**Appendix A: Decision Tree**

=== Run information ===

Scheme: weka.classifiers.trees.J48 -C 0.25 -M 2

Relation: selecteddata2-weka.filters.unsupervised.attribute.Reorder-R1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,19,20,21,22,23,24,25,26,18-weka.filters.unsupervised.attribute.Remove-R5-weka.filters.unsupervised.attribute.Remove-R10-weka.filters.unsupervised.attribute.NumericToNominal-Rfirst-last-weka.filters.unsupervised.attribute.Remove-R4-weka.filters.supervised.instance.ClassBalancer-num-intervals10-weka.filters.supervised.instance.ClassBalancer-num-intervals10

Instances: 25564

Attributes: 23

ecage26

ecsex99

marst26

pvreg25

dwtenr25

mortg25

multj28

alhrp28

yrxfte11

clwkr1

prmjb1

fllprt1

nocg2e6

imphwe1

uncoll1

n07c3g10

pubpv10

cqpc42

rppc42

udpd42

wgsal42

hleveg18

penpln1

Test mode: 10-fold cross-validation

=== Classifier model (full training set) ===

J48 pruned tree

------------------

clwkr1 = 1

| uncoll1 = 1: 1 (7875.58/1004.58)

| uncoll1 = 2: 1 (501.83/135.58)

| uncoll1 = 3

| | rppc42 = 0: 2 (10451.86/2552.63)

| | rppc42 = 25: 2 (51.12/21.09)

| | rppc42 = 50: 1 (13.23/5.46)

| | rppc42 = 75: 1 (10.1/4.55)

| | rppc42 = 100

| | | hleveg18 = 1: 1 (0.0)

| | | hleveg18 = 2: 1 (0.0)

| | | hleveg18 = 3: 1 (0.0)

| | | hleveg18 = 4: 1 (0.0)

| | | hleveg18 = 5: 1 (0.0)

| | | hleveg18 = 6: 2 (1.82)

| | | hleveg18 = 7: 1 (2.22)

| | | hleveg18 = 8: 2 (0.91)

| | | hleveg18 = 9: 1 (6.26/1.82)

| | | hleveg18 = 10: 1 (0.0)

| | | hleveg18 = 11: 2 (1.82)

| | | hleveg18 = 12: 1 (0.0)

| | rppc42 = 125

| | | pvreg25 = 10: 2 (0.0)

| | | pvreg25 = 11: 2 (0.0)

| | | pvreg25 = 12: 2 (0.0)

| | | pvreg25 = 13: 2 (0.0)

| | | pvreg25 = 24: 2 (4.55)

| | | pvreg25 = 35: 1 (1.11)

| | | pvreg25 = 46: 2 (0.0)

| | | pvreg25 = 47: 1 (2.02/0.91)

| | | pvreg25 = 48: 1 (3.33)

| | | pvreg25 = 59: 2 (0.91)

| | rppc42 = 150

| | | multj28 = 1: 1 (3.33)

| | | multj28 = 2: 2 (6.57/1.11)

| | rppc42 = 175: 1 (11.81/1.82)

| | rppc42 = 200

| | | multj28 = 1: 2 (2.73)

| | | multj28 = 2: 1 (9.59/1.82)

| | rppc42 = 225: 1 (13.43/4.55)

| | rppc42 = 250: 1 (13.83/2.73)

| | rppc42 = 275: 1 (14.74/3.64)

| | rppc42 = 300

| | | ecsex99 = 1: 1 (8.68/0.91)

| | | ecsex99 = 2: 2 (5.86/2.22)

| | rppc42 = 325: 1 (20.4/8.19)

| | rppc42 = 350: 1 (17.27/7.28)

| | rppc42 = 375

| | | prmjb1 = 1: 1 (7.77)

| | | prmjb1 = 2: 1 (2.02/0.91)

| | | prmjb1 = 8: 1 (0.0)

| | | prmjb1 = 9: 2 (2.73)

| | rppc42 = 400: 1 (9.59/1.82)

| | rppc42 = 425

| | | prmjb1 = 1: 1 (7.57/0.91)

| | | prmjb1 = 2: 1 (2.02/0.91)

| | | prmjb1 = 8: 1 (0.0)

| | | prmjb1 = 9: 2 (5.46)

| | rppc42 = 450: 1 (11.61/2.73)

| | rppc42 = 475: 1 (21.4/3.64)

| | rppc42 = 500

| | | hleveg18 = 1: 2 (0.0)

| | | hleveg18 = 2: 2 (0.0)

| | | hleveg18 = 3: 2 (0.0)

| | | hleveg18 = 4: 1 (1.11)

| | | hleveg18 = 5: 2 (0.0)

| | | hleveg18 = 6: 1 (2.02/0.91)

| | | hleveg18 = 7: 1 (2.22)

| | | hleveg18 = 8: 2 (0.0)

| | | hleveg18 = 9: 2 (4.55)

| | | hleveg18 = 10: 2 (0.0)

| | | hleveg18 = 11: 1 (4.04/1.82)

| | | hleveg18 = 12: 2 (0.0)

| | rppc42 = 525: 1 (10.3/3.64)

| | rppc42 = 550: 1 (13.43/4.55)

| | rppc42 = 575: 1 (16.05/2.73)

| | rppc42 = 600: 1 (16.76/4.55)

| | rppc42 = 625: 1 (18.38/7.28)

| | rppc42 = 650: 1 (12.72/2.73)

| | rppc42 = 675: 1 (15.65/4.55)

| | rppc42 = 700

| | | multj28 = 1: 2 (2.73)

| | | multj28 = 2: 1 (9.59/1.82)

| | rppc42 = 725: 1 (10.5/2.73)

| | rppc42 = 750: 1 (14.34/5.46)

| | rppc42 = 775: 1 (9.79/0.91)

| | rppc42 = 800: 1 (10.7/1.82)

| | rppc42 = 825: 1 (12.32/4.55)

| | rppc42 = 850: 1 (20.09/4.55)

| | rppc42 = 875: 1 (21.6/2.73)

| | rppc42 = 900: 1 (21.6/2.73)

| | rppc42 = 925: 1 (28.57/6.37)

| | rppc42 = 950: 1 (17.56/0.91)

| | rppc42 = 975: 1 (15.85/3.64)

| | rppc42 = 1000: 1 (31.39/3.64)

| | rppc42 = 1025: 1 (7.57/0.91)

| | rppc42 = 1050: 1 (23.62/3.64)

| | rppc42 = 1075: 1 (1.11)

| | rppc42 = 1100: 1 (47.54/10.92)

| | rppc42 = 1150: 1 (40.37/8.19)

| | rppc42 = 1200: 1 (37.13/2.73)

| | rppc42 = 1250: 1 (47.03/8.19)

| | rppc42 = 1300

| | | prmjb1 = 1: 1 (40.46/2.73)

| | | prmjb1 = 2: 1 (0.0)

| | | prmjb1 = 8: 1 (0.0)

| | | prmjb1 = 9: 2 (4.55)

| | rppc42 = 1350: 1 (46.63/10.01)

| | rppc42 = 1400

| | | prmjb1 = 1: 1 (23.82/2.73)

| | | prmjb1 = 2: 1 (2.22)

| | | prmjb1 = 8: 1 (0.0)

| | | prmjb1 = 9: 2 (3.64)

| | rppc42 = 1450

| | | prmjb1 = 1: 1 (49.54/1.82)

| | | prmjb1 = 2: 2 (0.91)

| | | prmjb1 = 8: 1 (0.0)

| | | prmjb1 = 9: 2 (5.86/2.22)

| | rppc42 = 1500: 1 (45.41/5.46)

| | rppc42 = 1550: 1 (36.34/6.37)

| | rppc42 = 1600: 1 (46.32/6.37)

| | rppc42 = 1650

| | | prmjb1 = 1: 1 (37.53/0.91)

| | | prmjb1 = 2: 1 (1.11)

| | | prmjb1 = 8: 1 (0.0)

| | | prmjb1 = 9: 2 (3.84/1.11)

| | rppc42 = 1700: 1 (21.4/3.64)

| | rppc42 = 1750: 1 (43.19/5.46)

| | rppc42 = 1800: 1 (34.32/5.46)

| | rppc42 = 1850: 1 (29.88/5.46)

| | rppc42 = 1900: 1 (38.24/2.73)

| | rppc42 = 1950: 1 (34.12/6.37)

| | rppc42 = 2000: 1 (53.29/10.01)

| | rppc42 = 2050: 1 (5.55)

| | rppc42 = 2100: 1 (60.95/5.46)

| | rppc42 = 2200: 1 (53.49/9.1)

| | rppc42 = 2300: 1 (60.46/12.74)

| | rppc42 = 2400: 1 (58.84/10.01)

| | rppc42 = 2500

| | | prmjb1 = 1: 1 (49.34/2.73)

| | | prmjb1 = 2: 2 (0.91)

| | | prmjb1 = 8: 1 (0.0)

| | | prmjb1 = 9: 2 (3.84/1.11)

| | rppc42 = 2600

| | | prmjb1 = 1: 1 (56.0/2.73)

| | | prmjb1 = 2: 1 (4.44)

| | | prmjb1 = 8: 1 (0.0)

| | | prmjb1 = 9: 2 (11.32/2.22)

| | rppc42 = 2700: 1 (42.28/4.55)

| | rppc42 = 2800: 1 (64.99/7.28)

| | rppc42 = 2900: 1 (46.52/5.46)

| | rppc42 = 3000: 1 (60.15/9.1)

| | rppc42 = 3100: 1 (48.85/10.01)

| | rppc42 = 3200: 1 (42.08/5.46)

| | rppc42 = 3300: 1 (48.74/5.46)

| | rppc42 = 3400: 1 (36.93/3.64)

| | rppc42 = 3500: 1 (62.97/6.37)

| | rppc42 = 3600: 1 (36.74/4.55)

| | rppc42 = 3700: 1 (32.1/5.46)

| | rppc42 = 3800: 1 (36.74/4.55)

| | rppc42 = 3900: 1 (43.19/5.46)

| | rppc42 = 4000: 1 (53.18/5.46)

| | rppc42 = 4100: 1 (40.26/3.64)

| | rppc42 = 4200: 1 (27.86/4.55)

| | rppc42 = 4300: 1 (34.32/5.46)

| | rppc42 = 4400

| | | prmjb1 = 1: 1 (32.7/2.73)

| | | prmjb1 = 2: 1 (0.0)

| | | prmjb1 = 8: 1 (0.0)

| | | prmjb1 = 9: 2 (4.55)

| | rppc42 = 4500

| | | prmjb1 = 1: 1 (15.54)

| | | prmjb1 = 2: 1 (2.02/0.91)

| | | prmjb1 = 8: 1 (0.0)

| | | prmjb1 = 9: 2 (3.84/1.11)

| | rppc42 = 4600: 1 (34.92/2.73)

| | rppc42 = 4700: 1 (23.82/2.73)

| | rppc42 = 4750: 1 (16.25/1.82)

| | rppc42 = 4800: 1 (21.09)

| | rppc42 = 4900: 1 (22.2)

| | rppc42 = 5000: 1 (49.85/5.46)

| | rppc42 = 5100: 1 (4.44)

| | rppc42 = 5250: 1 (61.75/1.82)

| | rppc42 = 5500: 1 (65.99/2.73)

| | rppc42 = 5750: 1 (50.56/7.28)

| | rppc42 = 6000: 1 (50.56/7.28)

| | rppc42 = 6250: 1 (37.13/2.73)

| | rppc42 = 6500: 1 (39.86/5.46)

| | rppc42 = 6750: 1 (38.04/3.64)

| | rppc42 = 7000: 1 (22.0/0.91)

| | rppc42 = 7250: 1 (30.88/0.91)

| | rppc42 = 7500: 1 (22.91/1.82)

| | rppc42 = 7750: 1 (22.0/0.91)

| | rppc42 = 8000: 1 (20.69/1.82)

| | rppc42 = 8250: 1 (18.47/1.82)

| | rppc42 = 8500: 1 (22.91/1.82)

| | rppc42 = 8750: 1 (19.98)

| | rppc42 = 9000: 1 (16.45/0.91)

| | rppc42 = 9250: 1 (12.21)

| | rppc42 = 9500: 1 (11.1)

| | rppc42 = 9750: 1 (10.9/0.91)

| | rppc42 = 10000: 1 (25.13/1.82)

| | rppc42 = 10250: 2 (0.0)

| | rppc42 = 10500: 1 (23.31)

| | rppc42 = 11000: 1 (24.22/0.91)

| | rppc42 = 11500: 1 (12.01/0.91)

| | rppc42 = 12000: 1 (13.32)

| | rppc42 = 12500: 1 (13.12/0.91)

| | rppc42 = 13000: 1 (15.54)

| | rppc42 = 13500: 1 (5.55)

| | rppc42 = 14000: 1 (3.33)

| | rppc42 = 14500: 1 (2.22)

| | rppc42 = 15000: 1 (4.44)

| | rppc42 = 15500: 1 (5.55)

| | rppc42 = 16000: 1 (2.22)

| | rppc42 = 16500: 1 (5.55)

| | rppc42 = 17000: 1 (2.22)

| | rppc42 = 17500: 1 (1.11)

| | rppc42 = 18000: 1 (1.11)

clwkr1 = 2: 2 (49.14)

clwkr1 = 3: 2 (698.84)

clwkr1 = 4: 2 (575.09)

clwkr1 = 5: 2 (358.52)

clwkr1 = 6: 2 (1515.97)

Number of Leaves : 205

Size of the tree : 225

Time taken to build model: 0.5 seconds

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 21323.2817 83.4114 %

Incorrectly Classified Instances 4240.7183 16.5886 %

Kappa statistic 0.6682

Mean absolute error 0.2597

Root mean squared error 0.3625

Relative absolute error 51.9476 %

Root relative squared error 72.5065 %

Total Number of Instances 25564

=== Detailed Accuracy By Class ===

TP Rate FP Rate Precision Recall F-Measure MCC ROC Area PRC Area Class

0.794 0.126 0.863 0.794 0.827 0.670 0.863 0.835 1

0.874 0.206 0.809 0.874 0.840 0.670 0.863 0.859 2

Weighted Avg. 0.834 0.166 0.836 0.834 0.834 0.670 0.863 0.847

=== Confusion Matrix ===

a b <-- classified as

10152.79 2629.21 | a = 1

1611.51 11170.49 | b = 2