is_tagged_in_small_status_count_action 3.475049e-01 1.028073e+00
## small_comments_on_large_post_count_timeline 4.970683e-01 5.648360e-06
## small_is_tagged_in_large_post_count_timeline 5.268781e-01 2.508674e-03
## small_is_tagged_in_large_post_count_action 5.268781e-01 2.508674e-03
## large_is_tagged_in_small_post_count_timeline 4.814825e-33 1.232595e-30
## small_comments_on_large_status_count_timeline 8.216641e+00 9.395553e-01
## co_like_post_count 1.171532e-02 3.570503e-02
## large_posts_photo_video_to_small_timeline_count 9.297856e-02 5.371989e-01
## large_comments_on_small_post_count_timeline 1.527661e-02 4.759719e-03
## small_is_tagged_in_large_status_count_timeline 3.046005e+00 2.686685e-01
## large_comments_on_small_post_count_action 1.527661e-02 4.759719e-03
## large_is_tagged_in_small_post_count_action 2.736911e-46 0.000000e+00
## co_comment_status_count 1.642972e-01 4.797945e-01
## large_is_tagged_in_small_status_count_timeline 1.100733e-01 2.194056e+00
```

## co_like_photo_count	1.087030e-01	2.751618e-05
## large_likes_small_post_count_action	5.069163e-01	2.672282e+00
## small_comments_on_large_photo_count_action	8.904126e+00	1.000687e+00
## co_tagged_post_count	0.000000e+00	0.000000e+00
## large_likes_small_status_count_action	1.347352e+00	1.028970e+01
## small_posts_post_to_large_timeline_count	6.112757e-01	6.799281e-04
## small_likes_large_photo_count_action	7.082869e+00	6.033444e-01
## large_comments_on_small_status_count_timeline	7.556235e-01	6.872679e+00
## co_attended_event_count	1.658722e-01	1.073917e-02
## small_comments_on_large_photo_count_timeline	9.469152e+00	9.952957e-01
## small_posts_photo_video_to_large_timeline_count	1.257114e+00	1.070702e+00
## large_posts_post_to_small_timeline_count	5.726411e-01	1.180906e-04
## small_is_tagged_in_large_status_count_action	3.046005e+00	2.686685e-01
## large_is_tagged_in_small_photo_count_action	9.809573e-02	6.595805e+00
## co_tagged_status_count	0.000000e+00	0.000000e+00
## large_likes_small_post_count_timeline	5.069163e-01	2.672282e+00
## small_likes_large_post_count_action	2.302413e+00	2.896338e-02
## large_likes_small_status_count_timeline	1.517288e+00	1.050192e+01
## small_likes_large_photo_count_timeline	7.098867e+00	4.808638e-01
## large_likes_small_photo_count_action	1.402212e+00	7.655605e+00
## co_comment_photo_count	8.209716e-01	3.616996e-03
## small_comments_on_large_post_count_action	4.970683e-01	5.648360e-06
## small_likes_large_status_count_timeline	9.043003e+00	8.864091e-01
## large_comments_on_small_photo_count_action	6.043592e-01	1.047441e+01
## large_comments_on_small_status_count_action	1.265331e-01	6.376295e+00
## co_like_status_count	5.414906e-02	6.010265e-02
## large_comments_on_small_photo_count_timeline	1.181729e+00	9.392479e+00
## small_is_tagged_in_large_photo_count_action	3.172813e+00	4.872444e-01
## large_likes_small_photo_count_timeline	1.723953e+00	7.284527e+00
## co_comment_post_count	5.299400e-01	3.945729e-02
## large_is_tagged_in_small_photo_count_timeline	7.697096e-01	5.596480e+00
## co_tagged_photo_count	3.196608e-01	2.047515e-01
## small_comments_on_large_status_count_action	8.101330e+00	9.388936e-01
## small_likes_large_status_count_action	9.047487e+00	8.986464e-01
## small_is_tagged_in_large_photo_count_timeline	1.380845e+00	1.097693e-01
##	Dim.3	Dim.4
## small_likes_large_post_count_timeline	4.219527e+00	1.235203e+01
## large_is_tagged_in_small_status_count_action	1.360109e+00	3.823211e-04
## small_comments_on_large_post_count_timeline	1.236983e+01	2.263240e-01
## small_is_tagged_in_large_post_count_timeline	1.027575e+01	1.174945e+00
## small_is_tagged_in_large_post_count_action	1.027575e+01	1.174945e+00
## large_is_tagged_in_small_post_count_timeline	6.933348e-31	3.081488e-31
## small_comments_on_large_status_count_timeline	6.381024e-02	2.285292e+00
## co_like_post_count	8.999158e-04	2.758473e-02
## large_posts_photo_video_to_small_timeline_count	1.057943e-04	3.227738e-04
## large_comments_on_small_post_count_timeline	5.603657e-03	4.096089e-01
## small_is_tagged_in_large_status_count_timeline	9.193967e+00	5.005442e+00
## large_comments_on_small_post_count_action	5.603657e-03	4.096089e-01
## large_is_tagged_in_small_post_count_action	1.836710e-36	1.925930e-32
## co_comment_status_count	1.444709e-01	9.928997e-03
## large_is_tagged_in_small_status_count_timeline	2.020260e-01	1.573372e-01
## co_like_photo_count	7.409744e-01	6.964078e-01
## large_likes_small_post_count_action	1.989815e-01	3.264657e-01
## small_comments_on_large_photo_count_action	8.305337e-01	1.878112e+00

## co_tagged_post_count	7.006492e-44	0.000000e+00
## large_likes_small_status_count_action	1.618679e-01	3.140926e-03
## small_posts_post_to_large_timeline_count	2.608712e-01	5.825578e+00
## small_likes_large_photo_count_action	4.753114e+00	1.757635e-01
## large_comments_on_small_status_count_timeline	1.266618e-01	1.754853e-01
## co_attended_event_count	6.006460e-01	6.875361e-01
## small_comments_on_large_photo_count_timeline	7.499639e-01	1.331922e+00
## small_posts_photo_video_to_large_timeline_count	1.657665e+00	1.444853e+00
## large_posts_post_to_small_timeline_count	2.561183e-01	5.738124e+00
## small_is_tagged_in_large_status_count_action	9.193967e+00	5.005442e+00
## large_is_tagged_in_small_photo_count_action	8.588752e-01	1.311882e+00
## co_tagged_status_count	0.000000e+00	0.000000e+00
## large_likes_small_post_count_timeline	1.989815e-01	3.264657e-01
## small_likes_large_post_count_action	4.219527e+00	1.235203e+01
## large_likes_small_status_count_timeline	1.349693e-01	2.622661e-02
## small_likes_large_photo_count_timeline	4.915134e+00	3.709662e-01
## large_likes_small_photo_count_action	2.654582e-03	6.830769e-02
## co_comment_photo_count	3.992077e-01	5.929203e-01
## small_comments_on_large_post_count_action	1.236983e+01	2.263240e-01
## small_likes_large_status_count_timeline	1.022110e+00	7.752415e-01
## large_comments_on_small_photo_count_action	5.315330e-02	3.566272e-01
## large_comments_on_small_status_count_action	7.184377e-03	3.697291e-01
## co_like_status_count	1.258113e+00	4.949734e-02
## large_comments_on_small_photo_count_timeline	2.009017e-02	6.970166e-02
## small_is_tagged_in_large_photo_count_action	2.093210e+00	5.837449e-01
## large_likes_small_photo_count_timeline	8.869123e-03	2.466756e-02
## co_comment_post_count	3.030059e+00	9.360167e-02
## large_is_tagged_in_small_photo_count_timeline	8.622068e-04	2.945263e-01
## co_tagged_photo_count	1.030219e-01	1.630405e+01
## small_comments_on_large_status_count_action	1.231817e-02	2.534515e+00
## small_likes_large_status_count_action	1.152477e+00	8.304108e-01
## small_is_tagged_in_large_photo_count_timeline	4.905203e-01	1.591597e+01
##	Dim.5	
## small_likes_large_post_count_timeline	1.974066e+00	
## large_is_tagged_in_small_status_count_action	1.142607e+01	
## small_comments_on_large_post_count_timeline	7.435134e-01	
## small_is_tagged_in_large_post_count_timeline	5.866896e-01	
## small_is_tagged_in_large_post_count_action	5.866896e-01	
## large_is_tagged_in_small_post_count_timeline	9.750020e-32	
## small_comments_on_large_status_count_timeline	2.207060e-03	
## co_like_post_count	5.706797e-05	
## large_posts_photo_video_to_small_timeline_count	1.825863e-01	
## large_comments_on_small_post_count_timeline	5.776918e+00	
## small_is_tagged_in_large_status_count_timeline	2.839426e-01	
## large_comments_on_small_post_count_action	5.776918e+00	
## large_is_tagged_in_small_post_count_action	2.773339e-30	
## co_comment_status_count	2.285539e-04	
## large_is_tagged_in_small_status_count_timeline	1.408785e+01	
## co_like_photo_count	1.164131e-01	
## large_likes_small_post_count_action	6.534834e+00	
## small_comments_on_large_photo_count_action	5.387441e-03	
## co_tagged_post_count	0.000000e+00	
## large_likes_small_status_count_action	2.779763e-01	
## small_posts_post_to_large_timeline_count	1.092661e+00	

```
## small_likes_large_photo_count_action      6.830152e-03
## large_comments_on_small_status_count_timeline 7.637534e+00
## co_attended_event_count                    2.602741e-01
## small_comments_on_large_photo_count_timeline 5.674429e-03
## small_posts_photo_video_to_large_timeline_count 3.913307e-01
## large_posts_post_to_small_timeline_count    1.110344e+00
## small_is_tagged_in_large_status_count_action 2.839426e-01
## large_is_tagged_in_small_photo_count_action 2.133658e-01
## co_tagged_status_count                     3.941152e-44
## large_likes_small_post_count_timeline       6.534834e+00
## small_likes_large_post_count_action        1.974066e+00
## large_likes_small_status_count_timeline     2.763238e-01
## small_likes_large_photo_count_timeline     2.155448e-03
## large_likes_small_photo_count_action       8.056957e+00
## co_comment_photo_count                     1.319127e-01
## small_comments_on_large_post_count_action   7.435134e-01
## small_likes_large_status_count_timeline     1.338798e-01
## large_comments_on_small_photo_count_action  2.021869e+00
## large_comments_on_small_status_count_action 8.169788e+00
## co_like_status_count                       1.719481e-02
## large_comments_on_small_photo_count_timeline 1.727860e+00
## small_is_tagged_in_large_photo_count_action 8.519769e-02
## large_likes_small_photo_count_timeline     7.852232e+00
## co_comment_post_count                       9.199636e-01
## large_is_tagged_in_small_photo_count_timeline 2.390387e-01
## co_tagged_photo_count                       7.390366e-01
## small_comments_on_large_status_count_action 5.600773e-02
## small_likes_large_status_count_action      1.199328e-01
## small_is_tagged_in_large_photo_count_timeline 8.339328e-01
```

```
# inTrain <- createDataPartition(new_data, p = 0.7, list=FALSE)
# train <- total[inTrain,] #get training data
# test <- total[-inTrain,]
# traincontrol <- trainControl(method = "cv", number = 10, verboseIter=TRUE)
sample = sample.split(friended, SplitRatio = .7)
train = subset(new_data, sample == TRUE)
test = subset(new_data, sample == FALSE)
# train_x = train[,0:50]
# train_y = train[,51]
# test_x = test[,0:50]
# test_y = test[,51]
```

```
model_logit = glm(friended~., data = train, family = binomial())
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```

```
# knitr::opts_chunk$set(warning=FALSE, message=FALSE)
logistic2 = stepAIC(model_logit, direction = "backward")
# summary(logistic)
```

```
logistic2$anova
```

```
## Stepwise Model Path
## Analysis of Deviance Table
##
## Initial Model:
## friended ~ small_likes_large_post_count_timeline + large_is_tagged_in_small_status_count_action +
##   small_comments_on_large_post_count_timeline + small_is_tagged_in_large_post_count_timeline +
##   small_is_tagged_in_large_post_count_action + large_is_tagged_in_small_post_count_timeline +
##   small_comments_on_large_status_count_timeline + co_like_post_count +
##   large_posts_photo_video_to_small_timeline_count + large_comments_on_small_post_count_timeline +
##   small_is_tagged_in_large_status_count_timeline + large_comments_on_small_post_count_action +
##   large_is_tagged_in_small_post_count_action + co_comment_status_count +
##   large_is_tagged_in_small_status_count_timeline + co_like_photo_count +
##   large_likes_small_post_count_action + small_comments_on_large_photo_count_action +
##   co_tagged_post_count + large_likes_small_status_count_action +
##   small_posts_post_to_large_timeline_count + small_likes_large_photo_count_action +
##   large_comments_on_small_status_count_timeline + co_attended_event_count +
##   small_comments_on_large_photo_count_timeline + small_posts_photo_video_to_large_timeline_count +
##   large_posts_post_to_small_timeline_count + small_is_tagged_in_large_status_count_action +
##   large_is_tagged_in_small_photo_count_action + co_tagged_status_count +
##   large_likes_small_post_count_timeline + small_likes_large_post_count_action +
##   large_likes_small_status_count_timeline + small_likes_large_photo_count_timeline +
##   large_likes_small_photo_count_action + co_comment_photo_count +
##   small_comments_on_large_post_count_action + small_likes_large_status_count_timeline +
##   large_comments_on_small_photo_count_action + large_comments_on_small_status_count_action +
##   co_like_status_count + large_comments_on_small_photo_count_timeline +
##   small_is_tagged_in_large_photo_count_action + large_likes_small_photo_count_timeline +
##   co_comment_post_count + large_is_tagged_in_small_photo_count_timeline +
##   co_tagged_photo_count + small_comments_on_large_status_count_action +
##   small_likes_large_status_count_action + small_is_tagged_in_large_photo_count_timeline
##
## Final Model:
## friended ~ small_likes_large_post_count_timeline + small_comments_on_large_post_count_timeline +
##   small_comments_on_large_status_count_timeline + co_comment_status_count +
##   co_like_photo_count + large_likes_small_post_count_action +
##   large_likes_small_status_count_action + small_likes_large_photo_count_action +
##   large_comments_on_small_status_count_timeline + co_attended_event_count +
##   small_posts_photo_video_to_large_timeline_count + large_posts_post_to_small_timeline_count +
##   large_likes_small_status_count_timeline + large_likes_small_photo_count_action +
##   large_comments_on_small_photo_count_action + large_comments_on_small_status_count_action +
##   small_is_tagged_in_large_photo_count_action + large_likes_small_photo_count_timeline +
##   co_tagged_photo_count + small_likes_large_status_count_action +
##   small_is_tagged_in_large_photo_count_timeline
##
##
##
##
```

		Step Df	Deviance
## 1			
## 2	- small_comments_on_large_post_count_action	0	0.000000e+00
## 3	- large_likes_small_post_count_timeline	0	0.000000e+00
## 4	- co_tagged_status_count	0	0.000000e+00
## 5	- co_tagged_post_count	0	0.000000e+00
## 6	- large_is_tagged_in_small_post_count_action	0	0.000000e+00
## 7	- large_comments_on_small_post_count_action	0	0.000000e+00
## 8	- large_is_tagged_in_small_post_count_timeline	0	0.000000e+00
## 9	- small is tagged in large post count action	0	0.000000e+00

```

## 10 - large_is_tagged_in_small_photo_count_action 1 1.428756e-08
## 11 - small_is_tagged_in_large_post_count_timeline 1 3.039958e-09
## 12 - co_comment_post_count 1 4.847863e-09
## 13 - large_is_tagged_in_small_status_count_timeline 1 1.623783e-08
## 14 - large_posts_photo_video_to_small_timeline_count 1 8.239300e-08
## 15 - small_posts_post_to_large_timeline_count 1 3.627628e-07
## 16 - small_is_tagged_in_large_status_count_action 1 5.589953e-09
## 17 - large_comments_on_small_post_count_timeline 1 2.672093e-08
## 18 - small_likes_large_post_count_action 1 1.499441e-08
## 19 - small_is_tagged_in_large_status_count_timeline 1 2.315522e-04
## 20 - small_comments_on_large_photo_count_timeline 1 4.108793e-04
## 21 - large_is_tagged_in_small_status_count_action 1 3.420938e-03
## 22 - co_like_status_count 1 2.018452e-02
## 23 - co_comment_photo_count 1 7.930932e-02
## 24 - co_like_post_count 1 2.923141e-01
## 25 - small_comments_on_large_status_count_action 1 4.380026e-01
## 26 - small_likes_large_status_count_timeline 1 1.086342e+00
## 27 - large_comments_on_small_photo_count_timeline 1 1.171686e+00
## 28 - small_likes_large_photo_count_timeline 1 6.556551e-03
## 29 - small_comments_on_large_photo_count_action 1 1.399310e+00
## 30 - large_is_tagged_in_small_photo_count_timeline 1 1.490237e+00
## Resid. Df Resid. Dev AIC
## 1 307 189.4723 275.4723
## 2 307 189.4723 275.4723
## 3 307 189.4723 275.4723
## 4 307 189.4723 275.4723
## 5 307 189.4723 275.4723
## 6 307 189.4723 275.4723
## 7 307 189.4723 275.4723
## 8 307 189.4723 275.4723
## 9 307 189.4723 275.4723
## 10 308 189.4723 273.4723
## 11 309 189.4723 271.4723
## 12 310 189.4723 269.4723
## 13 311 189.4723 267.4723
## 14 312 189.4723 265.4723
## 15 313 189.4723 263.4723
## 16 314 189.4723 261.4723
## 17 315 189.4723 259.4723
## 18 316 189.4723 257.4723
## 19 317 189.4726 255.4726
## 20 318 189.4730 253.4730
## 21 319 189.4764 251.4764
## 22 320 189.4966 249.4966
## 23 321 189.5759 247.5759
## 24 322 189.8682 245.8682
## 25 323 190.3062 244.3062
## 26 324 191.3925 243.3925
## 27 325 192.5642 242.5642
## 28 326 192.5708 240.5708
## 29 327 193.9701 239.9701
## 30 328 195.4603 239.4603

```

```
summary(logistic2)
```

```
##
## Call:
## glm(formula = friended ~ small_likes_large_post_count_timeline +
##      small_comments_on_large_post_count_timeline + small_comments_on_large_status_count_timeline +
##      co_comment_status_count + co_like_photo_count + large_likes_small_post_count_action +
##      large_likes_small_status_count_action + small_likes_large_photo_count_action +
##      large_comments_on_small_status_count_timeline + co_attended_event_count +
##      small_posts_photo_video_to_large_timeline_count + large_posts_post_to_small_timeline_count +
##      large_likes_small_status_count_timeline + large_likes_small_photo_count_action +
##      large_comments_on_small_photo_count_action + large_comments_on_small_status_count_action +
##      small_is_tagged_in_large_photo_count_action + large_likes_small_photo_count_timeline +
##      co_tagged_photo_count + small_likes_large_status_count_action +
##      small_is_tagged_in_large_photo_count_timeline, family = binomial(),
##      data = train)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -3.0229  -0.4511   0.0000   0.2968   2.1614
##
## Coefficients:
##                                     Estimate Std. Error
## (Intercept)                       -1.0951     0.3090
## small_likes_large_post_count_timeline      2.5782     1.0784
## small_comments_on_large_post_count_timeline 16.8070    1935.6060
## small_comments_on_large_status_count_timeline  1.0518     0.6553
## co_comment_status_count                1.9329     1.1968
## co_like_photo_count                   -1.1391     0.4517
## large_likes_small_post_count_action      20.1042    4266.1086
## large_likes_small_status_count_action     57.9501   2651.7614
## small_likes_large_photo_count_action      0.9324     0.2680
## large_comments_on_small_status_count_timeline -80.3822   9992.5003
## co_attended_event_count                 0.4491     0.2685
## small_posts_photo_video_to_large_timeline_count -3.8557     1.2632
## large_posts_post_to_small_timeline_count   18.5215   3790.8503
## large_likes_small_status_count_timeline  -55.7356   2651.7561
## large_likes_small_photo_count_action      5.3855     1.6699
## large_comments_on_small_photo_count_action  1.6428     0.9464
## large_comments_on_small_status_count_action 96.5599   9855.4617
## small_is_tagged_in_large_photo_count_action 82.4169  11722.0771
## large_likes_small_photo_count_timeline    -3.5327     1.4815
## co_tagged_photo_count                 61.7220   6488.7871
## small_likes_large_status_count_action      0.9919     0.4877
## small_is_tagged_in_large_photo_count_timeline -61.0841   6488.7870
##                                     z value Pr(>|z|)
## (Intercept)                       -3.544 0.000394 ***
## small_likes_large_post_count_timeline  2.391 0.016814 *
## small_comments_on_large_post_count_timeline  0.009 0.993072
## small_comments_on_large_status_count_timeline  1.605 0.108474
## co_comment_status_count                1.615 0.106291
## co_like_photo_count                   -2.522 0.011668 *
## large_likes_small_post_count_action      0.005 0.996240
```



```
## large_likes_small_status_count_action          0.022 0.982565
## small_likes_large_photo_count_action           3.479 0.000503 ***
## large_comments_on_small_status_count_timeline -0.008 0.993582
## co_attended_event_count                        1.673 0.094383 .
## small_posts_photo_video_to_large_timeline_count -3.052 0.002270 **
## large_posts_post_to_small_timeline_count        0.005 0.996102
## large_likes_small_status_count_timeline         -0.021 0.983231
## large_likes_small_photo_count_action            3.225 0.001260 **
## large_comments_on_small_photo_count_action      1.736 0.082584 .
## large_comments_on_small_status_count_action     0.010 0.992183
## small_is_tagged_in_large_photo_count_action     0.007 0.994390
## large_likes_small_photo_count_timeline          -2.385 0.017100 *
## co_tagged_photo_count                          0.010 0.992411
## small_likes_large_status_count_action           2.034 0.041963 *
## small_is_tagged_in_large_photo_count_timeline  -0.009 0.992489
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
## Null deviance: 470.29 on 349 degrees of freedom
## Residual deviance: 195.46 on 328 degrees of freedom
## AIC: 239.46
##
## Number of Fisher Scoring iterations: 23
```

```
logistic3 = stepAIC(model_logit, direction = "forward")
```

```
## Start: AIC=275.47
## friended ~ small_likes_large_post_count_timeline + large_is_tagged_in_small_status_count_action +
## small_comments_on_large_post_count_timeline + small_is_tagged_in_large_post_count_timeline +
## small_is_tagged_in_large_post_count_action + large_is_tagged_in_small_post_count_timeline +
## small_comments_on_large_status_count_timeline + co_like_post_count +
## large_posts_photo_video_to_small_timeline_count + large_comments_on_small_post_count_timeline +
## small_is_tagged_in_large_status_count_timeline + large_comments_on_small_post_count_action +
## large_is_tagged_in_small_post_count_action + co_comment_status_count +
## large_is_tagged_in_small_status_count_timeline + co_like_photo_count +
## large_likes_small_post_count_action + small_comments_on_large_photo_count_action +
## co_tagged_post_count + large_likes_small_status_count_action +
## small_posts_post_to_large_timeline_count + small_likes_large_photo_count_action +
## large_comments_on_small_status_count_timeline + co_attended_event_count +
## small_comments_on_large_photo_count_timeline + small_posts_photo_video_to_large_timeline_count +
## large_posts_post_to_small_timeline_count + small_is_tagged_in_large_status_count_action +
## large_is_tagged_in_small_photo_count_action + co_tagged_status_count +
## large_likes_small_post_count_timeline + small_likes_large_post_count_action +
## large_likes_small_status_count_timeline + small_likes_large_photo_count_timeline +
## large_likes_small_photo_count_action + co_comment_photo_count +
## small_comments_on_large_post_count_action + small_likes_large_status_count_timeline +
## large_comments_on_small_photo_count_action + large_comments_on_small_status_count_action +
## co_like_status_count + large_comments_on_small_photo_count_timeline +
## small_is_tagged_in_large_photo_count_action + large_likes_small_photo_count_timeline +
## co_comment_post_count + large_is_tagged_in_small_photo_count_timeline +
## co_tagged_photo_count + small_comments_on_large_status_count_action +
## small_likes_large_status_count_action + small_is_tagged_in_large_photo_count_timeline
```

```
logistic3$anova
```

```
## Stepwise Model Path
## Analysis of Deviance Table
##
## Initial Model:
## friended ~ small_likes_large_post_count_timeline + large_is_tagged_in_small_status_count_action +
##   small_comments_on_large_post_count_timeline + small_is_tagged_in_large_post_count_timeline +
##   small_is_tagged_in_large_post_count_action + large_is_tagged_in_small_post_count_timeline +
##   small_comments_on_large_status_count_timeline + co_like_post_count +
##   large_posts_photo_video_to_small_timeline_count + large_comments_on_small_post_count_timeline +
##   small_is_tagged_in_large_status_count_timeline + large_comments_on_small_post_count_action +
##   large_is_tagged_in_small_post_count_action + co_comment_status_count +
##   large_is_tagged_in_small_status_count_timeline + co_like_photo_count +
##   large_likes_small_post_count_action + small_comments_on_large_photo_count_action +
##   co_tagged_post_count + large_likes_small_status_count_action +
##   small_posts_post_to_large_timeline_count + small_likes_large_photo_count_action +
##   large_comments_on_small_status_count_timeline + co_attended_event_count +
##   small_comments_on_large_photo_count_timeline + small_posts_photo_video_to_large_timeline_count +
##   large_posts_post_to_small_timeline_count + small_is_tagged_in_large_status_count_action +
##   large_is_tagged_in_small_photo_count_action + co_tagged_status_count +
##   large_likes_small_post_count_timeline + small_likes_large_post_count_action +
##   large_likes_small_status_count_timeline + small_likes_large_photo_count_timeline +
##   large_likes_small_photo_count_action + co_comment_photo_count +
##   small_comments_on_large_post_count_action + small_likes_large_status_count_timeline +
##   large_comments_on_small_photo_count_action + large_comments_on_small_status_count_action +
##   co_like_status_count + large_comments_on_small_photo_count_timeline +
##   small_is_tagged_in_large_photo_count_action + large_likes_small_photo_count_timeline +
##   co_comment_post_count + large_is_tagged_in_small_photo_count_timeline +
##   co_tagged_photo_count + small_comments_on_large_status_count_action +
##   small_likes_large_status_count_action + small_is_tagged_in_large_photo_count_timeline
##
## Final Model:
## friended ~ small_likes_large_post_count_timeline + large_is_tagged_in_small_status_count_action +
##   small_comments_on_large_post_count_timeline + small_is_tagged_in_large_post_count_timeline +
##   small_is_tagged_in_large_post_count_action + large_is_tagged_in_small_post_count_timeline +
##   small_comments_on_large_status_count_timeline + co_like_post_count +
##   large_posts_photo_video_to_small_timeline_count + large_comments_on_small_post_count_timeline +
##   small_is_tagged_in_large_status_count_timeline + large_comments_on_small_post_count_action +
##   large_is_tagged_in_small_post_count_action + co_comment_status_count +
##   large_is_tagged_in_small_status_count_timeline + co_like_photo_count +
##   large_likes_small_post_count_action + small_comments_on_large_photo_count_action +
##   co_tagged_post_count + large_likes_small_status_count_action +
##   small_posts_post_to_large_timeline_count + small_likes_large_photo_count_action +
##   large_comments_on_small_status_count_timeline + co_attended_event_count +
##   small_comments_on_large_photo_count_timeline + small_posts_photo_video_to_large_timeline_count +
##   large_posts_post_to_small_timeline_count + small_is_tagged_in_large_status_count_action +
##   large_is_tagged_in_small_photo_count_action + co_tagged_status_count +
##   large_likes_small_post_count_timeline + small_likes_large_post_count_action +
##   large_likes_small_status_count_timeline + small_likes_large_photo_count_timeline +
##   large_likes_small_photo_count_action + co_comment_photo_count +
##   small_comments_on_large_post_count_action + small_likes_large_status_count_timeline +
##   large_comments_on_small_photo_count_action + large_comments_on_small_status_count_action +
```

```
##      co_like_status_count + large_comments_on_small_photo_count_timeline +
##      small_is_tagged_in_large_photo_count_action + large_likes_small_photo_count_timeline +
##      co_comment_post_count + large_is_tagged_in_small_photo_count_timeline +
##      co_tagged_photo_count + small_comments_on_large_status_count_action +
##      small_likes_large_status_count_action + small_is_tagged_in_large_photo_count_timeline
##
##
##      Step Df Deviance Resid. Df Resid. Dev      AIC
## 1              307    189.4723 275.4723
```

```
summary(logistic3)
```

```
##
## Call:
## glm(formula = friended ~ small_likes_large_post_count_timeline +
##      large_is_tagged_in_small_status_count_action + small_comments_on_large_post_count_timeline +
##      small_is_tagged_in_large_post_count_timeline + small_is_tagged_in_large_post_count_action +
##      large_is_tagged_in_small_post_count_timeline + small_comments_on_large_status_count_timeline +
##      co_like_post_count + large_posts_photo_video_to_small_timeline_count +
##      large_comments_on_small_post_count_timeline + small_is_tagged_in_large_status_count_timeline +
##      large_comments_on_small_post_count_action + large_is_tagged_in_small_post_count_action +
##      co_comment_status_count + large_is_tagged_in_small_status_count_timeline +
##      co_like_photo_count + large_likes_small_post_count_action +
##      small_comments_on_large_photo_count_action + co_tagged_post_count +
##      large_likes_small_status_count_action + small_posts_post_to_large_timeline_count +
##      small_likes_large_photo_count_action + large_comments_on_small_status_count_timeline +
##      co_attended_event_count + small_comments_on_large_photo_count_timeline +
##      small_posts_photo_video_to_large_timeline_count + large_posts_post_to_small_timeline_count +
##      small_is_tagged_in_large_status_count_action + large_is_tagged_in_small_photo_count_action +
##      co_tagged_status_count + large_likes_small_post_count_timeline +
##      small_likes_large_post_count_action + large_likes_small_status_count_timeline +
##      small_likes_large_photo_count_timeline + large_likes_small_photo_count_action +
##      co_comment_photo_count + small_comments_on_large_post_count_action +
##      small_likes_large_status_count_timeline + large_comments_on_small_photo_count_action +
##      large_comments_on_small_status_count_action + co_like_status_count +
##      large_comments_on_small_photo_count_timeline + small_is_tagged_in_large_photo_count_action +
##      large_likes_small_photo_count_timeline + co_comment_post_count +
##      large_is_tagged_in_small_photo_count_timeline + co_tagged_photo_count +
##      small_comments_on_large_status_count_action + small_likes_large_status_count_action +
##      small_is_tagged_in_large_photo_count_timeline, family = binomial(),
##      data = train)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -2.9428  -0.4465   0.0000   0.2364   2.1704
##
## Coefficients: (8 not defined because of singularities)
##
##              Estimate Std. Error
## (Intercept)    -1.087e+00  3.333e-01
## small_likes_large_post_count_timeline    -1.082e+03  2.373e+07
## large_is_tagged_in_small_status_count_action    1.442e+01  1.989e+04
## small_comments_on_large_post_count_timeline    2.131e+01  1.880e+04
## small_is_tagged_in_large_post_count_timeline   -2.330e+01  2.669e+04
## small_is_tagged_in_large_post_count_action              NA              NA
```

## large_is_tagged_in_small_post_count_timeline	NA	NA
## small_comments_on_large_status_count_timeline	2.261e+00	2.381e+00
## co_like_post_count	7.103e-01	1.299e+00
## large_posts_photo_video_to_small_timeline_count	-2.398e+02	4.745e+07
## large_comments_on_small_post_count_timeline	-1.965e+02	2.373e+07
## small_is_tagged_in_large_status_count_timeline	9.851e+02	2.373e+07
## large_comments_on_small_post_count_action	NA	NA
## large_is_tagged_in_small_post_count_action	NA	NA
## co_comment_status_count	2.032e+00	1.413e+00
## large_is_tagged_in_small_status_count_timeline	-1.290e+02	5.733e+04
## co_like_photo_count	-1.100e+00	6.876e-01
## large_likes_small_post_count_action	2.105e+01	6.900e+03
## small_comments_on_large_photo_count_action	1.364e+00	1.605e+00
## co_tagged_post_count	NA	NA
## large_likes_small_status_count_action	7.297e+01	3.621e+03
## small_posts_post_to_large_timeline_count	1.944e+03	4.745e+07
## small_likes_large_photo_count_action	9.479e-01	7.007e-01
## large_comments_on_small_status_count_timeline	-1.057e+02	8.693e+03
## co_attended_event_count	5.057e-01	2.704e-01
## small_comments_on_large_photo_count_timeline	-2.003e-02	9.906e-01
## small_posts_photo_video_to_large_timeline_count	-1.363e+02	4.745e+07
## large_posts_post_to_small_timeline_count	-1.924e+03	4.745e+07
## small_is_tagged_in_large_status_count_action	-9.740e+02	2.373e+07
## large_is_tagged_in_small_photo_count_action	1.303e+02	4.745e+07
## co_tagged_status_count	NA	NA
## large_likes_small_post_count_timeline	NA	NA
## small_likes_large_post_count_action	1.085e+03	2.373e+07
## large_likes_small_status_count_timeline	-7.076e+01	3.621e+03
## small_likes_large_photo_count_timeline	-6.905e-02	6.533e-01
## large_likes_small_photo_count_action	6.805e+00	2.820e+00
## co_comment_photo_count	-2.858e-01	1.290e+00
## small_comments_on_large_post_count_action	NA	NA
## small_likes_large_status_count_timeline	-1.760e+00	1.932e+00
## large_comments_on_small_photo_count_action	1.305e+01	1.783e+03
## large_comments_on_small_status_count_action	1.243e+02	6.641e+03
## co_like_status_count	-2.108e-01	1.478e+00
## large_comments_on_small_photo_count_timeline	-1.179e+01	1.783e+03
## small_is_tagged_in_large_photo_count_action	2.222e+02	4.745e+07
## large_likes_small_photo_count_timeline	-4.834e+00	2.497e+00
## co_comment_post_count	-1.914e+01	3.506e+04
## large_is_tagged_in_small_photo_count_timeline	-1.147e+02	4.745e+07
## co_tagged_photo_count	2.030e+02	4.745e+07
## small_comments_on_large_status_count_action	-1.444e+00	2.421e+00
## small_likes_large_status_count_action	2.769e+00	2.035e+00
## small_is_tagged_in_large_photo_count_timeline	-2.024e+02	4.745e+07
##	z value Pr(> z )	
## (Intercept)	-3.261	0.00111 **
## small_likes_large_post_count_timeline	0.000	0.99996
## large_is_tagged_in_small_status_count_action	0.001	0.99942
## small_comments_on_large_post_count_timeline	0.001	0.99910
## small_is_tagged_in_large_post_count_timeline	-0.001	0.99930
## small_is_tagged_in_large_post_count_action	NA	NA
## large_is_tagged_in_small_post_count_timeline	NA	NA
## small_comments_on_large_status_count_timeline	0.950	0.34230

```

## co_like_post_count          0.547  0.58440
## large_posts_photo_video_to_small_timeline_count 0.000  1.00000
## large_comments_on_small_post_count_timeline 0.000  0.99999
## small_is_tagged_in_large_status_count_timeline 0.000  0.99997
## large_comments_on_small_post_count_action      NA      NA
## large_is_tagged_in_small_post_count_action      NA      NA
## co_comment_status_count      1.439  0.15024
## large_is_tagged_in_small_status_count_timeline -0.002  0.99821
## co_like_photo_count          -1.600  0.10966
## large_likes_small_post_count_action            0.003  0.99757
## small_comments_on_large_photo_count_action      0.850  0.39542
## co_tagged_post_count          NA      NA
## large_likes_small_status_count_action           0.020  0.98392
## small_posts_post_to_large_timeline_count        0.000  0.99997
## small_likes_large_photo_count_action            1.353  0.17616
## large_comments_on_small_status_count_timeline  -0.012  0.99029
## co_attended_event_count      1.870  0.06144
## small_comments_on_large_photo_count_timeline  -0.020  0.98387
## small_posts_photo_video_to_large_timeline_count 0.000  1.00000
## large_posts_post_to_small_timeline_count        0.000  0.99997
## small_is_tagged_in_large_status_count_action    0.000  0.99997
## large_is_tagged_in_small_photo_count_action     0.000  1.00000
## co_tagged_status_count          NA      NA
## large_likes_small_post_count_timeline           NA      NA
## small_likes_large_post_count_action            0.000  0.99996
## large_likes_small_status_count_timeline         -0.020  0.98441
## small_likes_large_photo_count_timeline         -0.106  0.91583
## large_likes_small_photo_count_action            2.414  0.01580 *
## co_comment_photo_count        -0.222  0.82458
## small_comments_on_large_post_count_action        NA      NA
## small_likes_large_status_count_timeline         -0.911  0.36231
## large_comments_on_small_photo_count_action       0.007  0.99416
## large_comments_on_small_status_count_action      0.019  0.98507
## co_like_status_count          -0.143  0.88661
## large_comments_on_small_photo_count_timeline    -0.007  0.99472
## small_is_tagged_in_large_photo_count_action     0.000  1.00000
## large_likes_small_photo_count_timeline         -1.936  0.05288
## co_comment_post_count        -0.001  0.99956
## large_is_tagged_in_small_photo_count_timeline   0.000  1.00000
## co_tagged_photo_count          0.000  1.00000
## small_comments_on_large_status_count_action     -0.596  0.55096
## small_likes_large_status_count_action           1.361  0.17350
## small_is_tagged_in_large_photo_count_timeline   0.000  1.00000
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
## Null deviance: 470.29 on 349 degrees of freedom
## Residual deviance: 189.47 on 307 degrees of freedom
## AIC: 275.47
##
## Number of Fisher Scoring iterations: 21

```

```
# model_glm <- train(friended ~., data = train, method="bayesglm", trControl=traincontrol)
# predictrf <- predict(modelrf, test)
# confusionMatrix(predictrf, test$classe)
```