Summary of each model and its results

Evaluate Techniques for Wifi Locationing

XTOL Data Analytics and Big Data program

Module 3, Task 3

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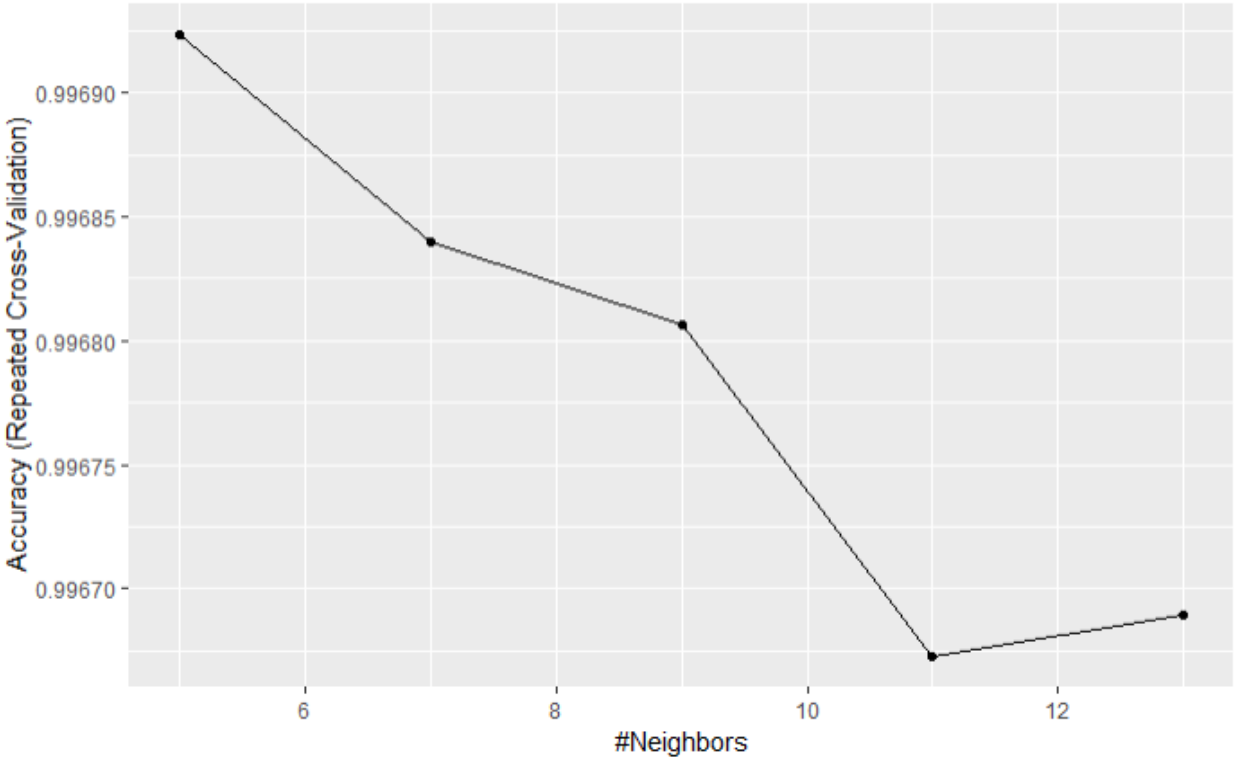
KNN

Building-only classifier

Summary

```
             Length Class      Mode
learn          2    -none-     list
k              1    -none-     numeric
theDots        0    -none-     list
xNames       100    -none-     character
problemType    1    -none-     character
tuneValue      1    data.frame list
obsLevels      3    -none-     character
param          0    -none-     list
```

Cross validation results

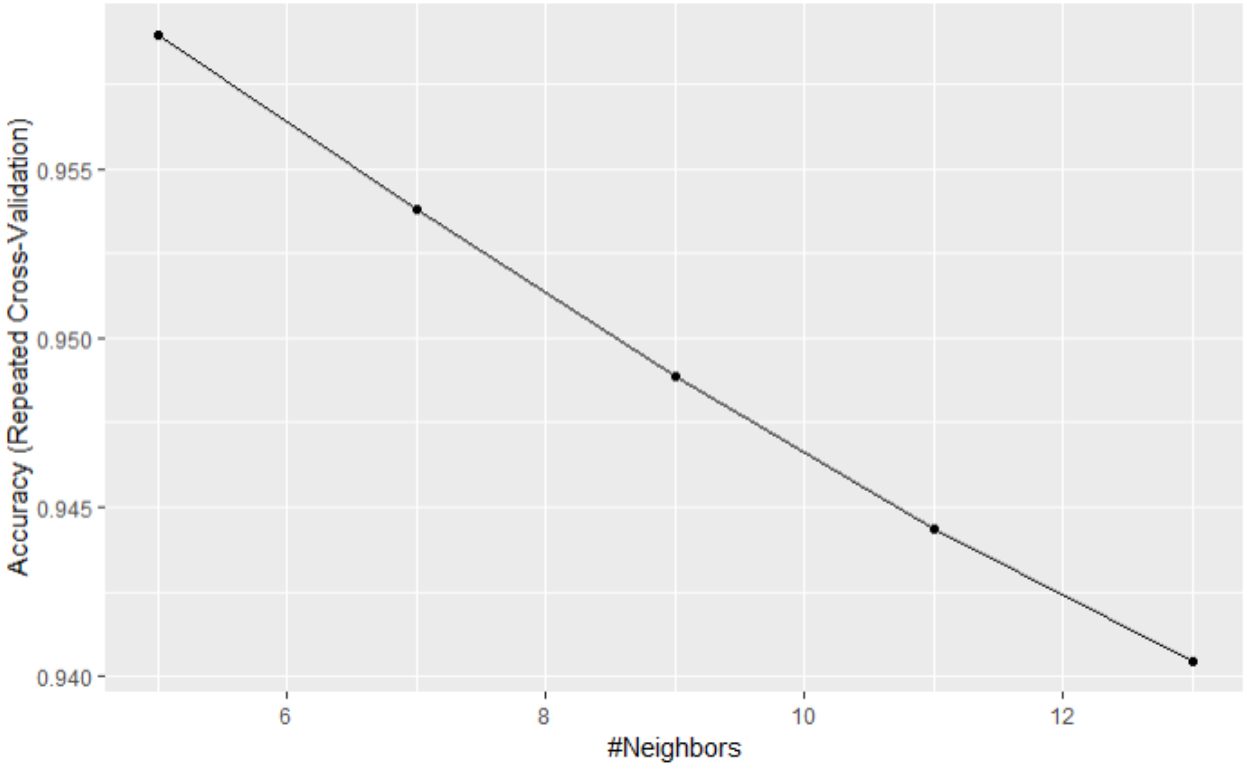


Building and Floor classifier

Summary

```
           Length Class      Mode
learn           2    -none-     list
k               1    -none-     numeric
theDots         0    -none-     list
xNames        100    -none-     character
problemType     1    -none-     character
tuneValue       1    data.frame list
obsLevels      13    -none-     character
param           0    -none-     list
```

Cross validation results



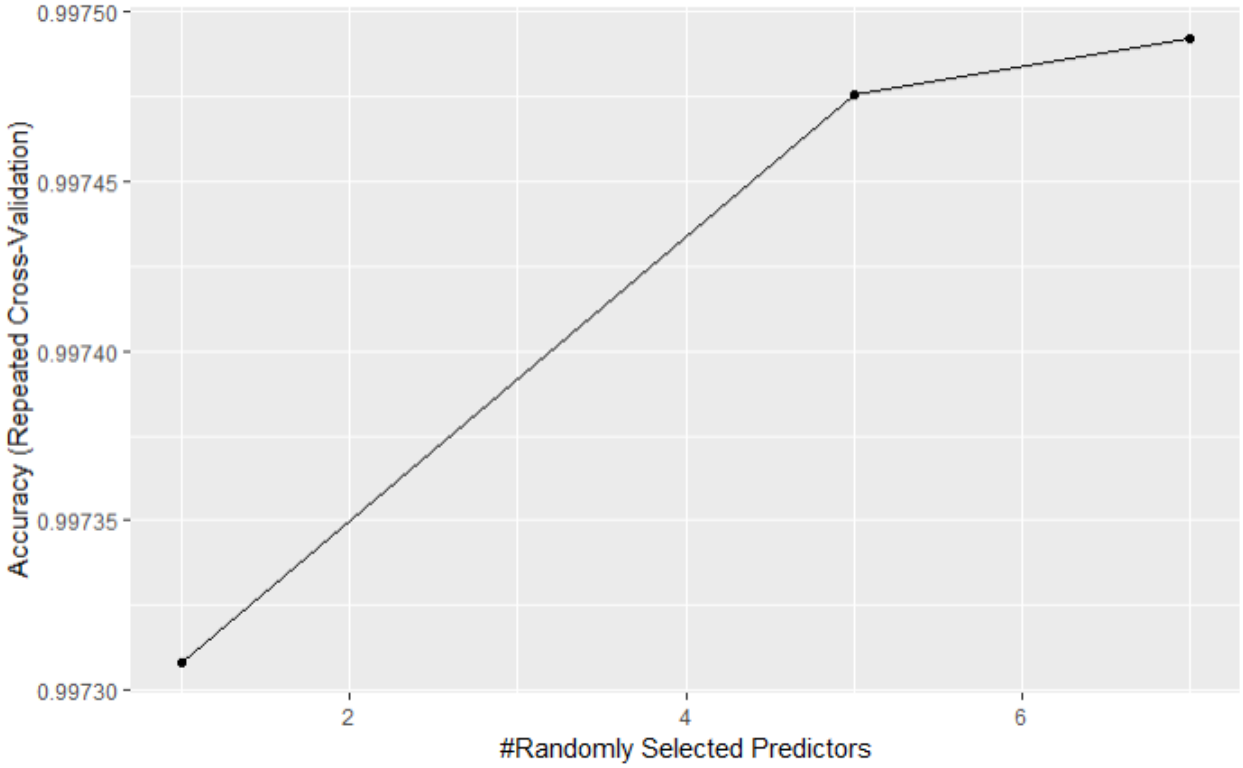
Random Forest

Building-only classifier

Summary

```
                Length Class      Mode
call               4  -none-     call
type               1  -none-     character
predicted      19937  factor     numeric
err.rate        2000  -none-     numeric
confusion         12  -none-     numeric
votes          59811  matrix     numeric
oob.times      19937  -none-     numeric
classes            3  -none-     character
importance       100  -none-     numeric
importanceSD       0  -none-     NULL
localImportance    0  -none-     NULL
proximity          0  -none-     NULL
ntree              1  -none-     numeric
mtry               1  -none-     numeric
forest            14  -none-     list
y              19937  factor     numeric
test               0  -none-     NULL
inbag              0  -none-     NULL
xNames           100  -none-     character
problemType        1  -none-     character
tuneValue          1  data.frame list
obsLevels          3  -none-     character
param              0  -none-     list
```

Cross validation results



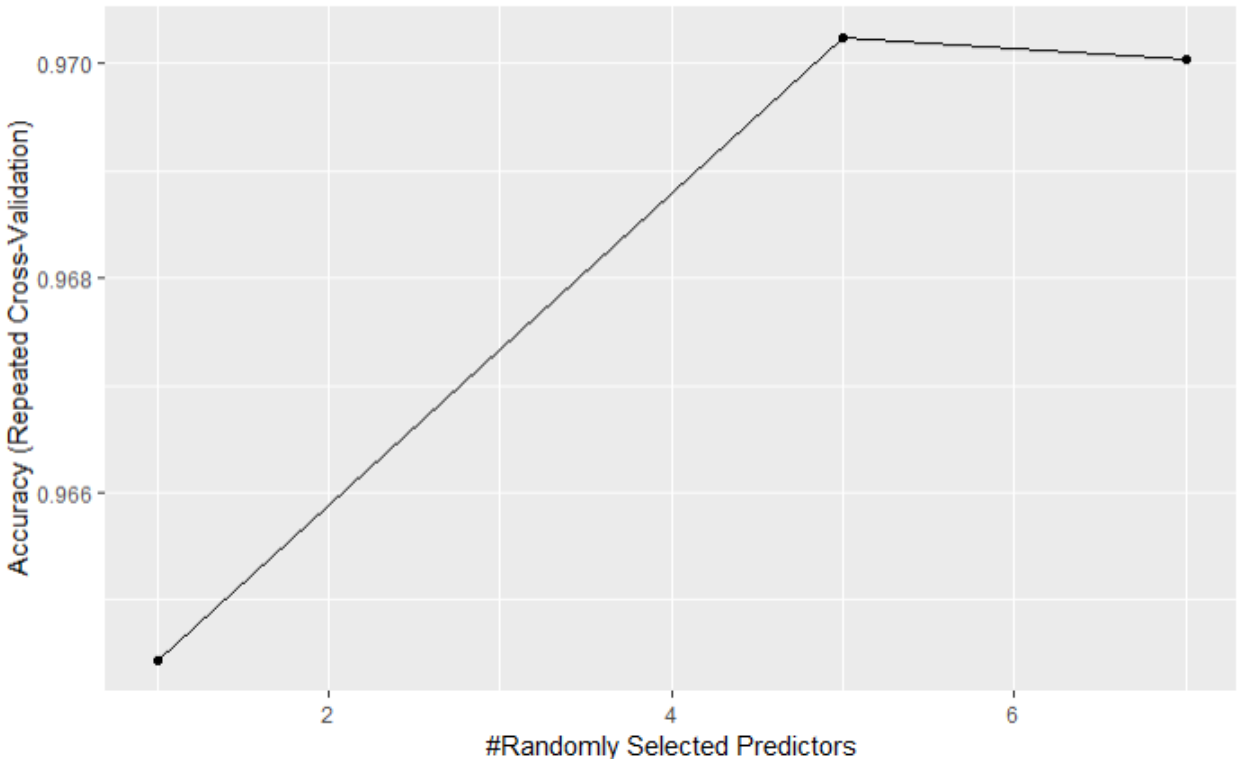
Building and Floor classifier

Summary

```
                Length Class      Mode
call                 4 -none-     call
type                 1 -none-     character
predicted        19937 factor     numeric
err.rate          7000 -none-     numeric
confusion          182 -none-     numeric
votes           259181 matrix     numeric
oob.times        19937 -none-     numeric
classes             13 -none-     character
importance         100 -none-     numeric
importanceSD         0 -none-     NULL
localImportance      0 -none-     NULL
proximity            0 -none-     NULL
ntree                1 -none-     numeric
mtry                 1 -none-     numeric
forest              14 -none-     list
y                19937 factor     numeric
test                 0 -none-     NULL
inbag                0 -none-     NULL
```

```
xNames              100 -none-     character
problemType           1 -none-     character
tuneValue             1 data.frame list
obsLevels            13 -none-     character
param                 0 -none-     list
```

Cross validation results



C5.0

Building-only classifier

Summary

```
Rules:

Rule 19/1: (779.3/0.2, lift
9.9)
  PC3 <= 0.7695976
  PC4 <= -0.8398229
  ->  class 0  [0.999]

Rule 19/2: (539.8/15, lift
9.6)
  PC4 > 3.344411
  ->  class 0  [0.970]

Rule 19/3: (681/20.9, lift
9.6)
  PC4 <= -3.737725
  ->  class 0  [0.968]

Rule 19/4: (1717.7, lift 1.9)
  PC1 > -0.589825
  PC5 <= -5.238693
  ->  class 1  [0.999]

Rule 19/5: (284.2, lift 1.9)
  PC1 > 14.75054
  ->  class 1  [0.997]

Rule 19/6: (1849.5/4, lift
1.9)
  PC1 > -0.589825
  PC5 > 2.679153
  PC8 > -4.834902
  ->  class 1  [0.997]

Rule 19/7: (19256/8766.4, lift
1.0)
  PC4 > -3.737725
  ->  class 1  [0.545]

Rule 19/8: (317.8, lift 2.7)
  PC1 > -0.589825
  PC1 <= 14.75054
  PC3 <= 0.7695976
  PC4 > -3.737725
  PC4 <= 3.344411
  PC5 <= 2.679153
  PC44 > 1.329403
  ->  class 2  [0.997]

Rule 19/9: (252.6/0.8, lift
2.7)
  PC1 <= -0.2163631
  PC3 <= 0.7695976
  PC4 > -0.2356297
  PC4 <= 3.344411
  PC20 > -0.2525934
  PC44 <= 1.329403
  PC45 > -0.05867752
  PC56 > -0.2703735
  ->  class 2  [0.993]

Rule 19/10: (494.8/2.6, lift
2.7)
  PC3 <= 0.7695976
  PC5 > -5.238693
  PC5 <= 2.679153
  PC8 > 1.618825
  ->  class 2  [0.993]

Rule 19/11: (222.6/0.5, lift
2.7)
  PC1 > -0.589825
  PC3 <= 0.7695976
  PC4 > -0.8398229
  PC4 <= -0.2356297
  PC5 <= 2.679153
  PC8 <= 1.618825
  ->  class 2  [0.993]

Rule 19/12: (331.9/2.8, lift
2.7)
  PC1 > -0.589825
  PC1 <= 14.75054
  PC3 <= 0.7695976
  PC4 > -3.737725
  PC4 <= 3.344411
  PC18 <= 0.3226619
  PC20 <= -0.2525934
  PC45 > -0.05867752
  ->  class 2  [0.989]

Rule 19/13: (1460.5/18.5, lift
2.7)
  PC1 <= -0.589825
  PC4 > -0.8398229
  PC4 <= 3.344411
  ->  class 2  [0.987]

Rule 19/14: (639.8/17.9, lift
2.6)
  PC3 <= 0.7695976
  PC8 <= -4.834902
  ->  class 2  [0.971]

Rule 19/15: (196.4/9.1, lift
2.6)
  PC1 > -0.589825
  PC1 <= 14.75054
  PC3 <= 0.7695976
  PC4 > -0.2356297
  PC4 <= 3.344411
  PC18 > 0.3226619
  ->  class 2  [0.949]

Default class: 1

-----  Trial 20:  -----

Rules:

Rule 20/1: (2411.1, lift 5.7)
  PC2 > 1.783876
  PC3 <= 0.4947133
  ->  class 0  [1.000]

Rule 20/2: (1539.1, lift 5.7)
  PC2 > 1.009027
  PC3 <= 4.84012
  PC18 > 0.7350252
  ->  class 0  [0.999]

Rule 20/3: (361.7, lift 5.7)
  PC4 > 3.10376
  PC18 > -0.6560995
  ->  class 0  [0.997]

Rule 20/4: (1025.3/8.2, lift
5.6)
  PC3 <= 1.471241
  PC18 <= -0.6560995
  ->  class 0  [0.991]

Rule 20/5: (2994.4, lift 2.3)
  PC3 > 1.471241
  ->  class 1  [1.000]

Rule 20/6: (1298.7, lift 2.3)
  PC1 > -0.2067926
  PC3 > 0.09497605
  PC18 > -0.6560995
  PC20 > 0.139076
  ->  class 1  [0.999]

Rule 20/7: (1081.6, lift 2.2)
  PC1 > -0.2067926
  PC6 > 4.738519
  ->  class 1  [0.999]

Rule 20/8: (1190.9, lift 2.3)
  PC1 > -0.2067926
  PC18 > -0.6560995
  PC20 > 0.287138
  ->  class 1  [0.999]

Rule 20/9: (815/24.8, lift
2.2)
  PC1 > 5.880764
  PC2 > -4.403933
  ->  class 1  [0.968]

Rule 20/10: (294.6/8.5, lift
2.2)
  PC1 > 13.5602
  ->  class 1  [0.968]

Rule 20/11: (3519.8/111.9,
lift 2.2)
  PC3 > 0.4947133
  PC4 <= 3.10376
  PC18 > -0.6560995
```

```
  PC18 <= 0.7350252
  ->  class 1  [0.968]

Rule 20/12: (1418.7, lift 2.6)
  PC1 <= -0.2067926
  PC2 <= 1.783876
  PC3 <= 0.4947133
  ->  class 2  [0.999]

Rule 20/13: (1082.5, lift 2.6)
  PC1 <= 13.5602
  PC2 <= -4.403933
  ->  class 2  [0.999]

Rule 20/14: (60.4, lift 2.6)
  PC2 <= 1.009027
  PC18 > 0.7350252
  ->  class 2  [0.984]

Rule 20/15: (11462.8/4527.9,
lift 1.6)
  PC1 <= 5.880764
  PC2 <= 1.783876
  PC3 <= 0.4947133
  PC6 <= 4.738519
  PC20 <= 0.287138
  ->  class 2  [0.605]

Default class: 1

-----  Trial 21:  -----

Rules:

Rule 21/1: (2290.8/199.1, lift
6.0)
  PC1 <= -0.2067926
  PC2 > 0.02603757
  PC3 <= 0.8535662
  ->  class 0  [0.913]

Rule 21/2: (2943.8/148.4, lift
2.1)
  PC3 > 0.8535662
  ->  class 1  [0.949]

Rule 21/3: (14822.8/6247.4,
lift 1.3)
  PC1 > -0.2067926
  ->  class 1  [0.579]

Rule 21/4: (2295.4, lift 2.5)
  PC1 <= -0.2067926
  PC2 <= 0.02603757
  PC3 <= 0.8535662
  ->  class 2  [1.000]

Rule 21/5: (653.1, lift 2.5)
  PC1 > -0.2067926
  PC1 <= 6.713067
  PC3 <= 0.4917827
  PC6 <= 0.6544133
  ->  class 2  [0.998]

Rule 21/6: (456.7, lift 2.5)
  PC1 <= 6.713067
  PC3 <= 0.8535662
  PC8 <= -4.120215
  ->  class 2  [0.998]

Rule 21/7: (568.4, lift 2.5)
  PC1 > -0.2067926
  PC1 <= 6.713067
  PC3 <= 0.4917827
  PC20 <= 0.139076
  PC44 > 0.06069905
  ->  class 2  [0.998]

Rule 21/8: (296.1, lift 2.5)
  PC8 <= -5.539928
  ->  class 2  [0.997]

Rule 21/9: (615.4/40.4, lift
2.4)
  PC1 > -0.2067926
  PC3 <= 0.8535662
  PC44 > 1.665709
  ->  class 2  [0.933]

Default class: 1

-----  Trial 22:  -----

Rules:

Rule 22/1: (2268.8, lift 6.7)
  PC2 > 2.231518
  PC3 <= 1.640775
  ->  class 0  [1.000]

Rule 22/2: (968.7, lift 2.4)
  PC1 > -0.2067926
  PC5 <= -3.872002
  PC44 <= 1.958047
  ->  class 1  [0.999]

Rule 22/3: (809.4, lift 2.4)
  PC1 > -0.2067926
  PC6 > 0.6544133
  PC8 > -5.120721
  PC20 > 0.139076
  ->  class 1  [0.999]

Rule 22/4: (1472, lift 2.4)
  PC1 > -0.2067926
  PC2 <= 2.231518
  PC3 > 0.4917827
  ->  class 1  [0.999]

Rule 22/5: (1244.9, lift 2.4)
  PC2 <= 2.231518
  PC3 > 0.7695976
  ->  class 1  [0.999]

Rule 22/6: (1945.9, lift 2.4)
  PC3 > 1.640775
  ->  class 1  [0.999]

Rule 22/7: (530.9, lift 2.4)
  PC1 > 3.377754
  PC6 > 0.6544133
  PC44 <= 0.06069905
  ->  class 1  [0.998]

Rule 22/8: (784.1/7.4, lift
2.3)
  PC1 > 6.82987
  PC8 > -5.120721
  PC44 <= 1.958047
  ->  class 1  [0.989]

Rule 22/9: (928.8/87.9, lift
2.1)
  PC2 <= 2.231518
  PC45 <= -0.4936924
  ->  class 1  [0.905]

Rule 22/10: (1164.5, lift 2.3)
  PC1 <= 6.82987
  PC2 <= 2.231518
  PC3 <= 0.4917827
  PC20 <= 0.139076
  PC44 > 0.06069905
  ->  class 2  [0.999]

Rule 22/11: (2650.4/185.5,
lift 2.2)
  PC1 <= -0.2067926
  PC2 <= 2.231518
  PC3 <= 0.7695976
  ->  class 2  [0.930]

Rule 22/12: (16543.4/8005.6,
lift 1.2)
  PC2 <= 2.231518
  ->  class 2  [0.516]

Default class: 2

-----  Trial 23:  -----

Rules:

Rule 23/1: (1927.5, lift 10.3)
  PC2 > 2.231518
  PC3 <= 1.640775
  ->  class 0  [0.999]

Rule 23/2: (862.8, lift 1.9)
  PC1 > 11.17529
  PC2 > -7.187222
  PC8 > -5.539928
  PC44 <= 3.051546
  ->  class 1  [0.999]

Rule 23/3: (1057.6, lift 1.9)
  PC2 <= 2.231518
  PC3 > 0.7695976
  ->  class 1  [0.999]

Rule 23/4: (1653.1, lift 1.9)
  PC3 > 1.640775
  ->  class 1  [0.999]

Rule 23/5: (875.2/11.3, lift
1.8)
  PC1 > -0.5890457
  PC2 > -2.807775
  PC2 <= 2.231518
  PC8 > -5.539928
  PC18 <= 0.03836392
  PC20 > -0.2525934
  ->  class 1  [0.986]

Rule 23/6: (12577.3/4126.1,
lift 1.3)
  PC1 > -0.5890457
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  PC2 > -0.7490856
  PC2 <= 2.231518
  PC18 <= 0.3226619
  PC21 <= 2.189467
  ->  class 1  [0.672]

Rule 23/7: (941.8, lift 2.7)
  PC1 <= 11.17529
  PC2 > -2.807775
  PC2 <= -0.7490856
  PC3 <= 0.7695976
  PC18 > 0.03836392
  PC56 > -0.2653593
  ->  class 2  [0.999]

Rule 23/8: (1071.6, lift 2.7)
  PC1 <= 11.17529
  PC2 <= 2.231518
  PC3 <= 0.7695976
  PC18 > 0.3226619
  ->  class 2  [0.999]

Rule 23/9: (1343, lift 2.7)
  PC1 <= -0.5890457
  PC2 <= 2.231518
  ->  class 2  [0.999]

Rule 23/10: (778.8, lift 2.7)
  PC1 <= 11.17529
  PC2 <= 2.231518
  PC3 <= 0.7695976
  PC20 <= -0.2525934
  ->  class 2  [0.999]

Rule 23/11: (363.1, lift 2.7)
  PC2 <= 2.231518
  PC21 > 2.189467
  ->  class 2  [0.997]

Rule 23/12: (247.1, lift 2.7)
  PC2 <= -7.187222
  ->  class 2  [0.996]

Rule 23/13: (210.9, lift 2.7)
  PC8 <= -5.539928
  ->  class 2  [0.995]

Rule 23/14: (178.6/0.1, lift
2.7)
  PC2 <= 2.231518
  PC44 > 3.051546
  ->  class 2  [0.994]

Rule 23/15: (1353.5/14.3, lift
2.7)
  PC1 <= 11.17529
  PC2 <= -2.807775
  PC3 <= 0.7695976
  ->  class 2  [0.989]

Default class: 1

-----  Trial 24:  -----

Rules:

Rule 24/1: (1571.1, lift 12.7)
  PC2 > 2.231518
  PC3 <= 1.640775
  ->  class 0  [0.999]

Rule 24/2: (814.9, lift 2.2)
  PC1 > -0.2831207
  PC2 <= 2.231518
  PC3 > 0.4954133
  PC8 <= 0.5344445
  ->  class 1  [0.999]

Rule 24/3: (862, lift 2.2)
  PC2 <= 2.231518
  PC3 > 0.7695976
  ->  class 1  [0.999]

Rule 24/4: (1347.4, lift 2.2)
  PC3 > 1.640775
  ->  class 1  [0.999]

Rule 24/5: (811.9/0.3, lift
2.2)
  PC1 > 5.880764
  PC8 > -4.633186
  PC56 <= 1.34914
  ->  class 1  [0.998]

Rule 24/6: (496.7, lift 2.2)
  PC1 > 14.75054
  ->  class 1  [0.998]

Rule 24/7: (380, lift 2.2)
  PC1 > -0.2831207
  PC2 <= 2.231518
  PC5 <= 3.012746
  PC20 > 0.2005897
  ->  class 1  [0.997]

Rule 24/8: (1091.7/46.8, lift
2.1)
  PC2 <= 2.231518
  PC5 > 3.012746
  ->  class 1  [0.956]

Rule 24/9: (827.5, lift 2.1)
  PC1 <= 14.75054
  PC2 <= 2.231518
  PC3 <= 0.7695976
  PC8 > 0.5344445
  PC20 <= 0.2005897
  ->  class 2  [0.999]

Rule 24/10: (2192.8/206, lift
1.9)
  PC1 <= -0.2831207
  PC2 <= 2.231518
  PC3 <= 0.7695976
  ->  class 2  [0.906]

Rule 24/11: (14235.2/5599.9,
lift 1.3)
  PC1 <= 14.75054
  PC2 <= 2.231518
  PC3 <= 0.4954133
  PC5 <= 3.012746
  PC20 <= 0.2005897
  ->  class 2  [0.607]

Default class: 2

-----  Trial 25:  -----

Rules:

Rule 25/1: (1335.7, lift 14.9)
  PC2 > 2.231518
  PC3 <= 1.640775
  ->  class 0  [0.999]

Rule 25/2: (686.1, lift 2.0)
  PC1 > -0.5890457
  PC5 <= -5.238693
  ->  class 1  [0.999]

Rule 25/3: (768.5, lift 2.0)
  PC1 > 7.579506
  PC8 > -4.616251
  PC56 <= 2.149431
  ->  class 1  [0.999]

Rule 25/4: (1145.6, lift 2.0)
  PC3 > 1.640775
  ->  class 1  [0.999]

Rule 25/5: (1233.6/2.2, lift
2.0)
  PC1 > -0.5890457
  PC5 > 2.442836
  PC8 > -4.616251
  ->  class 1  [0.997]

Rule 25/6: (13434.4/5437.4,
lift 1.2)
  PC1 > -0.5890457
  PC2 > -0.6973979
  PC2 <= 2.231518
  PC21 <= 1.853932
  ->  class 1  [0.595]

Rule 25/7: (955.6, lift 2.3)
  PC1 <= -0.5890457
  PC2 <= 2.231518
  ->  class 2  [0.999]

Rule 25/8: (408.6, lift 2.3)
  PC2 <= 2.231518
  PC5 <= 2.442836
  PC21 > 1.853932
  ->  class 2  [0.998]

Rule 25/9: (277.3, lift 2.3)
  PC2 <= 2.231518
  PC5 <= 2.442836
  PC56 > 2.149431
  ->  class 2  [0.996]

Rule 25/10: (311.9/0.4, lift
2.3)
  PC1 <= 7.579506
  PC2 <= 2.231518
  PC3 <= 0.4462703
  PC18 > 0.1234509
  PC45 > -0.01201332
  ->  class 2  [0.996]

Rule 25/11: (1928.6/17, lift
2.2)
  PC1 <= 7.579506
  PC2 <= -0.6973979
  PC5 > -5.238693
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  PC5 <= 2.442836
  ->  class 2  [0.991]

Rule 25/12: (1255/29.9, lift
2.2)
  PC2 <= 2.231518
  PC8 <= -4.616251
  ->  class 2  [0.975]

Default class: 1

-----  Trial 26:  -----

Rules:

Rule 26/1: (1125.2, lift 17.7)
  PC2 > 2.231518
  PC3 <= 1.640775
  ->  class 0  [0.999]

Rule 26/2: (956, lift 2.2)
  PC1 > -0.2957253
  PC6 > 4.805911
  PC8 <= 0.586879
  ->  class 1  [0.999]

Rule 26/3: (766.2, lift 2.2)
  PC1 > -0.2957253
  PC2 <= 2.231518
  PC3 > 0.4954133
  PC8 <= 0.586879
  ->  class 1  [0.999]

Rule 26/4: (847.8, lift 2.2)
  PC1 > -0.5890457
  PC5 > 3.544814
  PC8 > -5.513502
  ->  class 1  [0.999]

Rule 26/5: (965, lift 2.2)
  PC3 > 1.640775
  ->  class 1  [0.999]

Rule 26/6: (518.7, lift 2.2)
  PC1 > -0.5890457
  PC2 <= 2.231518
  PC8 > -5.513502
  PC20 <= 0.157818
  PC45 <= -0.4020706
  ->  class 1  [0.998]

Rule 26/7: (276.4/0.8, lift
2.2)
  PC1 > -0.5890457
  PC4 > -0.2922504
  PC5 > 2.0037
  PC8 > -5.513502
  PC20 <= 0.157818
  ->  class 1  [0.994]

Rule 26/8: (115.9, lift 2.2)
  PC1 > -0.5890457
  PC1 <= -0.5865937
  PC2 <= 2.231518
  ->  class 1  [0.992]

Rule 26/9: (99.3, lift 2.2)
  PC1 > -0.4334595
  PC1 <= -0.4253984
  PC2 <= 2.231518
  ->  class 1  [0.990]

Rule 26/10: (855.2/21.2, lift
2.2)
  PC2 <= 2.231518
  PC3 > 0.7031291
  ->  class 1  [0.974]

Rule 26/11: (1216.9/77.9, lift
2.1)
  PC1 > -0.5890457
  PC2 <= 2.231518
  PC8 > -5.513502
  PC20 > 0.157818
  ->  class 1  [0.935]

Rule 26/12: (804.9, lift 2.0)
  PC1 <= -0.5890457
  PC2 <= 2.231518
  ->  class 2  [0.999]

Rule 26/13: (643.8/0.3, lift
2.0)
  PC2 <= 2.231518
  PC3 <= 0.7031291
  PC8 > 0.586879
  PC20 <= 0.157818
  PC45 > -0.4020706
  ->  class 2  [0.998]

Rule 26/14: (629.3, lift 2.0)
  PC8 <= -5.513502
  ->  class 2  [0.998]

Rule 26/15: (436.3, lift 2.0)
  PC1 > -0.5865937
  PC1 <= -0.4334595
  PC2 <= 2.231518
  ->  class 2  [0.998]

Rule 26/16: (266.3, lift 2.0)
  PC1 > -0.4253984
  PC1 <= -0.2957253
  PC2 <= 2.231518
  PC3 <= 0.7031291
  ->  class 2  [0.996]

Rule 26/17: (14339.2/5471.7,
lift 1.2)
  PC2 <= 2.231518
  PC3 <= 0.4954133
  PC5 <= 3.544814
  PC6 <= 4.805911
  PC20 <= 0.157818
  PC45 > -0.4020706
  ->  class 2  [0.618]

Default class: 2

-----  Trial 27:  -----

Rules:

Rule 27/1: (949.2, lift 21.0)
  PC2 > 2.231518
  PC3 <= 1.640775
  ->  class 0  [0.999]

Rule 27/2: (859, lift 1.9)
  PC1 > -0.2199142
  PC2 > -3.343765
  PC2 <= 2.231518
  PC20 > 0.1624312
  ->  class 1  [0.999]

Rule 27/3: (978.9, lift 1.9)
  PC2 > -1.062682
  PC2 <= 2.231518
  PC3 > 0.4954133
  PC18 <= 0.318009
  ->  class 1  [0.999]

Rule 27/4: (814, lift 1.9)
  PC3 > 1.640775
  ->  class 1  [0.999]

Rule 27/5: (147.2, lift 1.9)
  PC2 > -3.343765
  PC2 <= 2.231518
  PC5 > 2.761577
  PC18 > -0.06240003
  ->  class 1  [0.993]

Rule 27/6: (2600.4/28.6, lift
1.9)
  PC1 > 11.24986
  ->  class 1  [0.989]

Rule 27/7: (1290.8/19.1, lift
1.9)
  PC2 > -3.343765
  PC2 <= 2.231518
  PC18 <= -0.06240003
  ->  class 1  [0.984]

Rule 27/8: (1225.4, lift 2.4)
  PC1 <= 11.24986
  PC2 <= -3.343765
  ->  class 2  [0.999]

Rule 27/9: (945, lift 2.4)
  PC1 <= -0.2199142
  PC2 <= 2.231518
  PC3 <= 0.4954133
  ->  class 2  [0.999]

Rule 27/10: (661.5/0.6, lift
2.4)
  PC1 <= 11.24986
  PC2 <= 2.231518
  PC18 > 0.318009
  ->  class 2  [0.998]

Rule 27/11: (1135.4/46.9, lift
2.3)
  PC1 <= 11.24986
  PC2 <= -1.062682
  PC5 <= 2.761577
  PC18 > -0.06240003
  ->  class 2  [0.958]

Rule 27/12: (13500.3/5830.4,
lift 1.3)
  PC1 <= 11.24986
  PC2 <= 2.231518
  PC3 <= 0.4954133
  PC20 <= 0.1624312
```
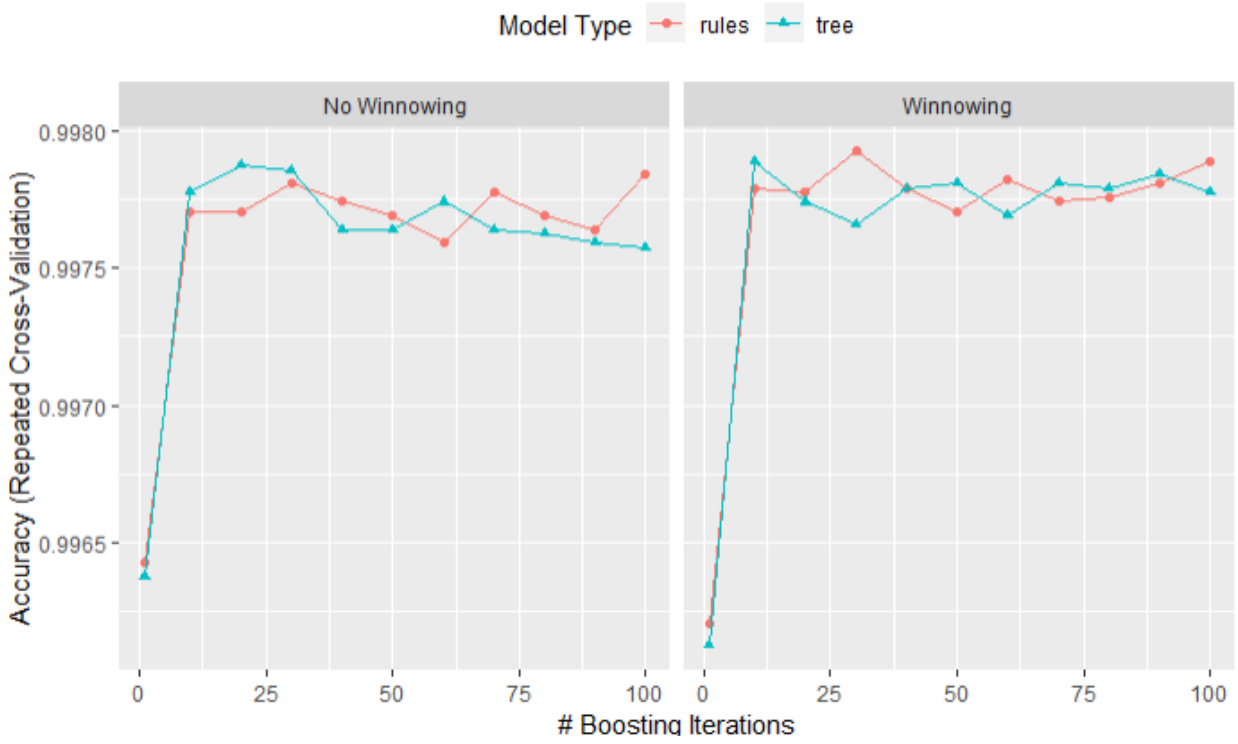

```
  ->  class 2  [0.568]

Default class: 1

-----  Trial 28:  -----

Rules:

Rule 28/1: (1204/399, lift
16.6)
  PC2 > 2.231518
  ->  class 0  [0.668]

Rule 28/2: (2111.4, lift 1.8)
  PC1 > 11.57262
  PC8 > -5.058322
  PC44 <= 3.051546
  ->  class 1  [1.000]

Rule 28/3: (818.7, lift 1.8)
  PC2 > -1.062682
  PC2 <= 2.231518
  PC3 > 0.5182653
  PC18 <= 0.318009
  ->  class 1  [0.999]

Rule 28/4: (497.1, lift 1.8)
  PC1 > -0.5890457
  PC2 > -3.739951
  PC5 > 3.012746
  PC8 > -5.058322
  ->  class 1  [0.998]

Rule 28/5: (15115/5047.8, lift
1.2)
  PC1 > -0.5890457
  PC4 > -0.1373443
  PC8 > -5.058322
  PC18 <= 0.318009
  PC21 <= 1.810277
  PC44 <= 1.509626
  ->  class 1  [0.666]

Rule 28/6: (985, lift 2.5)
  PC1 <= 11.57262
  PC2 <= -3.739951
  ->  class 2  [0.999]

Rule 28/7: (642.6, lift 2.5)
  PC1 <= 7.238853
  PC2 <= -1.062682
  PC4 > -0.1373443
  PC18 > -0.1543459
  ->  class 2  [0.998]

Rule 28/8: (575.8, lift 2.5)
  PC1 <= -0.5890457
  PC2 <= 2.231518
  ->  class 2  [0.998]

Rule 28/9: (325.3/0.1, lift
2.5)
  PC1 <= 11.57262
  PC2 <= 2.231518
  PC44 > 1.509626
  ->  class 2  [0.997]

Rule 28/10: (560.9/0.5, lift
2.5)
  PC1 <= 11.57262
  PC2 <= 2.231518
  PC18 > 0.318009
  ->  class 2  [0.997]

Rule 28/11: (302.6, lift 2.5)
  PC2 <= 2.231518
  PC44 > 3.051546
  ->  class 2  [0.997]

Rule 28/12: (248.2, lift 2.5)
  PC1 <= 11.57262
  PC2 <= 2.231518
  PC5 <= 3.012746
  PC21 > 1.810277
  ->  class 2  [0.996]

Rule 28/13: (201.5, lift 2.5)
  PC1 <= 7.238853
  PC2 <= 2.231518
  PC3 <= 0.5182653
  PC4 > -0.1373443
  PC18 > -0.06687276
  PC44 <= -0.05402443
  ->  class 2  [0.995]

Rule 28/14: (1006.9/32.4, lift
2.5)
  PC8 <= -5.058322
  ->  class 2  [0.967]

Rule 28/15: (673.1/67.9, lift
2.3)
  PC1 <= 11.57262
  PC2 <= 2.231518
  PC4 <= -0.1373443
  PC5 <= 3.012746
  PC18 > -0.1543459
  ->  class 2  [0.898]

Default class: 1

-----  Trial 29:  -----

Rules:

Rule 29/1: (627.2, lift 29.5)
  PC2 > 0.9487218
  PC3 <= 0.9319737
  ->  class 0  [0.998]

Rule 29/2: (285.3/5.1, lift
28.9)
  PC18 > 1.145156
  ->  class 0  [0.979]

Rule 29/3: (1659.6, lift 1.7)
  PC1 > 14.58976
  ->  class 1  [0.999]

Rule 29/4: (1133.4/2.1, lift
1.7)
  PC2 > -4.588735
  PC6 > 0.6589279
  PC8 > -3.711777
  PC18 <= 0.06461755
  ->  class 1  [0.997]

Rule 29/5: (607.7/2.9, lift
1.7)
  PC1 > 8.6641
  PC2 > -4.588735
  ->  class 1  [0.994]

Rule 29/6: (3080.7/35.3, lift
1.7)
  PC3 > 0.9319737
  PC18 <= 1.145156
  ->  class 1  [0.988]

Rule 29/7: (15248.9/5679.9,
lift 1.1)
  PC2 > -0.9983891
  PC18 <= 1.145156
  ->  class 1  [0.628]

Rule 29/8: (970.5, lift 2.7)
  PC1 <= 8.6641
  PC2 <= 0.9487218
  PC8 <= -3.711777
  ->  class 2  [0.999]

Rule 29/9: (977.6, lift 2.7)
  PC1 <= 14.58976
  PC2 <= -4.588735
  ->  class 2  [0.999]

Rule 29/10: (409.6, lift 2.7)
  PC1 <= 8.6641
  PC2 <= -0.9983891
  PC18 > 0.06461755
  ->  class 2  [0.998]

Rule 29/11: (468, lift 2.7)
  PC1 <= 14.58976
  PC2 <= 0.9487218
  PC18 > 0.3251283
  ->  class 2  [0.998]

Rule 29/12: (1135.1/2.2, lift
2.7)
  PC1 <= 8.6641
  PC2 <= 0.9487218
  PC6 <= 0.6589279
  ->  class 2  [0.997]

Rule 29/13: (277, lift 2.7)
  PC1 <= 14.58976
  PC2 <= 0.9487218
  PC3 <= 0.4954133
  PC18 > 0.2485706
  ->  class 2  [0.996]

Default class: 1
```

```
Evaluation on training data (19937 cases):

Trial          Rules
-----    ----------------
          No      Errors
   0      14   50( 0.3%)
   1       9  169( 0.8%)
   2      12  150( 0.8%)
   3      13   49( 0.2%)
   4      15   88( 0.4%)
   5      10   94( 0.5%)
   6      11   88( 0.4%)
   7      11 4055(20.3%)
   8       7 2771(13.9%)
   9       9   92( 0.5%)
  10      11  156( 0.8%)
  11      15   98( 0.5%)
  12      11   65( 0.3%)
  13      14   50( 0.3%)
  14      13 1381( 6.9%)
  15      11   54( 0.3%)
  16       9 1979( 9.9%)
  17      13   80( 0.4%)
  18      11  208( 1.0%)
  19      15  229( 1.1%)
  20      15   99( 0.5%)
  21       9  113( 0.6%)
  22      12   43( 0.2%)
  23      15   53( 0.3%)
  24      11   87( 0.4%)
  25      12   63( 0.3%)
  26      17  395( 2.0%)
  27      12   59( 0.3%)
  28      15 1513( 7.6%)
  29      13   67( 0.3%)
boost           39( 0.2%)   <<


     (a)   (b)   (c)    <-classified as
    ----  ----  ----
    5248     1          (a): class 0
          5196          (b): class 1
            38  9454    (c): class 2


  Attribute usage:

  100.00%  PC1
  100.00%  PC2
  100.00%  PC4
   99.93%  PC3
   96.10%  PC5
   96.03%  PC18
   93.90%  PC20
   70.28%  PC6
   69.01%  PC8
   64.28%  PC56
   61.56%  PC44
   58.15%  PC45
   41.49%  PC21

Time: 7.2 secs
```

Cross validation results



Building and Floor classifier

Summary

```
Rules:

Rule 59/218: (594.8/159.3,
lift 8.6)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC3 > -1.969858
  PC7 <= 0.9403377
  PC8 > -0.2284522
  PC22 > -0.7363216
  PC31 > -1.020629
  PC34 > -0.2343259
  PC43 <= 0.4003656
  PC45 <= 0.3518702
  PC66 <= 0.661222
  PC90 > -0.8783574
  ->  class 2\|1  [0.731]

Rule 59/219: (13.2/3.5, lift
8.2)
  PC1 > -0.430681
  PC1 <= 7.712098
  PC3 <= -0.078421
  PC6 > -3.303845
  PC8 > 0.4053988
  PC16 > -1.57082
  PC21 <= 0.9767466
  ->  class 2\|1  [0.702]

Rule 59/220: (38/13.2, lift
7.6)
  PC1 > -0.430681
  PC1 <= 12.83934
  PC2 <= 2.5099
  PC6 <= -3.303845
  PC16 > -1.57082
  PC21 <= 0.9767466
  ->  class 2\|1  [0.644]

Rule 59/221: (32.7/15.7, lift
6.1)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC3 <= -1.456332
  PC8 > -2.366995
  PC8 <= -0.2284522
  PC55 > -0.349167
  ->  class 2\|1  [0.520]

Rule 59/222: (60.1, lift 11.1)
  PC1 > -0.430681
  PC1 <= 7.712098
  PC2 <= 2.5099
  PC3 <= -0.078421
  PC6 > -3.303845
  PC8 <= 0.4053988
  PC10 > -0.7595807
  PC16 > -1.57082
  PC63 <= 0.1939764
  PC77 > -0.698553
  PC83 <= -0.1383405
  ->  class 2\|2  [0.984]

Rule 59/223: (338.6/6.2, lift
11.0)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 > -2.28156
  PC8 <= -0.2284522
  PC18 > 0.1355499
  PC26 > -2.096402
  PC28 > -0.1336785
  PC55 > -0.349167
  PC57 <= 0.1998243
  ->  class 2\|2  [0.979]

Rule 59/224: (29.9, lift 10.9)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 > -2.366995
  PC8 <= -0.2284522
```

```
  PC22 > 0.7315881
  PC24 <= 0.5337712
  PC26 <= 1.911687
  PC28 <= 0.04334826
  PC55 > -0.349167
  ->  class 2\|2  [0.969]

Rule 59/225: (26.4, lift 10.8)
  PC2 <= 2.5099
  PC8 > -2.366995
  PC8 <= -0.2284522
  PC48 > 1.831459
  PC55 > -0.349167
  ->  class 2\|2  [0.965]

Rule 59/226: (18.4, lift 10.7)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 > -0.2284522
  PC8 <= 1.706811
  PC14 <= 0.04802229
  PC32 > 0.2848878
  PC34 > -0.2343259
  PC43 <= 0.4003656
  ->  class 2\|2  [0.951]

Rule 59/227: (89.9/4.4, lift
10.6)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC3 > -1.969858
  PC8 > -0.2284522
  PC8 <= 1.706811
  PC9 > -3.206743
  PC14 <= -0.12576
  PC19 > -0.807842
  PC22 > -0.7363216
  PC29 <= 0.2904995
  PC33 > -0.1169735
  PC43 <= 0.4003656
  PC45 <= 0.3518702
  PC50 > -0.4993279
  PC58 > -1.022025
  PC87 > -1.009479
  PC92 <= 0.07465919
  ->  class 2\|2  [0.942]

Rule 59/228: (21.2/0.5, lift
10.5)
  PC1 <= -0.430681
  PC8 > -2.366995
  PC8 <= -0.2284522
  PC15 > -2.639711
  PC26 > -2.096402
  PC28 > -0.1336785
  PC28 <= -0.1169155
  PC55 > -0.349167
  PC57 <= 0.1998243
  PC58 > -0.2576883
  ->  class 2\|2  [0.937]

Rule 59/229: (61.1/3.5, lift
10.4)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 > -2.366995
  PC8 <= -0.2284522
  PC26 > 1.911687
  PC55 > -0.349167
  PC57 > 0.1998243
  ->  class 2\|2  [0.928]

Rule 59/230: (125.8/9.9, lift
10.3)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 > -2.366995
  PC8 <= -0.2284522
  PC14 > -3.377089
  PC44 <= -1.570117
  ->  class 2\|2  [0.915]

Rule 59/231: (125.7/10.8, lift
10.2)
  PC2 <= -1.025067
  PC3 > -1.969858
  PC8 > -0.2284522
  PC8 <= 0.09907256
  PC14 > 0.04802229
  PC21 <= 2.607432
  PC43 <= 0.4003656
  PC45 <= 0.3518702
  ->  class 2\|2  [0.908]

Rule 59/232: (13.9/0.5, lift
10.2)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 > -2.366995
  PC8 <= -0.2284522
  PC24 <= 0.5337712
  PC26 <= 1.911687
  PC45 > 0.17905
  PC50 > -0.2359059
  PC55 > -0.349167
  PC63 <= 0.07539722
  ->  class 2\|2  [0.907]

Rule 59/233: (19.7/1.1, lift
10.1)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 <= -0.2284522
  PC24 <= 0.5337712
  PC38 > 0.3118937
  PC45 <= 0.17905
  PC55 > -0.349167
  PC57 > 0.1998243
  ->  class 2\|2  [0.903]

Rule 59/234: (36.3/3.5, lift
9.9)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 <= -0.2284522
  PC45 > 0.17905
  PC55 > -0.349167
  PC57 > 0.1998243
  PC63 > 0.07539722
  ->  class 2\|2  [0.882]

Rule 59/235: (24/5.4, lift
8.5)
  PC1 <= -0.430681
  PC8 > 1.706811
  PC21 <= -0.2469342
  PC40 <= -1.505996
  ->  class 2\|2  [0.753]

Rule 59/236: (9/2.7, lift 7.4)
  PC1 <= -0.430681
  PC5 <= -0.02843485
  PC8 > 1.706811
  PC21 <= -0.2469342
  ->  class 2\|2  [0.661]

Rule 59/237: (1443.9/782.3,
lift 5.1)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 > -0.2284522
  PC8 <= 1.706811
  ->  class 2\|2  [0.458]

Rule 59/238: (8349.3/7235.3,
lift 1.5)
  PC1 <= -0.430681
  PC7 <= 0.1627358
  ->  class 2\|2  [0.134]

Rule 59/239: (6555.1/5771.2,
lift 1.3)
  PC42 <= -0.2960028
  ->  class 2\|2  [0.120]

Rule 59/240: (190.4/0.4, lift
8.7)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 > -2.366995
  PC8 <= -0.2284522
  PC22 <= 0.7315881
  PC24 <= 0.5337712
  PC26 <= 1.911687
  PC28 <= 0.04334826
  PC38 <= 0.3118937
  PC45 <= 0.17905
  PC48 <= 1.831459
  PC55 > -0.349167
  PC57 > 0.1998243
  ->  class 2\|3  [0.993]

Rule 59/241: (154.8/0.3, lift
8.6)
  PC1 <= -0.430681
  PC8 <= -2.366995
  PC9 <= 13.08143
  PC18 <= 0.4007553
  PC27 <= 0.6582274
  PC43 > -0.2123912
  PC71 <= -0.4219821
  ->  class 2\|3  [0.992]
```

```
Rule 59/242: (84.3, lift 8.6)
  PC5 <= 1.706661
  PC8 > -2.366995
  PC8 <= -0.2284522
  PC10 > -0.1655585
  PC31 > 0.4507802
  PC33 > -0.436803
  PC36 <= 0.1113107
  PC55 <= -0.349167
  PC76 > 0.03856554
  PC98 <= 0.9932177
  ->  class 2\|3  [0.988]

Rule 59/243: (72.3, lift 8.6)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 > -2.366995
  PC8 <= -0.2284522
  PC18 <= 0.1355499
  PC22 > -1.506412
  PC28 > -0.1169155
  PC30 <= 0.1029848
  PC46 <= 0.6978064
  PC53 <= 1.004849
  PC55 > -0.349167
  PC57 <= 0.1998243
  PC62 <= 0.778848
  PC63 <= 0.1278757
  PC77 > -0.6268708
  PC91 <= 0.7292686
  ->  class 2\|3  [0.986]

Rule 59/244: (66.2, lift 8.6)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 <= -0.2284522
  PC18 <= 0.4007553
  PC43 > -0.2123912
  PC85 <= 0.6340817
  PC94 > 0.8051957
  ->  class 2\|3  [0.985]

Rule 59/245: (97.4/0.6, lift
8.6)
  PC2 <= 2.5099
  PC8 <= -2.366995
  PC9 <= 13.08143
  PC16 > -0.07434393
  PC27 <= 0.6582274
  PC43 > -0.2123912
  PC46 <= 0.6020408
  PC55 <= 0.02386742
  PC85 <= 0.6340817
  ->  class 2\|3  [0.984]

Rule 59/246: (43.8, lift 8.5)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 > -2.366995
  PC8 <= -0.2284522
  PC15 <= -2.639711
  ->  class 2\|3  [0.978]

Rule 59/247: (42.4, lift 8.5)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 <= -0.2284522
  PC9 <= 13.08143
  PC27 <= 0.6582274
  PC43 > -0.2123912
  PC85 > 0.6340817
  PC89 > 0.2725144
  ->  class 2\|3  [0.977]

Rule 59/248: (75.1/0.9, lift
8.5)
  PC1 > -0.430681
  PC9 <= -1.926722
  PC10 <= -0.7595807
  PC19 > -1.342918
  PC36 > -4.764976
  PC79 > -0.3699443
  ->  class 2\|3  [0.975]

Rule 59/249: (41.2/0.1, lift
8.5)
  PC1 > -0.430681
  PC1 <= 7.712098
  PC2 <= 2.5099
  PC3 <= -0.078421
  PC8 <= 0.4053988
  PC10 > -0.7595807
  PC16 > -1.57082
  PC19 > -2.100959
  PC71 <= 0.5562124
  PC83 > -0.1383405
  ->  class 2\|3  [0.974]

Rule 59/250: (263.3/6.1, lift
8.5)
  PC1 <= -0.430681
  PC8 <= -2.366995
  PC11 > -4.154833
  PC20 <= 0.8054562
  PC28 > -0.3896254
  PC29 <= 0.2803762
  PC38 <= 0.2603965
  PC43 <= -0.2123912
  PC46 <= 0.6020408
  PC51 <= 0.6479242
  PC75 > -3.193952
  PC77 <= 1.472729
  PC88 > -0.2613862
  PC98 <= 0.4484963
  ->  class 2\|3  [0.973]

Rule 59/251: (222.8/6, lift
8.4)
  PC1 <= -0.430681
  PC8 <= -2.366995
  PC11 > -4.154833
  PC18 <= 0.4007553
  PC27 <= 0.6582274
  PC28 > -0.3896254
  PC39 > -1.071754
  PC43 > -0.2123912
  PC55 > 0.02386742
  PC58 <= 0.7851682
  PC85 <= 0.6340817
  ->  class 2\|3  [0.969]

Rule 59/252: (28.8, lift 8.4)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 > -2.366995
  PC8 <= -0.2284522
  PC18 <= 0.1355499
  PC22 > -1.506412
  PC27 > 0.3977295
  PC55 > -0.349167
  PC79 > -0.5828069
  ->  class 2\|3  [0.967]

Rule 59/253: (35.7/0.3, lift
8.4)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 <= -0.2284522
  PC18 <= 0.4007553
  PC25 <= 0.2106012
  PC54 <= 1.223546
  PC74 > 1.00145
  ->  class 2\|3  [0.967]

Rule 59/254: (85.1/2.3, lift
8.4)
  PC1 <= -0.430681
  PC8 <= -2.366995
  PC9 <= 13.08143
  PC18 > 0.4007553
  PC28 > -0.3896254
  PC43 > -0.2123912
  ->  class 2\|3  [0.962]

Rule 59/255: (344.5/16.1, lift
8.3)
  PC1 <= -0.430681
  PC8 <= -2.366995
  PC11 > -4.154833
  PC27 <= 0.6582274
  PC28 > -0.3896254
  PC55 <= 0.02386742
  PC64 <= -0.0583652
  PC73 > -1.384647
  PC73 <= 0.08739737
  PC85 <= 0.6340817
  ->  class 2\|3  [0.951]

Rule 59/256: (115.5/4.9, lift
8.3)
  PC1 <= -0.430681
  PC8 <= -2.366995
  PC28 > -0.3896254
  PC43 > -0.2123912
  PC54 > 1.223546
  PC85 <= 0.6340817
  ->  class 2\|3  [0.950]

Rule 59/257: (29.2/0.7, lift
8.3)
  PC1 > -0.430681
```

```
  PC3 <= -0.078421
  PC6 > -3.303845
  PC16 > -1.57082
  PC19 > -2.100959
  PC77 <= -0.698553
  ->  class 2\|3  [0.947]

Rule 59/258: (18, lift 8.3)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 > -2.366995
  PC8 <= -0.2284522
  PC18 <= 0.1355499
  PC55 > -0.349167
  PC57 <= 0.1998243
  PC58 <= -0.2576883
  ->  class 2\|3  [0.947]

Rule 59/259: (14.9, lift 8.2)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 <= -0.2284522
  PC28 <= -0.3896254
  PC61 <= -0.2708035
  PC73 > -1.384647
  ->  class 2\|3  [0.941]

Rule 59/260: (58.5/2.9, lift
8.2)
  PC1 > -0.430681
  PC1 <= 7.712098
  PC2 <= 2.5099
  PC3 <= -0.078421
  PC6 > -3.303845
  PC19 > -2.100959
  PC63 > 0.1939764
  PC83 <= -0.1383405
  ->  class 2\|3  [0.936]

Rule 59/261: (11.5, lift 8.0)
  PC2 <= 2.5099
  PC8 > -2.366995
  PC8 <= -2.28156
  PC18 > 0.1355499
  PC55 > -0.349167
  ->  class 2\|3  [0.923]

Rule 59/262: (36/2.1, lift
8.0)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC3 > -1.969858
  PC8 > -0.2284522
  PC8 <= 0.5471949
  PC21 <= 2.607432
  PC22 > -0.7363216
  PC43 > 0.4003656
  PC45 <= 0.3518702
  ->  class 2\|3  [0.919]

Rule 59/263: (260.3/21.8, lift
8.0)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 > -2.366995
  PC8 <= -0.3262501
  PC14 > -3.377089
  PC29 <= 0.3346566
  PC33 > -0.436803
  PC36 <= 0.1113107
  PC44 > -1.570117
  PC45 <= 0.50282
  PC55 <= -0.349167
  PC76 <= 0.03856554
  PC98 <= 0.9932177
  ->  class 2\|3  [0.913]

Rule 59/264: (9.3, lift 7.9)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 <= -0.2284522
  PC28 <= -0.3896254
  PC73 > -1.384647
  PC93 > 0.4516766
  ->  class 2\|3  [0.911]

Rule 59/265: (8.6, lift 7.9)
  PC1 <= -0.430681
  PC11 <= -4.154833
  PC20 > 0.3217192
  ->  class 2\|3  [0.906]

Rule 59/266: (138.5/12.5, lift
7.9)
  PC1 <= -0.430681
  PC8 <= -2.366995
  PC46 > 0.6020408
  PC60 > -0.5467761
  ->  class 2\|3  [0.904]

Rule 59/267: (209.3/21.8, lift
7.8)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 > -2.366995
  PC8 <= -0.2284522
  PC22 <= 0.7315881
  PC24 <= 0.5337712
  PC26 <= 1.911687
  PC28 <= 0.04334826
  PC48 <= 1.831459
  PC55 > -0.349167
  PC57 > 0.1998243
  PC63 <= 0.07539722
  ->  class 2\|3  [0.892]

Rule 59/268: (58.6/6.3, lift
7.7)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 > -2.366995
  PC8 <= -0.2284522
  PC14 > -3.377089
  PC21 > -0.1462368
  PC33 > -0.436803
  PC36 > 0.1113107
  PC37 <= 0.8458046
  PC44 > -1.570117
  PC50 > -1.578668
  PC55 <= -0.349167
  ->  class 2\|3  [0.879]

Rule 59/269: (25.9/2.6, lift
7.6)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 <= 1.706811
  PC45 <= 0.3518702
  PC58 <= -1.199014
  PC90 > -0.8783574
  ->  class 2\|3  [0.871]

Rule 59/270: (216.5/32.8, lift
7.4)
  PC1 <= -0.430681
  PC8 <= -2.366995
  PC9 <= 13.08143
  PC11 > -4.154833
  PC43 > -0.2123912
  PC89 <= 0.2725144
  PC96 > 0.2208158
  ->  class 2\|3  [0.845]

Rule 59/271: (17.4/2, lift
7.4)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 > -2.366995
  PC8 <= -0.2284522
  PC26 > -2.096402
  PC28 <= -0.1336785
  PC57 <= 0.1998243
  PC79 > -0.5828069
  ->  class 2\|3  [0.843]

Rule 59/272: (33.2/5.3, lift
7.2)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC3 <= -1.969858
  PC8 > -0.2284522
  ->  class 2\|3  [0.822]

Rule 59/273: (50.7/8.4, lift
7.2)
  PC1 > -0.430681
  PC2 <= 2.5099
  PC10 <= -0.7595807
  PC19 > -1.342918
  PC93 > 0.243144
  ->  class 2\|3  [0.821]

Rule 59/274: (9.2/1, lift 7.1)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC6 > -0.7171136
  PC8 > -0.2284522
  PC8 <= 1.706811
  PC45 > 0.3518702
  ->  class 2\|3  [0.818]
```

```
Rule 59/275: (58.5/14.5, lift
6.5)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 > -2.366995
  PC8 <= -0.2284522
  PC26 <= -2.096402
  PC55 > -0.349167
  PC79 > -0.5828069
  ->  class 2\|3  [0.744]

Rule 59/276: (409.7/188.1,
lift 4.7)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 <= 1.706811
  PC14 <= 0.04802229
  PC34 <= -0.2343259
  PC43 <= 0.4003656
  ->  class 2\|3  [0.541]

Rule 59/277: (754.2, lift
12.4)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC11 <= -4.154833
  PC20 <= 0.3217192
  ->  class 2\|4  [0.999]

Rule 59/278: (139.3/0.6, lift
12.3)
  PC2 <= 2.5099
  PC9 <= -1.926722
  PC79 <= -0.3699443
  PC93 <= 0.243144
  ->  class 2\|4  [0.989]

Rule 59/279: (218.3/2, lift
12.2)
  PC8 <= -2.366995
  PC9 <= 13.08143
  PC18 <= 0.4007553
  PC28 > -0.3896254
  PC43 > -0.2123912
  PC46 <= 0.6020408
  PC73 > -1.384647
  PC85 > 0.6340817
  PC89 <= 0.2725144
  PC96 <= 0.2208158
  ->  class 2\|4  [0.986]

Rule 59/280: (106.3/1, lift
12.2)
  PC2 <= 2.5099
  PC8 <= -0.2284522
  PC28 <= -0.3896254
  PC59 <= 0.1749866
  PC61 > -0.2708035
  PC93 <= 0.4516766
  ->  class 2\|4  [0.982]

Rule 59/281: (42.1/0.2, lift
12.1)
  PC2 <= 2.5099
  PC8 <= -0.2284522
  PC18 <= 0.4007553
  PC27 > 0.6582274
  PC28 > -0.3896254
  PC43 > -0.2123912
  PC46 <= 0.6020408
  ->  class 2\|4  [0.973]

Rule 59/282: (26.8, lift 12.0)
  PC1 > -0.430681
  PC1 <= 7.712098
  PC2 <= 2.5099
  PC3 <= -0.078421
  PC16 > -1.57082
  PC21 <= 0.9767466
  PC71 > 0.5562124
  ->  class 2\|4  [0.965]

Rule 59/283: (19.9, lift 11.8)
  PC1 <= -0.430681
  PC8 <= -2.366995
  PC43 <= -0.2123912
  PC51 > 0.6479242
  PC73 > -1.384647
  ->  class 2\|4  [0.954]

Rule 59/284: (37.8/1.1, lift
11.7)
  PC2 <= 2.5099
  PC8 <= -2.366995
  PC9 <= 13.08143
  PC46 <= 0.6020408
  PC58 > 0.7851682
  PC73 > -1.384647
  ->  class 2\|4  [0.947]

Rule 59/285: (14.5, lift 11.7)
  PC8 <= -2.366995
  PC11 > -4.154833
  PC18 <= 0.4007553
  PC39 <= -1.071754
  PC43 > -0.2123912
  PC55 > 0.02386742
  PC71 > -0.4219821
  PC73 > -1.384647
  ->  class 2\|4  [0.940]

Rule 59/286: (13.5, lift 11.6)
  PC8 <= -0.2284522
  PC10 <= -0.1655585
  PC31 > 0.4507802
  PC36 <= 0.1113107
  PC55 <= -0.349167
  PC76 > 0.03856554
  ->  class 2\|4  [0.936]

Rule 59/287: (12.4, lift 11.5)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 <= -2.366995
  PC9 <= 13.08143
  PC43 <= -0.2123912
  PC45 > 0.3997746
  ->  class 2\|4  [0.930]

Rule 59/288: (11.4, lift 11.5)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 > -2.366995
  PC8 <= -0.2284522
  PC45 > 0.50282
  PC55 <= -0.349167
  ->  class 2\|4  [0.925]

Rule 59/289: (336.3/30.7, lift
11.2)
  PC2 <= 2.5099
  PC8 <= -2.366995
  PC16 <= -0.07434393
  PC25 <= 0.2106012
  PC43 > -0.2123912
  PC46 <= 0.6020408
  PC54 <= 1.223546
  PC55 <= 0.02386742
  PC71 > -0.4219821
  PC73 > 0.08739737
  PC74 <= 1.00145
  PC94 <= 0.8051957
  ->  class 2\|4  [0.906]

Rule 59/290: (46.9/4.6, lift
11.0)
  PC1 <= -0.430681
  PC8 <= -2.366995
  PC18 <= 0.4007553
  PC28 > -0.3896254
  PC43 > -0.2123912
  PC64 > -0.0583652
  PC71 > -0.4219821
  PC73 <= 0.08739737
  ->  class 2\|4  [0.886]

Rule 59/291: (5.6, lift 10.8)
  PC1 > -0.430681
  PC2 <= 2.5099
  PC36 <= -4.764976
  ->  class 2\|4  [0.868]

Rule 59/292: (44.1/7.5, lift
10.1)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 > -2.366995
  PC8 <= -0.2284522
  PC31 <= 0.4507802
  PC36 <= 0.1113107
  PC55 <= -0.349167
  PC76 > 0.03856554
  PC98 <= 0.9932177
  ->  class 2\|4  [0.815]

Rule 59/293: (48.2/17.6, lift
7.8)
  PC1 <= -0.430681
  PC2 <= 2.5099
  PC8 <= -2.366995
  PC11 > -4.154833
  PC43 <= -0.2123912
```

```
  PC46 <= 0.6020408                    PC88 <= -0.2613862
  PC73 > -1.384647                     ->  class 2\|4  [0.629]            Default class: 2\|2
```

Evaluation on training data (19937 cases):

Trial	Rules			Trial	Rules	
	No	Errors			No	Errors
0	251	580(2.9%)		29	272	1328(6.7%)
1	258	1300(6.5%)		30	328	1270(6.4%)
2	251	1338(6.7%)		31	289	1186(5.9%)
3	285	1294(6.5%)		32	301	1117(5.6%)
4	268	1095(5.5%)		33	282	1379(6.9%)
5	353	1244(6.2%)		34	269	1348(6.8%)
6	312	1118(5.6%)		35	277	1242(6.2%)
7	289	1999(10.0%)		36	280	1096(5.5%)
8	288	1466(7.4%)		37	285	1644(8.2%)
9	295	1305(6.5%)		38	330	1231(6.2%)
10	285	1345(6.7%)		39	321	1065(5.3%)
11	296	1434(7.2%)		40	267	1279(6.4%)
12	290	1462(7.3%)		41	289	1621(8.1%)
13	280	1247(6.3%)		42	285	1312(6.6%)
14	270	1277(6.4%)		43	283	1400(7.0%)
15	271	1178(5.9%)		44	244	1180(5.9%)
16	329	1277(6.4%)		45	277	1215(6.1%)
17	300	1274(6.4%)		46	300	1115(5.6%)
18	287	1099(5.5%)		47	306	1357(6.8%)
19	266	1214(6.1%)		48	311	1206(6.0%)
20	291	1195(6.0%)		49	310	1227(6.2%)
21	259	1593(8.0%)		50	295	1189(6.0%)
22	305	1159(5.8%)		51	302	1165(5.8%)
23	297	1160(5.8%)		52	311	1088(5.5%)
24	290	1179(5.9%)		53	266	1247(6.3%)
25	284	1236(6.2%)		54	299	1219(6.1%)
26	284	1323(6.6%)		55	277	1246(6.2%)
27	277	1269(6.4%)		56	306	1281(6.4%)
28	269	1140(5.7%)		57	304	1279(6.4%)
				58	294	1541(7.7%)
				59	293	1234(6.2%)
				boost		40(0.2%) <<

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	<-classified as
1058								1					(a): class 0|0
	1356												(b): class 0|1
		1443											(c): class 0|2
			1391										(d): class 0|3
				1368									(e): class 1|0
					1484								(f): class 1|1
						1396							(g): class 1|2
							911	37					(h): class 1|3
								1942					(i): class 2|0
								1	2161				(j): class 2|1
								1		1576			(k): class 2|2
											2709		(l): class 2|3
												1102	(m): class 2|4

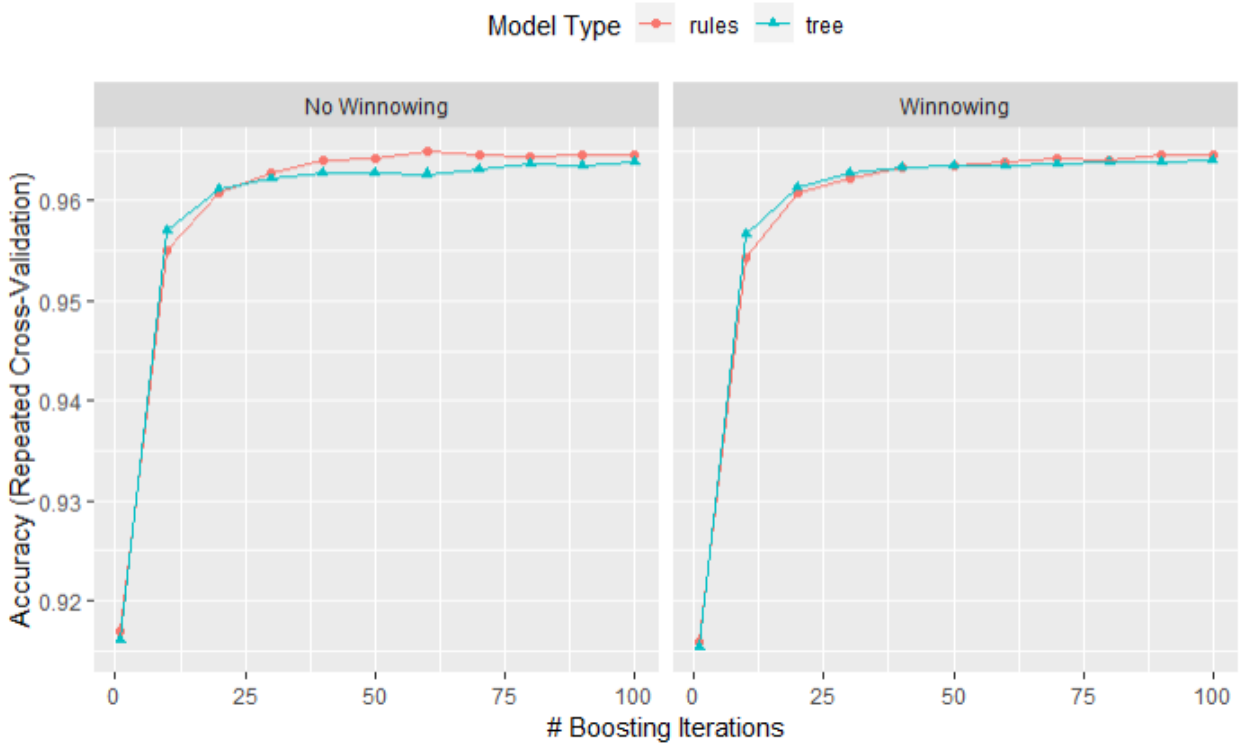
Attribute usage:

100.00%	PC1
100.00%	PC2
100.00%	PC3
99.80%	PC10
99.48%	PC8
98.33%	PC16
98.32%	PC15
97.67%	PC11

97.39% PC18
96.72% PC7
96.59% PC5
96.21% PC21
96.19% PC19
94.74% PC46
93.80% PC43
93.47% PC12
93.33% PC6
92.15% PC34
92.11% PC94
91.91% PC9
91.68% PC47
91.17% PC28
91.08% PC44
90.08% PC20
89.99% PC14
89.30% PC96
89.21% PC17
88.78% PC68
88.02% PC32
87.70% PC22
87.58% PC57
86.86% PC40
86.45% PC26
86.14% PC45
85.91% PC98
85.17% PC42
84.98% PC4
84.72% PC24
84.35% PC60
83.74% PC41
83.48% PC62
83.41% PC35
83.30% PC36
83.24% PC27
83.11% PC31
83.01% PC65
82.87% PC39
82.86% PC80
82.68% PC56
82.65% PC13
82.49% PC63
82.31% PC29
82.22% PC71
82.16% PC55
82.14% PC74
81.73% PC25
81.49% PC30
81.23% PC53
80.78% PC99
80.68% PC67
80.56% PC93
80.46% PC70
80.22% PC73
80.11% PC90
79.97% PC100
79.79% PC23
79.60% PC66
79.42% PC75
79.32% PC49
79.25% PC59
78.88% PC97
77.88% PC48
77.81% PC85
77.63% PC51
77.61% PC83
77.32% PC79
76.22% PC95
76.06% PC84
75.88% PC38
75.81% PC88
75.48% PC61
75.39% PC52
74.82% PC82
74.75% PC58
74.20% PC33
73.56% PC54
73.31% PC37
72.89% PC92
72.85% PC89
72.68% PC50
72.14% PC86
72.11% PC64
72.05% PC72
71.93% PC77
70.77% PC76
68.94% PC69
67.53% PC91
67.13% PC87
66.81% PC78
58.25% PC81

Time: 534.8 secs

Cross validation results



Comparison between models

Building-only classifiers

```
Call:
summary.resamples(object = ModelData)

Models: KNN, RF, C50
Number of resamples: 30

Accuracy
         Min.   1st Qu.    Median      Mean   3rd Qu.      Max. NA's
KNN 0.9954842 0.9964877 0.9969895 0.9969235 0.9974925 0.9984955    0
RF  0.9949850 0.9971149 0.9974925 0.9974921 0.9979940 0.9989975    0
C50 0.9954842 0.9971160 0.9979945 0.9979268 0.9988714 1.0000000    0

Kappa
         Min.   1st Qu.    Median      Mean   3rd Qu.      Max. NA's
KNN 0.9928895 0.9944715 0.9952621 0.9951629 0.9960560 0.9976354    0
RF  0.9921034 0.9954669 0.9960550 0.9960565 0.9968446 0.9984233    0
C50 0.9929112 0.9954676 0.9968488 0.9967418 0.9982264 1.0000000    0
```

Building and Floor classifiers

```
Call:
summary.resamples(object = ModelData)

Models: KNN, RF, C50
Number of resamples: 30

Accuracy
         Min.   1st Qu.    Median      Mean   3rd Qu.      Max. NA's
KNN 0.9514271 0.9559818 0.9598595 0.9589375 0.9612346 0.9674022    0
RF  0.9653614 0.9684012 0.9698795 0.9702394 0.9718946 0.9754139    0
C50 0.9568273 0.9623919 0.9651542 0.9648557 0.9677661 0.9739087    0

Kappa
         Min.   1st Qu.    Median      Mean   3rd Qu.      Max. NA's
KNN 0.9469866 0.9519434 0.9561812 0.9551742 0.9576804 0.9644125    0
RF  0.9621729 0.9654801 0.9671084 0.9675013 0.9693137 0.9731536    0
C50 0.9528738 0.9589453 0.9619530 0.9616352 0.9648088 0.9715220    0
```