

## APPENDIX-A

Predicting if a given tweet is rumor or not using a decision tree and using determining factors like favorite counts, retweets, user followers

```
> prop.table(table(user_train$Type))
```

```
Non-Rumor      Rumor
0.539194 0.460806
```

```
> prop.table(table(user_test$Type))
```

```
Non-Rumor      Rumor
0.560757 0.439243
```

```
> user_model
```

```
Call:
```

```
C5.0.default(x = user_train[-4], y = as.factor(user_train$Type))
```

```
Classification Tree
```

```
Number of samples: 9033
```

```
Number of predictors: 3
```

```
Tree size: 118
```

```
Non-standard options: attempt to group attributes
```

```
summary(user_model)
```

```
Call:
```

```
C5.0.default(x = user_train[-4], y = as.factor(user_train$Type))
```

```
C5.0 [Release 2.07 GPL Edition]
```

```
Thu Mar 30 21:24:37 2017
```

```
-----  
Class specified by attribute `outcome'
```

```
*** ignoring cases with bad or unknown class
```

```
Read 9032 cases (4 attributes) from undefined.data
```

```
Decision tree:
```

```
retweet_count > 1897:  
: ...retweet_count > 19641:  
: : ...retweet_count <= 19642: Non-Rumor (4)  
: : : retweet_count > 19642:  
: : : ...retweet_count <= 25501: Rumor (19)  
: : : retweet_count > 25501: Non-Rumor (2)  
: : retweet_count <= 19641:  
: : ...retweet_count > 4513:  
: : : ...retweet_count <= 8586: Non-Rumor (381)  
: : : : retweet_count > 8586:  
: : : : ...retweet_count > 19054: Non-Rumor (222)  
: : : : : retweet_count <= 19054:  
: : : : : ...retweet_count <= 12356: Non-Rumor (121/2)  
: : : : : retweet_count > 12356: Rumor (16)  
: : : retweet_count <= 4513:  
: : : ...retweet_count <= 2857: Non-Rumor (150/3)
```

```

: retweet_count > 2857:
: ...retweet_count <= 2859: Rumor (17)
:   retweet_count > 2859:
:     ...retweet_count > 3753:
:       ...retweet_count <= 4093: Non-Rumor (43)
:       : retweet_count > 4093: Rumor (5)
:     retweet_count <= 3753:
:       ...retweet_count <= 3179:
:         ...retweet_count > 3062: Non-Rumor (20/1)
:         : retweet_count <= 3062:
:           ...retweet_count <= 2939: Non-Rumor (4)
:           : retweet_count > 2939: Rumor (5)
:         retweet_count > 3179:
:           ...retweet_count <= 3263: Rumor (20)
:           retweet_count > 3263:
:             ...retweet_count > 3561: Rumor (5)
:             retweet_count <= 3561:
:               ...retweet_count > 3396: Non-Rumor (8)
:               retweet_count <= 3396:
:                 ...retweet_count <= 3349: Non-Rumor (7)
:                 retweet_count > 3349: Rumor (4)
retweet_count <= 1897:
: ...retweet_count > 1896: Rumor (637.1/0.1)
:   retweet_count <= 1896:
:     ...retweet_count > 934:
:       ...retweet_count <= 1021: Non-Rumor (100/3)
:       : retweet_count > 1021:
:         ...retweet_count > 1414: Non-Rumor (115/5)
:         : retweet_count <= 1414:
:           ...retweet_count > 1408: Rumor (18)
:           : retweet_count <= 1408:
:             ...retweet_count > 1358: Non-Rumor (21)
:             : retweet_count <= 1358:
:               ...retweet_count <= 1066:
:               : ...retweet_count <= 1023: Rumor (4)
:               : retweet_count > 1023: Non-Rumor (35)
:             retweet_count > 1066:
:               ...retweet_count > 1191: Non-Rumor (40/6)
:               : retweet_count <= 1191:
:                 ...retweet_count > 1145: Rumor (12/1)
:                 : retweet_count <= 1145:
:                   ...retweet_count <= 1096: Rumor (2)
:                   : retweet_count > 1096: Non-Rumor (8/1)
retweet_count <= 934:
: ...retweet_count <= 139:
:   ...retweet_count > 102:
:     : ...retweet_count > 137: Rumor (238/3)
:     : : retweet_count <= 137:
:     :   ...retweet_count > 112:
:     :     : ...retweet_count <= 131: Non-Rumor (44/10)
:     :     : : retweet_count > 131:
:     :     : : ...retweet_count <= 136: Rumor (38/7)
:     :     : : : retweet_count > 136: Non-Rumor (3)
:     :   retweet_count <= 112:
:     :     ...retweet_count > 111: Rumor (89)
:     :     : retweet_count <= 111:
:     :     : ...retweet_count <= 103: Rumor (77/2)
:     :     : : retweet_count > 103:
:     :     : : ...retweet_count <= 105: Non-Rumor (12)
:     :     : : : retweet_count > 105:
:     :     : : : ...retweet_count <= 106: Rumor (74/2)
:     :     :     : retweet_count > 106:
:     :     :     : ...retweet_count <= 109: Non-Rumor (6)

```

```

:      :      retweet_count > 109: Rumor (14/1)
:  retweet_count <= 102:
:  ....retweet_count <= 0:
:      :      ....user_followers_count <= 10: Non-Rumor (103/27)
:      :      :      user_followers_count > 10:
:      :      :      ....favorite_count <= 1: Rumor (1909.2/853.2)
:      :      :      :      favorite_count > 1:
:      :      :      :      ....favorite_count > 2: Non-Rumor (10/2)
:      :      :      :      :      favorite_count <= 2:
:      :      :      :      :      ....user_followers_count <= 1947: Non-Rumor (16/3)
:      :      :      :      :      :      user_followers_count > 1947: Rumor (11/3)
:  retweet_count > 0:
:  ....retweet_count > 90: Non-Rumor (76/5)
:      retweet_count <= 90:
:      ....retweet_count > 83:
:          :      ....retweet_count <= 86: Rumor (112/1)
:          :      :      retweet_count > 86: Non-Rumor (14/4)
:          :      :      retweet_count <= 83:
:          :      :      ....user_followers_count <= 21: Non-Rumor (119/25)
:          :      :      :      user_followers_count > 21:
:          :      :      :      ....retweet_count > 30:
:          :      :      :      :      ....retweet_count <= 35: Rumor (148/27)
:          :      :      :      :      :      retweet_count > 35:
:          :      :      :      :      :      :      ....retweet_count <= 43: [S1]
:          :      :      :      :      :      :      :      retweet_count > 43: [S2]
:          :      :      :      :      :      :      :      retweet_count <= 30:
:          :      :      :      :      :      :      :      ....retweet_count > 19:
:          :      :      :      :      :      :      :      :      ....retweet_count <= 26: Non-Rumor (188/33)
:          :      :      :      :      :      :      :      :      :      retweet_count > 26: [S3]
:          :      :      :      :      :      :      :      :      :      retweet_count <= 19:
:          :      :      :      :      :      :      :      :      :      :      ....retweet_count > 16: [S4]
:          :      :      :      :      :      :      :      :      :      :      :      retweet_count <= 16: [S5]
:  retweet_count > 139:
:  ....retweet_count <= 205:
:      :      ....retweet_count > 182: Non-Rumor (214/6)
:      :      :      retweet_count <= 182:
:      :      :      ....retweet_count <= 180: Non-Rumor (128/22)
:      :      :      :      retweet_count > 180: Rumor (8/2)
:  retweet_count > 205:
:  ....retweet_count <= 208: Rumor (64/1)
:      retweet_count > 208:
:      ....retweet_count <= 266:
:          :      ....retweet_count > 233: Non-Rumor (98/2)
:          :      :      retweet_count <= 233:
:          :      :      ....retweet_count <= 226: Non-Rumor (65/10)
:          :      :      :      retweet_count > 226: Rumor (28/3)
:      retweet_count > 266:
:      ....retweet_count <= 283:
:          :      ....retweet_count > 282: Rumor (189/1)
:          :      :      retweet_count <= 282:
:          :      :      ....retweet_count <= 271: Rumor (10)
:          :      :      :      retweet_count > 271: Non-Rumor (17)
:      retweet_count > 283:
:      ....retweet_count > 876:
:          :      ....retweet_count <= 901: Rumor (39/5)
:          :      :      retweet_count > 901:
:          :      :      ....retweet_count <= 910: Non-Rumor (4)
:          :      :      :      retweet_count > 910: Rumor (3)
:      retweet_count <= 876:
:      ....retweet_count <= 368:
:          :      ....retweet_count > 339: Non-Rumor (104/3)
:          :      :      retweet_count <= 339:
:          :      :      ....retweet_count <= 302: Non-Rumor (34/4)

```

```

:         retweet_count > 302:
:         :...retweet_count <= 305: Rumor (8)
:         retweet_count > 305: [s6]
retweet_count > 368:
:...retweet_count <= 401:
:   :...retweet_count > 400: Rumor (91/3)
:   retweet_count <= 400: [s7]
retweet_count > 401:
:   :...retweet_count <= 432: Non-Rumor (66/3)
:   retweet_count > 432:
:     :...retweet_count <= 449: [s8]
:     retweet_count > 449:
:       :...retweet_count > 724: [s9]
:       retweet_count <= 724: [s10]

```

SubTree [S1]

```

retweet_count > 41: Non-Rumor (68/2)
retweet_count <= 41:
:...retweet_count <= 39: Non-Rumor (49/2)
:   retweet_count > 39:
:     :...retweet_count <= 40: Rumor (13/2)
:     retweet_count > 40: Non-Rumor (12/2)

```

SubTree [S2]

```

retweet_count > 50: Non-Rumor (119/34)
retweet_count <= 50:
:...retweet_count > 49: Rumor (40/3)
:   retweet_count <= 49:
:     :...retweet_count <= 45: Rumor (61/12)
:     retweet_count > 45: Non-Rumor (15/1)

```

SubTree [S3]

```

retweet_count > 28: Non-Rumor (47/3)
retweet_count <= 28:
:...retweet_count > 27: Rumor (36/8)
:   retweet_count <= 27:
:     :...user_followers_count <= 1400: Rumor (6/2)
:     user_followers_count > 1400: Non-Rumor (4)

```

SubTree [S4]

```

retweet_count <= 17: Rumor (57/10)
retweet_count > 17: Non-Rumor (23/8)

```

SubTree [S5]

```

retweet_count <= 6: Non-Rumor (811.1/284)
retweet_count > 6:
:...retweet_count <= 10: Rumor (266/124)
:   retweet_count > 10:
:     :...retweet_count > 14:
:       :...retweet_count <= 15: Rumor (49/23)
:       retweet_count > 15: Non-Rumor (21/5)
:     retweet_count <= 14:
:       :...retweet_count > 13: Non-Rumor (18/1)
:       retweet_count <= 13:
:         :...retweet_count > 11: Non-Rumor (111/32)
:         retweet_count <= 11:
:           :...user_followers_count <= 242: Rumor (45/20)
:           user_followers_count > 242:

```

```
      :...user_followers_count <= 2415610: Non-Rumor (68/14)
        user_followers_count > 2415610: Rumor (4)
```

SubTree [S6]

```
user_followers_count > 4868: Non-Rumor (5)
user_followers_count <= 4868:
: ...retweet_count > 329: Non-Rumor (18/8)
  retweet_count <= 329:
: ...retweet_count <= 320: Non-Rumor (12/5)
  retweet_count > 320: Rumor (22)
```

SubTree [S7]

```
retweet_count > 370: Non-Rumor (34/3)
retweet_count <= 370:
: ...user_followers_count <= 1294: Rumor (19/3)
  user_followers_count > 1294: Non-Rumor (3)
```

SubTree [S8]

```
retweet_count <= 440: Non-Rumor (15/5)
retweet_count > 440: Rumor (19)
```

SubTree [S9]

```
retweet_count > 846: Non-Rumor (30/2)
retweet_count <= 846:
: ...retweet_count > 809: Rumor (27/2)
  retweet_count <= 809:
: ...retweet_count <= 727: Rumor (7)
  retweet_count > 727:
: ...user_followers_count <= 1883:
  : ...retweet_count <= 797: Non-Rumor (26/3)
  :   retweet_count > 797: Rumor (6/2)
  user_followers_count > 1883:
: ...retweet_count <= 749: Rumor (5)
  retweet_count > 749: Non-Rumor (2)
```

SubTree [S10]

```
retweet_count > 705: Non-Rumor (43)
retweet_count <= 705:
: ...retweet_count <= 529:
  : ...user_followers_count <= 116: Rumor (38/7)
  :   user_followers_count > 116: Non-Rumor (72/6)
  retweet_count > 529:
: ...retweet_count <= 540: Rumor (25)
  retweet_count > 540:
: ...retweet_count <= 575: Non-Rumor (47/2)
  retweet_count > 575:
: ...retweet_count <= 587: Rumor (20/4)
  retweet_count > 587:
: ...retweet_count <= 662: Non-Rumor (42/5)
  retweet_count > 662:
: ...retweet_count <= 668: Rumor (5)
  retweet_count > 668:
: ...retweet_count <= 698: Non-Rumor (18)
  retweet_count > 698: Rumor (12/4)
```

Evaluation on training data (9032 cases):

```

Decision Tree
-----
Size      Errors
118 1748(19.4%)  <<

```

```

(a)  (b)  <-classified as
----  ----
3729 1141  (a): class Non-Rumor
607  3555  (b): class Rumor

```

Attribute usage:

```

99.99% retweet_count
51.76% user_followers_count
21.55% favorite_count

```

```

> CrossTable(user_test$Type,user_pred,prop.chisq=FALSE,prop.c=FALSE,prop.r=FALSE,dnn=
c('actual default','predicted default'))

```

Cell Contents

	N
N / Table Total	

Total Observations in Table: 1004

actual	predicted Non-Rumor	Rumor	Row Total
Non-Rumor	407 0.405	156 0.155	563
Rumor	69 0.069	372 0.371	441
Column Total	476	528	1004

## AFTER BOOSTING

Decision tree:

```

retweet_count > 1897:
....retweet_count > 19641:
:   ....retweet_count <= 19642: Non-Rumor (4)
:   :   retweet_count > 19642:
:   :   ....retweet_count <= 25501: Rumor (19)
:   :   retweet_count > 25501: Non-Rumor (2)
:   retweet_count <= 19641:
:   ....retweet_count > 4513:
:   :   ....retweet_count <= 8586: Non-Rumor (381)
:   :   retweet_count > 8586:
:   :   ....retweet_count > 19054: Non-Rumor (222)

```

```

:         retweet_count <= 19054:
:         :...retweet_count <= 12356: Non-Rumor (121/2)
:         :         retweet_count > 12356: Rumor (16)
: retweet_count <= 4513:
: :...retweet_count <= 2857: Non-Rumor (150/3)
: :         retweet_count > 2857:
: :         :...retweet_count <= 2859: Rumor (17)
: :         :         retweet_count > 2859:
: :         :         :...retweet_count > 3753:
: :         :         :         :...retweet_count <= 4093: Non-Rumor (43)
: :         :         :         :         retweet_count > 4093: Rumor (5)
: :         :         :         retweet_count <= 3753:
: :         :         :         :...retweet_count <= 3179:
: :         :         :         :         :...retweet_count > 3062: Non-Rumor (20/1)
: :         :         :         :         :         retweet_count <= 3062:
: :         :         :         :         :         :...retweet_count <= 2939: Non-Rumor (4)
: :         :         :         :         :         :         retweet_count > 2939: Rumor (5)
: :         :         :         :         retweet_count > 3179:
: :         :         :         :         :...retweet_count <= 3263: Rumor (20)
: :         :         :         :         :         retweet_count > 3263:
: :         :         :         :         :         :...retweet_count > 3561: Rumor (5)
: :         :         :         :         :         :         retweet_count <= 3561:
: :         :         :         :         :         :         :...retweet_count > 3396: Non-Rumor (8)
: :         :         :         :         :         :         :         retweet_count <= 3396:
: :         :         :         :         :         :         :         :...retweet_count <= 3349: Non-Rumor (7)
: :         :         :         :         :         :         :         :         retweet_count > 3349: Rumor (4)
: retweet_count <= 1897:
: :...retweet_count > 1896: Rumor (637.1/0.1)
: :         retweet_count <= 1896:
: :         :...retweet_count > 934:
: :         :         :...retweet_count <= 1021: Non-Rumor (100/3)
: :         :         :         retweet_count > 1021:
: :         :         :         :...retweet_count > 1414: Non-Rumor (115/5)
: :         :         :         :         retweet_count <= 1414:
: :         :         :         :         :...retweet_count > 1408: Rumor (18)
: :         :         :         :         :         retweet_count <= 1408:
: :         :         :         :         :         :...retweet_count > 1358: Non-Rumor (21)
: :         :         :         :         :         :         retweet_count <= 1358:
: :         :         :         :         :         :         :...retweet_count <= 1066:
: :         :         :         :         :         :         :         :...retweet_count <= 1023: Rumor (4)
: :         :         :         :         :         :         :         :         retweet_count > 1023: Non-Rumor (35)
: :         :         :         :         :         :         :         retweet_count > 1066:
: :         :         :         :         :         :         :         :...retweet_count > 1191: Non-Rumor (40/6)
: :         :         :         :         :         :         :         :         retweet_count <= 1191:
: :         :         :         :         :         :         :         :         :...retweet_count > 1145: Rumor (12/1)
: :         :         :         :         :         :         :         :         :         retweet_count <= 1145:
: :         :         :         :         :         :         :         :         :         :...retweet_count <= 1096: Rumor (2)
: :         :         :         :         :         :         :         :         :         :         retweet_count > 1096: Non-Rumor (8/1)
: retweet_count <= 934:
: :...retweet_count <= 139:
: :         :...retweet_count > 102:
: :         :         :...retweet_count > 137: Rumor (238/3)
: :         :         :         retweet_count <= 137:
: :         :         :         :...retweet_count > 112:
: :         :         :         :         :...retweet_count <= 131: Non-Rumor (44/10)
: :         :         :         :         :         retweet_count > 131:
: :         :         :         :         :         :...retweet_count <= 136: Rumor (38/7)
: :         :         :         :         :         :         retweet_count > 136: Non-Rumor (3)
: :         :         :         :         :         retweet_count <= 112:
: :         :         :         :         :         :...retweet_count > 111: Rumor (89)
: :         :         :         :         :         :         retweet_count <= 111:
: :         :         :         :         :         :         :...retweet_count <= 103: Rumor (77/2)
: :         :         :         :         :         :         :         retweet_count > 103:

```

```

:         : ...retweet_count <= 105: Non-Rumor (12)
:         :         retweet_count > 105:
:         :         : ...retweet_count <= 106: Rumor (74/2)
:         :         :         retweet_count > 106:
:         :         :         : ...retweet_count <= 109: Non-Rumor (6)
:         :         :         :         retweet_count > 109: Rumor (14/1)
: retweet_count <= 102:
: : ...retweet_count <= 0:
: : : ...user_followers_count <= 10: Non-Rumor (103/27)
: : : : user_followers_count > 10:
: : : : : ...favorite_count <= 1: Rumor (1909.2/853.2)
: : : : :         favorite_count > 1:
: : : : : : ...favorite_count > 2: Non-Rumor (10/2)
: : : : : :         favorite_count <= 2:
: : : : : : : ...user_followers_count <= 1947: Non-Rumor (16/3)
: : : : : : :         user_followers_count > 1947: Rumor (11/3)
: : retweet_count > 0:
: : : ...retweet_count > 90: Non-Rumor (76/5)
: : :         retweet_count <= 90:
: : : : ...retweet_count > 83:
: : : : : ...retweet_count <= 86: Rumor (112/1)
: : : : : : retweet_count > 86: Non-Rumor (14/4)
: : : : retweet_count <= 83:
: : : : : ...user_followers_count <= 21: Non-Rumor (119/25)
: : : : :         user_followers_count > 21:
: : : : : : ...retweet_count > 30:
: : : : : : : ...retweet_count <= 35: Rumor (148/27)
: : : : : : :         retweet_count > 35:
: : : : : : : : ...retweet_count <= 43: [S1]
: : : : : : : :         retweet_count > 43: [S2]
: : : : : retweet_count <= 30:
: : : : : : ...retweet_count > 19:
: : : : : : : ...retweet_count <= 26: Non-Rumor (188/33)
: : : : : : :         retweet_count > 26: [S3]
: : : : : : retweet_count <= 19:
: : : : : : : ...retweet_count > 16: [S4]
: : : : : : :         retweet_count <= 16: [S5]
: retweet_count > 139:
: : ...retweet_count <= 205:
: : : ...retweet_count > 182: Non-Rumor (214/6)
: : : : retweet_count <= 182:
: : : : : ...retweet_count <= 180: Non-Rumor (128/22)
: : : : :         retweet_count > 180: Rumor (8/2)
: : retweet_count > 205:
: : : ...retweet_count <= 208: Rumor (64/1)
: : :         retweet_count > 208:
: : : : ...retweet_count <= 266:
: : : : : ...retweet_count > 233: Non-Rumor (98/2)
: : : : : : retweet_count <= 233:
: : : : : : : ...retweet_count <= 226: Non-Rumor (65/10)
: : : : : : :         retweet_count > 226: Rumor (28/3)
: : : : retweet_count > 266:
: : : : : ...retweet_count <= 283:
: : : : : : ...retweet_count > 282: Rumor (189/1)
: : : : : : : retweet_count <= 282:
: : : : : : : : ...retweet_count <= 271: Rumor (10)
: : : : : : : :         retweet_count > 271: Non-Rumor (17)
: : : : : retweet_count > 283:
: : : : : : ...retweet_count > 876:
: : : : : : : ...retweet_count <= 901: Rumor (39/5)
: : : : : : :         retweet_count > 901:
: : : : : : : : ...retweet_count <= 910: Non-Rumor (4)
: : : : : : : :         retweet_count > 910: Rumor (3)

```



```

retweet_count <= 876:
:...retweet_count <= 368:
:...retweet_count > 339: Non-Rumor (104/3)
:   retweet_count <= 339:
:   :...retweet_count <= 302: Non-Rumor (34/4)
:   :   retweet_count > 302:
:   :   :...retweet_count <= 305: Rumor (8)
:   :   :   retweet_count > 305: [s6]
retweet_count > 368:
:...retweet_count <= 401:
:...retweet_count > 400: Rumor (91/3)
:   retweet_count <= 400: [s7]
retweet_count > 401:
:...retweet_count <= 432: Non-Rumor (66/3)
:   retweet_count > 432:
:   :...retweet_count <= 449: [s8]
:   :   retweet_count > 449:
:   :   :...retweet_count > 724: [s9]
:   :   :   retweet_count <= 724: [s10]

```

SubTree [S1]

```

retweet_count > 41: Non-Rumor (68/2)
retweet_count <= 41:
:...retweet_count <= 39: Non-Rumor (49/2)
:   retweet_count > 39:
:   :...retweet_count <= 40: Rumor (13/2)
:   :   retweet_count > 40: Non-Rumor (12/2)

```

SubTree [S2]

```

retweet_count > 50: Non-Rumor (119/34)
retweet_count <= 50:
:...retweet_count > 49: Rumor (40/3)
:   retweet_count <= 49:
:   :...retweet_count <= 45: Rumor (61/12)
:   :   retweet_count > 45: Non-Rumor (15/1)

```

SubTree [S3]

```

retweet_count > 28: Non-Rumor (47/3)
retweet_count <= 28:
:...retweet_count > 27: Rumor (36/8)
:   retweet_count <= 27:
:   :...user_followers_count <= 1400: Rumor (6/2)
:   :   user_followers_count > 1400: Non-Rumor (4)

```

SubTree [S4]

```

retweet_count <= 17: Rumor (57/10)
retweet_count > 17: Non-Rumor (23/8)

```

SubTree [S5]

```

retweet_count <= 6: Non-Rumor (811.1/284)
retweet_count > 6:
:...retweet_count <= 10: Rumor (266/124)
:   retweet_count > 10:
:   :...retweet_count > 14:
:   :   :...retweet_count <= 15: Rumor (49/23)
:   :   :   retweet_count > 15: Non-Rumor (21/5)
:   :   retweet_count <= 14:
:   :   :...retweet_count > 13: Non-Rumor (18/1)

```

```

retweet_count <= 13:
:...retweet_count > 11: Non-Rumor (111/32)
  retweet_count <= 11:
:...user_followers_count <= 242: Rumor (45/20)
    user_followers_count > 242:
:...user_followers_count <= 2415610: Non-Rumor (68/14)
        user_followers_count > 2415610: Rumor (4)

```

SubTree [S6]

```

user_followers_count > 4868: Non-Rumor (5)
user_followers_count <= 4868:
:...retweet_count > 329: Non-Rumor (18/8)
    retweet_count <= 329:
:...retweet_count <= 320: Non-Rumor (12/5)
        retweet_count > 320: Rumor (22)

```

SubTree [S7]

```

retweet_count > 370: Non-Rumor (34/3)
retweet_count <= 370:
:...user_followers_count <= 1294: Rumor (19/3)
    user_followers_count > 1294: Non-Rumor (3)

```

SubTree [S8]

```

retweet_count <= 440: Non-Rumor (15/5)
retweet_count > 440: Rumor (19)

```

SubTree [S9]

```

retweet_count > 846: Non-Rumor (30/2)
retweet_count <= 846:
:...retweet_count > 809: Rumor (27/2)
    retweet_count <= 809:
:...retweet_count <= 727: Rumor (7)
        retweet_count > 727:
:...user_followers_count <= 1883:
            ...retweet_count <= 797: Non-Rumor (26/3)
                : retweet_count > 797: Rumor (6/2)
            user_followers_count > 1883:
            ...retweet_count <= 749: Rumor (5)
                retweet_count > 749: Non-Rumor (2)

```

SubTree [S10]

```

retweet_count > 705: Non-Rumor (43)
retweet_count <= 705:
:...retweet_count <= 529:
    ...user_followers_count <= 116: Rumor (38/7)
    : user_followers_count > 116: Non-Rumor (72/6)
retweet_count > 529:
:...retweet_count <= 540: Rumor (25)
    retweet_count > 540:
:...retweet_count <= 575: Non-Rumor (47/2)
        retweet_count > 575:
        ...retweet_count <= 587: Rumor (20/4)
            retweet_count > 587:
            ...retweet_count <= 662: Non-Rumor (42/5)
                retweet_count > 662:
                ...retweet_count <= 668: Rumor (5)
                    retweet_count > 668:
                    ...retweet_count <= 698: Non-Rumor (18)

```

retweet\_count > 698: Rumor (12/4)

----- Trial 1: -----

Decision tree:

```
retweet_count > 3753:
:...retweet_count <= 19639: Non-Rumor (635.4/20.6)
:  retweet_count > 19639: Rumor (25.1/9.7)
retweet_count <= 3753:
:...retweet_count > 1896:
:...retweet_count <= 1897: Rumor (516)
:  retweet_count > 1897: Non-Rumor (198.3/48.5)
retweet_count <= 1896:
:...retweet_count > 973: Non-Rumor (286.6/49.9)
:  retweet_count <= 973:
:...retweet_count <= 0: Non-Rumor (2531.7/919.2)
:  retweet_count > 0:
:...retweet_count <= 146:
:...retweet_count > 102: Rumor (528.8/81.2)
:  retweet_count <= 102:
:  :...retweet_count > 93: Non-Rumor (40.7/1.8)
:  :  retweet_count <= 93:
:  :  :...retweet_count > 83:
:  :  :  :...retweet_count <= 86: Rumor (91.7/1.8)
:  :  :  :  retweet_count > 86: Non-Rumor (41.1/14.3)
:  :  :  retweet_count <= 83:
:  :  :  :...retweet_count <= 6:
:  :  :  :  :...favorite_count > 6: Non-Rumor (25.8/7.2)
:  :  :  :  :  favorite_count <= 6:
:  :  :  :  :  :...retweet_count <= 2: Rumor (580.1/241.4)
:  :  :  :  :  :  retweet_count > 2:
:  :  :  :  :  :  :...retweet_count <= 3: Non-Rumor (89.3/26.9)
:  :  :  :  :  :  :  retweet_count > 3: Rumor (281.6/124)
:  :  :  retweet_count > 6:
:  :  :  :...retweet_count > 44:
:  :  :  :  :...retweet_count <= 50: Rumor (89.8/25.5)
:  :  :  :  :  retweet_count > 50: Non-Rumor (142.3/64.5)
:  :  :  :  retweet_count <= 44:
:  :  :  :  :...retweet_count > 35: Non-Rumor (159.1/28.6)
:  :  :  :  :  retweet_count <= 35:
:  :  :  :  :  :...retweet_count > 30: Rumor (149/49.2)
:  :  :  :  :  :  retweet_count <= 30: [S1]
:  :  retweet_count > 146:
:  :  :...retweet_count <= 205: Non-Rumor (290.7/42.5)
:  :  :  retweet_count > 205:
:  :  :  :...retweet_count <= 208: Rumor (52.8/1.8)
:  :  :  :  retweet_count > 208:
:  :  :  :  :...retweet_count <= 282: Non-Rumor (191.3/49.9)
:  :  :  :  :  retweet_count > 282:
:  :  :  :  :  :...retweet_count <= 283: Rumor (154.1/1.8)
:  :  :  :  :  :  retweet_count > 283:
:  :  :  :  :  :  :...retweet_count > 878: Rumor (42.6/14.6)
:  :  :  :  :  :  :  retweet_count <= 878:
:  :  :  :  :  :  :  :...retweet_count > 540: Non-Rumor (274.7/85.5)
:  :  :  :  :  :  :  :  retweet_count <= 540:
:  :  :  :  :  :  :  :  :...retweet_count <= 398: [S2]
:  :  :  :  :  :  :  :  :  retweet_count > 398:
:  :  :  :  :  :  :  :  :  :...retweet_count <= 401: Rumor (79.3/6.2)
:  :  :  :  :  :  :  :  :  :  retweet_count > 401: [S3]
```

subTree [S1]

```

retweet_count > 28: Non-Rumor (45.9/5.4)
retweet_count <= 28:
:...retweet_count <= 9: Non-Rumor (271.7/85.9)
  retweet_count > 9:
:...retweet_count <= 21:
  :...retweet_count <= 16: Non-Rumor (438.3/175.8)
  :   retweet_count > 16: Rumor (139.5/58.4)
  retweet_count > 21:
:...retweet_count <= 27: Non-Rumor (157.9/40.9)
  retweet_count > 27: Rumor (37/14.3)

```

SubTree [S2]

```

retweet_count <= 339: Rumor (96.9/42.1)
retweet_count > 339: Non-Rumor (135.8/21.9)

```

SubTree [S3]

```

retweet_count > 529: Rumor (20.3)
retweet_count <= 529:
:...retweet_count > 508: Non-Rumor (29.8)
  retweet_count <= 508:
:...retweet_count <= 432: Non-Rumor (56.4/5.4)
  retweet_count > 432:
:...user_followers_count <= 76: Rumor (31.3/1.8)
  user_followers_count > 76: Non-Rumor (73.2/30.7)

```

----- Trial 2: -----

Decision tree:

```

retweet_count > 3753: Non-Rumor (574.5/43.1)
retweet_count <= 3753:
:...retweet_count > 1896:
  :...retweet_count <= 1897: Rumor (433.7)
  :   retweet_count > 1897:
  :   :...retweet_count <= 2525: Non-Rumor (82.4)
  :   :   retweet_count > 2525:
  :   :   :...retweet_count <= 2857: Non-Rumor (24.3/6.6)
  :   :   :   retweet_count > 2857: Rumor (90.5/25.9)
  retweet_count <= 1896:
:...retweet_count > 901: Non-Rumor (296.9/75.9)
  retweet_count <= 901:
  :...retweet_count <= 49:
    :...retweet_count <= 0: Rumor (2728.8/1355.2)
    :   retweet_count > 0:
    :   :...retweet_count > 35: Non-Rumor (205.7/67.6)
    :   :   retweet_count <= 35:
    :   :   :...retweet_count > 33: Rumor (65.6/19.9)
    :   :   :   retweet_count <= 33:
    :   :   :   :...user_followers_count > 2195903: Rumor (25.8/6)
    :   :   :   :   user_followers_count <= 2195903:
    :   :   :   :   :...retweet_count > 18: Non-Rumor (376.5/139.1)
    :   :   :   :   :   retweet_count <= 18:
    :   :   :   :   :   :...favorite_count > 6: Non-Rumor (47.2/12.6)
    :   :   :   :   :   :   favorite_count <= 6:
    :   :   :   :   :   :   :...retweet_count <= 9: Non-Rumor (1320.7/571.4)
    :   :   :   :   :   :   :   retweet_count > 9: Rumor (510.5/244.3)
  retweet_count > 49:
:...retweet_count <= 139:
  :...retweet_count > 137: Rumor (166.6/6.6)
  :   retweet_count <= 137:

```

```

:   :...retweet_count > 112: Non-Rumor (96.9/36.2)
:   retweet_count <= 112:
:   :...retweet_count > 111: Rumor (60.6)
:   retweet_count <= 111:
:   :...retweet_count > 102: Rumor (142/33.1)
:   retweet_count <= 102:
:   :...retweet_count <= 90: Rumor (271.5/81)
:   retweet_count > 90: Non-Rumor (59.4/11)
retweet_count > 139:
:...retweet_count <= 207: Non-Rumor (290.4/64.9)
retweet_count > 207:
:...retweet_count <= 208: Rumor (42.2)
retweet_count > 208:
:...retweet_count <= 283:
:...retweet_count > 282: Rumor (130.2/2.2)
:   retweet_count <= 282:
:   :...retweet_count <= 233: Rumor (94.6/42)
:   retweet_count > 233: Non-Rumor (93.6/16.7)
retweet_count > 283:
:...retweet_count <= 369:
:...retweet_count > 339: Non-Rumor (78.8/7.8)
:   retweet_count <= 339:
:   :...retweet_count <= 302: Non-Rumor (42.8/6)
:   retweet_count > 302: Rumor (66.9/26.9)
retweet_count > 369:
:...retweet_count <= 401: Rumor (116.8/32.6)
retweet_count > 401:
:...retweet_count <= 422: Non-Rumor (35.6/2.2)
retweet_count > 422: [s1]

```

SubTree [s1]

```

user_followers_count <= 77: Rumor (97.5/30.3)
user_followers_count > 77:
:...retweet_count > 724: Rumor (107/39.8)
retweet_count <= 724:
:...retweet_count > 705: Non-Rumor (25.9)
retweet_count <= 705:
:...retweet_count <= 449: Rumor (40.6/13.6)
retweet_count > 449: Non-Rumor (189.1/67.1)

```

----- Trial 3: -----

Decision tree:

```

retweet_count > 3753: Non-Rumor (522.8/55.2)
retweet_count <= 3753:
:...retweet_count > 1896:
:...retweet_count <= 1897: Rumor (381.5)
:   retweet_count > 1897:
:   :...retweet_count <= 2525: Non-Rumor (72.5)
:   retweet_count > 2525: Rumor (116.8/52.4)
retweet_count <= 1896:
:...retweet_count > 1414: Non-Rumor (78.4/12.5)
retweet_count <= 1414:
:...retweet_count > 1408: Rumor (27.2)
retweet_count <= 1408:
:...retweet_count <= 0: Non-Rumor (2839.3/1208.6)
retweet_count > 0:
:...retweet_count <= 151:
:...retweet_count <= 83: Non-Rumor (2816.3/1348.3)
:   retweet_count > 83:
:   :...retweet_count <= 86: Rumor (69/2.5)

```

```

:         retweet_count > 86:
:         :...retweet_count <= 102: Non-Rumor (72.5/20.2)
:         :         retweet_count > 102: Rumor (491.6/126.2)
retweet_count > 151:
:...retweet_count <= 207: Non-Rumor (220.4/47.5)
:         retweet_count > 207:
:         :...retweet_count <= 208: Rumor (37.1)
:         :         retweet_count > 208:
:         :         :...retweet_count > 287: Non-Rumor (967.9/399.5)
:         :         :         retweet_count <= 287:
:         :         :         :...retweet_count > 282: Rumor (125.9/7.9)
:         :         :         :         retweet_count <= 282:
:         :         :         :         :...retweet_count > 233: Non-Rumor (87.8/20.1)
:         :         :         :         :         retweet_count <= 233:
:         :         :         :         :         :...retweet_count <= 222: Non-Rumor (66/15.5)
:         :         :         :         :         :         retweet_count > 222: Rumor (39.1/8.3)

```

----- Trial 4: -----

Decision tree:

```

retweet_count > 1897:
:...retweet_count <= 19641: Non-Rumor (643.9/99.5)
:   retweet_count > 19641: Rumor (28.4/5.8)
retweet_count <= 1897:
:...retweet_count > 1896: Rumor (341.7)
:   retweet_count <= 1896:
:   :...retweet_count > 1414: Non-Rumor (72.6/13.6)
:   :   retweet_count <= 1414:
:   :   :...retweet_count > 1378: Rumor (25.5/1.1)
:   :   :   retweet_count <= 1378:
:   :   :   :...retweet_count > 934:
:   :   :   :   :...retweet_count <= 1066: Non-Rumor (89.8/13)
:   :   :   :   :   retweet_count > 1066: Rumor (74.9/33.4)
:   :   :   :   retweet_count <= 934:
:   :   :   :   :...retweet_count <= 0: Non-Rumor (2910.6/1450.1)
:   :   :   :   :   retweet_count > 0:
:   :   :   :   :   :...retweet_count <= 139:
:   :   :   :   :   :   :...retweet_count > 137: Rumor (134.2/8.2)
:   :   :   :   :   :   :   retweet_count <= 137:
:   :   :   :   :   :   :   :...retweet_count <= 43:
:   :   :   :   :   :   :   :   :...retweet_count > 41: Non-Rumor (45.7/5.4)
:   :   :   :   :   :   :   :   :   retweet_count <= 41:
:   :   :   :   :   :   :   :   :   :...retweet_count > 30: Rumor (238.9/87.5)
:   :   :   :   :   :   :   :   :   :   retweet_count <= 30:
:   :   :   :   :   :   :   :   :   :   :...retweet_count <= 10: Rumor (1490.7/651.2)
:   :   :   :   :   :   :   :   :   :   :   retweet_count > 10: [S1]
:   :   :   :   :   :   :   retweet_count > 43:
:   :   :   :   :   :   :   :...retweet_count > 112: Non-Rumor (106.2/43)
:   :   :   :   :   :   :   :   retweet_count <= 112:
:   :   :   :   :   :   :   :   :...retweet_count > 111: Rumor (47.7)
:   :   :   :   :   :   :   :   :   retweet_count <= 111:
:   :   :   :   :   :   :   :   :   :...retweet_count <= 45: Rumor (82.4/18.1)
:   :   :   :   :   :   :   :   :   :   retweet_count > 45:
:   :   :   :   :   :   :   :   :   :   :...retweet_count <= 83: [S2]
:   :   :   :   :   :   :   :   :   :   :   retweet_count > 83: [S3]
:   :   :   :   :   :   :   retweet_count > 139:
:   :   :   :   :   :   :   :...retweet_count <= 266:
:   :   :   :   :   :   :   :   :...retweet_count > 233: Non-Rumor (56.9/5.4)
:   :   :   :   :   :   :   :   :   retweet_count <= 233:
:   :   :   :   :   :   :   :   :   :...retweet_count > 207:
:   :   :   :   :   :   :   :   :   :   :...retweet_count <= 208: Rumor (33.3)
:   :   :   :   :   :   :   :   :   :   :   retweet_count > 208: Non-Rumor (99.7/44.9)

```

```

:         retweet_count <= 207:
:         :...retweet_count > 182: Non-Rumor (130.8/17.5)
:         retweet_count <= 182: [S4]
retweet_count > 266:
:...retweet_count <= 283: Rumor (130/11.8)
    retweet_count > 283:
:...retweet_count <= 398:
:    :...retweet_count > 331: Non-Rumor (126.2/35.2)
:    retweet_count <= 331:
:    :...retweet_count <= 302: Non-Rumor (37.5/6.8
)
:         retweet_count > 302: Rumor (68.9/25.8)
retweet_count > 398:
:...retweet_count <= 401: Rumor (81.7/8.1)
    retweet_count > 401:
:...retweet_count <= 432: Non-Rumor (45.5/7)
    retweet_count > 432:
:    :...retweet_count > 878: Rumor (27.9/3.9)
        retweet_count <= 878: [S5]

```

SubTree [S1]

```

retweet_count > 28: Non-Rumor (35/8.1)
retweet_count <= 28:
:...retweet_count <= 26: Non-Rumor (701.7/334.7)
    retweet_count > 26: Rumor (58.7/18.4)

```

SubTree [S2]

```

retweet_count <= 49: Non-Rumor (17.5/2)
retweet_count > 49:
:...retweet_count <= 50: Rumor (38.6/6.7)
    retweet_count > 50: Non-Rumor (161.2/77.8)

```

SubTree [S3]

```

retweet_count <= 86: Rumor (62.3/2.7)
retweet_count > 86:
:...retweet_count <= 102: Non-Rumor (69/22.2)
    retweet_count > 102: Rumor (130.6/44.8)

```

SubTree [S4]

```

user_followers_count <= 1422: Non-Rumor (91.9/31.4)
user_followers_count > 1422: Rumor (42/13.9)

```

SubTree [S5]

```

retweet_count <= 508: Rumor (111.3/33.7)
retweet_count > 508:
:...retweet_count <= 529: Non-Rumor (21)
    retweet_count > 529:
:    :...retweet_count <= 540: Rumor (29)
        retweet_count > 540:
:    :...retweet_count <= 575: Non-Rumor (30.6/5.4)
        retweet_count > 575:
:    :...retweet_count <= 587: Rumor (29.9/4.7)
        retweet_count > 587:
:    :...retweet_count <= 724: Non-Rumor (94.1/32.7)
        retweet_count > 724:
:    :...retweet_count <= 846: Rumor (87.8/28.2)
        retweet_count > 846: Non-Rumor (48.4/16)

```

----- Trial 5: -----

Decision tree:

```
retweet_count <= 3753:
...retweet_count <= 1896:
:   ...retweet_count <= 901: Rumor (7829.4/3587.1)
:   :   retweet_count > 901: Non-Rumor (266.6/91.4)
:   retweet_count > 1896:
:   ...retweet_count <= 1897: Rumor (305)
:   :   retweet_count > 1897: Non-Rumor (187.8/70.5)
retweet_count > 3753:
...retweet_count > 19642: Rumor (22.6/2.4)
:   retweet_count <= 19642:
:   ...retweet_count > 19054: Non-Rumor (113.4)
:   :   retweet_count <= 19054:
:   :   ...retweet_count <= 12356: Non-Rumor (275.7/15.7)
:   :   :   retweet_count > 12356: Rumor (31.5)
```

----- Trial 6: -----

Decision tree:

```
retweet_count > 4513:
...retweet_count <= 12356: Non-Rumor (222.6)
:   retweet_count > 12356:
:   ...retweet_count <= 19054: Rumor (29.3)
:   :   retweet_count > 19054:
:   :   ...retweet_count <= 19642: Non-Rumor (105.4)
:   :   :   retweet_count > 19642: Rumor (21.4/2.6)
retweet_count <= 4513:
...retweet_count > 1896:
:   ...retweet_count <= 1897: Rumor (283.6)
:   :   retweet_count > 1897:
:   :   ...retweet_count <= 2525: Non-Rumor (53.9)
:   :   :   retweet_count > 2525:
:   :   :   ...retweet_count > 4093: Rumor (10.4)
:   :   :   :   retweet_count <= 4093:
:   :   :   :   ...retweet_count > 3753: Non-Rumor (19.1)
:   :   :   :   :   retweet_count <= 3753:
:   :   :   :   :   ...retweet_count <= 2857: Non-Rumor (25.4/7.7)
:   :   :   :   :   :   retweet_count > 2857: Rumor (106.3/37.5)
retweet_count <= 1896:
...retweet_count > 1414: Non-Rumor (49)
:   retweet_count <= 1414:
:   ...retweet_count > 1378: Rumor (25.2/1.4)
:   :   retweet_count <= 1378:
:   :   ...retweet_count <= 143:
:   :   :   ...retweet_count > 137: Rumor (117.1/6.3)
:   :   :   :   retweet_count <= 137:
:   :   :   :   ...retweet_count > 44: Rumor (643.4/265.4)
:   :   :   :   :   retweet_count <= 44:
:   :   :   :   :   ...retweet_count <= 0:
:   :   :   :   :   :   ...user_followers_count <= 199: Non-Rumor (815.6/381.8)
:   :   :   :   :   :   :   user_followers_count > 199: Rumor (2178.7/974.7)
:   :   :   :   :   :   retweet_count > 0:
:   :   :   :   :   :   ...retweet_count > 35: Non-Rumor (161.5/46.2)
:   :   :   :   :   :   :   retweet_count <= 35:
:   :   :   :   :   :   :   ...retweet_count <= 30: Non-Rumor (2403.2/1093.7)
:   :   :   :   :   :   :   :   retweet_count > 30: Rumor (162.9/62.1)
:   :   :   retweet_count > 143:
:   :   :   ...retweet_count <= 205: Non-Rumor (266.1/66.1)
:   :   :   :   retweet_count > 205:
```



```

: ...retweet_count <= 209: Rumor (39/3.4)
  retweet_count > 209:
: ...retweet_count <= 266: Non-Rumor (157.7/48.1)
  retweet_count > 266:
: ...retweet_count <= 283: Rumor (113/14.9)
  retweet_count > 283:
: ...retweet_count <= 366: Non-Rumor (159.5/44.7)
  retweet_count > 366:
: ...retweet_count <= 401: Rumor (150.7/53.7)
  retweet_count > 401:
: ...retweet_count <= 422: Non-Rumor (31.4/2.7
)
  retweet_count > 422: [S1]

```

SubTree [S1]

```

user_followers_count <= 76: Rumor (130.3/49.2)
user_followers_count > 76:
: ...user_followers_count <= 1069: Non-Rumor (371.7/127.9)
  user_followers_count > 1069: Rumor (161.4/74.8)

```

----- Trial 7: -----

Decision tree:

```

retweet_count > 4513:
: ...retweet_count <= 12356: Non-Rumor (200.9)
:   retweet_count > 12356:
:     : ...retweet_count <= 19054: Rumor (26.4)
:     :   retweet_count > 19054:
:     :     : ...retweet_count <= 19642: Non-Rumor (95.2)
:     :     :   retweet_count > 19642: Rumor (20.1/3.2)
retweet_count <= 4513:
: ...retweet_count > 1896:
:   : ...retweet_count <= 1897: Rumor (256)
:   :   retweet_count > 1897:
:   :     : ...retweet_count <= 2857: Non-Rumor (64.6)
:   :     :   retweet_count > 2857:
:   :     :     : ...retweet_count <= 2859: Rumor (20.1)
:   :     :     :   retweet_count > 2859:
:   :     :     :     : ...retweet_count <= 4093: Non-Rumor (107.8/42)
:   :     :     :     :   retweet_count > 4093: Rumor (9.4)
retweet_count <= 1896:
: ...retweet_count > 1414: Non-Rumor (44.2)
:   retweet_count <= 1414:
:     : ...retweet_count > 139:
:     :   : ...retweet_count <= 205: Non-Rumor (238.6/50.3)
:     :   :   retweet_count > 205:
:     :   :     : ...retweet_count <= 208: Rumor (28.1/2)
:     :   :     :   retweet_count > 208:
:     :   :     :     : ...retweet_count > 1367: Rumor (25.1/3.7)
:     :   :     :     :   retweet_count <= 1367:
:     :   :     :     :     : ...retweet_count > 934: Non-Rumor (154.2/38.3)
:     :   :     :     :     :   retweet_count <= 934:
:     :   :     :     :     :     : ...retweet_count <= 878: Non-Rumor (1096.8/519)
:     :   :     :     :     :     :   retweet_count > 878: Rumor (27.9/4)
retweet_count <= 139:
: ...retweet_count > 137: Rumor (94.4)
:   retweet_count <= 137:
:     : ...retweet_count > 102:
:     :   : ...retweet_count <= 112: Rumor (100.1)
:     :   :   retweet_count > 112: Non-Rumor (118.3/44.1)
:     :   retweet_count <= 102:

```

```

: ...retweet_count > 93: Non-Rumor (44.2/2.5)
  retweet_count <= 93:
: ...retweet_count > 83: Rumor (94.3/31.7)
  retweet_count <= 83:
: ...retweet_count <= 21:
  : ...retweet_count > 6: Rumor (1032.6/449.2)
  :   retweet_count <= 6:
  :     : ...favorite_count > 0: Non-Rumor (475.3/211.3)
  :     :   favorite_count <= 0:
  :     :     : ...user_followers_count <= 300: [S1]
  :     :     :   user_followers_count > 300: [S2]
  :   retweet_count > 21:
: ...retweet_count <= 26: Non-Rumor (72.4)
  retweet_count > 26: [S3]

```

SubTree [S1]

```

user_followers_count > 279: Rumor (78.5/14.7)
user_followers_count <= 279:
: ...retweet_count <= 1: Rumor (1146.9/508.5)
  retweet_count > 1: Non-Rumor (200.7/82.7)

```

SubTree [S2]

```

user_followers_count <= 905: Non-Rumor (899.1/373.2)
user_followers_count > 905:
: ...retweet_count <= 0: Non-Rumor (1119.4/546)
  retweet_count > 0:
: ...user_followers_count <= 10748: Rumor (335.7/131.1)
  user_followers_count > 10748: Non-Rumor (51.2/17.8)

```

SubTree [S3]

```

user_followers_count <= 21: Non-Rumor (36.8/6.3)
user_followers_count > 21:
: ...user_followers_count <= 59: Rumor (43.9/8.8)
  user_followers_count > 59:
: ...retweet_count <= 35:
  : ...retweet_count > 33: Rumor (33.1)
  :   retweet_count <= 33:
  :     : ...retweet_count <= 28: Rumor (61.2/21)
  :     :   retweet_count > 28: Non-Rumor (106.2/41)
  :   retweet_count > 35:
  :     : ...retweet_count <= 39: Non-Rumor (38.4/5.1)
  :     :   retweet_count > 39:
  :     :     : ...retweet_count <= 40: Rumor (20.1/2.8)
  :     :     :   retweet_count > 40:
  :     :     :     : ...retweet_count <= 43: Non-Rumor (45.3/5.1)
  :     :     :     :   retweet_count > 43:
  :     :     :     :     : ...retweet_count <= 50: Rumor (108.8/38.2)
  :     :     :     :     :   retweet_count > 50: Non-Rumor (158.7/60.3)

```

----- Trial 8: -----

Decision tree:

```

retweet_count > 4513:
: ...retweet_count <= 12356: Non-Rumor (180.2)
  :   retweet_count > 12356:
  :     : ...retweet_count <= 19054: Rumor (23.7)
  :     :   retweet_count > 19054: Non-Rumor (104.3/15.2)
retweet_count <= 4513:
: ...retweet_count > 1896:

```

```

: ...retweet_count <= 1897: Rumor (229.6)
:   retweet_count > 1897:
:     : ...retweet_count <= 2857: Non-Rumor (57.9)
:     :   retweet_count > 2857: Rumor (136.6/59.1)
retweet_count <= 1896:
: ...retweet_count > 934: Non-Rumor (183.3/35.1)
:   retweet_count <= 934:
:     : ...retweet_count <= 282:
:     :   : ...retweet_count > 146:
:     :   :   : ...retweet_count <= 205: Non-Rumor (160.1/6)
:     :   :   :   retweet_count > 205:
:     :   :   :     : ...retweet_count <= 233: Rumor (124.4/47.6)
:     :   :   :     :   retweet_count > 233: Non-Rumor (78.9/15.6)
:     :   :   retweet_count <= 146:
:     :   :     : ...retweet_count > 102:
:     :   :     :   : ...retweet_count <= 112: Rumor (89.8)
:     :   :     :   :   retweet_count > 112:
:     :   :     :   :     : ...retweet_count <= 131: Non-Rumor (65.7/18.1)
:     :   :     :   :     :   retweet_count > 131: Rumor (168.1/33.7)
:     :   :     :   retweet_count <= 102:
:     :   :     :     : ...retweet_count > 90: Non-Rumor (63.4)
:     :   :     :     :   retweet_count <= 90:
:     :   :     :     :     : ...retweet_count > 83: Rumor (61.5/14.3)
:     :   :     :     :     :   retweet_count <= 83:
:     :   :     :     :     :     : ...user_followers_count <= 2252: Non-Rumor (4699/2270.6)
:     :   :     :     :     :     :   user_followers_count > 2252: Rumor (1463.2/655.1)
retweet_count > 282:
: ...retweet_count <= 283: Rumor (122.9)
:   retweet_count > 283:
:     : ...retweet_count <= 400:
:     :   : ...retweet_count > 339: Non-Rumor (125.6/31.1)
:     :   :   retweet_count <= 339:
:     :   :     : ...retweet_count <= 302: Non-Rumor (31.6/6.8)
:     :   :     :   retweet_count > 302: Rumor (90.4/29.4)
:     :   retweet_count > 400:
:     :     : ...retweet_count <= 401: Rumor (76.4)
:     :     :   retweet_count > 401:
:     :     :     : ...retweet_count <= 432: Non-Rumor (34.9)
:     :     :     :   retweet_count > 432:
:     :     :     :     : ...user_followers_count <= 104: Rumor (141.1/47.1)
:     :     :     :     :   user_followers_count > 104:
:     :     :     :     :     : ...retweet_count > 797: Rumor (90.1/33.8)
:     :     :     :     :     :   retweet_count <= 797:
:     :     :     :     :     :     : ...retweet_count > 540: Non-Rumor (134.9/39.3)
:     :     :     :     :     :     :   retweet_count <= 540:
:     :     :     :     :     :     :     : ...retweet_count <= 529: Non-Rumor (91.3/36.

```

6)

retweet\_count > 529: Rumor (31.9)

----- Trial 9: -----

Decision tree:

```

retweet_count > 3753:
: ...retweet_count <= 12356: Non-Rumor (195)
:   retweet_count > 12356:
:     : ...retweet_count <= 19054: Rumor (21.7)
:     :   retweet_count > 19054: Non-Rumor (103.5/22)
retweet_count <= 3753:
: ...user_followers_count <= 9: Non-Rumor (138.8/29.7)
:   user_followers_count > 9:
:     : ...retweet_count > 1896:
:     :   : ...retweet_count <= 1897: Rumor (199.2)

```

```

:   retweet_count > 1897:
:   :...retweet_count <= 2857: Non-Rumor (52.3)
:   :   retweet_count > 2857:
:   :   :...retweet_count <= 2859: Rumor (16.5)
:   :   :   retweet_count > 2859: Non-Rumor (102.5/44.8)
retweet_count <= 1896:
:...favorite_count > 1: Non-Rumor (249.8/87.1)
  favorite_count <= 1:
  :...retweet_count > 934: Non-Rumor (160.2/25.9)
    retweet_count <= 934:
    :...retweet_count <= 0:
      :...user_followers_count <= 2636:
        :   :...favorite_count <= 0: Rumor (2340.7/957.1)
        :   :   favorite_count > 0:
        :   :   :...user_followers_count <= 220: Non-Rumor (21)
        :   :   :   user_followers_count > 220: Rumor (116.2/41.4)
        :   :   user_followers_count > 2636:
        :   :   :...favorite_count > 0: Non-Rumor (65.6/22.6)
        :   :   :   favorite_count <= 0:
        :   :   :   :...user_followers_count <= 4394: Non-Rumor (247.5/91.9)
        :   :   :   :   user_followers_count > 4394: Rumor (452.2/204.7)
      retweet_count > 0:
      :...retweet_count <= 26:
        :...retweet_count > 19: Non-Rumor (93.4/2)
        :   retweet_count <= 19:
        :   :...retweet_count > 16: Rumor (121.4/41.7)
        :   :   retweet_count <= 16:
        :   :   :...retweet_count > 11: Non-Rumor (210.5/60.8)
        :   :   :   retweet_count <= 11:
        :   :   :   :...retweet_count > 6:
        :   :   :   :   :...retweet_count <= 10: [S1]
        :   :   :   :   :   retweet_count > 10: [S2]
        :   :   :   :   :   retweet_count <= 6:
        :   :   :   :   :   :...user_followers_count > 952: [S3]
        :   :   :   :   :   :   user_followers_count <= 952: [S4]
      retweet_count > 26:
      :...retweet_count <= 35:
        :...retweet_count > 33: Rumor (53.8)
        :   retweet_count <= 33:
        :   :...retweet_count <= 28: Rumor (53.2/8.2)
        :   :   retweet_count > 28:
        :   :   :...retweet_count <= 30: Non-Rumor (26.4)
        :   :   :   retweet_count > 30: Rumor (107.3/30.7)
      retweet_count > 35:
      :...retweet_count <= 39: Non-Rumor (34.8)
        retweet_count > 39:
        :...retweet_count <= 139:
          :...retweet_count > 102:
            :   :...retweet_count <= 112: Rumor (80.5)
            :   :   retweet_count > 112: [S5]
            :   :   retweet_count <= 102:
            :   :   :...retweet_count > 90: Non-Rumor (58)
            :   :   :   retweet_count <= 90:
            :   :   :   :...retweet_count > 50: [S6]
            :   :   :   :   retweet_count <= 50: [S7]
          retweet_count > 139:
          :...retweet_count <= 205: Non-Rumor (168.3/10.2)
            retweet_count > 205:
            :...retweet_count <= 209: Rumor (29.5/2.8)
              retweet_count > 209: [S8]

```

SubTree [S1]

user\_followers\_count <= 1998: Rumor (357.2/144.2)  
user\_followers\_count > 1998: Non-Rumor (70.4/26.9)

SubTree [S2]

user\_followers\_count <= 242: Rumor (79.6/31.3)  
user\_followers\_count > 242: Non-Rumor (59.1/8.3)

SubTree [S3]

user\_followers\_count <= 1273: Rumor (89.9/24.9)  
user\_followers\_count > 1273: Non-Rumor (369.8/169)

SubTree [S4]

retweet\_count > 1: Non-Rumor (189.1/6.5)  
retweet\_count <= 1:  
:...user\_followers\_count <= 284: Rumor (169.8/65.7)  
    user\_followers\_count > 284: Non-Rumor (55.3)

SubTree [S5]

retweet\_count <= 131: Non-Rumor (64.4/22.1)  
retweet\_count > 131: Rumor (111.9/5.4)

SubTree [S6]

retweet\_count <= 83: Non-Rumor (112.7/19.2)  
retweet\_count > 83: Rumor (60/18.2)

SubTree [S7]

retweet\_count > 49: Rumor (32.1)  
retweet\_count <= 49:  
:...retweet\_count > 45: Non-Rumor (22.1)  
    retweet\_count <= 45:  
        :...retweet\_count <= 44: Non-Rumor (101.3/42.8)  
            retweet\_count > 44: Rumor (41.5)

SubTree [S8]

retweet\_count <= 222: Non-Rumor (53.4)  
retweet\_count > 222:  
:...retweet\_count <= 283:  
    :...retweet\_count > 282: Rumor (111.2)  
    : retweet\_count <= 282:  
        : ...retweet\_count <= 231: Rumor (39.1/2.6)  
        : retweet\_count > 231: Non-Rumor (89.3/25.6)  
retweet\_count > 283:  
:...retweet\_count <= 369:  
    :...retweet\_count > 339: Non-Rumor (48.6)  
    : retweet\_count <= 339:  
        : ...retweet\_count <= 302: Non-Rumor (22.6)  
        : retweet\_count > 302: Rumor (93.5/37.7)  
retweet\_count > 369:  
:...retweet\_count <= 401: Rumor (136.1/35.4)  
    retweet\_count > 401:  
        :...retweet\_count <= 432: Non-Rumor (30.6)  
        retweet\_count > 432:  
            :...retweet\_count <= 449: Rumor (38.2/9.6)  
            retweet\_count > 449:  
                :...retweet\_count > 797:  
                    :...retweet\_count <= 846: Rumor (40.1/2)

```

:   retweet_count > 846: Non-Rumor (84.2/35.6)
retweet_count <= 797:
:...retweet_count > 749: Non-Rumor (20.4)
  retweet_count <= 749:
:...retweet_count <= 461: Non-Rumor (17.7)
    retweet_count > 461:
:...retweet_count <= 471: Rumor (28.4/3.6)
      retweet_count > 471:
:...retweet_count <= 736: Non-Rumor (205.1/71.8)
        retweet_count > 736: Rumor (11.5)

```

Evaluation on training data (9032 cases):

Trial	Decision Tree	
-----	Size	Errors
0	118	1748(19.4%)
1	38	2553(28.3%)
2	35	2471(27.4%)
3	18	2703(29.9%)
4	45	2653(29.4%)
5	8	3722(41.2%)
6	29	2400(26.6%)
7	41	2766(30.6%)
8	28	2542(28.1%)
9	62	2077(23.0%)
boost		1843(20.4%) <<

(a)	(b)	<-classified as
-----	-----	
4388	482	(a): class Non-Rumor
1361	2801	(b): class Rumor

Attribute usage:

```

99.99% retweet_count
90.99% user_followers_count
80.59% favorite_count

```

Time: 0.7 secs

```
CrossTable(user_test$Type,user_boost_pred10,prop.chisq=FALSE,prop.c=FALSE,prop.r=FALSE,dnn=c('actual default','predicted default'))
```

Cell Contents

	N
N / Table Total	

Total Observations in Table: 1004

actual	predicted Non-Rumor	Rumor	Row Total
Non-Rumor	447 0.445	116 0.116	563
Rumor	112 0.112	329 0.328	441
Column Total	559	445	1004

## Appendix B

**Decision tree for predicting gender based on factors like retweets, user favorites, user followers and user friends**

```
prop.table(table(user_train$Gender))
```

```
      andy      female      male  
0.6957084 0.1481386 0.1561531
```

```
> prop.table(table(user_test$Gender))
```

```
      andy      female      male  
0.7176106 0.1334368 0.1489527
```

```
Call:
```

```
C5.0.default(x = user_train[-5], y = as.factor(user_train$Gender))
```

Classification Tree

Number of samples: 3868

Number of predictors: 5

Tree size: 58

Non-standard options: attempt to group attributes

```
> summary(user_model)
```

```
Call:
```

```
C5.0.default(x = user_train[-5], y = as.factor(user_train$Gender))
```

C5.0 [Release 2.07 GPL Edition]

Thu Mar 30 14:36:31 2017

-----  
Class specified by attribute `outcome`

Read 3868 cases (6 attributes) from undefined.data

Decision tree:

Type in {Politics, City}:

```
...user_followers_count > 242: andy (1196.6/340.6)  
: user_followers_count <= 242:  
:   ...user_followers_count <= 33:  
:     ...Type = Politics: andy (59.1/29.1)  
:     : Type = City:  
:       ...retweet_count > 423: female (116/53)  
:       : retweet_count <= 423:  
:         ...user_friends_count <= 96: andy (34/13)  
:         : user_friends_count > 96:  
:           ...user_friends_count <= 149: female (6)  
:           : user_friends_count > 149: male (9/5)  
:       user_followers_count > 33:  
:     ...Type = City: andy (531/204)  
:     Type = Politics:  
:       ...user_friends_count <= 351: andy (119.2/55.2)  
:       : user_friends_count > 351:  
:         ...user_friends_count <= 450: andy (20/4)  
:         : user_friends_count > 450:  
:           ...user_followers_count <= 145: female (16/6)  
:           : user_followers_count > 145:
```



```

:      :...user_followers_count <= 161: andy (4)
:      user_followers_count > 161:
:      :...user_followers_count <= 186: female (7)
:      user_followers_count > 186:
:      :...user_followers_count <= 210: andy (8)
:      user_followers_count > 210: female (5/1)
Type in {electronics,transport}:
:...user_friends_count <= 33:
:  :...user_followers_count > 13: andy (165/11)
:  user_followers_count <= 13:
:  :...retweet_count <= 5: andy (7/1)
:  retweet_count > 5: male (7/1)
user_friends_count > 33:
:...user_friends_count <= 52:
:  :...user_friends_count <= 35: male (6)
:  user_friends_count > 35:
:  :...Type = transport: andy (14/4)
:  Type = electronics:
:  :...user_friends_count <= 40: andy (14/1)
:  user_friends_count > 40:
:  :...retweet_count > 58: andy (8/2)
:  retweet_count <= 58:
:  :...user_friends_count > 43: male (19/2)
:  user_friends_count <= 43:
:  :...user_followers_count <= 231: andy (3)
:  user_followers_count > 231: male (2)
user_friends_count > 52:
:...retweet_count > 209: andy (195/31)
:  retweet_count <= 209:
:  :...retweet_count <= 4: andy (611/133)
:  retweet_count > 4:
:  :...retweet_count <= 30:
:  :  :...Type = transport: andy (35/11)
:  :  Type = electronics:
:  :  :...retweet_count <= 14:
:  :  :  :...favorite_count > 2: andy (5)
:  :  :  favorite_count <= 2:
:  :  :  :...user_followers_count <= 863: andy (35/7)
:  :  :  user_followers_count > 863:
:  :  :  :...user_friends_count <= 1996: [s1]
:  :  :  user_friends_count > 1996: [s2]
:  :  retweet_count > 14:
:  :  :...user_followers_count > 2180: andy (11/1)
:  :  user_followers_count <= 2180:
:  :  :...user_followers_count > 1059:
:  :  :  :...retweet_count <= 22: female (5/1)
:  :  :  retweet_count > 22: male (4/1)
:  :  user_followers_count <= 1059:
:  :  :...retweet_count > 17: andy (14/6)
:  :  retweet_count <= 17:
:  :  :...user_friends_count <= 141: male (3)
:  :  user_friends_count > 141: andy (12/5)
retweet_count > 30:
:...user_followers_count > 586: andy (208/36)
:  user_followers_count <= 586:
:  :...retweet_count <= 121: andy (212/57)
:  retweet_count > 121:
:  :...user_followers_count <= 26: andy (10)
:  user_followers_count > 26:
:  :...user_followers_count <= 33:
:  :  :...user_followers_count <= 27: female (2)
:  :  user_followers_count > 27: male (5)
:  user_followers_count > 33:

```

```

: ...user_followers_count > 542: male (5)
  user_followers_count <= 542: [S3]

```

SubTree [S1]

```

user_friends_count <= 1090: male (6)
user_friends_count > 1090: female (4/1)

```

SubTree [S2]

```

user_followers_count <= 2687: andy (5)
user_followers_count > 2687: male (5/1)

```

SubTree [S3]

```

user_followers_count > 292: andy (26/6)
user_followers_count <= 292:
: ...user_friends_count > 885:
  : ...user_friends_count <= 1353: andy (4)
  :   user_friends_count > 1353: female (2)
  user_friends_count <= 885:
  : ...user_friends_count > 514:
    : ...user_followers_count <= 118: female (2)
    :   user_followers_count > 118: male (7)
    user_friends_count <= 514:
    : ...user_followers_count <= 109:
      : ...user_followers_count > 60: andy (16)
      :   user_followers_count <= 60:
        :   : ...user_followers_count <= 49: andy (5/1)
        :     user_followers_count > 49: male (5)
      user_followers_count > 109:
      : ...user_followers_count <= 151: male (9/2)
      :   user_followers_count > 151:
        : ...user_followers_count > 258: male (4)
        :   user_followers_count <= 258:
          : ...user_followers_count > 175: andy (10/2)
          :   user_followers_count <= 175:
            : ...user_friends_count <= 227: andy (5/1)
            :   user_friends_count > 227: male (5)

```

Evaluation on training data (3868 cases):

Decision Tree			
-----			
Size	Errors		
58 1036(26.8%)	<<		
(a)	(b)	(c)	<-classified as
----	----	----	
2640	44	7	(a): class andy
465	103	5	(b): class female
497	18	89	(c): class male

Attribute usage:

```

100.00% Type
76.53% user_followers_count
50.80% user_friends_count
44.03% retweet_count

```

1.55% favorite\_count

Time: 0.1 secs

```
> user_pred=predict(user_model,user_test)
> library(gmodels)
> CrossTable(user_test$Gender,user_pred,prop.chisq=FALSE,prop.c=FALSE,prop.r=FALSE,dn
n=c('actual default','predicted default'))
```

Cell Contents

	N
N / Table Total	

Total Observations in Table: 1289

actual default	predicted default			Row Total
	andy	female	male	
andy	887 0.688	32 0.025	6 0.005	925
female	154 0.119	17 0.013	1 0.001	172
male	158 0.123	11 0.009	23 0.018	192
Column Total	1199	60	30	1289

## After Boosting

```
user_boost10=C5.0(user_train[-5],as.factor(user_train$Gender),trials=10)
> user_boost10
```

Call:

```
C5.0.default(x = user_train[-5], y = as.factor(user_train$Gender), trials = 10)
```

Classification Tree

Number of samples: 3868

Number of predictors: 4

Number of boosting iterations: 10 requested; 1 used due to early stopping

Non-standard options: attempt to group attributes

```
> summary(user_boost10)
```

Call:

```
C5.0.default(x = user_train[-5], y = as.factor(user_train$Gender), trials = 10)
```

-----

Class specified by attribute `outcome`

Read 3868 cases (5 attributes) from undefined.data

----- Trial 0: -----

Decision tree:

```

user_followers_count > 254:
: ...favorite_count <= 2: andy (2319/564)
:   favorite_count > 2:
:     ...user_followers_count <= 19474: female (10/3)
:     user_followers_count > 19474: andy (41/6)
user_followers_count <= 254:
: ...retweet_count > 174: andy (622/265)
:   retweet_count <= 174:
:     ...user_followers_count > 246:
:       ...user_friends_count <= 103: male (15)
:       user_friends_count > 103: andy (14/5)
:     user_followers_count <= 246:
:       ...user_friends_count > 597:
:         ...user_friends_count > 841: andy (44/11)
:         user_friends_count <= 841:
:           ...user_friends_count <= 604: female (8)
:           user_friends_count > 604:
:             ...retweet_count > 114: male (5/1)
:             retweet_count <= 114:
:               ...user_followers_count <= 207: andy (17/8)
:               user_followers_count > 207:
:                 ...user_followers_count <= 226: female (11)
:                 user_followers_count > 226: andy (3)
:       user_friends_count <= 597:
:         ...retweet_count <= 2: andy (335/75)
:         retweet_count > 2:
:           ...user_friends_count <= 52:
:             ...user_followers_count <= 14: male (21/4)
:             user_followers_count > 14: andy (26/7)
:           user_friends_count > 52:
:             ...retweet_count <= 106: andy (251/97)
:             retweet_count > 106:
:               ...user_followers_count <= 109: andy (79/12)
:               user_followers_count > 109:
:                 ...retweet_count <= 136: andy (17/3)
:                 retweet_count > 136:
:                   ...user_followers_count <= 185: male (22/5)
:                   user_followers_count > 185: andy (8/1)

```

----- Trial 1: -----

Decision tree:  
andy (3868/1556)

\*\*\* boosting reduced to 1 trial since last classifier is very inaccurate

\*\*\* boosting abandoned (too few classifiers)

Evaluation on training data (3868 cases):

Decision Tree

```
-----
Size      Errors
  20 1067(27.6%)  <<
```

(a)	(b)	(c)	<-classified as
2722	2	6	(a): class andy
517	26	4	(b): class female
537	1	53	(c): class male

Attribute usage:  
100.00% user\_followers\_count  
61.27% favorite\_count  
38.73% retweet\_count  
22.65% user\_friends\_count

Time: 0.2 secs

## APPENDIX C

Decision tree for predicting type of tweet based on user follower, number of retweets, number of friends

```
prop.table(table(user_train$Type))
```

```
      City electronics    Politics    transport
0.3877973  0.3094623  0.1489142  0.1538263
> prop.table(table(user_test$Type))
```

```
      City electronics    Politics    transport
0.3878976  0.2948022  0.1706749  0.1466253
```

```
summary(user_model)
```

Call:

```
C5.0.default(x = user_train[-5], y = as.factor(user_train$Type))
```

C5.0 [Release 2.07 GPL Edition]

Thu Mar 30 16:51:04 2017

-----  
Class specified by attribute `outcome`

Read 3868 cases (5 attributes) from undefined.data

Decision tree:

```
retweet_count > 283:
...retweet_count > 2859: Politics (71/1)
:   retweet_count <= 2859:
:       ...retweet_count > 1750:
:           ...retweet_count <= 1897: City (584)
:           :   retweet_count > 1897:
:           :       ...retweet_count <= 2827: Politics (5)
:           :       :   retweet_count > 2827: City (16)
:           :   retweet_count <= 1750:
:           :       ...retweet_count <= 492:
:           :           ...retweet_count > 399:
:           :           :   ...retweet_count <= 401: City (84)
:           :           :   :   retweet_count > 401:
:           :           :       ...retweet_count <= 448: Politics (13/1)
:           :           :       :   retweet_count > 448:
:           :           :           ...user_friends_count > 1489: City (30/1)
:           :           :           :   user_friends_count <= 1489:
:           :           :           :       ...retweet_count <= 449: City (4)
:           :           :           :       :   retweet_count > 449:
:           :           :           :           ...retweet_count <= 488: Politics (6)
:           :           :           :           :   retweet_count > 488: City (4)
:           :           :   retweet_count <= 399:
:           :           :       ...retweet_count <= 308:
:           :           :           ...retweet_count <= 294: Politics (2)
:           :           :           :   retweet_count > 294: City (10)
:           :           :       retweet_count > 308:
:           :           :           ...retweet_count <= 369: Politics (36)
:           :           :           :   retweet_count > 369:
:           :           :           :       ...retweet_count > 370: Politics (5)
:           :           :           :       :   retweet_count <= 370:
```

```

:         :...user_friends_count <= 230: City (3)
:         user_friends_count > 230:
:         :...user_followers_count <= 324: Politics (7)
:         user_followers_count > 324:
:         :...user_friends_count <= 1797: City (3)
:         user_friends_count > 1797: Politics (2)
:
: retweet_count > 492:
: :...retweet_count <= 668: Politics (52)
:   retweet_count > 668:
:   :...retweet_count <= 727: City (9)
:     retweet_count > 727:
:     :...retweet_count <= 801: Politics (13)
:       retweet_count > 801:
:       :...retweet_count <= 820: City (12)
:         retweet_count > 820:
:         :...retweet_count <= 857: Politics (18)
:           retweet_count > 857:
:           :...retweet_count <= 901: City (23/1)
:             retweet_count > 901:
:             :...retweet_count <= 1358: Politics (22/1)
:               retweet_count > 1358:
:               :...retweet_count <= 1414: City (17)
:                 retweet_count > 1414: Politics (5)
:
: retweet_count <= 283:
: :...retweet_count > 271: transport (188)
:   retweet_count <= 271:
:   :...retweet_count > 139:
:     :...retweet_count <= 181: Politics (26/3)
:       retweet_count > 181:
:       :...retweet_count > 231: Politics (11)
:         retweet_count <= 231:
:         :...retweet_count > 208:
:           :...retweet_count <= 226: Politics (8)
:             retweet_count > 226: City (19)
:             :...retweet_count <= 208:
:               :...retweet_count > 206: City (55)
:                 retweet_count <= 206:
:                 :...retweet_count <= 192: City (4)
:                   retweet_count > 192: Politics (2)
:
: retweet_count <= 139:
: :...retweet_count > 136: electronics (214/1)
:   retweet_count <= 136:
:   :...user_friends_count <= 109:
:     :...user_followers_count > 203:
:       :...retweet_count <= 0:
:         :...user_followers_count <= 527: electronics (122/7)
:           user_followers_count > 527:
:           :...user_followers_count <= 696: transport (5/1)
:             user_followers_count > 696: electronics (67/13)
:             :...retweet_count > 0:
:               :...retweet_count <= 28:
:                 :...retweet_count <= 3:
:                   :...user_friends_count <= 43: City (4/1)
:                     user_friends_count > 43: electronics (6/1)
:                     :...retweet_count > 3: [S1]
:                   :...retweet_count > 28:
:                     :...retweet_count > 106: electronics (3)
:                       retweet_count <= 106:
:                       :...user_followers_count <= 242: City (2)
:                         user_followers_count > 242:
:                         :...retweet_count <= 65: transport (6)
:                           retweet_count > 65: [S2]
:                       :...user_followers_count <= 203:
:                         :...retweet_count > 81:

```

```

:      : ...retweet_count > 114: City (3)
:      : retweet_count <= 114:
:      :   : ...retweet_count <= 103:
:      :   :   : ...retweet_count <= 92: electronics (15)
:      :   :   : retweet_count > 92: City (2)
:      :   : retweet_count > 103:
:      :   :   : ...retweet_count <= 106: transport (5)
:      :   :   : retweet_count > 106: electronics (17)
:      : retweet_count <= 81:
:      : ...retweet_count > 29:
:      :   : ...user_friends_count > 60: City (10/2)
:      :   :   : user_friends_count <= 60:
:      :   :   :   : ...retweet_count <= 32: City (3)
:      :   :   :   : retweet_count > 32: transport (10/2)
:      :   : retweet_count <= 29:
:      :   :   : ...retweet_count > 15:
:      :   :   :   : ...retweet_count <= 16: Politics (2)
:      :   :   :   :   : retweet_count > 16:
:      :   :   :   :   :   : ...retweet_count > 19: Politics (3/1)
:      :   :   :   :   :   : retweet_count <= 19: [S3]
:      :   :   : retweet_count <= 15:
:      :   :   :   : ...user_followers_count > 96:
:      :   :   :   :   : ...user_friends_count > 51: [S4]
:      :   :   :   :   :   : user_friends_count <= 51: [S5]
:      :   :   :   :   : user_followers_count <= 96:
:      :   :   :   :   :   : ...user_followers_count > 11: [S6]
:      :   :   :   :   :   :   : user_followers_count <= 11: [S7]
:      : user_friends_count > 109:
:      : ...retweet_count <= 0:
:      :   : ...user_followers_count <= 112:
:      :   :   : ...favorite_count > 0: City (3/1)
:      :   :   :   : favorite_count <= 0:
:      :   :   :   :   : ...user_followers_count <= 54:
:      :   :   :   :   :   : ...user_friends_count > 245: City (4/1)
:      :   :   :   :   :   :   : user_friends_count <= 245: [S8]
:      :   :   :   :   :   : user_followers_count > 54: [S9]
:      :   : user_followers_count > 112:
:      :   :   : ...user_friends_count > 8716:
:      :   :   :   : ...user_friends_count > 13300:
:      :   :   :   :   : ...user_friends_count <= 40464: electronics (12/3)
:      :   :   :   :   :   : user_friends_count > 40464: City (9/2)
:      :   :   :   :   : user_friends_count <= 13300:
:      :   :   :   :   :   : ...user_followers_count > 13287: transport (5/1)
:      :   :   :   :   :   :   : user_followers_count <= 13287: [S10]
:      :   :   : user_friends_count <= 8716:
:      :   :   :   : ...user_followers_count > 8353:
:      :   :   :   :   : ...user_followers_count <= 11661: transport (13/2)
:      :   :   :   :   :   : user_followers_count > 11661: [S11]
:      :   :   :   : user_followers_count <= 8353:
:      :   :   :   :   : ...favorite_count > 0: [S12]
:      :   :   :   :   :   : favorite_count <= 0:
:      :   :   :   :   :   :   : ...user_followers_count > 998:
:      :   :   :   :   :   :   :   : ...user_friends_count <= 892:
:      :   :   :   :   :   :   :   :   : ...user_followers_count > 1050: [S13]
:      :   :   :   :   :   :   :   :   :   : user_followers_count <= 1050: [S14]
:      :   :   :   :   :   :   :   :   : user_friends_count > 892: [S15]
:      :   :   :   :   :   :   : user_followers_count <= 998:
:      :   :   :   :   :   :   :   : ...user_friends_count > 328: [S16]
:      :   :   :   :   :   :   :   :   : user_friends_count <= 328:
:      :   :   :   :   :   :   :   :   : ...user_followers_count > 200: [S17]
:      :   :   :   :   :   :   :   :   :   : user_followers_count <= 200: [S18]
:      : retweet_count > 0:
:      :   : ...retweet_count > 103:
:      :   :   : ...retweet_count <= 106: transport (65/2)

```



```

:   retweet_count > 106:
:   :...retweet_count <= 112: electronics (74/1)
:   :   retweet_count > 112:
:   :   :...retweet_count <= 131: Politics (9)
:   :   :   retweet_count > 131: City (27/5)
retweet_count <= 103:
:...retweet_count > 85:
:   :...retweet_count <= 86: electronics (83)
:   :   retweet_count > 86:
:   :   :...retweet_count <= 93: Politics (7)
:   :   :   retweet_count > 93: City (55/1)
retweet_count <= 85:
:...retweet_count > 34:
:   :...retweet_count > 45:
:   :   :...retweet_count > 50: Politics (30/6)
:   :   :   retweet_count <= 50:
:   :   :   :...retweet_count <= 49: Politics (2)
:   :   :   :   retweet_count > 49: City (38)
:   :   retweet_count <= 45:
:   :   :...retweet_count > 44: transport (26)
:   :   :   retweet_count <= 44:
:   :   :   :...retweet_count > 40: Politics (12)
:   :   :   :   retweet_count <= 40: [s19]
retweet_count <= 34:
:...retweet_count > 32: [s20]
:   retweet_count <= 32:
:   :...retweet_count > 17:
:   :   :...retweet_count > 28: [s21]
:   :   :   retweet_count <= 28: [s22]
:   :   retweet_count <= 17:
:   :   :...user_friends_count <= 124: [s23]
:   :   :   user_friends_count > 124:
:   :   :   :...retweet_count > 16: [s24]
:   :   :   :   retweet_count <= 16:
:   :   :   :   :...retweet_count > 11:
:   :   :   :   :   :...retweet_count <= 14: [s25]
:   :   :   :   :   :   retweet_count > 14: [s26]
:   :   :   :   retweet_count <= 11:
:   :   :   :   :...favorite_count > 7: [s27]
:   :   :   :   :   favorite_count <= 7: [s28]

```

SubTree [s1]

```

user_followers_count <= 114320: Politics (5/1)
user_followers_count > 114320: electronics (3/1)

```

SubTree [s2]

```

retweet_count <= 103: electronics (3/1)
retweet_count > 103: transport (3)

```

SubTree [s3]

```

user_followers_count <= 85: electronics (2)
user_followers_count > 85: City (2)

```

SubTree [s4]

```

user_friends_count <= 77: Politics (4/2)
user_friends_count > 77:
:...user_followers_count <= 119: electronics (2/1)
:   user_followers_count > 119: transport (5)

```

SubTree [s5]

```
user_friends_count > 29: electronics (9)
user_friends_count <= 29:
:...retweet_count > 0: transport (3)
    retweet_count <= 0:
        :...user_friends_count <= 27: electronics (14/2)
            user_friends_count > 27: transport (2)
```

SubTree [S6]

```
user_friends_count <= 96: electronics (112/46)
user_friends_count > 96: transport (3/1)
```

SubTree [S7]

```
retweet_count > 7: electronics (2)
retweet_count <= 7:
:...retweet_count > 0: transport (3/1)
    retweet_count <= 0:
        :...user_friends_count <= 11:
            :...user_followers_count <= 1: electronics (3/1)
                : user_followers_count > 1:
                    : :...user_friends_count <= 6: transport (4/1)
                        : user_friends_count > 6:
                            : :...user_friends_count <= 10: City (3/1)
                                : user_friends_count > 10: electronics (2/1)
                            user_friends_count > 11:
                                :...user_followers_count <= 2: City (3)
                                    user_followers_count > 2:
                                        :...user_friends_count > 50: City (7/2)
                                            user_friends_count <= 50:
                                                :...user_friends_count <= 30: Politics (4)
                                                    user_friends_count > 30: electronics (3/1)
```

SubTree [S8]

```
user_followers_count <= 17: City (2/1)
user_followers_count > 17: Politics (7)
```

SubTree [S9]

```
user_followers_count <= 60: electronics (9/2)
user_followers_count > 60:
:...user_followers_count <= 72: City (7/2)
    user_followers_count > 72:
        :...user_friends_count > 318: electronics (7/4)
            user_friends_count <= 318:
                :...user_followers_count <= 73: electronics (2)
                    user_followers_count > 73:
                        :...user_followers_count <= 87: City (7/1)
                            user_followers_count > 87: electronics (3/1)
```

SubTree [S10]

```
user_followers_count <= 11961: Politics (3/1)
user_followers_count > 11961: City (13)
```

SubTree [S11]

```
user_followers_count > 80482: electronics (4)
user_followers_count <= 80482:
:...user_followers_count > 23681: transport (6)
    user_followers_count <= 23681:
        :...user_friends_count <= 5905: electronics (14/4)
```

```

        user_friends_count > 5905: transport (5/1)
SubTree [S12]
user_friends_count <= 364: electronics (13/2)
user_friends_count > 364:
:...user_followers_count > 2741:
    :...user_followers_count <= 4680: electronics (3)
    : user_followers_count > 4680: City (3/2)
    user_followers_count <= 2741:
    :...user_followers_count > 1524: transport (9/2)
    user_followers_count <= 1524:
    :...user_friends_count <= 1110:
        :...user_friends_count <= 741: transport (8/1)
        : user_friends_count > 741: City (7/3)
    user_friends_count > 1110:
    :...user_friends_count > 2453: electronics (2/1)
    user_friends_count <= 2453:
    :...user_followers_count <= 812: Politics (2)
    user_followers_count > 812: electronics (3/1)

SubTree [S13]
user_friends_count <= 147: transport (3/1)
user_friends_count > 147: electronics (57/6)

SubTree [S14]
user_followers_count <= 1009: electronics (2)
user_followers_count > 1009:
:...user_followers_count <= 1020: City (2)
    user_followers_count > 1020: transport (2)

SubTree [S15]
user_followers_count <= 1266: electronics (26/7)
user_followers_count > 1266:
:...user_followers_count > 1393: electronics (159/76)
    user_followers_count <= 1393:
    :...user_followers_count <= 1313: transport (4/1)
    user_followers_count > 1313: City (6/1)

SubTree [S16]
user_friends_count <= 359: transport (8/1)
user_friends_count > 359:
:...user_followers_count <= 301: electronics (44/20)
    user_followers_count > 301: City (107/74)

SubTree [S17]
user_friends_count <= 125: transport (4/1)
user_friends_count > 125: electronics (73/22)

SubTree [S18]
user_followers_count <= 118: transport (2)
user_followers_count > 118:
:...user_followers_count <= 145: electronics (8/2)
    user_followers_count > 145:
    :...user_friends_count > 265: City (4/1)
    user_friends_count <= 265:
    :...user_friends_count <= 187: City (2)
    user_friends_count > 187: Politics (6/2)

```

SubTree [S19]

user\_friends\_count <= 2598: City (14)  
user\_friends\_count > 2598:  
:...retweet\_count <= 35: City (2)  
    retweet\_count > 35: Politics (5/1)

SubTree [S20]

user\_friends\_count <= 1141: transport (47/13)  
user\_friends\_count > 1141: electronics (21/5)

SubTree [S21]

user\_followers\_count <= 495: City (19/1)  
user\_followers\_count > 495: Politics (6/2)

SubTree [S22]

retweet\_count > 27: electronics (18/3)  
retweet\_count <= 27:  
:...retweet\_count > 18: Politics (33)  
    retweet\_count <= 18:  
        :...user\_followers\_count <= 565: electronics (2)  
        user\_followers\_count > 565: Politics (4)

SubTree [S23]

user\_friends\_count > 122: transport (13)  
user\_friends\_count <= 122:  
:...user\_friends\_count <= 110: City (2)  
    user\_friends\_count > 110:  
        :...user\_followers\_count <= 26: Politics (2)  
        user\_followers\_count > 26: electronics (7/1)

SubTree [S24]

favorite\_count > 11: electronics (2)  
favorite\_count <= 11:  
:...user\_friends\_count <= 313: electronics (12/2)  
    user\_friends\_count > 313: City (27/15)

SubTree [S25]

user\_followers\_count <= 186: Politics (6/1)  
user\_followers\_count > 186: City (26/10)

SubTree [S26]

user\_friends\_count > 1270: City (13/1)  
user\_friends\_count <= 1270:  
:...user\_followers\_count <= 783: City (8/2)  
    user\_followers\_count > 783: transport (6/1)

SubTree [S27]

user\_friends\_count > 1384: City (10)  
user\_friends\_count <= 1384:  
:...user\_friends\_count <= 543: electronics (3)  
    user\_friends\_count > 543: transport (3)

SubTree [S28]

```

favorite_count > 0:
...user_followers_count <= 1285: City (9/2)
:   user_followers_count > 1285: electronics (22/6)
favorite_count <= 0:
...user_friends_count > 3525:
:   ...retweet_count > 7:
:       :   ...user_friends_count <= 4314: Politics (5/1)
:       :       user_friends_count > 4314: City (6/2)
:       retweet_count <= 7:
:           ...retweet_count > 3:
:               :   ...user_friends_count <= 4971: City (5)
:               :       user_friends_count > 4971: electronics (10/1)
:               retweet_count <= 3:
:                   ...user_friends_count <= 4914:
:                       :   ...user_followers_count <= 5030: Politics (5)
:                       :       user_followers_count > 5030: electronics (2)
:                       user_friends_count > 4914:
:                           ...retweet_count > 1:
:                               :   ...user_followers_count <= 1061: electronics (2)
:                               :       user_followers_count > 1061: City (3)
:                               retweet_count <= 1:
:                                   ...user_friends_count > 44200: City (2)
:                                   user_friends_count <= 44200:
:                                       ...user_friends_count > 11986: Politics (2)
:                                       user_friends_count <= 11986:
:                                           ...user_followers_count > 4384: electronics (3/1)
:                                           user_followers_count <= 4384:
:                                               ...user_friends_count > 4998: City (2)
:                                               user_friends_count <= 4998: [S29]
:   user_friends_count <= 3525:
:       ...retweet_count > 7:
:           :   ...retweet_count <= 8: City (28/7)
:           :       retweet_count > 8:
:               :   ...user_friends_count > 1141:
:               :       :   ...user_followers_count <= 2673: City (15)
:               :       :       user_followers_count > 2673: electronics (2)
:               :       user_friends_count <= 1141:
:               :           ...user_followers_count <= 82:
:               :               :   ...user_friends_count > 241: electronics (11)
:               :               :       user_friends_count <= 241:
:               :               :           :   ...user_followers_count <= 49: City (3)
:               :               :           :       user_followers_count > 49: electronics (3/1)
:               :               user_followers_count > 82:
:               :                   ...retweet_count <= 9:
:               :                       :   ...user_followers_count <= 297: City (4/1)
:               :                       :       user_followers_count > 297:
:               :                       :           :   ...user_friends_count > 885: City (2/1)
:               :                       :           :       user_friends_count <= 885: [S30]
:               :                       retweet_count > 9:
:               :                           ...retweet_count <= 10:
:               :                               :   ...user_friends_count <= 823: City (7)
:               :                               :       user_friends_count > 823: Politics (3/1)
:               :                               retweet_count > 10:
:               :                                   ...user_friends_count <= 279: electronics (3/1)
:               :                                   user_friends_count > 279:
:               :                                       ...user_friends_count <= 942: transport (8/4)
:               :                                       user_friends_count > 942: electronics (2)
:       retweet_count <= 7:
:           ...retweet_count > 5:
:               :   ...retweet_count > 6:
:               :       :   ...user_followers_count <= 309: Politics (6/2)
:               :       :       user_followers_count > 309: City (4/1)
:               :       retweet_count <= 6:
:               :           :   ...user_friends_count > 1170: electronics (8/1)

```

```

:      user_friends_count <= 1170:
:      :...user_friends_count <= 170: electronics (4/1)
:      :      user_friends_count > 170:
:      :      :...user_friends_count > 651: City (3/1)
:      :      :      user_friends_count <= 651:
:      :      :      :...user_followers_count <= 362: transport (5/1)
:      :      :      :      user_followers_count > 362: City (2/1)
:      retweet_count <= 5:
:      :...user_friends_count > 3007: Politics (4/2)
:      :      user_friends_count <= 3007:
:      :      :...user_friends_count > 1981:
:      :      :      :...retweet_count <= 3: City (7)
:      :      :      :      retweet_count > 3:
:      :      :      :      :...user_followers_count <= 627: transport (2)
:      :      :      :      :      user_followers_count > 627:
:      :      :      :      :      :...user_followers_count <= 2673: electronics (2)
:      :      :      :      :      :      user_followers_count > 2673: City (2)
:      :      user_friends_count <= 1981:
:      :      :...retweet_count > 2: City (35/13)
:      :      :      retweet_count <= 2:
:      :      :      :...retweet_count <= 1:
:      :      :      :      :...user_followers_count <= 1202:
:      :      :      :      :      :...user_friends_count <= 180: electronics (9/3)
:      :      :      :      :      :      :      user_friends_count > 180: City (28/11)
:      :      :      :      :      :      :      :      user_followers_count > 1202: [S31]
:      :      :      :      retweet_count > 1:
:      :      :      :      :...user_friends_count <= 207: City (8/1)
:      :      :      :      :      user_friends_count > 207:
:      :      :      :      :      :...user_friends_count <= 688: [S32]
:      :      :      :      :      :      user_friends_count > 688:
:      :      :      :      :      :      :...user_friends_count <= 1122: City (6)
:      :      :      :      :      :      :      user_friends_count > 1122: [S33]

```

SubTree [S29]

```

user_followers_count <= 2487: Politics (2)
user_followers_count > 2487: City (2)

```

SubTree [S30]

```

user_followers_count <= 403: transport (3)
user_followers_count > 403: electronics (6/1)

```

SubTree [S31]

```

user_followers_count <= 3148: electronics (11/2)
user_followers_count > 3148: City (2/1)

```

SubTree [S32]

```

user_followers_count > 600: transport (2)
user_followers_count <= 600:
:...user_friends_count > 463: electronics (5)
:      user_friends_count <= 463:
:      :...user_friends_count <= 323: electronics (2)
:      :      user_friends_count > 323: City (3)

```

SubTree [S33]

```

user_friends_count <= 1264: electronics (2)
user_friends_count > 1264:
:...user_followers_count <= 2204: City (4/1)
:      user_followers_count > 2204: electronics (3)

```

Evaluation on training data (3868 cases):

```

      Decision Tree
-----
Size      Errors
222  499(12.9%)  <<

      (a)   (b)   (c)   (d)   <-classified as
-----
1350   116    22    12   (a): class City
 59   1117     3    18   (b): class electronics
 66    48   454     8   (c): class Politics
 50    93     4   448   (d): class transport
  
```

Attribute usage:

```

100.00% retweet_count
 60.60% user_friends_count
 39.01% user_followers_count
 26.58% favorite_count
  
```

Time: 0.1 secs

```

> user_pred=predict(user_model,user_test)
> library(gmodels)
> CrossTable(user_test$Type,user_pred,prop.chisq=FALSE,prop.c=FALSE,prop.r=FALSE,dnn=c('actual default',
', 'predicted default'))
  
```

Cell Contents

	N
N / Table Total	

Total Observations in Table: 1289

actual default	predicted default				Row Total
	City	electronics	Politics	transport	
City	426 0.330	41 0.032	21 0.016	12 0.009	500
electronics	34 0.026	330 0.256	4 0.003	12 0.009	380
Politics	35 0.027	21 0.016	159 0.123	5 0.004	220
transport	19 0.015	45 0.035	1 0.001	124 0.096	189
Column Total	514	437	185	153	1289

user\_boost10

Call:

```
C5.0.default(x = user_train[-5], y = as.factor(user_train$Type), trials = 10)
```

## Classification Tree

Number of samples: 3868

Number of predictors: 4

Number of boosting iterations: 10

Average tree size: 200.6

## Non-standard options: attempt to group attributes

```
> summary(user_boost10)
```

```
:      : user_friends_count <= 2418: [S12]
:      :     retweet_count > 34:
:      :     ....retweet_count > 85:
:      :     ....retweet_count <= 86: electronics (25.7)
:      :     retweet_count > 86:
:      :     ....retweet_count > 110: [S13]
:      :     retweet_count <= 110: [S14]
:      :     retweet_count <= 85:
:      :     ....retweet_count <= 45:
:      :     ....retweet_count > 44: transport (8.6)
:      :     retweet_count <= 44: [S15]
:      :     retweet_count > 45:
:      :     ....retweet_count <= 49: Politics (5.4)
:      :     retweet_count > 49:
:      :     ....retweet_count <= 50: City (10.4)
:      :     retweet_count > 50: [S16]
:      : retweet_count <= 17:
:      : ....favorite_count > 2:
:      :     ....user_followers_count <= 455: Politics (3.7)
:      :     user_followers_count > 455: [S17]
:      : favorite_count <= 2:
:      : ....user_friends_count > 11384:
:      :     ....user_followers_count <= 28014: Politics (12.6)
:      :     user_followers_count > 28014: City (14.6/4.9)
:      :     user_friends_count <= 11384:
:      :     ....user_followers_count <= 16: Politics (22.9/10.9)
:      :     user_followers_count > 16:
:      :     ....user_friends_count > 4998: [S18]
:      :     user_friends_count <= 4998:
:      :     ....retweet_count > 15:
:      :         ....retweet_count <= 16: City (7.5/3.4)
:      :         retweet_count > 16:
:      :             ....user_friends_count <= 313: [S19]
:      :             user_friends_count > 313: [S20]
:      :         retweet_count <= 15:
:      :         ....retweet_count > 11: [S21]
:      :             retweet_count <= 11:
:      :                 ....user_friends_count > 3839: [S22]
:      :                 user_friends_count <= 3839: [S23]
```

SubTree [S1]

```
user_friends_count <= 1: City (16.1/7.3)
```

```
user_friends_count <= 1: electronics (10.1/719)
user_friends_count > 1: electronics (49.2/30)
```

SubTree [s2]



user\_followers\_count <= 50: City (9/3.8)  
user\_followers\_count > 50: electronics (22.1/9.9)

SubTree [S3]

user\_friends\_count <= 54: electronics (14.2/1.7)  
user\_friends\_count > 54:  
:...user\_friends\_count <= 58: Politics (4)  
    user\_friends\_count > 58: City (26.7/12.9)

SubTree [S4]

user\_friends\_count > 458: transport (11.1/5.3)  
user\_friends\_count <= 458:  
:...user\_friends\_count > 391: Politics (12.8/6.1)  
    user\_friends\_count <= 391:  
        :...user\_friends\_count > 318: Politics (15.9/7.3)  
            user\_friends\_count <= 318:  
                :...user\_followers\_count <= 118: transport (19.7/11.1)  
                    user\_followers\_count > 118: electronics (28.1/15.1)

SubTree [S5]

user\_followers\_count > 1024: electronics (16.7/5.8)  
user\_followers\_count <= 1024:  
:...user\_friends\_count <= 328: electronics (11.2/4.1)  
    user\_friends\_count > 328: transport (30.1/8.8)

SubTree [S6]

user\_followers\_count <= 358: electronics (5.7)  
user\_followers\_count > 358:  
:...user\_followers\_count <= 510: transport (19.3/3.9)  
    user\_followers\_count > 510:  
        :...user\_followers\_count > 6384: transport (4.9)  
            user\_followers\_count <= 6384:  
                :...user\_friends\_count <= 248: electronics (11.6)  
                    user\_friends\_count > 248:  
                        :...user\_followers\_count <= 913: transport (8.7)  
                            user\_followers\_count > 913: electronics (17.4/3.3)

SubTree [S7]

user\_friends\_count <= 813: electronics (14.7/6.5)  
user\_friends\_count > 813:  
:...user\_friends\_count <= 1522: City (20.6/10.2)  
    user\_friends\_count > 1522: electronics (6.3)

SubTree [S8]

user\_friends\_count <= 11846: City (23.6/11.2)  
user\_friends\_count > 11846: transport (12.8/6)

SubTree [S9]

user\_followers\_count > 16372: City (6.2)  
user\_followers\_count <= 16372:  
:...user\_friends\_count <= 1313: City (3.5)  
    user\_friends\_count > 1313: transport (29.7/6.4)

SubTree [S10]

```

user_followers_count > 6283: City (29.3/16.8)
user_followers_count <= 6283:
:...user_followers_count > 5413: transport (16.8/6.1)
  user_followers_count <= 5413:
:...user_followers_count > 4621:
  :...user_followers_count <= 5030: electronics (14.1/3.5)
  : user_followers_count > 5030: Politics (18/10.1)
  user_followers_count <= 4621:
:...user_followers_count > 4090: transport (23.2/12.8)
  user_followers_count <= 4090:
:...user_friends_count > 3297:
  :...user_friends_count > 4998: City (8.4/2.4)
  : user_friends_count <= 4998:
  : :...user_friends_count <= 4325: City (29.5/15.2)
  : user_friends_count > 4325: electronics (17.3/3.3)
  user_friends_count <= 3297:
:...user_followers_count > 2548:
  :...user_followers_count <= 2612: electronics (6.6)
  : user_followers_count > 2612:
  : :...user_friends_count > 2763: transport (19/9.4)
  : user_friends_count <= 2763:
  : :...user_friends_count > 2361: City (13.8)
  : user_friends_count <= 2361:
  : :...user_friends_count <= 1221: electronics (8.1/2.9)
  : user_friends_count > 1221: transport (22.1/6.5)
  user_followers_count <= 2548:
:...user_followers_count > 2436: transport (22/10.9)
  user_followers_count <= 2436:
  :...user_followers_count <= 983:
  : :...user_followers_count > 956: transport (7.2)
  : user_followers_count <= 956:
  : :...user_friends_count <= 488: transport (15.7/7.1)
  : user_friends_count > 488:
  : :...user_followers_count > 644:
  : : :...user_followers_count <= 766: [S24]
  : : user_followers_count > 766: [S25]
  : : user_followers_count <= 644:
  : : :...user_followers_count <= 394: [S26]
  : : user_followers_count > 394: [S27]
  user_followers_count > 983:
  :...user_followers_count <= 1028:
  : :...user_friends_count <= 707: City (6.1)
  : : user_friends_count > 707: electronics (18.6/5.8)
  : user_followers_count > 1028: [S28]

```

SubTree [S11]

```

user_followers_count <= 495: City (13.4)
user_followers_count > 495: Politics (15.5/4)

```

SubTree [S12]

```

user_friends_count <= 2133: transport (70.2/30.4)
user_friends_count > 2133: electronics (6.1)

```

SubTree [S13]

```

retweet_count <= 112: electronics (23.9)
retweet_count > 112: City (32.3/14.3)

```

SubTree [S14]

```

retweet_count > 103: transport (23/4.6)

```

```

retweet_count <= 103:
:...retweet_count <= 93: Politics (6.3)
  retweet_count > 93: City (18.8/3.4)

SubTree [S15]

retweet_count <= 35: City (4)
retweet_count > 35: Politics (22.9/9.7)

SubTree [S16]

retweet_count <= 59: Politics (5.7)
retweet_count > 59:
:...user_followers_count <= 140: City (13.1/3.6)
  user_followers_count > 140: Politics (24.8/6.7)

SubTree [S17]

user_followers_count <= 4134: City (7.6)
user_followers_count > 4134: electronics (22.8/7.7)

SubTree [S18]

user_followers_count > 23841: transport (3.7)
user_followers_count <= 23841:
:...favorite_count > 0: City (4.4)
  favorite_count <= 0:
:...user_followers_count <= 1506: City (9.5/2.8)
  user_followers_count > 1506: electronics (25.6/6)

SubTree [S19]

user_followers_count <= 230: City (21.2/9.2)
user_followers_count > 230: electronics (6)

SubTree [S20]

user_followers_count > 1605: City (13.1/3.2)
user_followers_count <= 1605:
:...user_friends_count <= 2089: Politics (28.9/14.3)
  user_friends_count > 2089: electronics (10.3/3.5)

SubTree [S21]

retweet_count <= 14: City (71/31.8)
retweet_count > 14:
:...user_friends_count <= 158: transport (4.1)
  user_friends_count > 158:
:...user_followers_count <= 783: City (14.6/2.7)
  user_followers_count > 783: transport (14.4/4.9)

SubTree [S22]

user_followers_count > 4522: electronics (5/2.4)
user_followers_count <= 4522:
:...retweet_count <= 4: Politics (12.2/3.7)
  retweet_count > 4: City (12.7/2.2)

SubTree [S23]

user_followers_count > 3413:
:...retweet_count <= 2: electronics (19.1/5.2)
:  retweet_count > 2: transport (22.1/8.7)

```

```

user_followers_count <= 3413:
:...favorite_count > 0: City (22.7/12.1)
  favorite_count <= 0:
  :...user_followers_count > 1722:
    :...user_friends_count > 3159: Politics (4.1)
    :   user_friends_count <= 3159:
    :     :...user_friends_count <= 1547: City (24.5/8)
    :     user_friends_count > 1547: electronics (20.6/6.9)
    user_followers_count <= 1722:
    :...retweet_count > 10:
      :...user_followers_count <= 91: electronics (17.1/7.4)
      :   user_followers_count > 91:
      :     :...user_friends_count <= 203: Politics (6.3/2.9)
      :     user_friends_count > 203:
      :       :...user_friends_count <= 942: transport (26.1/15.6)
      :       user_friends_count > 942: electronics (6.2/1.2)
      retweet_count <= 10:
      :...retweet_count > 9: City (28.9/11.5)
        retweet_count <= 9:
        :...user_followers_count <= 28: electronics (19.2/6.5)
        user_followers_count > 28:
        :...retweet_count > 8:
          :...user_followers_count <= 297: City (16.9/7.5)
          :   user_followers_count > 297: transport (22.9/11.1)
          retweet_count <= 8:
          :...retweet_count > 7:
            :...user_friends_count <= 866: City (16.5/2.5)
            :   user_friends_count > 866: Politics (20.7/10)
            retweet_count <= 7:
            :...user_followers_count > 937: [S29]
            user_followers_count <= 937:
            :...retweet_count > 6: Politics (22.2/12.8)
            retweet_count <= 6: [S30]

```

SubTree [S24]

```

user_followers_count <= 650: Politics (4.4)
user_followers_count > 650: City (35.9/16.9)

```

SubTree [S25]

```

user_followers_count > 925: Politics (12.2/5.6)
user_followers_count <= 925:
:...user_followers_count > 884: transport (12.6/3.7)
  user_followers_count <= 884:
  :...user_followers_count <= 810: electronics (10.2/3.2)
  user_followers_count > 810: Politics (19.3/7.9)

```

SubTree [S26]

```

user_followers_count > 387: Politics (3.2)
user_followers_count <= 387:
:...user_friends_count <= 570: City (27.8/15.8)
  user_friends_count > 570:
  :...user_friends_count > 1302: electronics (8.4/4.9)
  user_friends_count <= 1302:
  :...user_friends_count <= 772: electronics (18.3/7.9)
  user_friends_count > 772: transport (27.6/10.4)

```

SubTree [S27]

```

user_friends_count <= 650: electronics (17.7/7)
user_friends_count > 650:

```

```

:...user_followers_count <= 506: transport (19.7/8.5)
  user_followers_count > 506:
:...user_friends_count <= 728: City (7.1/2)
  user_friends_count > 728:
:...user_friends_count <= 1426: electronics (19.5/4.3)
  user_friends_count > 1426: City (4.3)

```

SubTree [S28]

```

user_followers_count > 2300: electronics (8.8)
user_followers_count <= 2300:
:...user_friends_count <= 923: electronics (15.6/5)
  user_friends_count > 923:
:...user_followers_count <= 1250:
  :...user_friends_count <= 1019: Politics (3.3)
  :  user_friends_count > 1019:
  :  :...user_followers_count <= 1185: City (19.2/6.8)
  :  :  user_followers_count > 1185: electronics (8.3/3.5)
  user_followers_count > 1250:
:...user_followers_count <= 1502:
  :...user_followers_count <= 1313: transport (8.2/3.5)
  :  user_followers_count > 1313: City (22.2/6.9)
  user_followers_count > 1502:
  :...user_followers_count <= 1572: electronics (5.2)
  :  user_followers_count > 1572:
  :  :...user_friends_count > 2157: City (9.3/3.4)
  :  :  user_friends_count <= 2157:
  :  :  :...user_followers_count <= 1935: transport (19.5/8.9)
  :  :  :  user_followers_count > 1935: City (22.8/13.7)

```

SubTree [S29]

```

user_followers_count <= 1012: electronics (6.6)
user_followers_count > 1012:
:...user_followers_count > 1425: electronics (5.7)
  user_followers_count <= 1425:
  :...user_followers_count > 1300: City (9/1.2)
  :  user_followers_count <= 1300:
  :  :...user_followers_count <= 1200: City (22.4/8.5)
  :  :  user_followers_count > 1200: electronics (13.9/4.2)

```

SubTree [S30]

```

user_friends_count <= 2: transport (7.4/3.1)
user_friends_count > 2:
:...user_friends_count <= 40:
  :...user_followers_count <= 62: City (12.1/3.4)
  :  user_followers_count > 62: electronics (14.5/4)
  user_friends_count > 40:
  :...retweet_count > 5:
  :  :...user_friends_count <= 215: Politics (16.3/9.6)
  :  :  user_friends_count > 215: transport (8.1/0.7)
  :  retweet_count <= 5:
  :  :...user_friends_count <= 110: City (17.5/5.6)
  :  :  user_friends_count > 110:
  :  :  :...user_friends_count <= 127: transport (13.9/3.1)
  :  :  :  user_friends_count > 127:
  :  :  :  :...user_friends_count > 1925: City (9.4/4.2)
  :  :  :  :  user_friends_count <= 1925:
  :  :  :  :  :...user_friends_count <= 507:
  :  :  :  :  :  :...user_followers_count <= 600: City (75.9/32)
  :  :  :  :  :  :  user_followers_count > 600: transport (8.1/2)
  :  :  :  :  :  :  user_friends_count > 507:

```



```

: : :...user_friends_count <= 10: City (4.7)
: : user_friends_count > 10: Politics (26.5/10.9)
: : user_followers_count > 9:
: : :...user_friends_count <= 55:
: : :   :...user_followers_count > 81:
: : :   :   :...user_followers_count <= 87: transport (4.7)
: : :   :   :   : user_followers_count > 87: electronics (29.3/7.2)
: : :   :   : user_followers_count <= 81:
: : :   :   :...favorite_count > 0: electronics (6.5/1.7)
: : :   :   : favorite_count <= 0:
: : :   :   :   :...user_followers_count > 55: City (14.6/4.9)
: : :   :   :   : user_followers_count <= 55:
: : :   :   :   :   :...user_friends_count <= 4: electronics (15.1/8.7)
: : :   :   :   :   : user_friends_count > 4: [S3]
: : : user_friends_count > 55:
: : :   :...user_followers_count > 112:
: : :   :   :...user_followers_count <= 116: transport (5.6)
: : :   :   :   : user_followers_count > 116:
: : :   :   :   :   :...favorite_count > 0: City (5.9/2.9)
: : :   :   :   :   : favorite_count <= 0:
: : :   :   :   :   :   :...user_friends_count > 329: [S4]
: : :   :   :   :   :   : user_friends_count <= 329:
: : :   :   :   :   :   :   :...user_friends_count <= 107: Politics (14.4/6.7)
: : :   :   :   :   :   :   :
: : :   :   :   :   :   :   : user_friends_count > 107: [S5]
: : :   :   :   :   :   :   : user_followers_count <= 112:
: : :   :   :   :   :   :   :   :...favorite_count > 0: City (9.1/3.8)
: : :   :   :   :   :   :   :   : favorite_count <= 0:
: : :   :   :   :   :   :   :   :   :...user_friends_count <= 83:
: : :   :   :   :   :   :   :   :   :   :...user_followers_count <= 13: City (4.1)
: : :   :   :   :   :   :   :   :   :   :   : user_followers_count > 13: [S6]
: : :   :   :   :   :   :   :   :   :   : user_friends_count > 83:
: : :   :   :   :   :   :   :   :   :   :   :...user_friends_count <= 108: [S7]
: : :   :   :   :   :   :   :   :   :   :   : user_friends_count > 108: [S8]
: : : user_followers_count > 208:
: : : :...user_friends_count <= 469:
: : : :   :...user_followers_count > 461:
: : : :   :   :...user_followers_count <= 698:
: : : :   :   :   :...user_friends_count <= 322: transport (34.7/10)
: : : :   :   :   :   : user_friends_count > 322:
: : : :   :   :   :   :   :...user_friends_count <= 372: City (12.5)
: : : :   :   :   :   :   :   : user_friends_count > 372: transport (12.5/2.8)
: : : :   :   :   :   : user_followers_count > 698:
: : : :   :   :   :   :   :...user_followers_count <= 1605:
: : : :   :   :   :   :   :   :...user_friends_count > 96: electronics (39.4/12.8)
: : : :   :   :   :   :   :   :   : user_friends_count <= 96: [S9]
: : : :   :   :   :   :   :   :   : user_followers_count > 1605:
: : : :   :   :   :   :   :   :   :   :...user_followers_count <= 2314: transport (15.5/2.9)
: : : :   :   :   :   :   :   :   :   :   : user_followers_count > 2314: [S10]
: : : :   :   :   :   :   :   :   : user_followers_count <= 461:
: : : :   :   :   :   :   :   :   :   :...favorite_count > 2: transport (2.8)
: : : :   :   :   :   :   :   :   :   :   : favorite_count <= 2:
: : : :   :   :   :   :   :   :   :   :   :   :...favorite_count > 0: electronics (9.7)
: : : :   :   :   :   :   :   :   :   :   :   :   : favorite_count <= 0:
: : : :   :   :   :   :   :   :   :   :   :   :   :   :...user_friends_count > 393: electronics (12.5)
: : : :   :   :   :   :   :   :   :   :   :   :   :   :   : user_friends_count <= 393:
: : : :   :   :   :   :   :   :   :   :   :   :   :   :   :   :...user_friends_count > 324: transport (11.5/2.8)
: : : :   :   :   :   :   :   :   :   :   :   :   :   :   :   :   : user_friends_count <= 324: [S11]
: : : user_friends_count > 469:
: : : :...user_followers_count <= 766:
: : : :   :...user_followers_count > 642:
: : : :   :   :...user_followers_count <= 711: City (19.4/8.3)
: : : :   :   :   : user_followers_count > 711:

```

```

:      : ...user_friends_count <= 899: City (14.7/6.9)
:      : user_friends_count > 899: Politics (13.2/4.3)
: user_followers_count <= 642:
:      : ...user_friends_count <= 474: Politics (5.1)
:      : user_friends_count > 474:
:          : ...user_followers_count > 612: transport (14.7/5.1)
:          : user_followers_count <= 612:
:              : ...user_followers_count > 506:
:                  : ...user_followers_count > 588: City (12.2/1.6)
:                  : user_followers_count <= 588: [S12]
:                  : user_followers_count <= 506:
:                      : ...favorite_count > 0: transport (9.4/3.2)
:                      : favorite_count <= 0: [S13]
: user_followers_count > 766:
: ...user_followers_count <= 884:
:     : ...user_followers_count > 846: Politics (10.5/3.6)
:     : user_followers_count <= 846:
:         : ...user_friends_count <= 1135: City (12.7/5)
:         : user_friends_count > 1135: electronics (15.1/3.1)
: user_followers_count > 884:
: ...favorite_count > 0:
:     : ...user_friends_count > 5905: transport (10.4/5.2)
:     : user_friends_count <= 5905: [S14]
:     : favorite_count <= 0:
:         : ...user_friends_count > 3525:
:             : ...user_friends_count <= 3769: Politics (10.3/2.8)
:             : user_friends_count > 3769:
:                 : ...user_friends_count <= 4984: [S15]
:                 : user_friends_count > 4984:
:                     : ...user_friends_count <= 5557: [S16]
:                     : user_friends_count > 5557:
:                         : ...user_followers_count <= 8631: [S17]
:                         : user_followers_count > 8631: [S18]
:         : user_friends_count <= 3525:
:             : ...user_friends_count > 2012:
:                 : ...user_followers_count <= 1888: City (37.6/17.2)
:
:         : user_followers_count > 1888:
:             : ...user_friends_count <= 2361: [S19]
:             : user_friends_count > 2361: [S20]
:         : user_friends_count <= 2012:
:             : ...user_friends_count > 1962: Politics (5.5/1)
:             : user_friends_count <= 1962: [S21]
retweet_count > 0:
...retweet_count > 139:
    : ...user_followers_count > 63642: City (3)
    : user_followers_count <= 63642:
        : ...retweet_count <= 181: Politics (17.9/3.8)
        : retweet_count > 181:
            : ...retweet_count > 231: Politics (6.5)
            : retweet_count <= 231:
                : ...retweet_count > 226: City (12.1)
                : retweet_count <= 226:
                    : ...retweet_count <= 208: City (26.6/4.5)
                    : retweet_count > 208: Politics (6.4)
retweet_count <= 139:
...retweet_count > 136: electronics (48.4)
    : retweet_count <= 136:
        : ...retweet_count > 112:
            : ...retweet_count <= 131: Politics (9.8)
            : retweet_count > 131: City (23/7.3)
        : retweet_count <= 112:
            : ...retweet_count > 103:

```



```

: ...retweet_count <= 110: transport (22.5/6.4)
:   retweet_count > 110: electronics (22)
retweet_count <= 103:
: ...retweet_count > 45:
:   ...retweet_count <= 85: Politics (59.5/27.8)
:   retweet_count > 85:
:     ...retweet_count <= 86: electronics (23.9)
:     retweet_count > 86: City (19.1/5.5)
retweet_count <= 45:
: ...retweet_count > 32:
:   ...retweet_count > 34:
:   :   ...retweet_count > 44: transport (7.7)
:   :   retweet_count <= 44: [S22]
:   retweet_count <= 34:
:   :   ...retweet_count <= 33: transport (4.6)
:   :   retweet_count > 33: [S23]
retweet_count <= 32:
: ...user_followers_count <= 16:
:   ...retweet_count <= 2: transport (7.6)
:   retweet_count > 2: Politics (19.1/8.6)
user_followers_count > 16:
: ...user_followers_count > 888943: [S24]
:   user_followers_count <= 888943:
:   :   ...retweet_count > 15:
:   :   :   ...retweet_count > 28: [S25]
:   :   :   retweet_count <= 28: [S26]
:   :   retweet_count <= 15:
:   :   :   ...retweet_count > 11:
:   :   :   :   ...retweet_count <= 14: [S27]
:   :   :   :   retweet_count > 14: [S28]
:   :   retweet_count <= 11:
:   :   :   ...favorite_count > 1: [S29]
:   :   :   :   favorite_count <= 1: [S30]

```

SubTree [S1]

```

retweet_count > 370: Politics (6)
retweet_count <= 370:
: ...user_friends_count <= 230: City (6.3)
:   user_friends_count > 230:
:   :   ...user_followers_count <= 324: Politics (11)
:   :   user_followers_count > 324: City (13.1/3.1)

```

SubTree [S2]

```

user_followers_count > 5378: Politics (3.9)
user_followers_count <= 5378:
: ...user_friends_count > 1600: City (10.2/2.3)
:   user_friends_count <= 1600:
:   :   ...retweet_count > 449: Politics (14.1)
:   :   retweet_count <= 449:
:   :   :   ...retweet_count <= 448: Politics (18.3/2.3)
:   :   :   retweet_count > 448: City (5.8)

```

SubTree [S3]

```

user_followers_count > 45: transport (15.5/5.4)
user_followers_count <= 45:
: ...user_followers_count > 33: City (7.7/3.1)
:   user_followers_count <= 33:
:   :   ...user_followers_count > 24: transport (11.9/1.4)
:   :   user_followers_count <= 24:
:   :   :   ...user_friends_count <= 16: transport (13.6/6.3)

```

user\_friends\_count > 16: electronics (14.6/7.2)

SubTree [S4]

user\_followers\_count <= 127: electronics (7.4)  
user\_followers\_count > 127:  
:...user\_followers\_count > 193: Politics (10.1/1.5)  
    user\_followers\_count <= 193:  
        :...user\_friends\_count <= 731: transport (25.4/11.6)  
        user\_friends\_count > 731: electronics (13.2/7.2)

SubTree [S5]

user\_followers\_count <= 145: electronics (15.9/5.2)  
user\_followers\_count > 145:  
:...user\_followers\_count > 200: electronics (4.5)  
    user\_followers\_count <= 200:  
        :...user\_friends\_count <= 187: City (5.8)  
        user\_friends\_count > 187:  
            :...user\_friends\_count <= 222: Politics (11.3)  
            user\_friends\_count > 222: City (14.1/6.1)

SubTree [S6]

user\_followers\_count <= 91: electronics (20.8/6.4)  
user\_followers\_count > 91: City (3)

SubTree [S7]

user\_friends\_count <= 97: electronics (21.7/11.5)  
user\_friends\_count > 97: transport (9.3/2.2)

SubTree [S8]

user\_followers\_count <= 54: Politics (23.3/9.3)  
user\_followers\_count > 54:  
:...user\_friends\_count <= 120: City (6.6)  
    user\_friends\_count > 120:  
        :...user\_friends\_count <= 134: electronics (9.7)  
        user\_friends\_count > 134:  
            :...user\_friends\_count <= 318:  
                :...user\_followers\_count <= 57: electronics (2.9)  
                :    user\_followers\_count > 57: City (33.1/9.2)  
                user\_friends\_count > 318:  
                    :...user\_followers\_count > 87: Politics (3.8)  
                    user\_followers\_count <= 87:  
                        :...user\_friends\_count <= 587: electronics (23.5/7.1)  
                        user\_friends\_count > 587: City (2.8)

SubTree [S9]

user\_followers\_count <= 1100: electronics (24/4.6)  
user\_followers\_count > 1100: City (12.5/5.5)

SubTree [S10]

user\_followers\_count <= 19474: electronics (50.4/14.5)  
user\_followers\_count > 19474: transport (6.9/1)

SubTree [S11]

user\_friends\_count > 257: electronics (17.4/3.1)  
user\_friends\_count <= 257:

```
:...user_friends_count <= 120: electronics (74.6/15.2)
  user_friends_count > 120:
    :...user_followers_count <= 239: electronics (9.6/1.5)
      user_followers_count > 239: City (31.2/12.2)
```

SubTree [S12]

```
user_followers_count <= 561: City (14.3/4.1)
user_followers_count > 561: electronics (15.2/3.3)
```

SubTree [S13]

```
user_followers_count <= 239: Politics (11/6.9)
user_followers_count > 239:
  :...user_friends_count > 1124: City (16.7/5.2)
    user_friends_count <= 1124:
      :...user_friends_count > 766: transport (20.8/9.6)
        user_friends_count <= 766:
          :...user_friends_count > 716: City (12.7/4.6)
            user_friends_count <= 716:
              :...user_friends_count > 630: transport (11.5/1.7)
                user_friends_count <= 630:
                  :...user_followers_count <= 397: City (32.6/18.2)
                    user_followers_count > 397: electronics (11.1/3.4)
```

SubTree [S14]

```
user_followers_count > 2741: electronics (15.1/1.7)
user_followers_count <= 2741:
  :...favorite_count <= 1: transport (27.5/14.3)
    favorite_count > 1: City (2.6)
```

SubTree [S15]

```
user_friends_count > 4644: electronics (17.2)
user_friends_count <= 4644:
  :...user_friends_count <= 3958: electronics (20.3/3.1)
    user_friends_count > 3958:
      :...user_followers_count > 5669: transport (7.7/2.8)
        user_followers_count <= 5669:
          :...user_friends_count <= 4051: City (5.9)
            user_friends_count > 4051: electronics (19.5/7.9)
```

SubTree [S16]

```
user_followers_count <= 1582: Politics (5.9/1.7)
user_followers_count > 1582:
  :...user_friends_count <= 5068: City (10.9/3.3)
    user_friends_count > 5068: transport (18.8/9.3)
```

SubTree [S17]

```
user_followers_count <= 5489: City (4.4)
user_followers_count > 5489: electronics (26.6/6)
```

SubTree [S18]

```
user_followers_count <= 11961: transport (15.5/7.7)
user_followers_count > 11961:
  :...user_followers_count <= 13287: City (16.2/2)
    user_followers_count > 13287:
      :...user_followers_count <= 31218:
        :...user_friends_count <= 12809: transport (11.4)
```

```
      : user_friends_count > 12809: electronics (12.4/2.2)
user_followers_count > 31218:
:...user_friends_count <= 40464: electronics (24/8.1)
  user_friends_count > 40464: City (6.6)
```

SubTree [S19]

```
user_followers_count <= 2076: electronics (6.9)
user_followers_count > 2076:
:...user_friends_count <= 2150: transport (9.7)
  user_friends_count > 2150: electronics (19.5/4.9)
```

SubTree [S20]

```
user_friends_count <= 2763: City (23.6/11.6)
user_friends_count > 2763:
:...user_friends_count > 3361: City (3.7/0.8)
  user_friends_count <= 3361:
:...user_followers_count > 3609: transport (11.2)
    user_followers_count <= 3609:
:...user_friends_count <= 2766: transport (4.8)
    user_friends_count > 2766: electronics (23.5/3.9)
```

SubTree [S21]

```
user_followers_count > 6686: transport (11.8/5.2)
user_followers_count <= 6686:
:...user_followers_count > 4280: electronics (21.4/8.7)
  user_followers_count <= 4280:
:...user_followers_count > 3387: transport (5.8)
    user_followers_count <= 3387:
:...user_followers_count <= 983: transport (21.1/7.1)
      user_followers_count > 983:
:...user_followers_count <= 1024: electronics (13.6/5.3)
        user_followers_count > 1024:
:...user_followers_count <= 1056: transport (10/3.1)
          user_followers_count > 1056:
:...user_friends_count <= 970:
      :...user_followers_count <= 2491: electronics (20.1/2.2)
      : user_followers_count > 2491: City (4.7)
      user_friends_count > 970:
:...user_friends_count <= 1019: transport (13.2/4.3)
      user_friends_count > 1019:
:...user_followers_count <= 1572: electronics (25.4/12.1)
      user_followers_count > 1572:
:...user_followers_count <= 1969: [S31]
      user_followers_count > 1969: [S32]
```

SubTree [S22]

```
user_friends_count <= 3140: City (25.5/4.7)
user_friends_count > 3140: Politics (7.8/1)
```

SubTree [S23]

```
user_friends_count <= 67: transport (4.6)
user_friends_count > 67:
:...user_friends_count > 7167: transport (3.8)
  user_friends_count <= 7167:
:...user_friends_count > 1141: electronics (20)
    user_friends_count <= 1141:
:...user_friends_count <= 172: electronics (20.7/3.3)
    user_friends_count > 172:
```

```
    :...user_friends_count <= 371: transport (7.7)
      user_friends_count > 371: electronics (28.9/11.5)
```

SubTree [S24]

```
user_followers_count <= 2571800: transport (9.9)
user_followers_count > 2571800: electronics (16.9/7.5)
```

SubTree [S25]

```
user_followers_count <= 495: City (11.7)
user_followers_count > 495: Politics (15.8/5.8)
```

SubTree [S26]

```
retweet_count > 27: electronics (19.6)
retweet_count <= 27:
:...retweet_count > 17: Politics (18.2)
  retweet_count <= 17:
  :...retweet_count <= 16: City (9.8/4.4)
    retweet_count > 16:
    :...user_friends_count <= 313: electronics (28.6/7.2)
      user_friends_count > 313:
      :...user_friends_count > 5171: electronics (4.8)
        user_friends_count <= 5171:
        :...user_followers_count > 1605: City (10.4)
          user_followers_count <= 1605:
          :...user_followers_count > 900: electronics (14.8/6.8)
            user_followers_count <= 900:
            :...user_friends_count > 2880: electronics (2.4)
              user_friends_count <= 2880:
              :...user_friends_count <= 386: Politics (3)
                user_friends_count > 386: City (24.3/7.4)
```

SubTree [S27]

```
retweet_count <= 12: City (14)
retweet_count > 12:
:...user_followers_count <= 186: Politics (13)
  user_followers_count > 186:
  :...user_followers_count <= 252: City (4.6)
    user_followers_count > 252: Politics (41.8/18.5)
```

SubTree [S28]

```
user_followers_count > 9852: Politics (4.6/1.4)
user_followers_count <= 9852:
:...user_friends_count > 1405: City (10.3)
  user_friends_count <= 1405:
  :...user_followers_count > 1342: transport (3.7)
    user_followers_count <= 1342:
    :...user_friends_count <= 832: transport (20.2/8.4)
      user_friends_count > 832: City (5.1)
```

SubTree [S29]

```
user_followers_count <= 492: Politics (15/8)
user_followers_count > 492:
:...user_friends_count > 30558: City (5.4)
  user_friends_count <= 30558:
  :...favorite_count <= 12: electronics (28.1/9.3)
    favorite_count > 12: City (2.7)
```

SubTree [S30]

```
user_friends_count > 9558: Politics (21.8/10.7)
user_friends_count <= 9558:
:...favorite_count > 0: City (22.5/14.1)
  favorite_count <= 0:
:...user_friends_count > 4998: electronics (24.7/5.9)
  user_friends_count <= 4998:
:...user_friends_count > 3839:
  :...retweet_count <= 9: City (24.3/9.7)
  : retweet_count > 9: Politics (7.2)
  user_friends_count <= 3839:
:...user_followers_count > 3324:
  :...retweet_count <= 2: transport (14.1/7.1)
  : retweet_count > 2:
  : :...user_friends_count <= 1996: City (11)
  : user_friends_count > 1996: transport (12.9/4.4)
  user_followers_count <= 3324:
:...user_followers_count > 1941:
  :...user_friends_count > 3140: Politics (3.6)
  : user_friends_count <= 3140:
  : :...retweet_count <= 1: electronics (17.2/3.5)
  : retweet_count > 1: City (25/8)
  user_followers_count <= 1941:
:...retweet_count > 8:
  :...user_friends_count > 1141: City (15.2)
  : user_friends_count <= 1141:
  : :...user_followers_count <= 94: [S33]
  : user_followers_count > 94:
  : :...user_followers_count <= 201: transport (19.5/11.1)
)
: user_followers_count > 201:
: :...retweet_count > 10: electronics (17.6/4.6)
: retweet_count <= 10:
: :...retweet_count > 9: City (14.7/6.5)
: retweet_count <= 9: [S34]
retweet_count <= 8:
:...retweet_count > 7: City (34.1/12.7)
  retweet_count <= 7:
  :...user_followers_count > 937: [S35]
  user_followers_count <= 937:
  :...user_friends_count <= 2: Politics (8.6/3.8)
  user_friends_count > 2: [S36]
```

SubTree [S31]

```
user_followers_count <= 1935: electronics (21.4/9.3)
user_followers_count > 1935: Politics (5.3)
```

SubTree [S32]

```
user_friends_count <= 1203: electronics (11.1/3.4)
user_friends_count > 1203: City (15/6)
```

SubTree [S33]

```
user_followers_count <= 26: City (6.4/0.8)
user_followers_count > 26: electronics (27/6.1)
```

SubTree [S34]

```
user_followers_count <= 297: City (4.6)
user_followers_count > 297: electronics (21/10.3)
```

SubTree [S35]

```
user_followers_count <= 1012: electronics (5.8)
user_followers_count > 1012:
:...user_friends_count <= 192: electronics (4.7)
    user_friends_count > 192: City (46.2/22.4)
```

SubTree [S36]

```
user_friends_count <= 57: electronics (28.9/10.2)
user_friends_count > 57:
:...user_friends_count > 1925: transport (10.6/4.6)
    user_friends_count <= 1925:
:...user_friends_count > 500:
    :...user_friends_count <= 1165: City (47/17.8)
    : user_friends_count > 1165: electronics (19.7/10.8)
    user_friends_count <= 500:
:...user_friends_count > 301:
    :...retweet_count <= 5: City (18.4/5.3)
    : retweet_count > 5: transport (11/2.7)
    user_friends_count <= 301:
:...user_followers_count > 114:
    :...user_friends_count <= 154:
    : :...user_friends_count <= 131: transport (18.7/6.8)
    : : user_friends_count > 131: electronics (5.6)
    : user_friends_count > 154:
    : :...user_friends_count <= 280: City (27.2/9.1)
    : : user_friends_count > 280: Politics (4.7)
    user_followers_count <= 114:
:...user_followers_count > 105: electronics (5)
    user_followers_count <= 105:
    :...user_followers_count <= 40: electronics (20.2/11.1)
    : user_followers_count > 40:
    : :...user_followers_count <= 69: City (9.7)
    : : user_followers_count > 69: Politics (22.1/4.9)
```

Evaluation on training data (3868 cases):

Trial	Decision Tree	
-----	Size	Errors

0	222	499(12.9%)
1	157	701(18.1%)
2	173	714(18.5%)
3	195	688(17.8%)
4	206	647(16.7%)
5	214	725(18.7%)
6	153	785(20.3%)
7	228	724(18.7%)
8	218	624(16.1%)
9	240	566(14.6%)
boost		210( 5.4%) <<

(a)	(b)	(c)	(d)	<-classified as
-----	-----	-----	-----	
1435	37	20	8	(a): class City
10	1177	4	6	(b): class electronics
40	26	497	13	(c): class Politics
19	27		549	(d): class transport

Attribute usage:

100.00% retweet\_count  
64.09% user\_followers\_count  
63.88% user\_friends\_count  
43.23% favorite\_count

Time: 0.8 secs

```
user_boost_pred10=predict(user_boost10,user_test)
> CrossTable(user_test$Type,user_boost_pred10,prop.chisq=FALSE,prop.c=FALSE,prop.r=FALSE,dnn=c('actual default','predicted default'))
```

Cell Contents

	N
N / Table Total	

Total Observations in Table: 1289

actual default	predicted default				Row Total
	City	electronics	Politics	transport	
City	426	40	20	14	500
	0.330	0.031	0.016	0.011	
electronics	28	334	2	16	380
	0.022	0.259	0.002	0.012	
Politics	34	22	158	6	220
	0.026	0.017	0.123	0.005	
transport	20	36	2	131	189
	0.016	0.028	0.002	0.102	
Column Total	508	432	182	167	1289



