**Classification with J48 classifier:**

=== Run information ===

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

Relation: DatasetForWeka13Feb2020 - Sheet1

Instances: 391

Attributes: 30

Name

NumAttr

NumOps

NumPubOps

Setters

Getters

Nesting

IFImpl

NOC

NumDesc

NumAnc

DIT

CLD

OpsInh

AttrInh

Dep\_Out

Dep\_In

NumAssEl\_ssc

NumAssEl\_sb

NumAssEl\_nsb

EC\_Attr

IC\_Attr

EC\_Par

IC\_Par

EndWithManager, Controller

HasType, Annotation, List

EndWithFactory, Impl, Implementation

IsEntity

Confidence level

Role Stereotypes

Test mode: 10-fold cross-validation

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

J48 pruned tree

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

EndWithManager, Controller = No

| CLD <= 0

| | DIT <= 0

| | | EndWithFactory, Impl, Implementation = No

| | | | Dep\_In <= 0

| | | | | Nesting <= 0

| | | | | | IC\_Attr <= 0

| | | | | | | Confidence level = five

| | | | | | | | EC\_Attr <= 0

| | | | | | | | | NumPubOps <= 2

| | | | | | | | | | NumAnc <= 0: four (5.0/2.0)

| | | | | | | | | | NumAnc > 0: six (4.0)

| | | | | | | | | NumPubOps > 2

| | | | | | | | | | IsEntity = Yes

| | | | | | | | | | | Getters <= 0

| | | | | | | | | | | | NumAttr <= 3: one (3.0/1.0)

| | | | | | | | | | | | NumAttr > 3: two (4.0)

| | | | | | | | | | | Getters > 0: two (6.0/1.0)

| | | | | | | | | | IsEntity = No

| | | | | | | | | | | Getters <= 1

| | | | | | | | | | | | NumPubOps <= 23: one (34.0/14.0)

| | | | | | | | | | | | NumPubOps > 23: two (2.0/1.0)

| | | | | | | | | | | Getters > 1: two (2.0/1.0)

| | | | | | | | EC\_Attr > 0: one (10.0/1.0)

| | | | | | | Confidence level = three: six (3.0/1.0)

| | | | | | | Confidence level = four: one (3.0/2.0)

| | | | | | | Confidence level = two: one (0.0)

| | | | | | IC\_Attr > 0

| | | | | | | EC\_Attr <= 1

| | | | | | | | Getters <= 2

| | | | | | | | | Setters <= 0

| | | | | | | | | | Confidence level = five

| | | | | | | | | | | IsEntity = Yes: one (6.0)

| | | | | | | | | | | IsEntity = No

| | | | | | | | | | | | NumAttr <= 2: three (9.0/2.0)

| | | | | | | | | | | | NumAttr > 2: one (3.0/1.0)

| | | | | | | | | | Confidence level = three: one (2.0)

| | | | | | | | | | Confidence level = four: three (1.0)

| | | | | | | | | | Confidence level = two: three (4.0)

| | | | | | | | | Setters > 0: three (9.0/1.0)

| | | | | | | | Getters > 2

| | | | | | | | | Dep\_Out <= 8: one (6.0/1.0)

| | | | | | | | | Dep\_Out > 8: three (3.0/1.0)

| | | | | | | EC\_Attr > 1: one (7.0)

| | | | | Nesting > 0

| | | | | | Dep\_Out <= 0: six (4.0)

| | | | | | Dep\_Out > 0: three (2.0)

| | | | Dep\_In > 0

| | | | | Dep\_Out <= 16

| | | | | | IC\_Attr <= 4: one (98.0/13.0)

| | | | | | IC\_Attr > 4

| | | | | | | NumAttr <= 7: three (3.0/2.0)

| | | | | | | NumAttr > 7

| | | | | | | | Dep\_In <= 5: two (4.0/1.0)

| | | | | | | | Dep\_In > 5: one (5.0/1.0)

| | | | | Dep\_Out > 16: three (3.0/2.0)

| | | EndWithFactory, Impl, Implementation = Yes

| | | | NumAttr <= 1

| | | | | NumOps <= 1: five (3.0)

| | | | | NumOps > 1: three (2.0)

| | | | NumAttr > 1: six (3.0)

| | DIT > 0

| | | HasType, Annotation, List = No

| | | | Dep\_Out <= 1

| | | | | EC\_Par <= 1

| | | | | | IsEntity = Yes

| | | | | | | NumAnc <= 2: three (22.0/2.0)

| | | | | | | NumAnc > 2: one (8.0/1.0)

| | | | | | IsEntity = No

| | | | | | | NumAnc <= 3

| | | | | | | | NumAssEl\_ssc <= 0

| | | | | | | | | EC\_Attr <= 0: three (14.0)

| | | | | | | | | EC\_Attr > 0: five (2.0)

| | | | | | | | NumAssEl\_ssc > 0: five (4.0/1.0)

| | | | | | | NumAnc > 3: three (5.0)

| | | | | EC\_Par > 1: one (2.0)

| | | | Dep\_Out > 1: three (2.0/1.0)

| | | HasType, Annotation, List = Yes: one (7.0/1.0)

| CLD > 0

| | Getters <= 2

| | | EC\_Attr <= 0

| | | | NumAnc <= 0

| | | | | NOC <= 4

| | | | | | Getters <= 0: six (7.0/1.0)

| | | | | | Getters > 0

| | | | | | | NumAttr <= 2: three (4.0/2.0)

| | | | | | | NumAttr > 2: one (2.0)

| | | | | NOC > 4: three (4.0)

| | | | NumAnc > 0: three (11.0/1.0)

| | | EC\_Attr > 0: six (12.0)

| | Getters > 2: two (6.0/1.0)

EndWithManager, Controller = Yes: four (25.0)

EndWithManager, Controller = no: three (1.0)

Number of Leaves : 50

Size of the tree : 94

Time taken to build model: 0.17 seconds

=== Predictions on test data ===

inst#,actual,predicted,error,prediction

1,2:two,2:two,,0.667

2,2:two,2:two,,0.667

3,2:two,2:two,,0.667

4,1:one,1:one,,0.625

5,1:one,1:one,,1

6,1:one,1:one,,1

7,1:one,1:one,,0.889

8,1:one,1:one,,0.889

9,1:one,1:one,,1

10,1:one,3:three,+,0.667

11,1:one,1:one,,0.625

12,1:one,1:one,,0.625

13,1:one,1:one,,0.833

14,1:one,1:one,,0.889

15,1:one,1:one,,0.889

16,1:one,5:six,+,0.778

17,1:one,1:one,,0.889

18,1:one,1:one,,0.889

19,1:one,1:one,,1

20,1:one,1:one,,0.889

21,3:three,3:three,,1

22,3:three,3:three,,0.5

23,3:three,3:three,,0.9

24,3:three,3:three,,0.897

25,3:three,3:three,,0.9

26,3:three,3:three,,0.897

27,3:three,3:three,,0.889

28,3:three,1:one,+,1

29,3:three,1:one,+,0.625

30,3:three,3:three,,0.889

31,5:six,3:three,+,0.5

32,5:six,3:three,+,0.9

33,5:six,1:one,+,0.625

34,5:six,3:three,+,0.667

35,5:six,1:one,+,1

36,4:four,4:four,,1

37,4:four,1:one,+,0.889

38,4:four,3:three,+,0.9

39,6:five,4:four,+,0.75

40,6:five,6:five,,1

1,2:two,2:two,,1

2,2:two,1:one,+,0.643

3,2:two,3:three,+,1

4,1:one,3:three,+,0.667

5,1:one,1:one,,0.361

6,1:one,1:one,,0.865

7,1:one,1:one,,0.865

8,1:one,1:one,,0.865

9,1:one,1:one,,0.88

10,1:one,1:one,,1

11,1:one,1:one,,0.667

12,1:one,2:two,+,1

13,1:one,1:one,,0.865

14,1:one,1:one,,0.865

15,1:one,1:one,,0.865

16,1:one,1:one,,0.865

17,1:one,3:three,+,0.886

18,1:one,1:one,,0.865

19,1:one,4:four,+,0.667

20,1:one,1:one,,0.865

21,3:three,4:four,+,0.667

22,3:three,5:six,+,0.857

23,3:three,1:one,+,0.88

24,3:three,3:three,,0.889

25,3:three,3:three,,0.886

26,3:three,6:five,+,0.75

27,3:three,3:three,,0.886

28,3:three,3:three,,0.889

29,3:three,3:three,,0.886

30,3:three,3:three,,0.886

31,5:six,3:three,+,1

32,5:six,1:one,+,0.865

33,5:six,3:three,+,1

34,5:six,1:one,+,0.88

35,5:six,5:six,,1

36,4:four,4:four,,1

37,4:four,4:four,,1

38,4:four,4:four,,1

39,6:five,6:five,,1

1,2:two,1:one,+,0.667

2,2:two,1:one,+,0.595

3,2:two,2:two,,0.75

4,1:one,1:one,,0.595

5,1:one,1:one,,0.932

6,1:one,2:two,+,0.75

7,1:one,1:one,,0.595

8,1:one,1:one,,0.932

9,1:one,1:one,,0.932

10,1:one,6:five,+,1

11,1:one,1:one,,0.932

12,1:one,1:one,,0.932

13,1:one,1:one,,0.932

14,1:one,1:one,,0.595

15,1:one,1:one,,0.595

16,1:one,1:one,,0.8

17,1:one,1:one,,1

18,1:one,1:one,,0.595

19,1:one,1:one,,0.8

20,1:one,2:two,+,0.5

21,3:three,3:three,,1

22,3:three,3:three,,1

23,3:three,3:three,,1

24,3:three,3:three,,1

25,3:three,1:one,+,0.595

26,3:three,3:three,,1

27,3:three,3:three,,0.846

28,3:three,1:one,+,0.667

29,3:three,3:three,,1

30,3:three,5:six,+,0.933

31,5:six,5:six,,0.933

32,5:six,1:one,+,0.875

33,5:six,3:three,+,1

34,5:six,3:three,+,1

35,5:six,3:three,+,1

36,4:four,4:four,,1

37,4:four,4:four,,1

38,4:four,4:four,,1

39,6:five,3:three,+,0.5

1,2:two,1:one,+,0.524

2,2:two,2:two,,0.75

3,2:two,2:two,,0.75

4,1:one,1:one,,0.915

5,1:one,1:one,,1

6,1:one,1:one,,0.915

7,1:one,1:one,,0.667

8,1:one,1:one,,0.915

9,1:one,1:one,,0.8

10,1:one,1:one,,1

11,1:one,1:one,,0.524

12,1:one,1:one,,0.833

13,1:one,1:one,,0.915

14,1:one,3:three,+,0.684

15,1:one,1:one,,0.915

16,1:one,1:one,,0.915

17,1:one,1:one,,0.524

18,1:one,1:one,,0.8

19,1:one,3:three,+,0.75

20,1:one,1:one,,0.915

21,3:three,2:two,+,0.75

22,3:three,3:three,,0.946

23,3:three,3:three,,0.946

24,3:three,1:one,+,0.915

25,3:three,1:one,+,0.833

26,3:three,2:two,+,1

27,3:three,3:three,,0.946

28,3:three,3:three,,0.946

29,3:three,3:three,,0.75

30,3:three,3:three,,0.946

31,5:six,5:six,,1

32,5:six,5:six,,1

33,5:six,3:three,+,0.75

34,5:six,5:six,,1

35,5:six,5:six,,0.846

36,4:four,3:three,+,0.5

37,4:four,4:four,,1

38,4:four,4:four,,1

39,6:five,3:three,+,1

1,2:two,4:four,+,1

2,2:two,1:one,+,0.667

3,2:two,1:one,+,0.98

4,1:one,1:one,,0.667

5,1:one,1:one,,0.98

6,1:one,1:one,,0.98

7,1:one,1:one,,0.98

8,1:one,1:one,,0.98

9,1:one,1:one,,0.98

10,1:one,1:one,,0.8

11,1:one,1:one,,0.933

12,1:one,1:one,,0.98

13,1:one,1:one,,0.926

14,1:one,1:one,,0.98

15,1:one,3:three,+,0.786

16,1:one,1:one,,0.933

17,1:one,3:three,+,0.571

18,1:one,1:one,,0.926

19,1:one,1:one,,0.933

20,1:one,1:one,,0.857

21,3:three,3:three,,1

22,3:three,1:one,+,0.667

23,3:three,6:five,+,0.75

24,3:three,1:one,+,0.426

25,3:three,3:three,,1

26,3:three,3:three,,0.875

27,3:three,3:three,,0.875

28,3:three,1:one,+,0.667

29,3:three,3:three,,1

30,3:three,3:three,,0.875

31,5:six,1:one,+,0.75

32,5:six,1:one,+,0.667

33,5:six,5:six,,0.818

34,5:six,5:six,,0.818

35,5:six,5:six,,0.818

36,4:four,4:four,,1

37,4:four,4:four,,1

38,4:four,4:four,,1

39,6:five,6:five,,1

1,2:two,1:one,+,0.8

2,2:two,2:two,,0.8

3,2:two,1:one,+,0.892

4,1:one,3:three,+,0.886

5,1:one,1:one,,0.892

6,1:one,2:two,+,0.75

7,1:one,1:one,,0.892

8,1:one,1:one,,0.667

9,1:one,1:one,,0.892

10,1:one,1:one,,0.8

11,1:one,1:one,,0.892

12,1:one,1:one,,0.892

13,1:one,3:three,+,0.857

14,1:one,1:one,,0.8

15,1:one,1:one,,0.892

16,1:one,1:one,,0.667

17,1:one,1:one,,0.8

18,1:one,1:one,,0.892

19,1:one,1:one,,0.8

20,3:three,5:six,+,1

21,3:three,1:one,+,0.5

22,3:three,3:three,,0.886

23,3:three,4:four,+,1

24,3:three,1:one,+,0.8

25,3:three,1:one,+,0.727

26,3:three,3:three,,0.886

27,3:three,3:three,,0.886

28,3:three,3:three,,0.5

29,3:three,3:three,,0.886

30,3:three,1:one,+,1

31,5:six,5:six,,0.833

32,5:six,3:three,+,1

33,5:six,5:six,,1

34,5:six,1:one,+,0.892

35,4:four,4:four,,1

36,4:four,4:four,,1

37,4:four,4:four,,1

38,4:four,4:four,,1

39,6:five,3:three,+,0.857

1,2:two,1:one,+,0.855

2,2:two,1:one,+,0.619

3,2:two,2:two,,1

4,1:one,1:one,,0.855

5,1:one,1:one,,0.855

6,1:one,1:one,,0.855

7,1:one,2:two,+,0.6

8,1:one,3:three,+,1

9,1:one,1:one,,0.8

10,1:one,1:one,,0.952

11,1:one,1:one,,0.855

12,1:one,1:one,,0.855

13,1:one,1:one,,1

14,1:one,3:three,+,1

15,1:one,1:one,,0.855

16,1:one,1:one,,0.855

17,1:one,1:one,,0.855

18,1:one,1:one,,0.952

19,1:one,1:one,,0.778

20,3:three,3:three,,1

21,3:three,3:three,,1

22,3:three,3:three,,1

23,3:three,3:three,,1

24,3:three,1:one,+,0.855

25,3:three,3:three,,1

26,3:three,6:five,+,1

27,3:three,5:six,+,1

28,3:three,3:three,,0.714

29,3:three,6:five,+,1

30,3:three,5:six,+,1

31,5:six,3:three,+,0.8

32,5:six,1:one,+,0.75

33,5:six,1:one,+,0.619

34,5:six,5:six,,1

35,4:four,4:four,,1

36,4:four,2:two,+,0.5

37,4:four,4:four,,1

38,4:four,4:four,,1

39,6:five,1:one,+,0.855

1,2:two,3:three,+,0.5

2,2:two,3:three,+,1

3,2:two,1:one,+,0.925

4,1:one,2:two,+,0.769

5,1:one,1:one,,0.925

6,1:one,1:one,,0.565

7,1:one,1:one,,0.8

8,1:one,1:one,,0.925

9,1:one,3:three,+,0.733

10,1:one,1:one,,0.565

11,1:one,1:one,,0.925

12,1:one,1:one,,0.925

13,1:one,1:one,,0.925

14,1:one,1:one,,0.8

15,1:one,1:one,,0.565

16,1:one,1:one,,0.8

17,1:one,1:one,,0.925

18,1:one,3:three,+,1

19,1:one,1:one,,0.565

20,3:three,1:one,+,0.565

21,3:three,1:one,+,0.565

22,3:three,3:three,,0.733

23,3:three,1:one,+,0.565

24,3:three,3:three,,0.889

25,3:three,3:three,,0.733

26,3:three,1:one,+,0.8

27,3:three,3:three,,0.889

28,3:three,1:one,+,0.8

29,3:three,1:one,+,0.925

30,3:three,3:three,,1

31,5:six,5:six,,1

32,5:six,5:six,,0.833

33,5:six,2:two,+,0.769

34,5:six,1:one,+,0.925

35,4:four,4:four,,1

36,4:four,4:four,,1

37,4:four,3:three,+,0.5

38,4:four,3:three,+,0.5

39,6:five,3:three,+,0.882

1,2:two,2:two,,1

2,2:two,1:one,+,0.333

3,1:one,1:one,,0.896

4,1:one,1:one,,1

5,1:one,1:one,,0.896

6,1:one,1:one,,1

7,1:one,1:one,,1

8,1:one,1:one,,0.896

9,1:one,1:one,,1

10,1:one,1:one,,0.896

11,1:one,1:one,,1

12,1:one,1:one,,1

13,1:one,1:one,,0.896

14,1:one,1:one,,1

15,1:one,3:three,+,0.872

16,1:one,3:three,+,0.872

17,1:one,1:one,,1

18,1:one,1:one,,1

19,1:one,1:one,,1

20,3:three,1:one,+,1

21,3:three,6:five,+,1

22,3:three,3:three,,0.872

23,3:three,3:three,,0.872

24,3:three,1:one,+,0.896

25,3:three,3:three,,0.75

26,3:three,3:three,,0.872

27,3:three,6:five,+,1

28,3:three,1:one,+,0.613

29,3:three,3:three,,0.75

30,5:six,3:three,+,0.75

31,5:six,5:six,,1

32,5:six,5:six,,1

33,5:six,1:one,+,0.333

34,5:six,5:six,,1

35,4:four,4:four,,1

36,4:four,4:four,,1

37,4:four,4:four,,1

38,6:five,3:three,+,0.872

39,6:five,1:one,+,1

1,2:two,1:one,+,0.889

2,2:two,1:one,+,0.889

3,1:one,1:one,,0.889

4,1:one,1:one,,1

5,1:one,2:two,+,0.8

6,1:one,1:one,,0.884

7,1:one,1:one,,0.884

8,1:one,1:one,,0.889

9,1:one,1:one,,0.884

10,1:one,1:one,,0.884

11,1:one,1:one,,0.667

12,1:one,3:three,+,0.667

13,1:one,1:one,,0.884

14,1:one,1:one,,0.884

15,1:one,5:six,+,0.5

16,1:one,2:two,+,0.5

17,1:one,1:one,,0.884

18,1:one,1:one,,0.889

19,1:one,1:one,,0.889

20,3:three,1:one,+,0.667

21,3:three,1:one,+,1

22,3:three,3:three,,0.895

23,3:three,3:three,,1

24,3:three,3:three,,0.895

25,3:three,1:one,+,0.884

26,3:three,1:one,+,0.884

27,3:three,5:six,+,0.8

28,3:three,3:three,,0.895

29,3:three,3:three,,0.9

30,5:six,3:three,+,0.5

31,5:six,1:one,+,0.884

32,5:six,1:one,+,0.727

33,5:six,5:six,,1

34,5:six,5:six,,1

35,4:four,3:three,+,0.667

36,4:four,4:four,,1

37,4:four,4:four,,1

38,6:five,3:three,+,0.895

39,6:five,6:five,,1

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 257 65.7289 %

Incorrectly Classified Instances 134 34.2711 %

Kappa statistic 0.5069

Mean absolute error 0.1313

Root mean squared error 0.3074

Relative absolute error 54.5493 %

Root relative squared error 88.7058 %

Total Number of Instances 391

=== Detailed Accuracy By Class ===

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

0.832 0.263 0.702 0.832 0.762 0.563 0.839 0.751 one

0.357 0.033 0.455 0.357 0.400 0.363 0.714 0.291 two

0.573 0.149 0.578 0.573 0.576 0.425 0.737 0.528 three

0.788 0.014 0.839 0.788 0.813 0.796 0.909 0.794 four

0.404 0.023 0.704 0.404 0.514 0.489 0.688 0.444 six

0.308 0.019 0.364 0.308 0.333 0.314 0.675 0.181 five

Weighted Avg. 0.657 0.159 0.652 0.657 0.647 0.515 0.786 0.607

=== Confusion Matrix ===

a b c d e f <-- classified as

139 8 16 1 2 1 | a = one

14 10 3 1 0 0 | b = two

28 2 59 2 6 6 | c = three

1 1 5 26 0 0 | d = four

14 1 13 0 19 0 | e = six

2 0 6 1 0 4 | f = five