J48 classifier:

=== Run information ===

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

Relation: germandata decritize

Instances: 1000

Attributes: 21

checking

duration

credit history

purpose

credit amount

saving status

employment

installment-commitment

other parties

debtors

residence since

property magnitued

age

other installment

housing

existing credits

job

num-dependents

telephone

foreign worker

Class label

Test mode: evaluate on training data

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

J48 pruned tree

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checking = A11

| foreign worker = A201

| | credit history = A34: good (58.0/17.0)

| | credit history = A32

| | | debtors = A101

| | | | saving status = A65

| | | | | credit amount = A51

| | | | | | residence since = A114

| | | | | | | duration = a21: good (4.0)

| | | | | | | duration = a23: good (0.0)

| | | | | | | duration = a22: bad (6.0/2.0)

| | | | | | | duration = a24: good (0.0)

| | | | | | residence since = A112: bad (4.0)

| | | | | | residence since = A113: good (1.0)

| | | | | | residence since = A111: bad (0.0)

| | | | | credit amount = A52: bad (4.0)

| | | | | credit amount = A53: bad (0.0)

| | | | | credit amount = A54: bad (0.0)

| | | | saving status = A61: bad (103.0/44.0)

| | | | saving status = A63: good (3.0)

| | | | saving status = A64: good (4.0)

| | | | saving status = A62

| | | | | telephone = A192: good (4.0/1.0)

| | | | | telephone = A191: bad (4.0)

| | | debtors = A103: good (11.0/1.0)

| | | debtors = A102: bad (7.0/3.0)

| | credit history = A33: bad (12.0/3.0)

| | credit history = A30: bad (13.0/3.0)

| | credit history = A31: bad (21.0/5.0)

| foreign worker = A202: good (15.0/2.0)

checking = A12

| credit amount = A51

| | saving status = A65: good (31.0/4.0)

| | saving status = A61

| | | duration = a21

| | | | property magnitued = A121: good (40.0/6.0)

| | | | property magnitued = A122: good (16.0/5.0)

| | | | property magnitued = A124: bad (1.0)

| | | | property magnitued = A123

| | | | | telephone = A192: good (14.0/3.0)

| | | | | telephone = A191: bad (12.0/4.0)

| | | duration = a23: bad (2.0)

| | | duration = a22

| | | | job = A173

| | | | | telephone = A192: bad (8.0/2.0)

| | | | | telephone = A191: good (8.0/2.0)

| | | | job = A172: bad (8.0/1.0)

| | | | job = A174: bad (4.0)

| | | | job = A171: bad (0.0)

| | | duration = a24: good (0.0)

| | saving status = A63

| | | duration = a21: good (7.0/1.0)

| | | duration = a23: good (0.0)

| | | duration = a22: bad (3.0/1.0)

| | | duration = a24: good (0.0)

| | saving status = A64: good (12.0/3.0)

| | saving status = A62

| | | other parties = A93

| | | | num-dependents = A181: good (15.0/3.0)

| | | | num-dependents = A184: bad (2.0)

| | | other parties = A92

| | | | employment = A75: bad (0.0)

| | | | employment = A73: bad (5.0/1.0)

| | | | employment = A74: good (2.0)

| | | | employment = A71: bad (0.0)

| | | | employment = A72: bad (4.0)

| | | other parties = A91: good (3.0/1.0)

| | | other parties = A94: bad (2.0)

| credit amount = A52

| | saving status = A65: good (10.0/1.0)

| | saving status = A61

| | | duration = a21: good (7.0/1.0)

| | | duration = a23

| | | | other installment = A143: bad (5.0)

| | | | other installment = A141: good (2.0)

| | | | other installment = A142: bad (0.0)

| | | duration = a22: good (11.0/3.0)

| | | duration = a24: bad (1.0)

| | saving status = A63: good (1.0)

| | saving status = A64: good (1.0)

| | saving status = A62

| | | telephone = A192

| | | | job = A173: good (2.0)

| | | | job = A172: good (0.0)

| | | | job = A174: bad (5.0/2.0)

| | | | job = A171: good (0.0)

| | | telephone = A191: bad (3.0)

| credit amount = A53

| | credit history = A34: bad (1.0)

| | credit history = A32: bad (9.0)

| | credit history = A33: good (2.0)

| | credit history = A30: good (1.0)

| | credit history = A31: good (1.0)

| credit amount = A54: bad (8.0)

checking = A14: good (394.0/46.0)

checking = A13: good (63.0/14.0)

Number of Leaves : 71

Size of the tree : 97

Time taken to build model: 0.02 seconds

=== Evaluation on training set ===

Time taken to test model on training data: 0 seconds

=== Summary ===

Correctly Classified Instances 815 81.5 %

Incorrectly Classified Instances 185 18.5 %

Kappa statistic 0.5407

Mean absolute error 0.2745

Root mean squared error 0.3705

Relative absolute error 65.3306 %

Root relative squared error 80.8427 %

Total Number of Instances 1000

=== Detailed Accuracy By Class ===

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

0.899 0.380 0.847 0.899 0.872 0.544 0.818 0.879 good

0.620 0.101 0.724 0.620 0.668 0.544 0.818 0.714 bad

Weighted Avg. 0.815 0.296 0.810 0.815 0.811 0.544 0.818 0.830

=== Confusion Matrix ===

a b <-- classified as

629 71 | a = good

114 186 | b = bad

PART classifier:

=== Run information ===

Scheme: weka.classifiers.rules.PART -C 0.25 -M 2

Relation: germandata decritize

Instances: 1000

Attributes: 21

checking

duration

credit history

purpose

credit amount

saving status

employment

installment-commitment

other parties

debtors

residence since

property magnitued

age

other installment

housing

existing credits

job

num-dependents

telephone

foreign worker

Class label

Test mode: evaluate on training data

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

PART decision list

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checking = A14 AND

other installment = A143 AND

credit history = A32 AND

existing credits = A161: good (142.0/11.0)

checking = A14 AND

other installment = A143 AND

credit history = A34: good (134.0/3.0)

debtors = A103 AND

housing = A152 AND

credit amount = A51 AND

other installment = A143: good (25.0)

checking = A13 AND

credit amount = A51 AND

foreign worker = A201 AND

num-dependents = A181 AND

property magnitued = A123: good (18.0/3.0)

saving status = A64: good (30.0/6.0)

checking = A13 AND

property magnitued = A122: good (11.0)

credit history = A33 AND

checking = A14 AND

employment = A73 AND

telephone = A191: good (10.0)

saving status = A63 AND

job = A173 AND

housing = A152: good (15.0/3.0)

credit history = A34 AND

residence since = A113 AND

credit amount = A51 AND

employment = A74: good (11.0)

saving status = A65 AND

foreign worker = A201 AND

debtors = A101 AND

checking = A12 AND

existing credits = A162: good (8.0)

credit history = A30 AND

housing = A151: bad (10.0/1.0)

duration = a24 AND

saving status = A61: bad (5.0/1.0)

duration = a21 AND

credit amount = A51 AND

existing credits = A163: good (14.0/2.0)

saving status = A65 AND

foreign worker = A201 AND

debtors = A101 AND

credit history = A33: good (12.0/1.0)

duration = a23 AND

saving status = A61: bad (38.0/10.0)

foreign worker = A201 AND

purpose = A41 AND

credit amount = A51: good (20.0/2.0)

foreign worker = A202: good (17.0/3.0)

purpose = A46 AND

checking = A11: bad (10.0/1.0)

duration = a23 AND

telephone = A191: bad (10.0/4.0)

duration = a21 AND

credit amount = A51 AND

residence since = A114 AND

other installment = A143 AND

housing = A152: good (36.0/3.0)

duration = a21 AND

credit amount = A52 AND

checking = A12 AND

num-dependents = A181: good (10.0/1.0)

purpose = A40 AND

credit amount = A51 AND

debtors = A101 AND

other parties = A92: bad (27.0/5.0)

duration = a21 AND

credit amount = A52: bad (10.0/2.0)

duration = a23: good (9.0/1.0)

credit amount = A53 AND

credit history = A32: bad (9.0)

checking = A14 AND

purpose = A43 AND

other installment = A141: good (11.0/1.0)

installment-commitment = A83 AND

purpose = A49: good (6.0)

installment-commitment = A81 AND

num-dependents = A181 AND

age = A131 AND

credit amount = A51 AND

property magnitued = A121: good (6.0/2.0)

debtors = A103: good (12.0/4.0)

credit history = A31: bad (26.0/7.0)

debtors = A102 AND

saving status = A61 AND

employment = A73 AND

age = A131: good (4.0/1.0)

debtors = A101 AND

credit amount = A52 AND

duration = a22 AND

purpose = A41: good (13.0/2.0)

debtors = A102: bad (13.0/3.0)

credit amount = A51 AND

installment-commitment = A81 AND

num-dependents = A181 AND

other parties = A92: good (7.0/1.0)

credit amount = A51 AND

installment-commitment = A82 AND

job = A173 AND

checking = A12: good (14.0/2.0)

credit amount = A53: good (7.0/2.0)

credit amount = A52 AND

duration = a22 AND

purpose = A43: good (6.0/1.0)

credit amount = A52 AND

duration = a22 AND

housing = A152 AND

job = A173 AND

saving status = A61: bad (6.0)

credit amount = A52 AND

duration = a22: good (13.0/5.0)

credit amount = A51 AND

other installment = A141 AND

installment-commitment = A84: bad (17.0/4.0)

credit amount = A51 AND

existing credits = A162 AND

saving status = A61 AND

other parties = A94: good (7.0/1.0)

credit amount = A51 AND

existing credits = A162 AND

num-dependents = A184 AND

credit history = A34: good (6.0)

credit amount = A51 AND

saving status = A62 AND

purpose = A43: bad (8.0/2.0)

credit amount = A51 AND

saving status = A62: good (14.0/2.0)

credit amount = A51 AND

credit history = A33 AND

existing credits = A162 AND

duration = a22: bad (7.0/2.0)

credit amount = A51 AND

credit history = A33 AND

existing credits = A161: bad (7.0)

credit amount = A51 AND

credit history = A30: bad (7.0/2.0)

credit amount = A51 AND

credit history = A34 AND

other installment = A143 AND

property magnitued = A121: bad (5.0/1.0)

credit amount = A51 AND

credit history = A34 AND

housing = A152: bad (17.0/6.0)

credit amount = A51 AND

credit history = A32 AND

existing credits = A162: good (11.0/3.0)

credit amount = A51 AND

credit history = A32 AND

job = A174: good (11.0/3.0)

credit amount = A51 AND

credit history = A32 AND

job = A172 AND

employment = A73 AND

other parties = A93: bad (10.0/3.0)

credit amount = A51 AND

credit history = A34: good (4.0/1.0)

credit amount = A51 AND

credit history = A32 AND

saving status = A65 AND

other parties = A93: good (4.0)

credit history = A32 AND

credit amount = A51 AND

saving status = A61 AND

job = A172 AND

other parties = A94: good (6.0/2.0)

credit history = A32 AND

credit amount = A51 AND

saving status = A61 AND

job = A172: bad (10.0/2.0)

credit amount = A51 AND

job = A173 AND

saving status = A65: bad (5.0/1.0)

credit amount = A51 AND

job = A173 AND

checking = A12 AND

age = A131: good (10.0/4.0)

credit amount = A51 AND

job = A173 AND

checking = A11 AND

residence since = A112: bad (9.0/3.0)

credit amount = A51 AND

job = A173 AND

checking = A11 AND

other parties = A92: good (11.0/4.0)

credit amount = A51 AND

property magnitued = A121: good (9.0)

: bad (20.0/6.0)

Number of Rules : 62

Time taken to build model: 0.08 seconds

=== Evaluation on training set ===

Time taken to test model on training data: 0.02 seconds

=== Summary ===

Correctly Classified Instances 854 85.4 %

Incorrectly Classified Instances 146 14.6 %

Kappa statistic 0.6477

Mean absolute error 0.2234

Root mean squared error 0.3342

Relative absolute error 53.1753 %

Root relative squared error 72.9352 %

Total Number of Instances 1000

=== Detailed Accuracy By Class ===

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

0.906 0.267 0.888 0.906 0.897 0.648 0.896 0.945 good

0.733 0.094 0.769 0.733 0.751 0.648 0.896 0.782 bad

Weighted Avg. 0.854 0.215 0.852 0.854 0.853 0.648 0.896 0.896

=== Confusion Matrix ===

a b <-- classified as

634 66 | a = good

80 220 | b = bad

One R Classifier:

=== Run information ===

Scheme: weka.classifiers.rules.OneR -B 6

Relation: germandata decritize

Instances: 1000

Attributes: 21

checking

duration

credit history

purpose

credit amount

saving status

employment

installment-commitment

other parties

debtors

residence since

property magnitued

age

other installment

housing

existing credits

job

num-dependents

telephone

foreign worker

Class label

Test mode: evaluate on training data

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

credit history:

A34 -> good

A32 -> good

A33 -> good

A30 -> bad

A31 -> bad

(717/1000 instances correct)

Time taken to build model: 0.02 seconds

=== Evaluation on training set ===

Time taken to test model on training data: 0.01 seconds

=== Summary ===

Correctly Classified Instances 717 71.7 %

Incorrectly Classified Instances 283 28.3 %

Kappa statistic 0.1567

Mean absolute error 0.283

Root mean squared error 0.532

Relative absolute error 67.3553 %

Root relative squared error 116.087 %

Total Number of Instances 1000

=== Detailed Accuracy By Class ===

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

0.949 0.823 0.729 0.949 0.824 0.202 0.563 0.727 good

0.177 0.051 0.596 0.177 0.272 0.202 0.563 0.352 bad

Weighted Avg. 0.717 0.592 0.689 0.717 0.659 0.202 0.563 0.615

=== Confusion Matrix ===

a b <-- classified as

664 36 | a = good

247 53 | b = bad