```
 1 *--------------------------------------------------------------*

 2 User:                  u63452984
 3 Date:                  07 January 2024
 4 Time:                  06:40:44
 5 *--------------------------------------------------------------*

 6 * Training Output
 7 *--------------------------------------------------------------*

 8
 9
10
11
12 Variable Summary
13
14            Measurement      Frequency
15 Role            Level         Count
16
17 ID         INTERVAL           1
18 INPUT      INTERVAL           3
19 INPUT      NOMINAL            3
20 TARGET     BINARY             1
21
22
23
24
25 Model Events
26
27                                        Number
28                     Measurement          of
29  Target     Event      Level           Levels      Order
         Label
30
31 IMP_Churn      1      BINARY             2      Descending
    Imputed Churn
```

```
32
33
34
35
36   Predicted and decision variables
37
38   Type             Variable       Label
39
40   TARGET        IMP_Churn        Imputed Churn
41   PREDICTED     P_IMP_Churn1     Predicted: IMP_Churn=1
42   RESIDUAL      R_IMP_Churn1     Residual: IMP_Churn=1
43   PREDICTED     P_IMP_Churn0     Predicted: IMP_Churn=0
44   RESIDUAL      R_IMP_Churn0     Residual: IMP_Churn=0
45   FROM          F_IMP_Churn      From: IMP_Churn
46   INTO          I_IMP_Churn      Into: IMP_Churn
47
48
49
50
51
52   The HPFOREST Procedure
53
54         Performance Information
55
56   Execution Mode       Single-Machine
57   Number of Threads     2
58
59
60                 Data Access Information
61
62   Data                          Engine     Role      Path
63
64   WORK.HPDMFOREST_TRAINDATA     V9         Input     On Client
65
66
67                 Model Information
```

```
68
69  Parameter                         Value

71  Variables to Try                     2     (Default)
72  Maximum Trees                      100
73  Actual Trees                       100
74  Inbag Fraction                     0.6
75  Prune Fraction                       0     (Default)
76  Prune Threshold                    0.1     (Default)
77  Leaf Fraction                  0.00001     (Default)
78  Leaf Size Setting                    1     (Default)
79  Leaf Size Used                       1
80  Category Bins                       30
81  Interval Bins                      100
82  Minimum Category Size                5
83  Node Size                       100000     (Default)
84  Maximum Depth                       50
85  Alpha                             0.05
86  Exhaustive                        5000
87  Rows of Sequence to Skip             5     (Default)
88  Split Criterion                      .     Gini
89  Preselection Method                  .     BinnedSearch
90  Missing Value Handling               .     Valid value
91
92
93                          Number of Observations
94
95  Type                            NTrain          NValid
            NTotal
96
97  Number of Observations Read      17497            7502
            24999
98  Number of Observations Used      17497            7502
            24999
99
100
```

```
101                  Baseline Fit Statistics
102
103 Statistic                              Value        Validation
104
105 Average Square Error                   0.174          0.174
106 Misclassification Rate                 0.224          0.224
107 Log Loss                               0.531          0.532
108
109
110
            Fit Statistics
111
112                                  Average     Average     Average
113                                   Square      Square      Square     M
    isclassification   Misclassification   Misclassification
           Log          Log         Log
114    Number         Number       Error       Error       Error
              Rate                  Rate                    Rate
         Loss         Loss       Loss
115   of Trees      of Leaves    (Train)       (OOB)       (Valid)
             (Train)                  (OOB)                  (Valid)
      (Train)       (OOB)       (Valid)
116
117       1            1028        0.165        0.220       0.224
             0.214                  0.272                   0.276
        1.203      2.429      2.540
118       2            2579        0.136        0.230       0.205
             0.187                  0.287                   0.291
        0.494      2.618      1.159
119       3            3222        0.135        0.213       0.191
             0.188                  0.275                   0.249
        0.433      1.881      0.731
120       4            4360        0.130        0.209       0.188
             0.187                  0.274                   0.242
        0.418      1.543      0.621
121       5            5636        0.127        0.205       0.185
```

|  |  |  | 0.186 |  | 0.272 |  | 0.238 |
| 0.406 | 1.331 | 0.582 |

| 122 | 6 | 7162 | 0.123 | 0.202 | 0.184 |
|  |  | 0.183 |  | 0.270 |  | 0.236 |
| 0.396 | 1.198 | 0.580 |

| 123 | 7 | 8475 | 0.121 | 0.199 | 0.183 |
|  |  | 0.184 |  | 0.267 |  | 0.233 |
| 0.391 | 1.066 | 0.574 |

| 124 | 8 | 9369 | 0.121 | 0.195 | 0.181 |
|  |  | 0.186 |  | 0.258 |  | 0.231 |
| 0.392 | 0.903 | 0.564 |

| 125 | 9 | 10347 | 0.121 | 0.192 | 0.181 |
|  |  | 0.188 |  | 0.252 |  | 0.228 |
| 0.392 | 0.783 | 0.555 |

| 126 | 10 | 12052 | 0.119 | 0.191 | 0.180 |
|  |  | 0.188 |  | 0.251 |  | 0.228 |
| 0.386 | 0.745 | 0.554 |

| 127 | 11 | 12964 | 0.119 | 0.189 | 0.180 |
|  |  | 0.189 |  | 0.246 |  | 0.228 |
| 0.387 | 0.687 | 0.552 |

| 128 | 12 | 14452 | 0.118 | 0.188 | 0.179 |
|  |  | 0.188 |  | 0.245 |  | 0.229 |
| 0.384 | 0.663 | 0.551 |

| 129 | 13 | 15240 | 0.119 | 0.186 | 0.179 |
|  |  | 0.191 |  | 0.242 |  | 0.228 |
| 0.387 | 0.628 | 0.549 |

| 130 | 14 | 16319 | 0.119 | 0.185 | 0.178 |
|  |  | 0.192 |  | 0.240 |  | 0.229 |
| 0.387 | 0.613 | 0.547 |

| 131 | 15 | 17204 | 0.120 | 0.184 | 0.178 |
|  |  | 0.194 |  | 0.238 |  | 0.227 |
| 0.388 | 0.600 | 0.546 |

| 132 | 16 | 18766 | 0.119 | 0.183 | 0.178 |
|  |  | 0.193 |  | 0.237 |  | 0.227 |
| 0.385 | 0.584 | 0.546 |

| 133 | 17 | 19568 | 0.119 | 0.182 | 0.178 |

|  |  |  | 0.194 |  | 0.235 |  | 0.227 |
|---|---|---|---|---|---|---|---|
|  | 0.387 | 0.578 | 0.545 |  |  |  |  |
| 134 | 18 | 20594 | 0.119 | 0.182 | 0.178 |  |  |
|  |  |  | 0.195 |  | 0.234 |  | 0.227 |
|  | 0.388 | 0.573 | 0.545 |  |  |  |  |
| 135 | 19 | 21485 | 0.120 | 0.181 | 0.177 |  |  |
|  |  |  | 0.197 |  | 0.234 |  | 0.226 |
|  | 0.389 | 0.571 | 0.544 |  |  |  |  |
| 136 | 20 | 22780 | 0.119 | 0.181 | 0.177 |  |  |
|  |  |  | 0.196 |  | 0.233 |  | 0.227 |
|  | 0.388 | 0.563 | 0.544 |  |  |  |  |
| 137 | 21 | 23767 | 0.120 | 0.181 | 0.177 |  |  |
|  |  |  | 0.198 |  | 0.232 |  | 0.226 |
|  | 0.388 | 0.561 | 0.544 |  |  |  |  |
| 138 | 22 | 24994 | 0.119 | 0.180 | 0.177 |  |  |
|  |  |  | 0.197 |  | 0.231 |  | 0.225 |
|  | 0.388 | 0.561 | 0.543 |  |  |  |  |
| 139 | 23 | 26254 | 0.119 | 0.180 | 0.177 |  |  |
|  |  |  | 0.198 |  | 0.230 |  | 0.226 |
|  | 0.387 | 0.559 | 0.543 |  |  |  |  |
| 140 | 24 | 27699 | 0.119 | 0.180 | 0.177 |  |  |
|  |  |  | 0.198 |  | 0.230 |  | 0.226 |
|  | 0.386 | 0.557 | 0.543 |  |  |  |  |
| 141 | 25 | 28879 | 0.118 | 0.180 | 0.177 |  |  |
|  |  |  | 0.198 |  | 0.229 |  | 0.226 |
|  | 0.385 | 0.557 | 0.543 |  |  |  |  |
| 142 | 26 | 30597 | 0.118 | 0.180 | 0.177 |  |  |
|  |  |  | 0.197 |  | 0.230 |  | 0.226 |
|  | 0.383 | 0.557 | 0.544 |  |  |  |  |
| 143 | 27 | 31691 | 0.118 | 0.180 | 0.177 |  |  |
|  |  |  | 0.197 |  | 0.229 |  | 0.225 |
|  | 0.384 | 0.555 | 0.544 |  |  |  |  |
| 144 | 28 | 33055 | 0.117 | 0.179 | 0.177 |  |  |
|  |  |  | 0.198 |  | 0.228 |  | 0.225 |
|  | 0.383 | 0.553 | 0.543 |  |  |  |  |
| 145 | 29 | 34387 | 0.117 | 0.179 | 0.177 |  |  |

```
                    0.198                     0.228                     0.226
         0.382     0.552     0.543
146        30          35875      0.117      0.179      0.177
                    0.197                     0.228                     0.226
         0.381     0.552     0.544
147        31          36996      0.117      0.179      0.177
                    0.197                     0.228                     0.225
         0.381     0.551     0.543
148        32          38225      0.117      0.179      0.177
                    0.197                     0.228                     0.225
         0.381     0.549     0.543
149        33          39124      0.117      0.179      0.177
                    0.197                     0.228                     0.225
         0.382     0.549     0.543
150        34          40345      0.117      0.179      0.177
                    0.197                     0.228                     0.225
         0.381     0.548     0.542
151        35          41652      0.117      0.178      0.177
                    0.197                     0.227                     0.225
         0.381     0.548     0.542
152        36          42378      0.117      0.178      0.177
                    0.197                     0.226                     0.225
         0.382     0.547     0.542
153        37          42947      0.118      0.178      0.177
                    0.199                     0.226                     0.225
         0.384     0.546     0.542
154        38          44073      0.118      0.178      0.177
                    0.199                     0.226                     0.225
         0.384     0.546     0.542
155        39          45199      0.118      0.178      0.177
                    0.199                     0.226                     0.225
         0.384     0.546     0.542
156        40          46872      0.117      0.178      0.177
                    0.199                     0.226                     0.225
         0.382     0.546     0.542
157        41          47947      0.117      0.178      0.177
```

```
                0.198                    0.226                    0.225
        0.382      0.545      0.542
158        42          49486       0.117      0.178      0.177
                0.198                    0.226                    0.225
        0.381      0.545      0.542
159        43          50903       0.116      0.178      0.177
                0.199                    0.226                    0.225
        0.381      0.545      0.542
160        44          52021       0.117      0.177      0.177
                0.199                    0.226                    0.225
        0.381      0.545      0.542
161        45          52867       0.117      0.177      0.177
                0.199                    0.226                    0.225
        0.382      0.544      0.541
162        46          54218       0.117      0.177      0.176
                0.200                    0.226                    0.225
        0.381      0.543      0.541
163        47          55421       0.117      0.177      0.176
                0.199                    0.226                    0.225
        0.381      0.543      0.541
164        48          56543       0.117      0.177      0.176
                0.200                    0.226                    0.224
        0.381      0.543      0.541
165        49          57385       0.117      0.177      0.176
                0.200                    0.226                    0.225
        0.382      0.542      0.540
166        50          58689       0.117      0.177      0.176
                0.200                    0.226                    0.225
        0.382      0.542      0.540
167        51          59731       0.117      0.177      0.176
                0.200                    0.226                    0.225
        0.382      0.542      0.540
168        52          61190       0.117      0.177      0.176
                0.200                    0.226                    0.225
        0.382      0.542      0.540
169        53          62379       0.117      0.177      0.176
```

```
                0.200                       0.226                       0.225
        0.382     0.542     0.540
170        54          63595        0.117        0.177        0.176
                0.200                       0.226                       0.225
        0.381     0.542     0.540
171        55          64903        0.117        0.177        0.176
                0.200                       0.226                       0.225
        0.381     0.542     0.540
172        56          66282        0.117        0.177        0.176
                0.200                       0.226                       0.225
        0.381     0.542     0.540
173        57          67476        0.116        0.177        0.176
                0.199                       0.226                       0.225
        0.381     0.542     0.540
174        58          68928        0.116        0.177        0.176
                0.200                       0.227                       0.224
        0.380     0.542     0.540
175        59          70172        0.116        0.177        0.176
                0.200                       0.226                       0.225
        0.380     0.542     0.540
176        60          71036        0.116        0.177        0.176
                0.200                       0.226                       0.224
        0.381     0.541     0.540
177        61          72163        0.116        0.177        0.176
                0.200                       0.226                       0.225
        0.381     0.541     0.540
178        62          73352        0.116        0.177        0.176
                0.200                       0.226                       0.224
        0.381     0.541     0.539
179        63          74460        0.116        0.177        0.176
                0.200                       0.226                       0.224
        0.381     0.541     0.539
180        64          75841        0.116        0.177        0.176
                0.200                       0.226                       0.224
        0.380     0.541     0.539
181        65          76717        0.116        0.176        0.176
```

```
              0.200                      0.226                      0.224
      0.381      0.540      0.539
182        66          78394      0.116      0.176      0.176
              0.200                      0.226                      0.225
      0.380      0.541      0.539
183        67          79148      0.116      0.176      0.176
              0.201                      0.226                      0.225
      0.381      0.540      0.539
184        68          80027      0.117      0.176      0.176
              0.200                      0.226                      0.224
      0.381      0.540      0.539
185        69          81183      0.117      0.176      0.176
              0.200                      0.225                      0.224
      0.381      0.540      0.539
186        70          82423      0.117      0.176      0.176
              0.200                      0.226                      0.224
      0.381      0.540      0.539
187        71          83550      0.117      0.176      0.176
              0.200                      0.226                      0.224
      0.381      0.540      0.538
188        72          84369      0.117      0.176      0.176
              0.200                      0.226                      0.224
      0.382      0.540      0.538
189        73          85507      0.117      0.176      0.176
              0.200                      0.226                      0.224
      0.382      0.540      0.538
190        74          86968      0.117      0.176      0.176
              0.200                      0.226                      0.224
      0.381      0.540      0.538
191        75          87705      0.117      0.176      0.176
              0.200                      0.226                      0.224
      0.382      0.540      0.538
192        76          89071      0.117      0.176      0.176
              0.200                      0.225                      0.224
      0.382      0.540      0.538
193        77          89882      0.117      0.176      0.176
```

|  |  |  | 0.200 |  | 0.225 |  | 0.224 |
|---|---|---|---|---|---|---|---|
|  |  | 0.382 | 0.539 | 0.538 |  |  |  |
| 194 | 78 | 91433 | 0.117 | 0.176 | 0.176 |  |  |
|  |  |  | 0.201 |  | 0.225 |  | 0.224 |
|  |  | 0.381 | 0.540 | 0.538 |  |  |  |
| 195 | 79 | 92224 | 0.117 | 0.176 | 0.176 |  |  |
|  |  |  | 0.200 |  | 0.225 |  | 0.224 |
|  |  | 0.382 | 0.539 | 0.538 |  |  |  |
| 196 | 80 | 93557 | 0.117 | 0.176 | 0.176 |  |  |
|  |  |  | 0.200 |  | 0.225 |  | 0.224 |
|  |  | 0.382 | 0.539 | 0.538 |  |  |  |
| 197 | 81 | 94512 | 0.117 | 0.176 | 0.176 |  |  |
|  |  |  | 0.201 |  | 0.225 |  | 0.224 |
|  |  | 0.382 | 0.539 | 0.538 |  |  |  |
| 198 | 82 | 95866 | 0.117 | 0.176 | 0.176 |  |  |
|  |  |  | 0.201 |  | 0.225 |  | 0.225 |
|  |  | 0.382 | 0.539 | 0.538 |  |  |  |
| 199 | 83 | 96890 | 0.117 | 0.176 | 0.176 |  |  |
|  |  |  | 0.201 |  | 0.225 |  | 0.224 |
|  |  | 0.382 | 0.539 | 0.538 |  |  |  |
| 200 | 84 | 98218 | 0.117 | 0.176 | 0.176 |  |  |
|  |  |  | 0.201 |  | 0.225 |  | 0.224 |
|  |  | 0.382 | 0.539 | 0.538 |  |  |  |
| 201 | 85 | 99387 | 0.117 | 0.176 | 0.176 |  |  |
|  |  |  | 0.201 |  | 0.225 |  | 0.225 |
|  |  | 0.382 | 0.539 | 0.538 |  |  |  |
| 202 | 86 | 100424 | 0.117 | 0.176 | 0.176 |  |  |
|  |  |  | 0.201 |  | 0.225 |  | 0.224 |
|  |  | 0.382 | 0.539 | 0.538 |  |  |  |
| 203 | 87 | 101341 | 0.117 | 0.176 | 0.175 |  |  |
|  |  |  | 0.201 |  | 0.225 |  | 0.224 |
|  |  | 0.382 | 0.539 | 0.538 |  |  |  |
| 204 | 88 | 102613 | 0.117 | 0.176 | 0.176 |  |  |
|  |  |  | 0.201 |  | 0.225 |  | 0.224 |
|  |  | 0.382 | 0.539 | 0.538 |  |  |  |
| 205 | 89 | 104083 | 0.117 | 0.176 | 0.176 |  |  |

|       |     |        |       |       |       |
|-------|-----|--------|-------|-------|-------|
|       |     |        | 0.201 |       | 0.225 |       | 0.224 |
|       |     |        | 0.382 | 0.539 | 0.538 |
| 206   | 90  | 105265 | 0.117 | 0.176 | 0.176 |
|       |     |        | 0.202 |       | 0.225 |       | 0.225 |
|       |     |        | 0.382 | 0.539 | 0.538 |
| 207   | 91  | 106620 | 0.117 | 0.176 | 0.176 |
|       |     |        | 0.202 |       | 0.225 |       | 0.224 |
|       |     |        | 0.382 | 0.539 | 0.538 |
| 208   | 92  | 107517 | 0.117 | 0.176 | 0.176 |
|       |     |        | 0.202 |       | 0.225 |       | 0.224 |
|       |     |        | 0.382 | 0.539 | 0.538 |
| 209   | 93  | 108832 | 0.117 | 0.176 | 0.176 |
|       |     |        | 0.201 |       | 0.225 |       | 0.224 |
|       |     |        | 0.382 | 0.539 | 0.538 |
| 210   | 94  | 110299 | 0.117 | 0.176 | 0.176 |
|       |     |        | 0.201 |       | 0.225 |       | 0.224 |
|       |     |        | 0.381 | 0.539 | 0.538 |
| 211   | 95  | 111287 | 0.117 | 0.176 | 0.176 |
|       |     |        | 0.201 |       | 0.225 |       | 0.224 |
|       |     |        | 0.381 | 0.539 | 0.538 |
| 212   | 96  | 112519 | 0.117 | 0.176 | 0.176 |
|       |     |        | 0.201 |       | 0.225 |       | 0.224 |
|       |     |        | 0.381 | 0.539 | 0.538 |
| 213   | 97  | 113664 | 0.117 | 0.176 | 0.176 |
|       |     |        | 0.202 |       | 0.225 |       | 0.224 |
|       |     |        | 0.381 | 0.538 | 0.538 |
| 214   | 98  | 115457 | 0.116 | 0.176 | 0.176 |
|       |     |        | 0.201 |       | 0.225 |       | 0.224 |
|       |     |        | 0.381 | 0.539 | 0.538 |
| 215   | 99  | 116383 | 0.116 | 0.176 | 0.176 |
|       |     |        | 0.202 |       | 0.225 |       | 0.224 |
|       |     |        | 0.381 | 0.539 | 0.538 |
| 216   | 100 | 117951 | 0.116 | 0.176 | 0.176 |
|       |     |        | 0.202 |       | 0.225 |       | 0.224 |
|       |     |        | 0.381 | 0.539 | 0.538 |
| 217   |     |        |       |       |       |

Loss Reduction Variable Importance

| Variable | Number of Rules | OOB Gini | Valid Gini | Gini | Margin | OOB Margin | Valid Margin |
|---|---|---|---|---|---|---|---|
| M_Variable | 14 | 0.000006 | -0.00001 | -0.00001 | 0.000011 | -0.00000 | -0.00000 |
| PaymentMethod | 3436 | 0.001555 | -0.00138 | -0.00154 | 0.003110 | 0.00025 | 0.00026 |
| MembershipLevel | 7251 | 0.004056 | -0.00403 | -0.00461 | 0.008111 | 0.00013 | 0.00008 |
| TotalPurchases | 23922 | 0.017622 | -0.01630 | -0.01545 | 0.035243 | 0.00328 | 0.00403 |
| Age | 34661 | 0.030005 | -0.03257 | -0.03324 | 0.060010 | 0.00004 | -0.00026 |
| IMP_TotalSpent | 48567 | 0.057337 | -0.05445 | -0.05468 | 0.114673 | 0.00268 | 0.00254 |

                  Procedure Task Timing

| Task | Seconds | Percent |
|---|---|---|
| Reading Data | 0.05 | 0.18% |
| Training Forest | 25.65 | 99.82% |
| Saving Model | 0.00 | 0.00% |

The ASTORE Procedure

```
245
246                     Store Key
247
248  7B432C3C6E6E678EF8CF42DA805FD6350CF0B045
249
250
251          Basic Information
252
253  Analytic Engine      hpforest
254  Time Created          07Jan2024:06:40:30
255
256
257                                    Input Variables
258
259
                     Format
260  Name                          Length      Role        Type
         RawType        Name
261
262  Age                              8     Input     Interval
         Num
263  IMP_TotalSpent                   8     Input     Interval
         Num
264  TotalPurchases                   8     Input     Interval
         Num
265  M_Variable                       8     Input     Classification
         Num
266  MembershipLevel                  8     Input     Classification
         Character
267  PaymentMethod                   11     Input     Classification
         Character
268
269
270                           Output Variables
271
272  Name                       Length     Type          Label
```

```
273
274 P_IMP_Churn1                    8    Num          Predicted: IMP_
     Churn=1
275 P_IMP_Churn0                    8    Num          Predicted: IMP_
     Churn=0
276 I_IMP_Churn                    32    Character    Into: IMP_Churn
277 _WARN_                          4    Character    Warnings
278
279
280 *-----------------------------------------------------------
    -*
281 * Score Output
282 *-----------------------------------------------------------
    -*
283
284
285
286 The HP4SCORE Procedure
287
288        Performance Information
289
290 Execution Mode        Single-Machine
291 Number of Threads     1
292
293
294              Data Access Information
295
296 Data                 Engine    Role       Path
297
298 WORK._SCORETRAIN     V9        Input      On Client
299 WORK._OUTTEMP        V9        Output     On Client
300
301
302        Number of Observations
303
304 Type                                      N
```

```
305
306  Number of Observations Read          17497
307  Number of Observations Used          17497
308  Sum of Frequencies Used              17497
309
310
311          Procedure Task Timing
312
313  Task                Seconds       Percent
314
315  Scoring Data          2.06      100.00%
316
317
318
319  The HP4SCORE Procedure
320
321        Performance Information
322
323  Execution Mode       Single-Machine
324  Number of Threads     1
325
326
327              Data Access Information
328
329  Data                      Engine    Role       Path
330
331  EMWS3.HPDMFOREST_TRAIN    V9        Input      On Client
332  WORK._OUTTEMP             V9        Output     On Client
333
334
335         Number of Observations
336
337  Type                               N
338
339  Number of Observations Read          17497
340  Number of Observations Used          17497
```

```
341  Sum of Frequencies Used                 17497
342
343
344          Procedure Task Timing
345
346  Task                Seconds      Percent
347
348  Scoring Data         1.91      100.00%
349
350
351
352  The HP4SCORE Procedure
353
354        Performance Information
355
356  Execution Mode        Single-Machine
357  Number of Threads     1
358
359
360                 Data Access Information
361
362  Data                       Engine    Role      Path
363
364  EMWS3.HPDMFOREST_VALIDATE    V9       Input     On Client
365  WORK._OUTTEMP                V9       Output    On Client
366
367
368          Number of Observations
369
370  Type                                  N
371
372  Number of Observations Read         7502
373  Number of Observations Used         7502
374  Sum of Frequencies Used             7502
375
376
```

```
377          Procedure Task Timing
378
379 Task              Seconds      Percent
380
381 Scoring Data        1.28      100.00%
382
383
384 *------------------------------------------------------------
    -*
385 * Report Output
386 *------------------------------------------------------------
    -*
387
388
389
390
391 Fit Statistics
392
393 Target=IMP_Churn Target Label=Imputed Churn
394
395    Fit
396 Statistics    Statistics Label                    Train
     Validation
397
398  _ASE_        Average Squared Error                 0.12
         0.18
399  _DIV_        Divisor for ASE                   34994.00
     15004.00
400  _MAX_        Maximum Absolute Error                0.82
         0.94
401  _NOBS_       Sum of Frequencies                17497.00
      7502.00
402  _RASE_       Root Average Squared Error            0.34
         0.42
403  _SSE_        Sum of Squared Errors              4072.11
       2633.75
```

```
404  _DISF_       Frequency of Classified Cases      17497.00
       7502.00
405  _MISC_       Misclassification Rate                 0.20
          0.22
406  _WRONG_      Number of Wrong Classifications     3526.00
       1682.00
407
408
409
410
411  Classification Table
412
413  Data Role=TRAIN Target Variable=IMP_Churn Target Label=Imput
     ed Churn
414
415                              Target       Outcome     Frequency
          Total
416  Target    Outcome    Percentage   Percentage     Count
       Percentage
417
418   0          0        79.4221      99.9411        13578
          77.6019
419   1          0        20.5779      89.9514         3518
          20.1063
420   0          1         1.9950       0.0589            8
          0.0457
421   1          1        98.0050      10.0486          393
          2.2461
422
423
424  Data Role=VALIDATE Target Variable=IMP_Churn Target Label=Im
     puted Churn
425
426                              Target       Outcome     Frequency
          Total
427  Target    Outcome    Percentage   Percentage      Count
```

|  | Percentage | | | | |
|---|---|---|---|---|---|
| 429 | 0 | 0 | 77.9111 | 99.2617 | 5781 77.0595 |
| 430 | 1 | 0 | 22.0889 | 97.6758 | 1639 21.8475 |
| 431 | 0 | 1 | 52.4390 | 0.7383 | 43 0.5732 |
| 432 | 1 | 1 | 47.5610 | 2.3242 | 39 0.5199 |

433

434

435

436

437  Event Classification Table

438

439  Data Role=TRAIN Target=IMP_Churn Target Label=Imputed Churn

440

441

| False Negative | True Negative | False Positive | True Positive |
|---|---|---|---|
| 3518 | 13578 | 8 | 393 |

445

446

447  Data Role=VALIDATE Target=IMP_Churn Target Label=Imputed Churn

448

449

| False Negative | True Negative | False Positive | True Positive |
|---|---|---|---|
| 1639 | 5781 | 43 | 39 |

453

454

455

456

457  Assessment Score Rankings

458

459 Data Role=TRAIN Target Variable=IMP_Churn Target Label=Imputed Churn

460

461

| Depth | Gain | Lift | Cumulative Lift | % Response | Cumulative % Response | Number of Observations | Mean Posterior Probability |
|---|---|---|---|---|---|---|---|
| 5 | 326.928 | 4.26928 | 4.26928 | 95.4286 | 95.4286 | 875 | 0.51420 |
| 10 | 325.394 | 4.23860 | 4.25394 | 94.7429 | 95.0857 | 875 | 0.40461 |
| 15 | 317.213 | 4.00852 | 4.17213 | 89.6000 | 93.2571 | 875 | 0.35773 |
| 20 | 300.085 | 3.48700 | 4.00085 | 77.9429 | 89.4286 | 875 | 0.31967 |
| 25 | 264.652 | 2.22923 | 3.64652 | 49.8286 | 81.5086 | 875 | 0.28499 |
| 30 | 220.835 | 1.01747 | 3.20835 | 22.7429 | 71.7143 | 875 | 0.25699 |
| 35 | 181.183 | 0.42998 | 2.81183 | 9.6110 | 62.8511 | 874 | 0.23698 |
| 40 | 148.459 | 0.19429 | 2.48459 | 4.3429 | 55.5365 | 875 | 0.22221 |
| 45 | 121.531 | 0.06135 | 2.21531 | 1.3714 | 49.5174 | 875 | 0.20934 |
| 50 | 99.682 | 0.03068 | 1.99682 | 0.6857 | 44.6337 | 875 | 0.19853 |
| 55 | 81.759 | 0.02556 | 1.81759 | 0.5714 | 40.6276 | 875 | 0.18933 |
| 60 | 66.654 | 0.00511 | 1.66654 | 0.1143 | 37.2512 | 875 | 0.18097 |
| 65 | 53.833 | 0.00000 | 1.53833 | 0.0000 | 3 | | |

(Line numbers 462–477 correspond to the above header and data rows.)

```
       4.3854            875            0.17348
478    70      42.856    0.00000       1.42856       0.0000       3
       1.9317            874            0.16602
479    75      33.331    0.00000       1.33331       0.0000       2
       9.8026            875            0.15817
480    80      24.996    0.00000       1.24996       0.0000       2
       7.9397            875            0.14991
481    85      17.643    0.00000       1.17643       0.0000       2
       6.2960            875            0.14038
482    90      11.106    0.00000       1.11106       0.0000       2
       4.8349            875            0.12946
483    95       5.258    0.00000       1.05258       0.0000       2
       3.5276            875            0.11383
484   100       0.000    0.00000       1.00000       0.0000       2
       2.3524            874            0.08582
485

486

487  Data Role=VALIDATE Target Variable=IMP_Churn Target Label=Im
     puted Churn
488

489

                                   Mean
490                                Cumulative        %         Cum
     ulative        Number of        Posterior
491  Depth      Gain      Lift        Lift       Response       % R
     esponse    Observations    Probability
492

493     5    59.3317    1.59332       1.59332      35.6383         3
       5.6383            376            0.44637
494    10    36.3266    1.13260       1.36327      25.3333         3
       0.4927            375            0.34239
495    15    20.7036    0.89416       1.20704      20.0000         2
       6.9982            375            0.30878
496    20    17.3547    1.07299       1.17355      24.0000         2
       6.2492            375            0.28804
497    25    14.8681    1.04915       1.14868      23.4667         2
```

5.6930          375          0.27251
498   30    11.8196   0.96569      1.11820    21.6000      2
      5.0111          375          0.25928
499   35    9.9823    0.98954      1.09982    22.1333      2
      4.6002          375          0.24680
500   40    7.2634    0.88224      1.07263    19.7333      2
      3.9920          375          0.23615
501   45    5.2809    0.89416      1.05281    20.0000      2
      3.5486          375          0.22663
502   50    4.7676    1.00146      1.04768    22.4000      2
      3.4338          375          0.21786
503   55    3.9973    0.96312      1.03997    21.5426      2
      3.2614          376          0.20922
504   60    2.3855    0.84647      1.02385    18.9333      2
      2.9009          375          0.20043
505   65    2.3049    1.01338      1.02305    22.6667      2
      2.8829          375          0.19206
506   70    2.1508    1.00146      1.02151    22.4000      2
      2.8484          375          0.18409
507   75    1.4610    0.91800      1.01461    20.5333      2
      2.6942          375          0.17592
508   80    1.2298    0.97761      1.01230    21.8667      2
      2.6425          375          0.16742
509   85    1.0960    0.98954      1.01096    22.1333      2
      2.6125          375          0.15772
510   90    0.4473    0.89416      1.00447    20.0000      2
      2.4674          375          0.14655
511   95    0.1805    0.95377      1.00181    21.3333      2
      2.4077          375          0.13232
512  100    0.0000    0.96569      1.00000    21.6000      2
      2.3674          375          0.10138
513
514
515
516
517 Assessment Score Distribution

518

519 Data Role=TRAIN Target Variable=IMP_Churn Target Label=Imputed Churn

520

521   Posterior     Number                    Mean
522 Probability      of      Number of    Posterior
523    Range       Events    Nonevents   Probability    Percentage
524

525   0.75-0.80        5          0        0.76239        0.0286

526   0.70-0.75       18          0        0.71964        0.1029

527   0.65-0.70       29          0        0.66834        0.1657

528   0.60-0.65       58          0        0.62432        0.3315

529   0.55-0.60      109          1        0.57382        0.6287

530   0.50-0.55      174          7        0.52257        1.0345

531   0.45-0.50      318         19        0.47275        1.9260

532   0.40-0.45      603         35        0.42160        3.6463

533   0.35-0.40      890         85        0.37373        5.5724

534   0.30-0.35      951        236        0.32465        6.7840

535   0.25-0.30      585        950        0.27288        8.7729

536   0.20-0.25      162       2948        0.22219       17.7745

537   0.15-0.20        9       5380        0.17422       30.7996

538   0.10-0.15        0       3168        0.12960       18.10

```
60
```

| | Posterior Probability Range | Number of Events | Number of Nonevents | Mean Posterior Probability | Percentage |
|---|---|---|---|---|---|
| 539 | 0.05-0.10 | 0 | 732 | 0.08465 | 4.1836 |
| 540 | 0.00-0.05 | 0 | 25 | 0.04442 | 0.1429 |
| 541 | | | | | |
| 542 | | | | | |

543 Data Role=VALIDATE Target Variable=IMP_Churn Target Label=Imputed Churn

544

| | Posterior Probability Range | Number of Events | Number of Nonevents | Mean Posterior Probability | Percentage |
|---|---|---|---|---|---|
| 545 | | | | | |
| 546 | | | | | |
| 547 | | | | | |
| 548 | | | | | |
| 549 | 0.70-0.75 | 1 | 1 | 0.71059 | 0.0267 |
| 550 | 0.65-0.70 | 4 | 4 | 0.66621 | 0.1066 |
| 551 | 0.60-0.65 | 6 | 3 | 0.61798 | 0.1200 |
| 552 | 0.55-0.60 | 13 | 8 | 0.57683 | 0.2799 |
| 553 | 0.50-0.55 | 15 | 27 | 0.52124 | 0.5599 |
| 554 | 0.45-0.50 | 22 | 31 | 0.47489 | 0.7065 |
| 555 | 0.40-0.45 | 33 | 74 | 0.42185 | 1.4263 |
| 556 | 0.35-0.40 | 67 | 185 | 0.37087 | 3.3591 |
| 557 | 0.30-0.35 | 136 | 444 | 0.32140 | 7.7313 |
| 558 | 0.25-0.30 | 287 | 969 | 0.27296 | 16.7422 |
| 559 | 0.20-0.25 | 414 | 1580 | 0.22391 | 26.57 |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | 96 |
| 560 | 0.15-0.20 | 462 | 1665 | 0.17650 | 28.35 |
| | | | | | 24 |
| 561 | 0.10-0.15 | 195 | 714 | 0.13155 | 12.11 |
| | | | | | 68 |
| 562 | 0.05-0.10 | 23 | 117 | 0.08378 | 1.86 |
| | | | | | 62 |
| 563 | 0.00-0.05 | 0 | 2 | 0.04577 | 0.02 |
| | | | | | 67 |