TESTING SIZE = 2000

##########################

testing set

##########################

##
##
##
#1 DEFAULT SETTINGS

=== Run information ===

Scheme:weka.classifiers.trees.J48 -C 0.25 -M 2
Relation: optesting_minus_1900
Instances: 3220
Attributes: 55
1
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63
64
Test mode:10-fold cross-validation

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

J48 pruned tree

```
36 <= 1
|   42 <= 7
|   |   21 <= 7
|   |   |   22 <= 5
|   |   |   |   18 <= 1: 3 (3.0)
|   |   |   |   18 > 1
|   |   |   |   |   4 <= 11
|   |   |   |   |   |   2 <= 12: 1 (2.0/1.0)
|   |   |   |   |   |   2 > 12: 2 (2.0)
|   |   |   |   |   4 > 11: 5 (51.0)
|   |   |   22 > 5: 0 (2.0)
|   |   21 > 7
|   |   |   33 <= 3: 9 (101.0/3.0)
|   |   |   33 > 3: 0 (4.0/1.0)
|   42 > 7
|   |   45 <= 0
|   |   |   54 <= 0
|   |   |   |   20 <= 3: 5 (7.0)
|   |   |   |   20 > 3
|   |   |   |   |   2 <= 3: 1 (4.0)
|   |   |   |   |   2 > 3: 8 (10.0)
|   |   |   54 > 0: 2 (14.0)
|   |   45 > 0
```

```
|  |  |  21 <= 5
|  |  |  |  14 <= 1
|  |  |  |  |  30 <= 5
|  |  |  |  |  |  38 <= 9: 6 (15.0/1.0)
|  |  |  |  |  |  38 > 9: 4 (3.0/1.0)
|  |  |  |  |  30 > 5: 4 (11.0)
|  |  |  |  14 > 1: 0 (4.0)
|  |  |  21 > 5
|  |  |  |  28 <= 8: 0 (306.0/1.0)
|  |  |  |  28 > 8
|  |  |  |  |  1 <= 0: 0 (2.0/1.0)
|  |  |  |  |  1 > 0: 8 (2.0)
36 > 1
|  21 <= 0
|  |  42 <= 8
|  |  |  5 <= 1
|  |  |  |  37 <= 9
|  |  |  |  |  27 <= 13
|  |  |  |  |  |  5 <= 0
|  |  |  |  |  |  |  10 <= 7: 1 (5.0)
|  |  |  |  |  |  |  10 > 7
|  |  |  |  |  |  |  |  37 <= 5: 2 (74.0)
|  |  |  |  |  |  |  |  37 > 5: 3 (2.0/1.0)
|  |  |  |  |  |  5 > 0: 6 (2.0/1.0)
|  |  |  |  |  27 > 13: 1 (41.0)
|  |  |  |  37 > 9
|  |  |  |  |  43 <= 5
|  |  |  |  |  |  3 <= 11: 5 (2.0/1.0)
|  |  |  |  |  |  3 > 11: 3 (26.0)
|  |  |  |  |  43 > 5: 4 (11.0/1.0)
|  |  |  5 > 1
|  |  |  |  30 <= 4
|  |  |  |  |  18 <= 5
|  |  |  |  |  |  12 <= 14: 4 (2.0/1.0)
|  |  |  |  |  |  12 > 14: 3 (6.0)
|  |  |  |  |  18 > 5: 5 (232.0/3.0)
|  |  |  |  30 > 4: 4 (3.0)
|  |  42 > 8
|  |  |  41 <= 8
|  |  |  |  30 <= 2
|  |  |  |  |  26 <= 4
|  |  |  |  |  |  45 <= 3: 2 (17.0)
|  |  |  |  |  |  45 > 3: 6 (5.0/1.0)
|  |  |  |  |  26 > 4
|  |  |  |  |  |  61 <= 1
|  |  |  |  |  |  |  36 <= 15: 1 (4.0/1.0)
|  |  |  |  |  |  |  36 > 15: 4 (4.0)
|  |  |  |  |  |  61 > 1
|  |  |  |  |  |  |  20 <= 9: 6 (309.0/4.0)
|  |  |  |  |  |  |  20 > 9
|  |  |  |  |  |  |  |  19 <= 12: 8 (2.0)
|  |  |  |  |  |  |  |  19 > 12: 1 (12.0/1.0)
```

```
|  |  |  |  30 > 2
|  |  |  |  |  2 <= 1: 4 (9.0)
|  |  |  |  |  2 > 1: 5 (2.0/1.0)
|  |  |  41 > 8
|  |  |  |  2 <= 6: 4 (36.0)
|  |  |  |  2 > 6: 6 (2.0)
|  21 > 0
|  |  60 <= 5
|  |  |  62 <= 0
|  |  |  |  4 <= 7
|  |  |  |  |  12 <= 10
|  |  |  |  |  |  49 <= 2: 4 (29.0)
|  |  |  |  |  |  49 > 2: 8 (2.0)
|  |  |  |  |  12 > 10
|  |  |  |  |  |  17 <= 5
|  |  |  |  |  |  |  18 <= 14
|  |  |  |  |  |  |  |  19 <= 11: 7 (6.0)
|  |  |  |  |  |  |  |  19 > 11: 1 (4.0)
|  |  |  |  |  |  |  18 > 14: 8 (2.0)
|  |  |  |  |  |  17 > 5: 5 (2.0)
|  |  |  |  4 > 7
|  |  |  |  |  53 <= 0
|  |  |  |  |  |  26 <= 12
|  |  |  |  |  |  |  19 <= 8
|  |  |  |  |  |  |  |  37 <= 0
|  |  |  |  |  |  |  |  |  13 <= 14: 8 (4.0)
|  |  |  |  |  |  |  |  |  13 > 14: 7 (7.0/1.0)
|  |  |  |  |  |  |  |  37 > 0
|  |  |  |  |  |  |  |  |  43 <= 4
|  |  |  |  |  |  |  |  |  |  25 <= 0: 7 (12.0)
|  |  |  |  |  |  |  |  |  |  25 > 0: 9 (2.0)
|  |  |  |  |  |  |  |  |  43 > 4: 7 (244.0)
|  |  |  |  |  |  |  19 > 8
|  |  |  |  |  |  |  |  49 <= 0
|  |  |  |  |  |  |  |  |  15 <= 0
|  |  |  |  |  |  |  |  |  |  18 <= 6: 7 (2.0)
|  |  |  |  |  |  |  |  |  |  18 > 6: 9 (8.0)
|  |  |  |  |  |  |  |  |  15 > 0: 7 (3.0)
|  |  |  |  |  |  |  |  49 > 0: 8 (2.0)
|  |  |  |  |  |  26 > 12
|  |  |  |  |  |  |  5 <= 2: 4 (8.0/1.0)
|  |  |  |  |  |  |  5 > 2
|  |  |  |  |  |  |  |  17 <= 1: 7 (16.0/1.0)
|  |  |  |  |  |  |  |  17 > 1
|  |  |  |  |  |  |  |  |  27 <= 8: 5 (2.0/1.0)
|  |  |  |  |  |  |  |  |  27 > 8: 9 (16.0)
|  |  |  |  |  53 > 0
|  |  |  |  |  |  17 <= 0
|  |  |  |  |  |  |  18 <= 6
|  |  |  |  |  |  |  |  52 <= 14: 7 (5.0)
|  |  |  |  |  |  |  |  52 > 14: 3 (6.0)
|  |  |  |  |  |  |  18 > 6: 1 (2.0)
```

```
|  |  |  |  |  |  17 > 0
|  |  |  |  |  |  |  6 <= 0: 9 (5.0)
|  |  |  |  |  |  |  6 > 0: 5 (3.0)
|  |  |  62 > 0
|  |  |  |  2 <= 1: 1 (7.0)
|  |  |  |  2 > 1: 2 (8.0)
|  |  60 > 5
|  |  |  43 <= 3
|  |  |  |  42 <= 7
|  |  |  |  |  3 <= 3
|  |  |  |  |  |  20 <= 13
|  |  |  |  |  |  |  62 <= 4
|  |  |  |  |  |  |  |  43 <= 1
|  |  |  |  |  |  |  |  |  38 <= 4: 9 (12.0)
|  |  |  |  |  |  |  |  |  38 > 4: 4 (6.0/1.0)
|  |  |  |  |  |  |  |  43 > 1: 4 (2.0/1.0)
|  |  |  |  |  |  |  62 > 4: 1 (3.0)
|  |  |  |  |  |  20 > 13: 1 (33.0)
|  |  |  |  |  3 > 3
|  |  |  |  |  |  29 <= 13
|  |  |  |  |  |  |  33 <= 1
|  |  |  |  |  |  |  |  63 <= 0
|  |  |  |  |  |  |  |  |  18 <= 12
|  |  |  |  |  |  |  |  |  |  25 <= 2: 3 (238.0/5.0)
|  |  |  |  |  |  |  |  |  |  25 > 2
|  |  |  |  |  |  |  |  |  |  |  19 <= 6: 3 (6.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  19 > 6: 9 (3.0)
|  |  |  |  |  |  |  |  |  18 > 12
|  |  |  |  |  |  |  |  |  |  2 <= 6
|  |  |  |  |  |  |  |  |  |  |  9 <= 0: 9 (5.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  9 > 0: 3 (9.0)
|  |  |  |  |  |  |  |  |  |  2 > 6
|  |  |  |  |  |  |  |  |  |  |  53 <= 10: 9 (5.0)
|  |  |  |  |  |  |  |  |  |  |  53 > 10: 5 (9.0/1.0)
|  |  |  |  |  |  |  |  63 > 0
|  |  |  |  |  |  |  |  |  46 <= 0: 2 (7.0)
|  |  |  |  |  |  |  |  |  46 > 0
|  |  |  |  |  |  |  |  |  |  19 <= 13: 3 (3.0/1.0)
|  |  |  |  |  |  |  |  |  |  19 > 13: 1 (3.0)
|  |  |  |  |  |  |  33 > 1
|  |  |  |  |  |  |  |  26 <= 14: 8 (2.0/1.0)
|  |  |  |  |  |  |  |  26 > 14: 5 (4.0)
|  |  |  |  |  |  29 > 13
|  |  |  |  |  |  |  63 <= 2
|  |  |  |  |  |  |  |  33 <= 2
|  |  |  |  |  |  |  |  |  21 <= 5: 5 (6.0/1.0)
|  |  |  |  |  |  |  |  |  21 > 5
|  |  |  |  |  |  |  |  |  |  26 <= 2
|  |  |  |  |  |  |  |  |  |  |  19 <= 7
|  |  |  |  |  |  |  |  |  |  |  |  20 <= 0: 7 (3.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  |  20 > 0: 3 (18.0)
|  |  |  |  |  |  |  |  |  |  |  19 > 7: 9 (14.0/1.0)
```

```
|  |  |  |  |  |  |  |  |  |  26 > 2
|  |  |  |  |  |  |  |  |  |  |  30 <= 12: 9 (128.0/4.0)
|  |  |  |  |  |  |  |  |  |  |  30 > 12: 4 (2.0)
|  |  |  |  |  |  |  |  33 > 2
|  |  |  |  |  |  |  |  |  2 <= 0: 4 (7.0)
|  |  |  |  |  |  |  |  |  2 > 0: 7 (2.0/1.0)
|  |  |  |  |  |  |  63 > 2: 2 (6.0)
|  |  |  |  42 > 7
|  |  |  |  |  35 <= 5
|  |  |  |  |  |  25 <= 0
|  |  |  |  |  |  |  44 <= 0: 3 (7.0)
|  |  |  |  |  |  |  44 > 0: 8 (2.0/1.0)
|  |  |  |  |  |  25 > 0: 0 (4.0/1.0)
|  |  |  |  |  35 > 5
|  |  |  |  |  |  30 <= 7: 8 (53.0)
|  |  |  |  |  |  30 > 7: 7 (2.0)
|  |  |  43 > 3
|  |  |  |  33 <= 1
|  |  |  |  |  19 <= 10
|  |  |  |  |  |  50 <= 0
|  |  |  |  |  |  |  3 <= 14
|  |  |  |  |  |  |  |  5 <= 7
|  |  |  |  |  |  |  |  |  9 <= 0
|  |  |  |  |  |  |  |  |  |  12 <= 10: 4 (2.0)
|  |  |  |  |  |  |  |  |  |  12 > 10: 1 (3.0)
|  |  |  |  |  |  |  |  |  9 > 0: 9 (3.0/1.0)
|  |  |  |  |  |  |  |  5 > 7
|  |  |  |  |  |  |  |  |  53 <= 7: 7 (14.0)
|  |  |  |  |  |  |  |  |  53 > 7: 8 (7.0)
|  |  |  |  |  |  |  3 > 14: 3 (4.0)
|  |  |  |  |  |  50 > 0
|  |  |  |  |  |  |  27 <= 5
|  |  |  |  |  |  |  |  7 <= 1
|  |  |  |  |  |  |  |  |  34 <= 5: 2 (139.0/3.0)
|  |  |  |  |  |  |  |  |  34 > 5: 8 (6.0/1.0)
|  |  |  |  |  |  |  |  7 > 1: 7 (2.0)
|  |  |  |  |  |  |  27 > 5
|  |  |  |  |  |  |  |  26 <= 1
|  |  |  |  |  |  |  |  |  36 <= 13
|  |  |  |  |  |  |  |  |  |  37 <= 1
|  |  |  |  |  |  |  |  |  |  |  61 <= 1: 8 (4.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  61 > 1: 2 (35.0)
|  |  |  |  |  |  |  |  |  |  37 > 1: 8 (2.0)
|  |  |  |  |  |  |  |  |  36 > 13
|  |  |  |  |  |  |  |  |  |  30 <= 1
|  |  |  |  |  |  |  |  |  |  |  19 <= 4: 3 (7.0)
|  |  |  |  |  |  |  |  |  |  |  19 > 4: 1 (4.0/1.0)
|  |  |  |  |  |  |  |  |  |  30 > 1: 8 (2.0)
|  |  |  |  |  |  |  |  26 > 1
|  |  |  |  |  |  |  |  |  18 <= 1: 3 (2.0)
|  |  |  |  |  |  |  |  |  18 > 1
|  |  |  |  |  |  |  |  |  |  62 <= 9: 8 (155.0/3.0)
```

```
|  |  |  |  |  |  |  |  |  |  62 > 9
|  |  |  |  |  |  |  |  |  |  |  37 <= 0: 2 (8.0)
|  |  |  |  |  |  |  |  |  |  |  37 > 0: 8 (5.0)
|  |  |  |  |  19 > 10
|  |  |  |  |  |  12 <= 12
|  |  |  |  |  |  |  28 <= 9: 4 (3.0/1.0)
|  |  |  |  |  |  |  28 > 9: 8 (34.0/1.0)
|  |  |  |  |  |  12 > 12
|  |  |  |  |  |  |  36 <= 4
|  |  |  |  |  |  |  |  9 <= 1: 4 (3.0/2.0)
|  |  |  |  |  |  |  |  9 > 1: 2 (2.0/1.0)
|  |  |  |  |  |  |  36 > 4
|  |  |  |  |  |  |  |  63 <= 5
|  |  |  |  |  |  |  |  |  49 <= 5
|  |  |  |  |  |  |  |  |  |  20 <= 13
|  |  |  |  |  |  |  |  |  |  |  18 <= 10: 8 (6.0/2.0)
|  |  |  |  |  |  |  |  |  |  |  18 > 10: 1 (4.0/1.0)
|  |  |  |  |  |  |  |  |  |  20 > 13
|  |  |  |  |  |  |  |  |  |  |  52 <= 8
|  |  |  |  |  |  |  |  |  |  |  |  43 <= 15: 8 (7.0)
|  |  |  |  |  |  |  |  |  |  |  |  43 > 15: 1 (5.0)
|  |  |  |  |  |  |  |  |  |  |  52 > 8: 1 (138.0/2.0)
|  |  |  |  |  |  |  |  |  49 > 5: 8 (2.0)
|  |  |  |  |  |  |  |  |  63 > 5: 2 (2.0)
|  |  |  |  33 > 1
|  |  |  |  |  38 <= 0
|  |  |  |  |  |  27 <= 7
|  |  |  |  |  |  |  54 <= 1: 4 (13.0/1.0)
|  |  |  |  |  |  |  54 > 1: 2 (3.0)
|  |  |  |  |  |  27 > 7
|  |  |  |  |  |  |  12 <= 15
|  |  |  |  |  |  |  |  61 <= 12
|  |  |  |  |  |  |  |  |  46 <= 1
|  |  |  |  |  |  |  |  |  |  34 <= 13: 4 (2.0)
|  |  |  |  |  |  |  |  |  |  34 > 13
|  |  |  |  |  |  |  |  |  |  |  59 <= 9: 6 (2.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  59 > 9: 8 (9.0)
|  |  |  |  |  |  |  |  |  46 > 1: 3 (2.0/1.0)
|  |  |  |  |  |  |  |  61 > 12: 1 (3.0)
|  |  |  |  |  |  |  12 > 15: 1 (47.0)
|  |  |  |  |  38 > 0
|  |  |  |  |  |  9 <= 1
|  |  |  |  |  |  |  62 <= 0
|  |  |  |  |  |  |  |  5 <= 14
|  |  |  |  |  |  |  |  |  58 <= 1: 4 (150.0)
|  |  |  |  |  |  |  |  |  58 > 1
|  |  |  |  |  |  |  |  |  |  53 <= 5: 4 (5.0/1.0)
|  |  |  |  |  |  |  |  |  |  53 > 5: 0 (2.0)
|  |  |  |  |  |  |  |  5 > 14: 7 (3.0)
|  |  |  |  |  |  |  62 > 0: 1 (4.0/1.0)
|  |  |  |  |  |  9 > 1: 6 (3.0/2.0)
```

Number of Leaves : 142

Size of the tree : 283

Time taken to build model: 0.2 seconds

=== Stratified cross-validation ===
=== Summary ===

Correctly Classified Instances	2866	89.0062 %
Incorrectly Classified Instances	354	10.9938 %
Kappa statistic	0.8778	
Mean absolute error	0.0243	
Root mean squared error	0.141	
Relative absolute error	13.4958 %	
Root relative squared error	47.0003 %	
Total Number of Instances	3220	

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	ROC Area	Class
0.966	0.005	0.954	0.966	0.96	0.985	0
0.858	0.015	0.864	0.858	0.861	0.929	1
0.874	0.012	0.893	0.874	0.883	0.934	2
0.891	0.018	0.851	0.891	0.87	0.938	3
0.873	0.014	0.87	0.873	0.871	0.933	4
0.913	0.01	0.913	0.913	0.913	0.959	5
0.942	0.005	0.957	0.942	0.95	0.975	6
0.902	0.011	0.902	0.902	0.902	0.955	7
0.847	0.019	0.834	0.847	0.841	0.93	8
0.83	0.014	0.864	0.83	0.847	0.928	9
Weighted Avg.	0.89	0.012	0.89	0.89	0.89	0.947

=== Confusion Matrix ===

a	b	c	d	e	f	g	h	i	j	<-- classified as
310	0	0	0	4	2	2	0	3	0	a = 0
3	279	5	8	12	3	2	3	10	0	b = 1
1	8	284	9	0	3	2	2	13	3	c = 2
1	6	9	302	0	4	0	1	6	10	d = 3
3	3	1	3	267	3	5	9	5	7	e = 4
0	2	2	9	2	294	2	0	1	10	f = 5
2	3	3	0	6	2	311	1	2	0	g = 6
0	4	2	2	6	3	1	293	6	8	h = 7
2	15	8	7	6	3	0	6	272	2	i = 8
3	3	4	15	4	5	0	10	8	254	j = 9

##
##
##

#2 confidence factor = 0.1

=== Run information ===

Scheme:weka.classifiers.trees.J48 -C 0.1 -M 2
Relation: optesting_minus_1900
Instances: 3220
Attributes: 55
1
2
3
4
5
6
7
9
10
11
12
13
14
15
17
18
19
20
21
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62
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64
Test mode:10-fold cross-validation

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

J48 pruned tree

```
36 <= 1
|   42 <= 7
|   |   21 <= 7
|   |   |   22 <= 5
|   |   |   |   18 <= 1: 3 (3.0)
|   |   |   |   18 > 1
|   |   |   |   |   4 <= 11
|   |   |   |   |   |   2 <= 12: 1 (2.0/1.0)
|   |   |   |   |   |   2 > 12: 2 (2.0)
|   |   |   |   |   4 > 11: 5 (51.0)
|   |   |   22 > 5: 0 (2.0)
|   |   21 > 7
|   |   |   33 <= 3: 9 (101.0/3.0)
|   |   |   33 > 3: 0 (4.0/1.0)
|   42 > 7
|   |   45 <= 0
|   |   |   54 <= 0
|   |   |   |   20 <= 3: 5 (7.0)
|   |   |   |   20 > 3
|   |   |   |   |   2 <= 3: 1 (4.0)
|   |   |   |   |   2 > 3: 8 (10.0)
|   |   |   54 > 0: 2 (14.0)
|   |   45 > 0
|   |   |   21 <= 5
|   |   |   |   14 <= 1
|   |   |   |   |   30 <= 5
|   |   |   |   |   |   38 <= 9: 6 (15.0/1.0)
|   |   |   |   |   |   38 > 9: 4 (3.0/1.0)
|   |   |   |   |   30 > 5: 4 (11.0)
|   |   |   |   14 > 1: 0 (4.0)
|   |   |   21 > 5
|   |   |   |   28 <= 8: 0 (306.0/1.0)
|   |   |   |   28 > 8
|   |   |   |   |   1 <= 0: 0 (2.0/1.0)
```

```
|  |  |  |  |  1 > 0: 8 (2.0)
36 > 1
|  21 <= 0
|  |  42 <= 8
|  |  |  5 <= 1
|  |  |  |  37 <= 9
|  |  |  |  |  27 <= 13
|  |  |  |  |  |  5 <= 0
|  |  |  |  |  |  |  10 <= 7: 1 (5.0)
|  |  |  |  |  |  |  10 > 7
|  |  |  |  |  |  |  |  37 <= 5: 2 (74.0)
|  |  |  |  |  |  |  |  37 > 5: 3 (2.0/1.0)
|  |  |  |  |  |  5 > 0: 6 (2.0/1.0)
|  |  |  |  |  27 > 13: 1 (41.0)
|  |  |  |  37 > 9
|  |  |  |  |  43 <= 5
|  |  |  |  |  |  3 <= 11: 5 (2.0/1.0)
|  |  |  |  |  |  3 > 11: 3 (26.0)
|  |  |  |  |  43 > 5: 4 (11.0/1.0)
|  |  |  5 > 1
|  |  |  |  30 <= 4
|  |  |  |  |  18 <= 5
|  |  |  |  |  |  12 <= 14: 4 (2.0/1.0)
|  |  |  |  |  |  12 > 14: 3 (6.0)
|  |  |  |  |  18 > 5: 5 (232.0/3.0)
|  |  |  |  30 > 4: 4 (3.0)
|  |  42 > 8
|  |  |  41 <= 8
|  |  |  |  30 <= 2
|  |  |  |  |  26 <= 4
|  |  |  |  |  |  45 <= 3: 2 (17.0)
|  |  |  |  |  |  45 > 3: 6 (5.0/1.0)
|  |  |  |  |  26 > 4
|  |  |  |  |  |  61 <= 1
|  |  |  |  |  |  |  36 <= 15: 1 (4.0/1.0)
|  |  |  |  |  |  |  36 > 15: 4 (4.0)
|  |  |  |  |  |  61 > 1
|  |  |  |  |  |  |  20 <= 9: 6 (309.0/4.0)
|  |  |  |  |  |  |  20 > 9
|  |  |  |  |  |  |  |  19 <= 12: 8 (2.0)
|  |  |  |  |  |  |  |  19 > 12: 1 (12.0/1.0)
|  |  |  |  30 > 2
|  |  |  |  |  2 <= 1: 4 (9.0)
|  |  |  |  |  2 > 1: 5 (2.0/1.0)
|  |  |  41 > 8
|  |  |  |  2 <= 6: 4 (36.0)
|  |  |  |  2 > 6: 6 (2.0)
|  21 > 0
|  |  60 <= 5
|  |  |  62 <= 0
|  |  |  |  4 <= 7
|  |  |  |  |  12 <= 10
```

```
|  |  |  |  |  |  |  49 <= 2: 4 (29.0)
|  |  |  |  |  |  |  49 > 2: 8 (2.0)
|  |  |  |  |  |  12 > 10
|  |  |  |  |  |  |  17 <= 5
|  |  |  |  |  |  |  |  18 <= 14
|  |  |  |  |  |  |  |  |  19 <= 11: 7 (6.0)
|  |  |  |  |  |  |  |  |  19 > 11: 1 (4.0)
|  |  |  |  |  |  |  |  18 > 14: 8 (2.0)
|  |  |  |  |  |  |  17 > 5: 5 (2.0)
|  |  |  |  |  4 > 7
|  |  |  |  |  |  53 <= 0
|  |  |  |  |  |  |  26 <= 12
|  |  |  |  |  |  |  |  19 <= 8
|  |  |  |  |  |  |  |  |  37 <= 0
|  |  |  |  |  |  |  |  |  |  13 <= 14: 8 (4.0)
|  |  |  |  |  |  |  |  |  |  13 > 14: 7 (7.0/1.0)
|  |  |  |  |  |  |  |  |  37 > 0: 7 (258.0/2.0)
|  |  |  |  |  |  |  |  19 > 8
|  |  |  |  |  |  |  |  |  49 <= 0
|  |  |  |  |  |  |  |  |  |  15 <= 0
|  |  |  |  |  |  |  |  |  |  |  18 <= 6: 7 (2.0)
|  |  |  |  |  |  |  |  |  |  |  18 > 6: 9 (8.0)
|  |  |  |  |  |  |  |  |  |  15 > 0: 7 (3.0)
|  |  |  |  |  |  |  |  |  49 > 0: 8 (2.0)
|  |  |  |  |  |  |  26 > 12
|  |  |  |  |  |  |  |  5 <= 2: 4 (8.0/1.0)
|  |  |  |  |  |  |  |  5 > 2
|  |  |  |  |  |  |  |  |  17 <= 1: 7 (16.0/1.0)
|  |  |  |  |  |  |  |  |  17 > 1
|  |  |  |  |  |  |  |  |  |  27 <= 8: 5 (2.0/1.0)
|  |  |  |  |  |  |  |  |  |  27 > 8: 9 (16.0)
|  |  |  |  |  |  53 > 0
|  |  |  |  |  |  |  17 <= 0
|  |  |  |  |  |  |  |  18 <= 6
|  |  |  |  |  |  |  |  |  52 <= 14: 7 (5.0)
|  |  |  |  |  |  |  |  |  52 > 14: 3 (6.0)
|  |  |  |  |  |  |  |  18 > 6: 1 (2.0)
|  |  |  |  |  |  |  17 > 0
|  |  |  |  |  |  |  |  6 <= 0: 9 (5.0)
|  |  |  |  |  |  |  |  6 > 0: 5 (3.0)
|  |  |  62 > 0
|  |  |  |  2 <= 1: 1 (7.0)
|  |  |  |  2 > 1: 2 (8.0)
|  |  60 > 5
|  |  |  43 <= 3
|  |  |  |  42 <= 7
|  |  |  |  |  3 <= 3
|  |  |  |  |  |  20 <= 13
|  |  |  |  |  |  |  62 <= 4
|  |  |  |  |  |  |  |  43 <= 1
|  |  |  |  |  |  |  |  |  38 <= 4: 9 (12.0)
|  |  |  |  |  |  |  |  |  38 > 4: 4 (6.0/1.0)
```

```
|  |  |  |  |  |  |  |  43 > 1: 4 (2.0/1.0)
|  |  |  |  |  |  |  |  62 > 4: 1 (3.0)
|  |  |  |  |  |  |  20 > 13: 1 (33.0)
|  |  |  |  |  |  3 > 3
|  |  |  |  |  |  |  29 <= 13
|  |  |  |  |  |  |  |  63 <= 0
|  |  |  |  |  |  |  |  |  18 <= 12
|  |  |  |  |  |  |  |  |  |  62 <= 10: 3 (243.0/6.0)
|  |  |  |  |  |  |  |  |  |  62 > 10
|  |  |  |  |  |  |  |  |  |  |  18 <= 8: 3 (2.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  18 > 8: 2 (2.0)
|  |  |  |  |  |  |  |  |  18 > 12
|  |  |  |  |  |  |  |  |  |  2 <= 6
|  |  |  |  |  |  |  |  |  |  |  9 <= 0: 9 (8.0/3.0)
|  |  |  |  |  |  |  |  |  |  |  9 > 0: 3 (9.0)
|  |  |  |  |  |  |  |  |  |  2 > 6
|  |  |  |  |  |  |  |  |  |  |  53 <= 10: 9 (6.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  53 > 10: 5 (11.0/1.0)
|  |  |  |  |  |  |  63 > 0
|  |  |  |  |  |  |  |  46 <= 0: 2 (7.0)
|  |  |  |  |  |  |  |  46 > 0
|  |  |  |  |  |  |  |  |  19 <= 13: 3 (3.0/1.0)
|  |  |  |  |  |  |  |  |  19 > 13: 1 (3.0)
|  |  |  |  |  |  29 > 13
|  |  |  |  |  |  |  63 <= 2
|  |  |  |  |  |  |  |  33 <= 2
|  |  |  |  |  |  |  |  |  21 <= 5: 5 (6.0/1.0)
|  |  |  |  |  |  |  |  |  21 > 5
|  |  |  |  |  |  |  |  |  |  26 <= 2
|  |  |  |  |  |  |  |  |  |  |  19 <= 7
|  |  |  |  |  |  |  |  |  |  |  |  20 <= 0: 7 (3.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  |  20 > 0: 3 (18.0)
|  |  |  |  |  |  |  |  |  |  |  19 > 7: 9 (14.0/1.0)
|  |  |  |  |  |  |  |  |  |  26 > 2
|  |  |  |  |  |  |  |  |  |  |  30 <= 12: 9 (128.0/4.0)
|  |  |  |  |  |  |  |  |  |  |  30 > 12: 4 (2.0)
|  |  |  |  |  |  |  |  33 > 2
|  |  |  |  |  |  |  |  |  2 <= 0: 4 (7.0)
|  |  |  |  |  |  |  |  |  2 > 0: 7 (2.0/1.0)
|  |  |  |  |  |  |  63 > 2: 2 (6.0)
|  |  |  |  42 > 7
|  |  |  |  |  35 <= 5
|  |  |  |  |  |  25 <= 0
|  |  |  |  |  |  |  44 <= 0: 3 (7.0)
|  |  |  |  |  |  |  44 > 0: 8 (2.0/1.0)
|  |  |  |  |  |  25 > 0: 0 (4.0/1.0)
|  |  |  |  |  35 > 5
|  |  |  |  |  |  30 <= 7: 8 (53.0)
|  |  |  |  |  |  30 > 7: 7 (2.0)
|  |  |  43 > 3
|  |  |  |  33 <= 1
|  |  |  |  |  19 <= 10
```

```
|  |  |  |  |  |  50 <= 0
|  |  |  |  |  |  |  3 <= 14
|  |  |  |  |  |  |  |  5 <= 7
|  |  |  |  |  |  |  |  |  9 <= 0
|  |  |  |  |  |  |  |  |  |  12 <= 10: 4 (2.0)
|  |  |  |  |  |  |  |  |  |  12 > 10: 1 (3.0)
|  |  |  |  |  |  |  |  |  9 > 0: 9 (3.0/1.0)
|  |  |  |  |  |  |  |  5 > 7
|  |  |  |  |  |  |  |  |  53 <= 7: 7 (14.0)
|  |  |  |  |  |  |  |  |  53 > 7: 8 (7.0)
|  |  |  |  |  |  |  3 > 14: 3 (4.0)
|  |  |  |  |  |  50 > 0
|  |  |  |  |  |  |  27 <= 5
|  |  |  |  |  |  |  |  7 <= 1
|  |  |  |  |  |  |  |  |  34 <= 5: 2 (139.0/3.0)
|  |  |  |  |  |  |  |  |  34 > 5: 8 (6.0/1.0)
|  |  |  |  |  |  |  |  7 > 1: 7 (2.0)
|  |  |  |  |  |  |  27 > 5
|  |  |  |  |  |  |  |  26 <= 1
|  |  |  |  |  |  |  |  |  36 <= 13
|  |  |  |  |  |  |  |  |  |  37 <= 1
|  |  |  |  |  |  |  |  |  |  |  61 <= 1: 8 (4.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  61 > 1: 2 (35.0)
|  |  |  |  |  |  |  |  |  |  37 > 1: 8 (2.0)
|  |  |  |  |  |  |  |  |  36 > 13
|  |  |  |  |  |  |  |  |  |  30 <= 1
|  |  |  |  |  |  |  |  |  |  |  19 <= 4: 3 (7.0)
|  |  |  |  |  |  |  |  |  |  |  19 > 4: 1 (4.0/1.0)
|  |  |  |  |  |  |  |  |  |  30 > 1: 8 (2.0)
|  |  |  |  |  |  |  |  26 > 1
|  |  |  |  |  |  |  |  |  18 <= 1: 3 (2.0)
|  |  |  |  |  |  |  |  |  18 > 1
|  |  |  |  |  |  |  |  |  |  62 <= 9: 8 (155.0/3.0)
|  |  |  |  |  |  |  |  |  |  62 > 9
|  |  |  |  |  |  |  |  |  |  |  37 <= 0: 2 (8.0)
|  |  |  |  |  |  |  |  |  |  |  37 > 0: 8 (5.0)
|  |  |  |  |  19 > 10
|  |  |  |  |  |  12 <= 12
|  |  |  |  |  |  |  28 <= 9: 4 (3.0/1.0)
|  |  |  |  |  |  |  28 > 9: 8 (34.0/1.0)
|  |  |  |  |  |  12 > 12
|  |  |  |  |  |  |  36 <= 4
|  |  |  |  |  |  |  |  9 <= 1: 4 (3.0/2.0)
|  |  |  |  |  |  |  |  9 > 1: 2 (2.0/1.0)
|  |  |  |  |  |  |  36 > 4
|  |  |  |  |  |  |  |  63 <= 5
|  |  |  |  |  |  |  |  |  52 <= 6: 8 (6.0)
|  |  |  |  |  |  |  |  |  52 > 6
|  |  |  |  |  |  |  |  |  |  20 <= 13
|  |  |  |  |  |  |  |  |  |  |  18 <= 10: 8 (7.0/2.0)
|  |  |  |  |  |  |  |  |  |  |  18 > 10: 1 (3.0)
|  |  |  |  |  |  |  |  |  |  20 > 13: 1 (146.0/5.0)
```

```
|  |  |  |  |  |  |  |  63 > 5: 2 (2.0)
|  |  |  |  33 > 1
|  |  |  |  |  38 <= 0
|  |  |  |  |  |  27 <= 7
|  |  |  |  |  |  |  54 <= 1: 4 (13.0/1.0)
|  |  |  |  |  |  |  54 > 1: 2 (3.0)
|  |  |  |  |  |  27 > 7
|  |  |  |  |  |  |  12 <= 15
|  |  |  |  |  |  |  |  61 <= 12
|  |  |  |  |  |  |  |  |  46 <= 1
|  |  |  |  |  |  |  |  |  |  34 <= 13: 4 (2.0)
|  |  |  |  |  |  |  |  |  |  34 > 13
|  |  |  |  |  |  |  |  |  |  |  59 <= 9: 6 (2.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  59 > 9: 8 (9.0)
|  |  |  |  |  |  |  |  |  46 > 1: 3 (2.0/1.0)
|  |  |  |  |  |  |  |  61 > 12: 1 (3.0)
|  |  |  |  |  |  |  12 > 15: 1 (47.0)
|  |  |  |  |  38 > 0
|  |  |  |  |  |  9 <= 1
|  |  |  |  |  |  |  62 <= 0
|  |  |  |  |  |  |  |  5 <= 14
|  |  |  |  |  |  |  |  |  58 <= 1: 4 (150.0)
|  |  |  |  |  |  |  |  |  58 > 1
|  |  |  |  |  |  |  |  |  |  53 <= 5: 4 (5.0/1.0)
|  |  |  |  |  |  |  |  |  |  53 > 5: 0 (2.0)
|  |  |  |  |  |  |  |  5 > 14: 7 (3.0)
|  |  |  |  |  |  |  62 > 0: 1 (4.0/1.0)
|  |  |  |  |  |  9 > 1: 6 (3.0/2.0)

Number of Leaves  :  136

Size of the tree :  271


Time taken to build model: 0.2 seconds

=== Stratified cross-validation ===
=== Summary ===

Correctly Classified Instances        2865               88.9752 %
Incorrectly Classified Instances       355               11.0248 %
Kappa statistic                          0.8775
Mean absolute error                      0.025
Root mean squared error                  0.1416
Relative absolute error                 13.884  %
Root relative squared error             47.2187 %
Total Number of Instances             3220

=== Detailed Accuracy By Class ===

               TP Rate   FP Rate   Precision   Recall  F-Measure   ROC Area  Class
               0.966     0.004      0.96      0.966     0.963      0.985    0
```

0.865 0.016 0.862 0.865 0.863 0.928 1
0.871 0.011 0.898 0.871 0.884 0.932 2
0.894 0.019 0.846 0.894 0.869 0.937 3
0.863 0.013 0.871 0.863 0.867 0.931 4
0.916 0.01 0.908 0.916 0.912 0.962 5
0.942 0.005 0.954 0.942 0.948 0.974 6
0.902 0.012 0.896 0.902 0.899 0.954 7
0.844 0.019 0.834 0.844 0.839 0.933 8
0.83 0.013 0.87 0.83 0.849 0.928 9
Weighted Avg. 0.89 0.012 0.89 0.89 0.89 0.946

=== Confusion Matrix ===

a b c d e f g h i j <-- classified as
310 0 0 0 4 2 2 0 3 0 | a = 0
1 281 5 9 12 3 2 3 9 0 | b = 1
1 8 283 10 0 3 2 2 13 3 | c = 2
1 6 8 303 0 4 0 1 6 10 | d = 3
3 3 1 3 264 5 6 10 6 5 | e = 4
0 2 2 9 1 295 2 0 1 10 | f = 5
2 3 3 0 6 2 311 1 2 0 | g = 6
0 4 2 2 6 3 1 293 6 8 | h = 7
2 16 8 6 6 3 0 7 271 2 | i = 8
3 3 3 16 4 5 0 10 8 254 | j = 9

##
##
###
#3 conf fact = 0.01

=== Run information ===

Scheme:weka.classifiers.trees.J48 -C 0.01 -M 2
Relation: optesting_minus_1900
Instances: 3220
Attributes: 55
1
2
3
4
5
6
7
9
10
11
12
13
14
15
17
18

19
20
21
22
23
25
26
27
28
29
30
33
34
35
36
37
38
41
42
43
44
45
46
47
49
50
51
52
53
54
55
57
58
59
60
61
62
63
64
Test mode:10-fold cross-validation

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

J48 pruned tree
----

36 <= 1
| 42 <= 7
| | 21 <= 7
| | | 22 <= 5
| | | | 18 <= 1: 3 (3.0)
| | | | 18 > 1

```
|  |  |  |  |  4 <= 11: 2 (4.0/2.0)
|  |  |  |  |  4 > 11: 5 (51.0)
|  |  |  22 > 5: 0 (2.0)
|  |  21 > 7
|  |  |  33 <= 3: 9 (101.0/3.0)
|  |  |  33 > 3: 0 (4.0/1.0)
|  42 > 7
|  |  45 <= 0
|  |  |  54 <= 0
|  |  |  |  20 <= 3: 5 (7.0)
|  |  |  |  20 > 3
|  |  |  |  |  2 <= 3: 1 (4.0)
|  |  |  |  |  2 > 3: 8 (10.0)
|  |  |  54 > 0: 2 (14.0)
|  |  45 > 0
|  |  |  21 <= 5
|  |  |  |  14 <= 1
|  |  |  |  |  30 <= 5
|  |  |  |  |  |  38 <= 9: 6 (15.0/1.0)
|  |  |  |  |  |  38 > 9: 4 (3.0/1.0)
|  |  |  |  |  30 > 5: 4 (11.0)
|  |  |  |  14 > 1: 0 (4.0)
|  |  |  21 > 5
|  |  |  |  28 <= 8: 0 (306.0/1.0)
|  |  |  |  28 > 8: 8 (4.0/2.0)
36 > 1
|  21 <= 0
|  |  42 <= 8
|  |  |  5 <= 1
|  |  |  |  37 <= 9
|  |  |  |  |  27 <= 13
|  |  |  |  |  |  5 <= 0
|  |  |  |  |  |  |  10 <= 7: 1 (5.0)
|  |  |  |  |  |  |  10 > 7
|  |  |  |  |  |  |  |  37 <= 5: 2 (74.0)
|  |  |  |  |  |  |  |  37 > 5: 3 (2.0/1.0)
|  |  |  |  |  |  5 > 0: 6 (2.0/1.0)
|  |  |  |  |  27 > 13: 1 (41.0)
|  |  |  |  37 > 9
|  |  |  |  |  43 <= 5
|  |  |  |  |  |  3 <= 11: 5 (2.0/1.0)
|  |  |  |  |  |  3 > 11: 3 (26.0)
|  |  |  |  |  43 > 5: 4 (11.0/1.0)
|  |  |  5 > 1
|  |  |  |  30 <= 4
|  |  |  |  |  18 <= 5
|  |  |  |  |  |  12 <= 14: 4 (2.0/1.0)
|  |  |  |  |  |  12 > 14: 3 (6.0)
|  |  |  |  |  18 > 5
|  |  |  |  |  |  20 <= 7: 5 (226.0)
|  |  |  |  |  |  20 > 7: 5 (6.0/3.0)
|  |  |  |  30 > 4: 4 (3.0)
```

```
|  |  42 > 8
|  |  |  41 <= 8
|  |  |  |  30 <= 2
|  |  |  |  |  26 <= 4
|  |  |  |  |  |  45 <= 3: 2 (17.0)
|  |  |  |  |  |  45 > 3: 6 (5.0/1.0)
|  |  |  |  |  26 > 4
|  |  |  |  |  |  61 <= 1
|  |  |  |  |  |  |  36 <= 15: 1 (4.0/1.0)
|  |  |  |  |  |  |  36 > 15: 4 (4.0)
|  |  |  |  |  |  61 > 1
|  |  |  |  |  |  |  20 <= 9: 6 (309.0/4.0)
|  |  |  |  |  |  |  20 > 9
|  |  |  |  |  |  |  |  19 <= 12: 8 (2.0)
|  |  |  |  |  |  |  |  19 > 12: 1 (12.0/1.0)
|  |  |  |  30 > 2
|  |  |  |  |  2 <= 1: 4 (9.0)
|  |  |  |  |  2 > 1: 5 (2.0/1.0)
|  |  |  41 > 8
|  |  |  |  2 <= 6: 4 (36.0)
|  |  |  |  2 > 6: 6 (2.0)
|  21 > 0
|  |  60 <= 5
|  |  |  62 <= 0
|  |  |  |  4 <= 7
|  |  |  |  |  12 <= 10
|  |  |  |  |  |  49 <= 2: 4 (29.0)
|  |  |  |  |  |  49 > 2: 8 (2.0)
|  |  |  |  |  12 > 10
|  |  |  |  |  |  17 <= 5
|  |  |  |  |  |  |  18 <= 14
|  |  |  |  |  |  |  |  19 <= 11: 7 (6.0)
|  |  |  |  |  |  |  |  19 > 11: 1 (4.0)
|  |  |  |  |  |  |  18 > 14: 8 (2.0)
|  |  |  |  |  |  17 > 5: 5 (2.0)
|  |  |  |  4 > 7
|  |  |  |  |  53 <= 0
|  |  |  |  |  |  26 <= 12
|  |  |  |  |  |  |  19 <= 8: 7 (269.0/7.0)
|  |  |  |  |  |  |  19 > 8
|  |  |  |  |  |  |  |  49 <= 0
|  |  |  |  |  |  |  |  |  15 <= 0
|  |  |  |  |  |  |  |  |  |  18 <= 6: 7 (2.0)
|  |  |  |  |  |  |  |  |  |  18 > 6: 9 (8.0)
|  |  |  |  |  |  |  |  |  15 > 0: 7 (3.0)
|  |  |  |  |  |  |  |  49 > 0: 8 (2.0)
|  |  |  |  |  |  26 > 12
|  |  |  |  |  |  |  5 <= 2: 4 (8.0/1.0)
|  |  |  |  |  |  |  5 > 2
|  |  |  |  |  |  |  |  17 <= 1: 7 (16.0/1.0)
|  |  |  |  |  |  |  |  17 > 1
|  |  |  |  |  |  |  |  |  27 <= 8: 5 (2.0/1.0)
```

```
|  |  |  |  |  |  |  |  |  27 > 8: 9 (16.0)
|  |  |  |  |  53 > 0
|  |  |  |  |  |  17 <= 0
|  |  |  |  |  |  |  18 <= 6
|  |  |  |  |  |  |  |  52 <= 14: 7 (5.0)
|  |  |  |  |  |  |  |  52 > 14: 3 (6.0)
|  |  |  |  |  |  |  18 > 6: 1 (2.0)
|  |  |  |  |  |  17 > 0
|  |  |  |  |  |  |  6 <= 0: 9 (5.0)
|  |  |  |  |  |  |  6 > 0: 5 (3.0)
|  |  |  62 > 0
|  |  |  |  2 <= 1: 1 (7.0)
|  |  |  |  2 > 1: 2 (8.0)
|  |  60 > 5
|  |  |  43 <= 3
|  |  |  |  42 <= 7
|  |  |  |  |  3 <= 3
|  |  |  |  |  |  20 <= 13
|  |  |  |  |  |  |  62 <= 4
|  |  |  |  |  |  |  |  43 <= 1
|  |  |  |  |  |  |  |  |  38 <= 4: 9 (12.0)
|  |  |  |  |  |  |  |  |  38 > 4: 4 (6.0/1.0)
|  |  |  |  |  |  |  |  43 > 1: 4 (2.0/1.0)
|  |  |  |  |  |  |  62 > 4: 1 (3.0)
|  |  |  |  |  |  20 > 13: 1 (33.0)
|  |  |  |  |  3 > 3
|  |  |  |  |  |  29 <= 13
|  |  |  |  |  |  |  63 <= 0
|  |  |  |  |  |  |  |  18 <= 12
|  |  |  |  |  |  |  |  |  62 <= 10: 3 (243.0/6.0)
|  |  |  |  |  |  |  |  |  62 > 10: 2 (4.0/2.0)
|  |  |  |  |  |  |  |  18 > 12
|  |  |  |  |  |  |  |  |  2 <= 6
|  |  |  |  |  |  |  |  |  |  9 <= 0: 9 (8.0/3.0)
|  |  |  |  |  |  |  |  |  |  9 > 0: 3 (9.0)
|  |  |  |  |  |  |  |  |  2 > 6
|  |  |  |  |  |  |  |  |  |  53 <= 10: 9 (6.0/1.0)
|  |  |  |  |  |  |  |  |  |  53 > 10: 5 (11.0/1.0)
|  |  |  |  |  |  |  63 > 0
|  |  |  |  |  |  |  |  46 <= 0: 2 (7.0)
|  |  |  |  |  |  |  |  46 > 0
|  |  |  |  |  |  |  |  |  19 <= 13: 3 (3.0/1.0)
|  |  |  |  |  |  |  |  |  19 > 13: 1 (3.0)
|  |  |  |  |  |  29 > 13
|  |  |  |  |  |  |  63 <= 2
|  |  |  |  |  |  |  |  33 <= 2
|  |  |  |  |  |  |  |  |  21 <= 5: 5 (6.0/1.0)
|  |  |  |  |  |  |  |  |  21 > 5
|  |  |  |  |  |  |  |  |  |  26 <= 2
|  |  |  |  |  |  |  |  |  |  |  19 <= 7
|  |  |  |  |  |  |  |  |  |  |  |  20 <= 0: 7 (3.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  |  20 > 0: 3 (18.0)
```

```
|  |  |  |  |  |  |  |  |  |  |  19 > 7: 9 (14.0/1.0)
|  |  |  |  |  |  |  |  |  |  26 > 2
|  |  |  |  |  |  |  |  |  |  |  30 <= 12: 9 (128.0/4.0)
|  |  |  |  |  |  |  |  |  |  |  30 > 12: 4 (2.0)
|  |  |  |  |  |  |  |  33 > 2
|  |  |  |  |  |  |  |  |  2 <= 0: 4 (7.0)
|  |  |  |  |  |  |  |  |  2 > 0: 7 (2.0/1.0)
|  |  |  |  |  |  |  63 > 2: 2 (6.0)
|  |  |  |  42 > 7
|  |  |  |  |  35 <= 5
|  |  |  |  |  |  25 <= 0
|  |  |  |  |  |  |  44 <= 0: 3 (7.0)
|  |  |  |  |  |  |  44 > 0: 8 (2.0/1.0)
|  |  |  |  |  |  25 > 0: 0 (4.0/1.0)
|  |  |  |  |  35 > 5
|  |  |  |  |  |  30 <= 7: 8 (53.0)
|  |  |  |  |  |  30 > 7: 7 (2.0)
|  |  |  43 > 3
|  |  |  |  33 <= 1
|  |  |  |  |  19 <= 10
|  |  |  |  |  |  50 <= 0
|  |  |  |  |  |  |  3 <= 14
|  |  |  |  |  |  |  |  5 <= 7
|  |  |  |  |  |  |  |  |  9 <= 0
|  |  |  |  |  |  |  |  |  |  12 <= 10: 4 (2.0)
|  |  |  |  |  |  |  |  |  |  12 > 10: 1 (3.0)
|  |  |  |  |  |  |  |  |  9 > 0: 9 (3.0/1.0)
|  |  |  |  |  |  |  |  5 > 7
|  |  |  |  |  |  |  |  |  53 <= 7: 7 (14.0)
|  |  |  |  |  |  |  |  |  53 > 7: 8 (7.0)
|  |  |  |  |  |  |  3 > 14: 3 (4.0)
|  |  |  |  |  |  50 > 0
|  |  |  |  |  |  |  27 <= 5
|  |  |  |  |  |  |  |  7 <= 1
|  |  |  |  |  |  |  |  |  34 <= 5: 2 (139.0/3.0)
|  |  |  |  |  |  |  |  |  34 > 5: 8 (6.0/1.0)
|  |  |  |  |  |  |  |  7 > 1: 7 (2.0)
|  |  |  |  |  |  |  27 > 5
|  |  |  |  |  |  |  |  26 <= 1
|  |  |  |  |  |  |  |  |  36 <= 13
|  |  |  |  |  |  |  |  |  |  37 <= 1
|  |  |  |  |  |  |  |  |  |  |  61 <= 1: 8 (4.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  61 > 1: 2 (35.0)
|  |  |  |  |  |  |  |  |  |  37 > 1: 8 (2.0)
|  |  |  |  |  |  |  |  36 > 13
|  |  |  |  |  |  |  |  |  30 <= 1
|  |  |  |  |  |  |  |  |  |  19 <= 4: 3 (7.0)
|  |  |  |  |  |  |  |  |  |  19 > 4: 1 (4.0/1.0)
|  |  |  |  |  |  |  |  |  30 > 1: 8 (2.0)
|  |  |  |  |  |  |  26 > 1
|  |  |  |  |  |  |  |  18 <= 1: 3 (2.0)
|  |  |  |  |  |  |  |  18 > 1
```

```
|  |  |  |  |  |  |  |  |  |  62 <= 9: 8 (155.0/3.0)
|  |  |  |  |  |  |  |  |  |  62 > 9
|  |  |  |  |  |  |  |  |  |  |  37 <= 0: 2 (8.0)
|  |  |  |  |  |  |  |  |  |  |  37 > 0: 8 (5.0)
|  |  |  |  |  19 > 10
|  |  |  |  |  |  12 <= 12
|  |  |  |  |  |  |  28 <= 9: 4 (3.0/1.0)
|  |  |  |  |  |  |  28 > 9: 8 (34.0/1.0)
|  |  |  |  |  |  12 > 12
|  |  |  |  |  |  |  36 <= 4: 2 (5.0/4.0)
|  |  |  |  |  |  |  36 > 4
|  |  |  |  |  |  |  |  63 <= 5
|  |  |  |  |  |  |  |  |  52 <= 6: 8 (6.0)
|  |  |  |  |  |  |  |  |  52 > 6
|  |  |  |  |  |  |  |  |  |  20 <= 13
|  |  |  |  |  |  |  |  |  |  |  18 <= 10: 8 (7.0/2.0)
|  |  |  |  |  |  |  |  |  |  |  18 > 10: 1 (3.0)
|  |  |  |  |  |  |  |  |  |  20 > 13: 1 (146.0/5.0)
|  |  |  |  |  |  |  |  63 > 5: 2 (2.0)
|  |  |  |  33 > 1
|  |  |  |  |  38 <= 0
|  |  |  |  |  |  27 <= 7
|  |  |  |  |  |  |  54 <= 1: 4 (13.0/1.0)
|  |  |  |  |  |  |  54 > 1: 2 (3.0)
|  |  |  |  |  |  27 > 7
|  |  |  |  |  |  |  12 <= 15
|  |  |  |  |  |  |  |  61 <= 12
|  |  |  |  |  |  |  |  |  46 <= 1
|  |  |  |  |  |  |  |  |  |  34 <= 13: 4 (2.0)
|  |  |  |  |  |  |  |  |  |  34 > 13
|  |  |  |  |  |  |  |  |  |  |  59 <= 9: 6 (2.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  59 > 9: 8 (9.0)
|  |  |  |  |  |  |  |  |  46 > 1: 3 (2.0/1.0)
|  |  |  |  |  |  |  |  61 > 12: 1 (3.0)
|  |  |  |  |  |  |  12 > 15: 1 (47.0)
|  |  |  |  |  38 > 0
|  |  |  |  |  |  62 <= 0
|  |  |  |  |  |  |  5 <= 14
|  |  |  |  |  |  |  |  58 <= 1: 4 (150.0)
|  |  |  |  |  |  |  |  58 > 1
|  |  |  |  |  |  |  |  |  53 <= 5: 4 (6.0/2.0)
|  |  |  |  |  |  |  |  |  53 > 5: 0 (3.0/1.0)
|  |  |  |  |  |  |  5 > 14: 7 (3.0)
|  |  |  |  |  |  62 > 0: 1 (5.0/2.0)

Number of Leaves  :  130

Size of the tree :  259


Time taken to build model: 0.21 seconds
```

=== Stratified cross-validation ===
=== Summary ===

Correctly Classified Instances	2866	89.0062 %
Incorrectly Classified Instances	354	10.9938 %
Kappa statistic	0.8778	
Mean absolute error	0.0257	
Root mean squared error	0.1418	
Relative absolute error	14.2892 %	
Root relative squared error	47.2793 %	
Total Number of Instances	3220	

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	ROC Area	Class
0.966	0.004	0.966	0.966	0.966	0.984	0
0.889	0.018	0.85	0.889	0.869	0.94	1
0.865	0.011	0.898	0.865	0.881	0.936	2
0.897	0.019	0.849	0.897	0.872	0.942	3
0.866	0.014	0.869	0.866	0.867	0.933	4
0.91	0.009	0.916	0.91	0.913	0.963	5
0.942	0.005	0.957	0.942	0.95	0.974	6
0.902	0.013	0.888	0.902	0.895	0.953	7
0.835	0.017	0.843	0.835	0.839	0.939	8
0.824	0.013	0.869	0.824	0.846	0.933	9
Weighted Avg.	0.89	0.012	0.89	0.89	0.89	0.95

=== Confusion Matrix ===

a	b	c	d	e	f	g	h	i	j	<-- classified as
310	0	0	0	4	2	2	0	3	0	a = 0
1	289	6	7	10	2	1	4	5	0	b = 1
1	10	281	9	0	2	2	2	15	3	c = 2
2	7	6	304	0	5	0	2	4	9	d = 3
3	3	2	2	265	4	6	9	6	6	e = 4
0	3	2	10	2	293	2	0	1	9	f = 5
2	3	3	0	6	2	311	1	2	0	g = 6
0	1	2	2	7	5	1	293	6	8	h = 7
1	19	8	6	7	1	0	8	268	3	i = 8
1	5	3	18	4	4	0	11	8	252	j = 9

##
#4 conf fact = 0.5

=== Run information ===

Scheme:weka.classifiers.trees.J48 -C 0.5 -M 2
Relation: optesting_minus_1900

Instances: 3220
Attributes: 55
1
2
3
4
5
6
7
9
10
11
12
13
14
15
17
18
19
20
21
22
23
25
26
27
28
29
30
33
34
35
36
37
38
41
42
43
44
45
46
47
49
50
51
52
53
54
55
57
58
59

60
61
62
63
64
Test mode:10-fold cross-validation

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

J48 pruned tree

```
36 <= 1
|   42 <= 7
|   |   21 <= 7
|   |   |   22 <= 5
|   |   |   |   18 <= 1: 3 (3.0)
|   |   |   |   18 > 1
|   |   |   |   |   4 <= 11
|   |   |   |   |   |   2 <= 12: 1 (2.0/1.0)
|   |   |   |   |   |   2 > 12: 2 (2.0)
|   |   |   |   |   4 > 11: 5 (51.0)
|   |   |   22 > 5: 0 (2.0)
|   |   21 > 7
|   |   |   33 <= 3: 9 (101.0/3.0)
|   |   |   33 > 3: 0 (4.0/1.0)
|   42 > 7
|   |   45 <= 0
|   |   |   54 <= 0
|   |   |   |   20 <= 3: 5 (7.0)
|   |   |   |   20 > 3
|   |   |   |   |   2 <= 3: 1 (4.0)
|   |   |   |   |   2 > 3: 8 (10.0)
|   |   |   54 > 0: 2 (14.0)
|   |   45 > 0
|   |   |   21 <= 5
|   |   |   |   14 <= 1
|   |   |   |   |   30 <= 5
|   |   |   |   |   |   38 <= 9: 6 (15.0/1.0)
|   |   |   |   |   |   38 > 9: 4 (3.0/1.0)
|   |   |   |   |   30 > 5: 4 (11.0)
|   |   |   |   14 > 1: 0 (4.0)
|   |   |   21 > 5
|   |   |   |   28 <= 8: 0 (306.0/1.0)
|   |   |   |   28 > 8
|   |   |   |   |   1 <= 0: 0 (2.0/1.0)
|   |   |   |   |   1 > 0: 8 (2.0)
36 > 1
|   21 <= 0
|   |   42 <= 8
|   |   |   5 <= 1
|   |   |   |   37 <= 9
```

```
|  |  |  |  |  27 <= 13
|  |  |  |  |  |  5 <= 0
|  |  |  |  |  |  |  10 <= 7: 1 (5.0)
|  |  |  |  |  |  |  10 > 7
|  |  |  |  |  |  |  |  37 <= 5: 2 (74.0)
|  |  |  |  |  |  |  |  37 > 5: 3 (2.0/1.0)
|  |  |  |  |  |  5 > 0: 6 (2.0/1.0)
|  |  |  |  |  27 > 13: 1 (41.0)
|  |  |  |  37 > 9
|  |  |  |  |  43 <= 5
|  |  |  |  |  |  3 <= 11: 5 (2.0/1.0)
|  |  |  |  |  |  3 > 11: 3 (26.0)
|  |  |  |  |  43 > 5: 4 (11.0/1.0)
|  |  |  5 > 1
|  |  |  |  30 <= 4
|  |  |  |  |  18 <= 5
|  |  |  |  |  |  12 <= 14: 4 (2.0/1.0)
|  |  |  |  |  |  12 > 14: 3 (6.0)
|  |  |  |  |  18 > 5: 5 (232.0/3.0)
|  |  |  |  30 > 4: 4 (3.0)
|  |  42 > 8
|  |  |  41 <= 8
|  |  |  |  30 <= 2
|  |  |  |  |  26 <= 4
|  |  |  |  |  |  45 <= 3: 2 (17.0)
|  |  |  |  |  |  45 > 3: 6 (5.0/1.0)
|  |  |  |  |  26 > 4
|  |  |  |  |  |  61 <= 1
|  |  |  |  |  |  |  36 <= 15: 1 (4.0/1.0)
|  |  |  |  |  |  |  36 > 15: 4 (4.0)
|  |  |  |  |  |  61 > 1
|  |  |  |  |  |  |  20 <= 9: 6 (309.0/4.0)
|  |  |  |  |  |  |  20 > 9
|  |  |  |  |  |  |  |  19 <= 12: 8 (2.0)
|  |  |  |  |  |  |  |  19 > 12: 1 (12.0/1.0)
|  |  |  |  30 > 2
|  |  |  |  |  2 <= 1: 4 (9.0)
|  |  |  |  |  2 > 1: 5 (2.0/1.0)
|  |  |  41 > 8
|  |  |  |  2 <= 6: 4 (36.0)
|  |  |  |  2 > 6: 6 (2.0)
|  21 > 0
|  |  60 <= 5
|  |  |  62 <= 0
|  |  |  |  4 <= 7
|  |  |  |  |  12 <= 10
|  |  |  |  |  |  49 <= 2: 4 (29.0)
|  |  |  |  |  |  49 > 2: 8 (2.0)
|  |  |  |  |  12 > 10
|  |  |  |  |  |  17 <= 5
|  |  |  |  |  |  |  18 <= 14
|  |  |  |  |  |  |  |  19 <= 11: 7 (6.0)
```

```
|  |  |  |  |  |  |  |  19 > 11: 1 (4.0)
|  |  |  |  |  |  |  |  18 > 14: 8 (2.0)
|  |  |  |  |  |  |  17 > 5: 5 (2.0)
|  |  |  |  |  4 > 7
|  |  |  |  |  |  53 <= 0
|  |  |  |  |  |  |  26 <= 12
|  |  |  |  |  |  |  |  19 <= 8
|  |  |  |  |  |  |  |  |  37 <= 0
|  |  |  |  |  |  |  |  |  |  13 <= 14: 8 (4.0)
|  |  |  |  |  |  |  |  |  |  13 > 14: 7 (7.0/1.0)
|  |  |  |  |  |  |  |  |  37 > 0
|  |  |  |  |  |  |  |  |  |  43 <= 4
|  |  |  |  |  |  |  |  |  |  |  25 <= 0: 7 (12.0)
|  |  |  |  |  |  |  |  |  |  |  25 > 0: 9 (2.0)
|  |  |  |  |  |  |  |  |  |  43 > 4: 7 (244.0)
|  |  |  |  |  |  |  |  19 > 8
|  |  |  |  |  |  |  |  |  49 <= 0
|  |  |  |  |  |  |  |  |  |  15 <= 0
|  |  |  |  |  |  |  |  |  |  |  18 <= 6: 7 (2.0)
|  |  |  |  |  |  |  |  |  |  |  18 > 6: 9 (8.0)
|  |  |  |  |  |  |  |  |  |  15 > 0: 7 (3.0)
|  |  |  |  |  |  |  |  |  49 > 0: 8 (2.0)
|  |  |  |  |  |  |  26 > 12
|  |  |  |  |  |  |  |  5 <= 2: 4 (8.0/1.0)
|  |  |  |  |  |  |  |  5 > 2
|  |  |  |  |  |  |  |  |  17 <= 1: 7 (16.0/1.0)
|  |  |  |  |  |  |  |  |  17 > 1
|  |  |  |  |  |  |  |  |  |  27 <= 8: 5 (2.0/1.0)
|  |  |  |  |  |  |  |  |  |  27 > 8: 9 (16.0)
|  |  |  |  |  53 > 0
|  |  |  |  |  |  17 <= 0
|  |  |  |  |  |  |  18 <= 6
|  |  |  |  |  |  |  |  52 <= 14: 7 (5.0)
|  |  |  |  |  |  |  |  52 > 14: 3 (6.0)
|  |  |  |  |  |  |  18 > 6: 1 (2.0)
|  |  |  |  |  |  17 > 0
|  |  |  |  |  |  |  6 <= 0: 9 (5.0)
|  |  |  |  |  |  |  6 > 0: 5 (3.0)
|  |  |  62 > 0
|  |  |  |  2 <= 1: 1 (7.0)
|  |  |  |  2 > 1: 2 (8.0)
|  |  60 > 5
|  |  |  43 <= 3
|  |  |  |  42 <= 7
|  |  |  |  |  3 <= 3
|  |  |  |  |  |  20 <= 13
|  |  |  |  |  |  |  62 <= 4
|  |  |  |  |  |  |  |  43 <= 1
|  |  |  |  |  |  |  |  |  38 <= 4: 9 (12.0)
|  |  |  |  |  |  |  |  |  38 > 4: 4 (6.0/1.0)
|  |  |  |  |  |  |  |  43 > 1: 4 (2.0/1.0)
|  |  |  |  |  |  |  62 > 4: 1 (3.0)
```

```
|  |  |  |  |  |  20 > 13: 1 (33.0)
|  |  |  |  |  3 > 3
|  |  |  |  |  |  29 <= 13
|  |  |  |  |  |  |  33 <= 1
|  |  |  |  |  |  |  |  63 <= 0
|  |  |  |  |  |  |  |  |  18 <= 12
|  |  |  |  |  |  |  |  |  |  25 <= 2: 3 (238.0/5.0)
|  |  |  |  |  |  |  |  |  |  25 > 2
|  |  |  |  |  |  |  |  |  |  |  19 <= 6: 3 (6.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  19 > 6: 9 (3.0)
|  |  |  |  |  |  |  |  |  18 > 12
|  |  |  |  |  |  |  |  |  |  2 <= 6
|  |  |  |  |  |  |  |  |  |  |  9 <= 0: 9 (5.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  9 > 0: 3 (9.0)
|  |  |  |  |  |  |  |  |  |  2 > 6
|  |  |  |  |  |  |  |  |  |  |  53 <= 10: 9 (5.0)
|  |  |  |  |  |  |  |  |  |  |  53 > 10: 5 (9.0/1.0)
|  |  |  |  |  |  |  |  63 > 0
|  |  |  |  |  |  |  |  |  46 <= 0: 2 (7.0)
|  |  |  |  |  |  |  |  |  46 > 0
|  |  |  |  |  |  |  |  |  |  19 <= 13: 3 (3.0/1.0)
|  |  |  |  |  |  |  |  |  |  19 > 13: 1 (3.0)
|  |  |  |  |  |  |  33 > 1
|  |  |  |  |  |  |  |  26 <= 14: 8 (2.0/1.0)
|  |  |  |  |  |  |  |  26 > 14: 5 (4.0)
|  |  |  |  |  |  29 > 13
|  |  |  |  |  |  |  63 <= 2
|  |  |  |  |  |  |  |  33 <= 2
|  |  |  |  |  |  |  |  |  21 <= 5: 5 (6.0/1.0)
|  |  |  |  |  |  |  |  |  21 > 5
|  |  |  |  |  |  |  |  |  |  26 <= 2
|  |  |  |  |  |  |  |  |  |  |  19 <= 7
|  |  |  |  |  |  |  |  |  |  |  |  20 <= 0: 7 (3.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  |  20 > 0: 3 (18.0)
|  |  |  |  |  |  |  |  |  |  |  19 > 7: 9 (14.0/1.0)
|  |  |  |  |  |  |  |  |  |  26 > 2
|  |  |  |  |  |  |  |  |  |  |  30 <= 12: 9 (128.0/4.0)
|  |  |  |  |  |  |  |  |  |  |  30 > 12: 4 (2.0)
|  |  |  |  |  |  |  |  33 > 2
|  |  |  |  |  |  |  |  |  2 <= 0: 4 (7.0)
|  |  |  |  |  |  |  |  |  2 > 0: 7 (2.0/1.0)
|  |  |  |  |  |  |  63 > 2: 2 (6.0)
|  |  |  |  42 > 7
|  |  |  |  |  35 <= 5
|  |  |  |  |  |  25 <= 0
|  |  |  |  |  |  |  44 <= 0: 3 (7.0)
|  |  |  |  |  |  |  44 > 0: 8 (2.0/1.0)
|  |  |  |  |  |  25 > 0: 0 (4.0/1.0)
|  |  |  |  |  35 > 5
|  |  |  |  |  |  30 <= 7: 8 (53.0)
|  |  |  |  |  |  30 > 7: 7 (2.0)
|  |  |  43 > 3
```

```
|  |  |  |  33 <= 1
|  |  |  |  |  19 <= 10
|  |  |  |  |  |  50 <= 0
|  |  |  |  |  |  |  3 <= 14
|  |  |  |  |  |  |  |  5 <= 7
|  |  |  |  |  |  |  |  |  9 <= 0
|  |  |  |  |  |  |  |  |  |  12 <= 10: 4 (2.0)
|  |  |  |  |  |  |  |  |  |  12 > 10: 1 (3.0)
|  |  |  |  |  |  |  |  |  9 > 0: 9 (3.0/1.0)
|  |  |  |  |  |  |  |  5 > 7
|  |  |  |  |  |  |  |  |  53 <= 7: 7 (14.0)
|  |  |  |  |  |  |  |  |  53 > 7: 8 (7.0)
|  |  |  |  |  |  |  3 > 14: 3 (4.0)
|  |  |  |  |  |  50 > 0
|  |  |  |  |  |  |  27 <= 5
|  |  |  |  |  |  |  |  7 <= 1
|  |  |  |  |  |  |  |  |  34 <= 5: 2 (139.0/3.0)
|  |  |  |  |  |  |  |  |  34 > 5: 8 (6.0/1.0)
|  |  |  |  |  |  |  |  7 > 1: 7 (2.0)
|  |  |  |  |  |  |  27 > 5
|  |  |  |  |  |  |  |  26 <= 1
|  |  |  |  |  |  |  |  |  36 <= 13
|  |  |  |  |  |  |  |  |  |  37 <= 1
|  |  |  |  |  |  |  |  |  |  |  61 <= 1: 8 (4.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  61 > 1: 2 (35.0)
|  |  |  |  |  |  |  |  |  |  37 > 1: 8 (2.0)
|  |  |  |  |  |  |  |  |  36 > 13
|  |  |  |  |  |  |  |  |  |  30 <= 1
|  |  |  |  |  |  |  |  |  |  |  19 <= 4: 3 (7.0)
|  |  |  |  |  |  |  |  |  |  |  19 > 4: 1 (4.0/1.0)
|  |  |  |  |  |  |  |  |  |  30 > 1: 8 (2.0)
|  |  |  |  |  |  |  |  26 > 1
|  |  |  |  |  |  |  |  |  18 <= 1: 3 (2.0)
|  |  |  |  |  |  |  |  |  18 > 1
|  |  |  |  |  |  |  |  |  |  62 <= 9: 8 (155.0/3.0)
|  |  |  |  |  |  |  |  |  |  62 > 9
|  |  |  |  |  |  |  |  |  |  |  37 <= 0: 2 (8.0)
|  |  |  |  |  |  |  |  |  |  |  37 > 0: 8 (5.0)
|  |  |  |  |  19 > 10
|  |  |  |  |  |  12 <= 12
|  |  |  |  |  |  |  28 <= 9: 4 (3.0/1.0)
|  |  |  |  |  |  |  28 > 9: 8 (34.0/1.0)
|  |  |  |  |  |  12 > 12
|  |  |  |  |  |  |  36 <= 4
|  |  |  |  |  |  |  |  9 <= 1: 4 (3.0/2.0)
|  |  |  |  |  |  |  |  9 > 1: 2 (2.0/1.0)
|  |  |  |  |  |  |  36 > 4
|  |  |  |  |  |  |  |  63 <= 5
|  |  |  |  |  |  |  |  |  52 <= 6: 8 (6.0)
|  |  |  |  |  |  |  |  |  52 > 6
|  |  |  |  |  |  |  |  |  |  49 <= 5
|  |  |  |  |  |  |  |  |  |  |  20 <= 13
```

```
|  |  |  |  |  |  |  |  |  |  |  |  18 <= 10: 8 (6.0/2.0)
|  |  |  |  |  |  |  |  |  |  |  |  18 > 10: 1 (3.0)
|  |  |  |  |  |  |  |  |  |  |  20 > 13
|  |  |  |  |  |  |  |  |  |  |  |  52 <= 8
|  |  |  |  |  |  |  |  |  |  |  |  |  43 <= 15: 8 (2.0)
|  |  |  |  |  |  |  |  |  |  |  |  |  43 > 15: 1 (5.0)
|  |  |  |  |  |  |  |  |  |  |  |  52 > 8: 1 (138.0/2.0)
|  |  |  |  |  |  |  |  |  |  |  49 > 5: 8 (2.0)
|  |  |  |  |  |  |  |  |  63 > 5: 2 (2.0)
|  |  |  |  33 > 1
|  |  |  |  |  38 <= 0
|  |  |  |  |  |  27 <= 7
|  |  |  |  |  |  |  54 <= 1: 4 (13.0/1.0)
|  |  |  |  |  |  |  54 > 1: 2 (3.0)
|  |  |  |  |  |  27 > 7
|  |  |  |  |  |  |  12 <= 15
|  |  |  |  |  |  |  |  61 <= 12
|  |  |  |  |  |  |  |  |  46 <= 1
|  |  |  |  |  |  |  |  |  |  34 <= 13: 4 (2.0)
|  |  |  |  |  |  |  |  |  |  34 > 13
|  |  |  |  |  |  |  |  |  |  |  59 <= 9: 6 (2.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  59 > 9: 8 (9.0)
|  |  |  |  |  |  |  |  |  46 > 1: 3 (2.0/1.0)
|  |  |  |  |  |  |  |  61 > 12: 1 (3.0)
|  |  |  |  |  |  |  12 > 15: 1 (47.0)
|  |  |  |  |  38 > 0
|  |  |  |  |  |  9 <= 1
|  |  |  |  |  |  |  62 <= 0
|  |  |  |  |  |  |  |  5 <= 14
|  |  |  |  |  |  |  |  |  58 <= 1: 4 (150.0)
|  |  |  |  |  |  |  |  |  58 > 1
|  |  |  |  |  |  |  |  |  |  53 <= 5: 4 (5.0/1.0)
|  |  |  |  |  |  |  |  |  |  53 > 5: 0 (2.0)
|  |  |  |  |  |  |  |  5 > 14: 7 (3.0)
|  |  |  |  |  |  |  62 > 0: 1 (4.0/1.0)
|  |  |  |  |  |  9 > 1: 6 (3.0/2.0)

Number of Leaves  :  143

Size of the tree :  285


Time taken to build model: 0.16 seconds

=== Stratified cross-validation ===
=== Summary ===

Correctly Classified Instances        2863               88.913  %
Incorrectly Classified Instances      357                11.087  %
Kappa statistic                          0.8768
Mean absolute error                      0.0244
Root mean squared error                  0.1417
```

Relative absolute error 13.5312 %
Root relative squared error 47.2205 %
Total Number of Instances 3220

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	ROC Area	Class
0.966	0.005	0.954	0.966	0.96	0.985	0
0.852	0.015	0.863	0.852	0.858	0.928	1
0.874	0.012	0.89	0.874	0.882	0.928	2
0.888	0.018	0.853	0.888	0.87	0.938	3
0.873	0.014	0.87	0.873	0.871	0.933	4
0.913	0.01	0.91	0.913	0.912	0.959	5
0.942	0.005	0.957	0.942	0.95	0.975	6
0.902	0.011	0.902	0.902	0.902	0.955	7
0.847	0.019	0.829	0.847	0.838	0.928	8
0.83	0.014	0.864	0.83	0.847	0.929	9
Weighted Avg.	0.889	0.012	0.889	0.889	0.889	0.946

=== Confusion Matrix ===

a	b	c	d	e	f	g	h	i	j	<-- classified as
310	0	0	0	4	2	2	0	3	0	a = 0
3	277	6	8	12	3	2	3	11	0	b = 1
1	8	284	8	0	3	2	2	14	3	c = 2
1	6	9	301	0	5	0	1	6	10	d = 3
3	3	1	3	267	3	5	9	5	7	e = 4
0	2	2	9	2	294	2	0	1	10	f = 5
2	3	3	0	6	2	311	1	2	0	g = 6
0	4	2	2	6	3	1	293	6	8	h = 7
2	15	8	7	6	3	0	6	272	2	i = 8
3	3	4	15	4	5	0	10	8	254	j = 9

best conf fact = 0.01
##
##
##
#5 num obj min = 2

=== Run information ===

Scheme:weka.classifiers.trees.J48 -C 0.01 -M 2
Relation: optesting_minus_1900
Instances: 3220
Attributes: 55
1
2
3
4
5

6
7
9
10
11
12
13
14
15
17
18
19
20
21
22
23
25
26
27
28
29
30
33
34
35
36
37
38
41
42
43
44
45
46
47
49
50
51
52
53
54
55
57
58
59
60
61
62
63
64
Test mode:10-fold cross-validation

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

J48 pruned tree

```
36 <= 1
|   42 <= 7
|   |   21 <= 7
|   |   |   22 <= 5
|   |   |   |   18 <= 1: 3 (3.0)
|   |   |   |   18 > 1
|   |   |   |   |   4 <= 11: 2 (4.0/2.0)
|   |   |   |   |   4 > 11: 5 (51.0)
|   |   |   22 > 5: 0 (2.0)
|   |   21 > 7
|   |   |   33 <= 3: 9 (101.0/3.0)
|   |   |   33 > 3: 0 (4.0/1.0)
|   42 > 7
|   |   45 <= 0
|   |   |   54 <= 0
|   |   |   |   20 <= 3: 5 (7.0)
|   |   |   |   20 > 3
|   |   |   |   |   2 <= 3: 1 (4.0)
|   |   |   |   |   2 > 3: 8 (10.0)
|   |   |   54 > 0: 2 (14.0)
|   |   45 > 0
|   |   |   21 <= 5
|   |   |   |   14 <= 1
|   |   |   |   |   30 <= 5
|   |   |   |   |   |   38 <= 9: 6 (15.0/1.0)
|   |   |   |   |   |   38 > 9: 4 (3.0/1.0)
|   |   |   |   |   30 > 5: 4 (11.0)
|   |   |   |   14 > 1: 0 (4.0)
|   |   |   21 > 5
|   |   |   |   28 <= 8: 0 (306.0/1.0)
|   |   |   |   28 > 8: 8 (4.0/2.0)
36 > 1
|   21 <= 0
|   |   42 <= 8
|   |   |   5 <= 1
|   |   |   |   37 <= 9
|   |   |   |   |   27 <= 13
|   |   |   |   |   |   5 <= 0
|   |   |   |   |   |   |   10 <= 7: 1 (5.0)
|   |   |   |   |   |   |   10 > 7
|   |   |   |   |   |   |   |   37 <= 5: 2 (74.0)
|   |   |   |   |   |   |   |   37 > 5: 3 (2.0/1.0)
|   |   |   |   |   |   5 > 0: 6 (2.0/1.0)
|   |   |   |   |   27 > 13: 1 (41.0)
|   |   |   |   37 > 9
|   |   |   |   |   43 <= 5
|   |   |   |   |   |   3 <= 11: 5 (2.0/1.0)
```

```
|  |  |  |  |  |  3 > 11: 3 (26.0)
|  |  |  |  |  43 > 5: 4 (11.0/1.0)
|  |  |  5 > 1
|  |  |  |  30 <= 4
|  |  |  |  |  18 <= 5
|  |  |  |  |  |  12 <= 14: 4 (2.0/1.0)
|  |  |  |  |  |  12 > 14: 3 (6.0)
|  |  |  |  |  18 > 5
|  |  |  |  |  |  20 <= 7: 5 (226.0)
|  |  |  |  |  |  20 > 7: 5 (6.0/3.0)
|  |  |  |  30 > 4: 4 (3.0)
|  |  42 > 8
|  |  |  41 <= 8
|  |  |  |  30 <= 2
|  |  |  |  |  26 <= 4
|  |  |  |  |  |  45 <= 3: 2 (17.0)
|  |  |  |  |  |  45 > 3: 6 (5.0/1.0)
|  |  |  |  |  26 > 4
|  |  |  |  |  |  61 <= 1
|  |  |  |  |  |  |  36 <= 15: 1 (4.0/1.0)
|  |  |  |  |  |  |  36 > 15: 4 (4.0)
|  |  |  |  |  |  61 > 1
|  |  |  |  |  |  |  20 <= 9: 6 (309.0/4.0)
|  |  |  |  |  |  |  20 > 9
|  |  |  |  |  |  |  |  19 <= 12: 8 (2.0)
|  |  |  |  |  |  |  |  19 > 12: 1 (12.0/1.0)
|  |  |  |  30 > 2
|  |  |  |  |  2 <= 1: 4 (9.0)
|  |  |  |  |  2 > 1: 5 (2.0/1.0)
|  |  |  41 > 8
|  |  |  |  2 <= 6: 4 (36.0)
|  |  |  |  2 > 6: 6 (2.0)
|  21 > 0
|  |  60 <= 5
|  |  |  62 <= 0
|  |  |  |  4 <= 7
|  |  |  |  |  12 <= 10
|  |  |  |  |  |  49 <= 2: 4 (29.0)
|  |  |  |  |  |  49 > 2: 8 (2.0)
|  |  |  |  |  12 > 10
|  |  |  |  |  |  17 <= 5
|  |  |  |  |  |  |  18 <= 14
|  |  |  |  |  |  |  |  19 <= 11: 7 (6.0)
|  |  |  |  |  |  |  |  19 > 11: 1 (4.0)
|  |  |  |  |  |  |  18 > 14: 8 (2.0)
|  |  |  |  |  |  17 > 5: 5 (2.0)
|  |  |  |  4 > 7
|  |  |  |  |  53 <= 0
|  |  |  |  |  |  26 <= 12
|  |  |  |  |  |  |  19 <= 8: 7 (269.0/7.0)
|  |  |  |  |  |  |  19 > 8
|  |  |  |  |  |  |  |  49 <= 0
```

```
|  |  |  |  |  |  |  |  |  15 <= 0
|  |  |  |  |  |  |  |  |  |  18 <= 6: 7 (2.0)
|  |  |  |  |  |  |  |  |  |  18 > 6: 9 (8.0)
|  |  |  |  |  |  |  |  |  15 > 0: 7 (3.0)
|  |  |  |  |  |  |  |  |  49 > 0: 8 (2.0)
|  |  |  |  |  |  |  26 > 12
|  |  |  |  |  |  |  |  5 <= 2: 4 (8.0/1.0)
|  |  |  |  |  |  |  |  5 > 2
|  |  |  |  |  |  |  |  |  17 <= 1: 7 (16.0/1.0)
|  |  |  |  |  |  |  |  |  17 > 1
|  |  |  |  |  |  |  |  |  |  27 <= 8: 5 (2.0/1.0)
|  |  |  |  |  |  |  |  |  |  27 > 8: 9 (16.0)
|  |  |  |  |  |  53 > 0
|  |  |  |  |  |  |  17 <= 0
|  |  |  |  |  |  |  |  18 <= 6
|  |  |  |  |  |  |  |  |  52 <= 14: 7 (5.0)
|  |  |  |  |  |  |  |  |  52 > 14: 3 (6.0)
|  |  |  |  |  |  |  |  18 > 6: 1 (2.0)
|  |  |  |  |  |  |  17 > 0
|  |  |  |  |  |  |  |  6 <= 0: 9 (5.0)
|  |  |  |  |  |  |  |  6 > 0: 5 (3.0)
|  |  |  62 > 0
|  |  |  |  2 <= 1: 1 (7.0)
|  |  |  |  2 > 1: 2 (8.0)
|  |  60 > 5
|  |  |  43 <= 3
|  |  |  |  42 <= 7
|  |  |  |  |  3 <= 3
|  |  |  |  |  |  20 <= 13
|  |  |  |  |  |  |  62 <= 4
|  |  |  |  |  |  |  |  43 <= 1
|  |  |  |  |  |  |  |  |  38 <= 4: 9 (12.0)
|  |  |  |  |  |  |  |  |  38 > 4: 4 (6.0/1.0)
|  |  |  |  |  |  |  |  43 > 1: 4 (2.0/1.0)
|  |  |  |  |  |  |  62 > 4: 1 (3.0)
|  |  |  |  |  |  20 > 13: 1 (33.0)
|  |  |  |  |  3 > 3
|  |  |  |  |  |  29 <= 13
|  |  |  |  |  |  |  63 <= 0
|  |  |  |  |  |  |  |  18 <= 12
|  |  |  |  |  |  |  |  |  62 <= 10: 3 (243.0/6.0)
|  |  |  |  |  |  |  |  |  62 > 10: 2 (4.0/2.0)
|  |  |  |  |  |  |  |  18 > 12
|  |  |  |  |  |  |  |  |  2 <= 6
|  |  |  |  |  |  |  |  |  |  9 <= 0: 9 (8.0/3.0)
|  |  |  |  |  |  |  |  |  |  9 > 0: 3 (9.0)
|  |  |  |  |  |  |  |  |  2 > 6
|  |  |  |  |  |  |  |  |  |  53 <= 10: 9 (6.0/1.0)
|  |  |  |  |  |  |  |  |  |  53 > 10: 5 (11.0/1.0)
|  |  |  |  |  |  |  63 > 0
|  |  |  |  |  |  |  |  46 <= 0: 2 (7.0)
|  |  |  |  |  |  |  |  46 > 0
```

```
|  |  |  |  |  |  |  |  |  19 <= 13: 3 (3.0/1.0)
|  |  |  |  |  |  |  |  |  19 > 13: 1 (3.0)
|  |  |  |  |  |  29 > 13
|  |  |  |  |  |  |  63 <= 2
|  |  |  |  |  |  |  |  33 <= 2
|  |  |  |  |  |  |  |  |  21 <= 5: 5 (6.0/1.0)
|  |  |  |  |  |  |  |  |  21 > 5
|  |  |  |  |  |  |  |  |  |  26 <= 2
|  |  |  |  |  |  |  |  |  |  |  19 <= 7
|  |  |  |  |  |  |  |  |  |  |  |  20 <= 0: 7 (3.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  |  20 > 0: 3 (18.0)
|  |  |  |  |  |  |  |  |  |  |  19 > 7: 9 (14.0/1.0)
|  |  |  |  |  |  |  |  |  |  26 > 2
|  |  |  |  |  |  |  |  |  |  |  30 <= 12: 9 (128.0/4.0)
|  |  |  |  |  |  |  |  |  |  |  30 > 12: 4 (2.0)
|  |  |  |  |  |  |  |  33 > 2
|  |  |  |  |  |  |  |  |  2 <= 0: 4 (7.0)
|  |  |  |  |  |  |  |  |  2 > 0: 7 (2.0/1.0)
|  |  |  |  |  |  |  63 > 2: 2 (6.0)
|  |  |  |  42 > 7
|  |  |  |  |  35 <= 5
|  |  |  |  |  |  25 <= 0
|  |  |  |  |  |  |  44 <= 0: 3 (7.0)
|  |  |  |  |  |  |  44 > 0: 8 (2.0/1.0)
|  |  |  |  |  |  25 > 0: 0 (4.0/1.0)
|  |  |  |  |  35 > 5
|  |  |  |  |  |  30 <= 7: 8 (53.0)
|  |  |  |  |  |  30 > 7: 7 (2.0)
|  |  |  43 > 3
|  |  |  |  33 <= 1
|  |  |  |  |  19 <= 10
|  |  |  |  |  |  50 <= 0
|  |  |  |  |  |  |  3 <= 14
|  |  |  |  |  |  |  |  5 <= 7
|  |  |  |  |  |  |  |  |  9 <= 0
|  |  |  |  |  |  |  |  |  |  12 <= 10: 4 (2.0)
|  |  |  |  |  |  |  |  |  |  12 > 10: 1 (3.0)
|  |  |  |  |  |  |  |  |  9 > 0: 9 (3.0/1.0)
|  |  |  |  |  |  |  |  5 > 7
|  |  |  |  |  |  |  |  |  53 <= 7: 7 (14.0)
|  |  |  |  |  |  |  |  |  53 > 7: 8 (7.0)
|  |  |  |  |  |  |  3 > 14: 3 (4.0)
|  |  |  |  |  |  50 > 0
|  |  |  |  |  |  |  27 <= 5
|  |  |  |  |  |  |  |  7 <= 1
|  |  |  |  |  |  |  |  |  34 <= 5: 2 (139.0/3.0)
|  |  |  |  |  |  |  |  |  34 > 5: 8 (6.0/1.0)
|  |  |  |  |  |  |  |  7 > 1: 7 (2.0)
|  |  |  |  |  |  |  27 > 5
|  |  |  |  |  |  |  |  26 <= 1
|  |  |  |  |  |  |  |  |  36 <= 13
|  |  |  |  |  |  |  |  |  |  37 <= 1
```

```
|  |  |  |  |  |  |  |  |  |  |  61 <= 1: 8 (4.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  61 > 1: 2 (35.0)
|  |  |  |  |  |  |  |  |  |  37 > 1: 8 (2.0)
|  |  |  |  |  |  |  |  |  36 > 13
|  |  |  |  |  |  |  |  |  |  30 <= 1
|  |  |  |  |  |  |  |  |  |  |  19 <= 4: 3 (7.0)
|  |  |  |  |  |  |  |  |  |  |  19 > 4: 1 (4.0/1.0)
|  |  |  |  |  |  |  |  |  |  30 > 1: 8 (2.0)
|  |  |  |  |  |  |  |  |  26 > 1
|  |  |  |  |  |  |  |  |  |  18 <= 1: 3 (2.0)
|  |  |  |  |  |  |  |  |  |  18 > 1
|  |  |  |  |  |  |  |  |  |  62 <= 9: 8 (155.0/3.0)
|  |  |  |  |  |  |  |  |  |  62 > 9
|  |  |  |  |  |  |  |  |  |  |  37 <= 0: 2 (8.0)
|  |  |  |  |  |  |  |  |  |  |  37 > 0: 8 (5.0)
|  |  |  |  |  19 > 10
|  |  |  |  |  |  12 <= 12
|  |  |  |  |  |  |  28 <= 9: 4 (3.0/1.0)
|  |  |  |  |  |  |  28 > 9: 8 (34.0/1.0)
|  |  |  |  |  |  12 > 12
|  |  |  |  |  |  |  36 <= 4: 2 (5.0/4.0)
|  |  |  |  |  |  |  36 > 4
|  |  |  |  |  |  |  |  63 <= 5
|  |  |  |  |  |  |  |  |  52 <= 6: 8 (6.0)
|  |  |  |  |  |  |  |  |  52 > 6
|  |  |  |  |  |  |  |  |  |  20 <= 13
|  |  |  |  |  |  |  |  |  |  |  18 <= 10: 8 (7.0/2.0)
|  |  |  |  |  |  |  |  |  |  |  18 > 10: 1 (3.0)
|  |  |  |  |  |  |  |  |  |  20 > 13: 1 (146.0/5.0)
|  |  |  |  |  |  |  |  |  63 > 5: 2 (2.0)
|  |  |  |  33 > 1
|  |  |  |  |  38 <= 0
|  |  |  |  |  |  27 <= 7
|  |  |  |  |  |  |  54 <= 1: 4 (13.0/1.0)
|  |  |  |  |  |  |  54 > 1: 2 (3.0)
|  |  |  |  |  |  27 > 7
|  |  |  |  |  |  |  12 <= 15
|  |  |  |  |  |  |  |  61 <= 12
|  |  |  |  |  |  |  |  |  46 <= 1
|  |  |  |  |  |  |  |  |  |  34 <= 13: 4 (2.0)
|  |  |  |  |  |  |  |  |  |  34 > 13
|  |  |  |  |  |  |  |  |  |  |  59 <= 9: 6 (2.0/1.0)
|  |  |  |  |  |  |  |  |  |  |  59 > 9: 8 (9.0)
|  |  |  |  |  |  |  |  |  46 > 1: 3 (2.0/1.0)
|  |  |  |  |  |  |  |  61 > 12: 1 (3.0)
|  |  |  |  |  |  |  12 > 15: 1 (47.0)
|  |  |  |  |  38 > 0
|  |  |  |  |  |  62 <= 0
|  |  |  |  |  |  |  5 <= 14
|  |  |  |  |  |  |  |  58 <= 1: 4 (150.0)
|  |  |  |  |  |  |  |  58 > 1
|  |  |  |  |  |  |  |  |  53 <= 5: 4 (6.0/2.0)
```

| | | | | | | | | 53 > 5: 0 (3.0/1.0)
| | | | | | | 5 > 14: 7 (3.0)
| | | | | | 62 > 0: 1 (5.0/2.0)

Number of Leaves : 130

Size of the tree : 259

Time taken to build model: 0.16 seconds

=== Stratified cross-validation ===
=== Summary ===

Correctly Classified Instances	2866	89.0062 %
Incorrectly Classified Instances	354	10.9938 %
Kappa statistic	0.8778	
Mean absolute error	0.0257	
Root mean squared error	0.1418	
Relative absolute error	14.2892 %	
Root relative squared error	47.2793 %	
Total Number of Instances	3220	

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	ROC Area	Class
0.966	0.004	0.966	0.966	0.966	0.984	0
0.889	0.018	0.85	0.889	0.869	0.94	1
0.865	0.011	0.898	0.865	0.881	0.936	2
0.897	0.019	0.849	0.897	0.872	0.942	3
0.866	0.014	0.869	0.866	0.867	0.933	4
0.91	0.009	0.916	0.91	0.913	0.963	5
0.942	0.005	0.957	0.942	0.95	0.974	6
0.902	0.013	0.888	0.902	0.895	0.953	7
0.835	0.017	0.843	0.835	0.839	0.939	8
0.824	0.013	0.869	0.824	0.846	0.933	9
Weighted Avg.	0.89	0.012	0.89	0.89	0.89	0.95

=== Confusion Matrix ===

a	b	c	d	e	f	g	h	i	j	<-- classified as
310	0	0	0	4	2	2	0	3	0	a = 0
1	289	6	7	10	2	1	4	5	0	b = 1
1	10	281	9	0	2	2	2	15	3	c = 2
2	7	6	304	0	5	0	2	4	9	d = 3
3	3	2	2	265	4	6	9	6	6	e = 4
0	3	2	10	2	293	2	0	1	9	f = 5
2	3	3	0	6	2	311	1	2	0	g = 6
0	1	2	2	7	5	1	293	6	8	h = 7
1	19	8	6	7	1	0	8	268	3	i = 8
1	5	3	18	4	4	0	11	8	252	j = 9

##
##
##
#6 num obj min = 5

=== Run information ===

Scheme:weka.classifiers.trees.J48 -C 0.01 -M 5
Relation: optesting_minus_1900
Instances: 3220
Attributes: 55
1
2
3
4
5
6
7
9
10
11
12
13
14
15
17
18
19
20
21
22
23
25
26
27
28
29
30
33
34
35
36
37
38
41
42
43
44
45
46

47
49
50
51
52
53
54
55
57
58
59
60
61
62
63
64
Test mode:10-fold cross-validation

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

J48 pruned tree

```
36 <= 1
|   42 <= 7
|   |   21 <= 7: 5 (60.0/8.0)
|   |   21 > 7
|   |   |   42 <= 5: 9 (100.0/3.0)
|   |   |   42 > 5: 0 (5.0/2.0)
|   42 > 7
|   |   45 <= 0
|   |   |   54 <= 0
|   |   |   |   20 <= 3: 5 (7.0)
|   |   |   |   20 > 3
|   |   |   |   |   2 <= 4: 1 (5.0/1.0)
|   |   |   |   |   2 > 4: 8 (9.0)
|   |   |   54 > 0: 2 (14.0)
|   |   45 > 0
|   |   |   21 <= 5
|   |   |   |   14 <= 0
|   |   |   |   |   30 <= 5: 6 (18.0/4.0)
|   |   |   |   |   30 > 5: 4 (10.0)
|   |   |   |   14 > 0: 0 (5.0/1.0)
|   |   |   21 > 5: 0 (310.0/4.0)
36 > 1
|   21 <= 0
|   |   42 <= 8
|   |   |   5 <= 1
|   |   |   |   37 <= 9
|   |   |   |   |   27 <= 13
|   |   |   |   |   |   10 <= 7: 1 (6.0/1.0)
|   |   |   |   |   |   10 > 7: 2 (77.0/3.0)
```

```
|  |  |  |  |  27 > 13: 1 (41.0)
|  |  |  |  37 > 9
|  |  |  |  |  43 <= 5: 3 (28.0/2.0)
|  |  |  |  |  43 > 5: 4 (11.0/1.0)
|  |  |  5 > 1
|  |  |  |  18 <= 5
|  |  |  |  |  9 <= 1: 4 (5.0/2.0)
|  |  |  |  |  9 > 1: 3 (5.0)
|  |  |  |  18 > 5: 5 (233.0/4.0)
|  |  42 > 8
|  |  |  41 <= 8
|  |  |  |  30 <= 2
|  |  |  |  |  26 <= 4
|  |  |  |  |  |  45 <= 3: 2 (17.0)
|  |  |  |  |  |  45 > 3: 6 (5.0/1.0)
|  |  |  |  |  26 > 4
|  |  |  |  |  |  61 <= 1: 4 (8.0/4.0)
|  |  |  |  |  |  61 > 1
|  |  |  |  |  |  |  20 <= 9: 6 (309.0/4.0)
|  |  |  |  |  |  |  20 > 9: 1 (14.0/3.0)
|  |  |  |  30 > 2: 4 (11.0/2.0)
|  |  |  41 > 8: 4 (38.0/2.0)
|  21 > 0
|  |  60 <= 5
|  |  |  62 <= 0
|  |  |  |  4 <= 7
|  |  |  |  |  12 <= 10: 4 (31.0/2.0)
|  |  |  |  |  12 > 10
|  |  |  |  |  |  19 <= 10: 7 (7.0/1.0)
|  |  |  |  |  |  19 > 10: 1 (7.0/3.0)
|  |  |  |  4 > 7
|  |  |  |  |  53 <= 0
|  |  |  |  |  |  26 <= 12
|  |  |  |  |  |  |  19 <= 8
|  |  |  |  |  |  |  |  37 <= 0
|  |  |  |  |  |  |  |  |  59 <= 12: 7 (6.0)
|  |  |  |  |  |  |  |  |  59 > 12: 8 (5.0/1.0)
|  |  |  |  |  |  |  |  37 > 0: 7 (258.0/2.0)
|  |  |  |  |  |  |  19 > 8
|  |  |  |  |  |  |  |  11 <= 12: 9 (9.0/2.0)
|  |  |  |  |  |  |  |  11 > 12: 7 (6.0/1.0)
|  |  |  |  |  |  26 > 12
|  |  |  |  |  |  |  5 <= 2: 4 (8.0/1.0)
|  |  |  |  |  |  |  5 > 2
|  |  |  |  |  |  |  |  17 <= 1: 7 (16.0/1.0)
|  |  |  |  |  |  |  |  17 > 1: 9 (18.0/2.0)
|  |  |  |  |  53 > 0
|  |  |  |  |  |  17 <= 0
|  |  |  |  |  |  |  11 <= 8: 3 (6.0)
|  |  |  |  |  |  |  11 > 8: 7 (7.0/2.0)
|  |  |  |  |  17 > 0: 9 (8.0/3.0)
|  |  |  62 > 0
```

```
|  |  |  |  2 <= 1: 1 (7.0)
|  |  |  |  2 > 1: 2 (8.0)
|  |  60 > 5
|  |  |  43 <= 3
|  |  |  |  42 <= 7
|  |  |  |  |  3 <= 3
|  |  |  |  |  |  20 <= 13
|  |  |  |  |  |  |  5 <= 8: 4 (5.0)
|  |  |  |  |  |  |  5 > 8
|  |  |  |  |  |  |  |  54 <= 1: 9 (13.0/1.0)
|  |  |  |  |  |  |  |  54 > 1: 1 (5.0/2.0)
|  |  |  |  |  |  20 > 13: 1 (33.0)
|  |  |  |  |  3 > 3
|  |  |  |  |  |  29 <= 13
|  |  |  |  |  |  |  63 <= 0
|  |  |  |  |  |  |  |  18 <= 12: 3 (247.0/9.0)
|  |  |  |  |  |  |  |  18 > 12
|  |  |  |  |  |  |  |  |  2 <= 6
|  |  |  |  |  |  |  |  |  |  9 <= 0: 9 (8.0/3.0)
|  |  |  |  |  |  |  |  |  |  9 > 0: 3 (9.0)
|  |  |  |  |  |  |  |  |  2 > 6
|  |  |  |  |  |  |  |  |  |  53 <= 10: 9 (6.0/1.0)
|  |  |  |  |  |  |  |  |  |  53 > 10: 5 (11.0/1.0)
|  |  |  |  |  |  |  63 > 0
|  |  |  |  |  |  |  |  46 <= 0: 2 (7.0)
|  |  |  |  |  |  |  |  46 > 0: 1 (6.0/3.0)
|  |  |  |  |  |  29 > 13
|  |  |  |  |  |  |  63 <= 2
|  |  |  |  |  |  |  |  33 <= 2
|  |  |  |  |  |  |  |  |  21 <= 5: 5 (6.0/1.0)
|  |  |  |  |  |  |  |  |  21 > 5
|  |  |  |  |  |  |  |  |  |  26 <= 2
|  |  |  |  |  |  |  |  |  |  |  19 <= 7: 3 (21.0/3.0)
|  |  |  |  |  |  |  |  |  |  |  19 > 7: 9 (14.0/1.0)
|  |  |  |  |  |  |  |  |  |  26 > 2: 9 (130.0/6.0)
|  |  |  |  |  |  |  |  33 > 2: 4 (9.0/2.0)
|  |  |  |  |  |  |  63 > 2: 2 (6.0)
|  |  |  |  42 > 7
|  |  |  |  |  35 <= 5
|  |  |  |  |  |  26 <= 4: 3 (7.0)
|  |  |  |  |  |  26 > 4: 0 (6.0/3.0)
|  |  |  |  |  35 > 5: 8 (55.0/2.0)
|  |  |  43 > 3
|  |  |  |  33 <= 1
|  |  |  |  |  19 <= 10
|  |  |  |  |  |  50 <= 0
|  |  |  |  |  |  |  58 <= 6
|  |  |  |  |  |  |  |  53 <= 7
|  |  |  |  |  |  |  |  |  38 <= 1: 4 (5.0/3.0)
|  |  |  |  |  |  |  |  |  38 > 1: 7 (13.0)
|  |  |  |  |  |  |  |  53 > 7: 8 (10.0/3.0)
|  |  |  |  |  |  |  58 > 6: 3 (5.0/1.0)
```

```
|  |  |  |  |  |  50 > 0
|  |  |  |  |  |  |  27 <= 5
|  |  |  |  |  |  |  |  34 <= 5
|  |  |  |  |  |  |  |  |  45 <= 9: 2 (136.0/1.0)
|  |  |  |  |  |  |  |  |  45 > 9: 7 (5.0/3.0)
|  |  |  |  |  |  |  |  34 > 5: 8 (6.0/1.0)
|  |  |  |  |  |  |  27 > 5
|  |  |  |  |  |  |  |  26 <= 1
|  |  |  |  |  |  |  |  |  38 <= 0
|  |  |  |  |  |  |  |  |  |  44 <= 9: 2 (39.0/4.0)
|  |  |  |  |  |  |  |  |  |  44 > 9
|  |  |  |  |  |  |  |  |  |  |  4 <= 12: 1 (5.0/2.0)
|  |  |  |  |  |  |  |  |  |  |  4 > 12: 3 (5.0/2.0)
|  |  |  |  |  |  |  |  |  38 > 0: 3 (5.0)
|  |  |  |  |  |  |  |  26 > 1
|  |  |  |  |  |  |  |  |  21 <= 4: 2 (10.0/3.0)
|  |  |  |  |  |  |  |  |  21 > 4: 8 (160.0/6.0)
|  |  |  |  |  19 > 10
|  |  |  |  |  |  12 <= 12
|  |  |  |  |  |  |  10 <= 1: 4 (5.0/2.0)
|  |  |  |  |  |  |  10 > 1: 8 (32.0)
|  |  |  |  |  |  12 > 12
|  |  |  |  |  |  |  36 <= 4: 2 (5.0/4.0)
|  |  |  |  |  |  |  36 > 4
|  |  |  |  |  |  |  |  52 <= 6: 8 (6.0)
|  |  |  |  |  |  |  |  52 > 6
|  |  |  |  |  |  |  |  |  27 <= 5: 2 (6.0/3.0)
|  |  |  |  |  |  |  |  |  27 > 5
|  |  |  |  |  |  |  |  |  |  20 <= 13: 8 (6.0/1.0)
|  |  |  |  |  |  |  |  |  |  20 > 13: 1 (146.0/5.0)
|  |  |  |  33 > 1
|  |  |  |  |  38 <= 0
|  |  |  |  |  |  27 <= 7
|  |  |  |  |  |  |  13 <= 3: 4 (11.0)
|  |  |  |  |  |  |  13 > 3: 2 (5.0/2.0)
|  |  |  |  |  |  27 > 7
|  |  |  |  |  |  |  30 <= 0
|  |  |  |  |  |  |  |  20 <= 13: 8 (5.0/3.0)
|  |  |  |  |  |  |  |  20 > 13: 1 (51.0/2.0)
|  |  |  |  |  |  |  30 > 0: 8 (9.0/3.0)
|  |  |  |  |  38 > 0
|  |  |  |  |  |  62 <= 0
|  |  |  |  |  |  |  19 <= 3: 7 (9.0/4.0)
|  |  |  |  |  |  |  19 > 3: 4 (153.0/2.0)
|  |  |  |  |  |  62 > 0: 1 (5.0/2.0)
```

Number of Leaves : 90

Size of the tree : 179

Time taken to build model: 0.14 seconds

=== Stratified cross-validation ===
=== Summary ===

Correctly Classified Instances	2834	88.0124 %
Incorrectly Classified Instances	386	11.9876 %
Kappa statistic	0.8668	
Mean absolute error	0.0305	
Root mean squared error	0.144	
Relative absolute error	16.9631 %	
Root relative squared error	48.0159 %	
Total Number of Instances	3220	

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	ROC Area	Class
0.96	0.005	0.957	0.96	0.958	0.992	0
0.846	0.018	0.844	0.846	0.845	0.95	1
0.846	0.012	0.89	0.846	0.868	0.945	2
0.9	0.018	0.852	0.9	0.875	0.951	3
0.84	0.014	0.86	0.84	0.85	0.949	4
0.91	0.012	0.893	0.91	0.902	0.968	5
0.952	0.007	0.943	0.952	0.947	0.978	6
0.898	0.013	0.882	0.898	0.89	0.962	7
0.819	0.018	0.832	0.819	0.826	0.931	8
0.824	0.016	0.846	0.824	0.834	0.949	9
Weighted Avg.	0.88	0.013	0.88	0.88	0.88	0.958

=== Confusion Matrix ===

a	b	c	d	e	f	g	h	i	j	<-- classified as
308	0	1	0	6	2	1	0	1	2	a = 0
0	275	7	4	9	7	1	6	13	3	b = 1
1	13	275	8	2	1	5	3	12	5	c = 2
0	6	4	305	1	9	0	1	5	8	d = 3
5	2	2	3	257	6	9	11	6	5	e = 4
1	1	0	9	2	293	2	0	2	12	f = 5
2	2	3	0	6	0	314	1	2	0	g = 6
0	2	4	6	7	2	0	292	5	7	h = 7
2	20	9	7	4	3	1	8	263	4	i = 8
3	5	4	16	5	5	0	9	7	252	j = 9

##
##
###
#7 num obj min = 10

=== Run information ===

Scheme:weka.classifiers.trees.J48 -C 0.01 -M 10
Relation: optesting_minus_1900
Instances: 3220

Attributes: 55
1
2
3
4
5
6
7
9
10
11
12
13
14
15
17
18
19
20
20
21
22
23
25
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34
35
36
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38
41
42
43
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45
46
47
49
50
51
52
53
54
55
57
58
59
60

61
62
63
64
Test mode:10-fold cross-validation

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

J48 pruned tree

```
36 <= 1
|   42 <= 7
|   |   21 <= 7: 5 (60.0/8.0)
|   |   21 > 7: 9 (105.0/7.0)
|   42 > 7
|   |   45 <= 0
|   |   |   62 <= 1
|   |   |   |   2 <= 7: 8 (11.0/4.0)
|   |   |   |   2 > 7: 5 (10.0/3.0)
|   |   |   62 > 1: 2 (14.0)
|   |   45 > 0
|   |   |   21 <= 5
|   |   |   |   30 <= 5: 6 (18.0/4.0)
|   |   |   |   30 > 5: 4 (15.0/4.0)
|   |   |   21 > 5: 0 (310.0/4.0)
36 > 1
|   21 <= 0
|   |   42 <= 8
|   |   |   5 <= 1
|   |   |   |   37 <= 9
|   |   |   |   |   27 <= 13
|   |   |   |   |   |   2 <= 4: 1 (11.0/6.0)
|   |   |   |   |   |   2 > 4: 2 (72.0/1.0)
|   |   |   |   |   27 > 13: 1 (41.0)
|   |   |   |   37 > 9
|   |   |   |   |   43 <= 5: 3 (28.0/2.0)
|   |   |   |   |   43 > 5: 4 (11.0/1.0)
|   |   |   5 > 1
|   |   |   |   18 <= 5: 3 (10.0/4.0)
|   |   |   |   18 > 5: 5 (233.0/4.0)
|   |   42 > 8
|   |   |   9 <= 2
|   |   |   |   41 <= 8
|   |   |   |   |   30 <= 2
|   |   |   |   |   |   20 <= 9: 6 (311.0/7.0)
|   |   |   |   |   |   20 > 9: 1 (14.0/2.0)
|   |   |   |   |   30 > 2: 4 (10.0/1.0)
|   |   |   |   41 > 8: 4 (37.0/1.0)
|   |   |   9 > 2
|   |   |   |   45 <= 3: 2 (18.0)
|   |   |   |   45 > 3: 6 (12.0/6.0)
```

```
|  21 > 0
|  |  60 <= 5
|  |  |  62 <= 0
|  |  |  |  4 <= 7
|  |  |  |  |  12 <= 10: 4 (31.0/2.0)
|  |  |  |  |  12 > 10: 7 (14.0/8.0)
|  |  |  |  4 > 7
|  |  |  |  |  26 <= 12
|  |  |  |  |  |  19 <= 8: 7 (281.0/14.0)
|  |  |  |  |  |  19 > 8: 9 (17.0/8.0)
|  |  |  |  |  26 > 12
|  |  |  |  |  |  17 <= 2
|  |  |  |  |  |  |  60 <= 2: 7 (13.0)
|  |  |  |  |  |  |  60 > 2: 4 (12.0/6.0)
|  |  |  |  |  |  17 > 2: 9 (24.0/6.0)
|  |  |  62 > 0: 2 (15.0/7.0)
|  |  60 > 5
|  |  |  43 <= 3
|  |  |  |  42 <= 7
|  |  |  |  |  3 <= 3
|  |  |  |  |  |  20 <= 13
|  |  |  |  |  |  |  37 <= 15: 9 (12.0/1.0)
|  |  |  |  |  |  |  37 > 15: 4 (11.0/5.0)
|  |  |  |  |  |  20 > 13: 1 (33.0)
|  |  |  |  |  3 > 3
|  |  |  |  |  |  63 <= 0
|  |  |  |  |  |  |  29 <= 13
|  |  |  |  |  |  |  |  18 <= 12: 3 (247.0/9.0)
|  |  |  |  |  |  |  |  18 > 12
|  |  |  |  |  |  |  |  |  21 <= 3: 5 (12.0/2.0)
|  |  |  |  |  |  |  |  |  21 > 3
|  |  |  |  |  |  |  |  |  |  51 <= 7: 9 (12.0/2.0)
|  |  |  |  |  |  |  |  |  |  51 > 7: 3 (10.0/2.0)
|  |  |  |  |  |  |  29 > 13
|  |  |  |  |  |  |  |  21 <= 7: 4 (15.0/9.0)
|  |  |  |  |  |  |  |  21 > 7
|  |  |  |  |  |  |  |  |  26 <= 5
|  |  |  |  |  |  |  |  |  |  19 <= 7: 3 (22.0/3.0)
|  |  |  |  |  |  |  |  |  |  19 > 7: 9 (19.0/1.0)
|  |  |  |  |  |  |  |  |  26 > 5: 9 (120.0/7.0)
|  |  |  |  |  |  63 > 0
|  |  |  |  |  |  |  46 <= 0: 2 (13.0)
|  |  |  |  |  |  |  46 > 0: 9 (10.0/6.0)
|  |  |  |  42 > 7
|  |  |  |  |  35 <= 5: 3 (13.0/6.0)
|  |  |  |  |  35 > 5: 8 (55.0/2.0)
|  |  |  43 > 3
|  |  |  |  33 <= 1
|  |  |  |  |  19 <= 10
|  |  |  |  |  |  50 <= 0
|  |  |  |  |  |  |  53 <= 7: 7 (20.0/6.0)
|  |  |  |  |  |  |  53 > 7: 8 (13.0/6.0)
```

```
|  |  |  |  |  |  50 > 0
|  |  |  |  |  |  |  27 <= 5: 2 (147.0/11.0)
|  |  |  |  |  |  |  27 > 5
|  |  |  |  |  |  |  |  26 <= 1
|  |  |  |  |  |  |  |  |  36 <= 13: 2 (41.0/6.0)
|  |  |  |  |  |  |  |  |  36 > 13: 3 (13.0/6.0)
|  |  |  |  |  |  |  |  26 > 1
|  |  |  |  |  |  |  |  |  21 <= 4: 2 (10.0/3.0)
|  |  |  |  |  |  |  |  |  21 > 4: 8 (160.0/6.0)
|  |  |  |  |  19 > 10
|  |  |  |  |  |  12 <= 12: 8 (37.0/4.0)
|  |  |  |  |  |  12 > 12: 1 (169.0/25.0)
|  |  |  |  33 > 1
|  |  |  |  |  38 <= 0
|  |  |  |  |  |  27 <= 7: 4 (16.0/4.0)
|  |  |  |  |  |  27 > 7
|  |  |  |  |  |  |  12 <= 15: 8 (18.0/9.0)
|  |  |  |  |  |  |  12 > 15: 1 (47.0)
|  |  |  |  |  38 > 0: 4 (167.0/12.0)

Number of Leaves  :  57

Size of the tree :  113


Time taken to build model: 0.15 seconds

=== Stratified cross-validation ===
=== Summary ===

Correctly Classified Instances        2758               85.6522 %
Incorrectly Classified Instances       462               14.3478 %
Kappa statistic                          0.8406
Mean absolute error                      0.0375
Root mean squared error                  0.1507
Relative absolute error                 20.8201 %
Root relative squared error             50.2361 %
Total Number of Instances             3220

=== Detailed Accuracy By Class ===

               TP Rate   FP Rate   Precision   Recall  F-Measure   ROC Area  Class
                 0.947    0.004      0.959     0.947     0.953      0.991    0
                 0.803    0.02       0.821     0.803     0.812      0.957    1
                 0.834    0.016      0.858     0.834     0.846      0.948    2
                 0.858    0.024      0.806     0.858     0.831      0.953    3
                 0.814    0.018      0.825     0.814     0.819      0.956    4
                 0.885    0.015      0.866     0.885     0.876      0.968    5
                 0.936    0.006      0.951     0.936     0.944      0.985    6
                 0.889    0.012      0.889     0.889     0.889      0.968    7
                 0.801    0.027      0.767     0.801     0.784      0.949    8
                 0.791    0.017      0.829     0.791     0.809      0.948    9
```

Weighted Avg. 0.857 0.016 0.857 0.857 0.857 0.963

=== Confusion Matrix ===

a b c d e f g h i j <-- classified as
304 0 0 1 7 3 2 0 2 2 | a = 0
0 261 11 6 11 6 1 4 20 5 | b = 1
1 16 271 12 4 1 2 0 14 4 | c = 2
1 5 6 291 1 12 0 4 9 10 | d = 3
4 5 1 4 249 4 9 8 12 10 | e = 4
2 0 0 13 2 285 1 1 9 9 | f = 5
1 4 7 0 8 0 309 0 1 0 | g = 6
0 1 4 7 12 0 0 289 5 7 | h = 7
2 21 11 9 3 7 1 7 257 3 | i = 8
2 5 5 18 5 11 0 12 6 242 | j = 9

##
##
###
#8 num obj min = 15

=== Run information ===

Scheme:weka.classifiers.trees.J48 -C 0.01 -M 15
Relation: optesting_minus_1900
Instances: 3220
Attributes: 55
1
2
3
4
5
6
7
9
10
11
12
13
14
15
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18
19
20
21
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49
50
51
52
53
54
55
57
58
59
60
61
62
63
64
Test mode:10-fold cross-validation

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

J48 pruned tree
----

36 <= 1
| 42 <= 7
| | 21 <= 7: 5 (60.0/8.0)
| | 21 > 7: 9 (105.0/7.0)
| 42 > 7
| | 45 <= 0
| | | 53 <= 3: 8 (20.0/11.0)
| | | 53 > 3: 2 (15.0/1.0)
| | 45 > 0
| | | 21 <= 5
| | | | 30 <= 5: 6 (18.0/4.0)
| | | | 30 > 5: 4 (15.0/4.0)
| | | 21 > 5: 0 (310.0/4.0)
36 > 1

```
|  21 <= 0
|  |  42 <= 8
|  |  |  5 <= 1
|  |  |  |  37 <= 9
|  |  |  |  |  27 <= 13: 2 (83.0/9.0)
|  |  |  |  |  27 > 13: 1 (41.0)
|  |  |  |  37 > 9
|  |  |  |  |  34 <= 3: 3 (24.0/1.0)
|  |  |  |  |  34 > 3: 4 (15.0/5.0)
|  |  |  5 > 1
|  |  |  |  20 <= 6: 5 (228.0/3.0)
|  |  |  |  20 > 6: 3 (15.0/9.0)
|  |  42 > 8
|  |  |  9 <= 2
|  |  |  |  41 <= 8
|  |  |  |  |  20 <= 9
|  |  |  |  |  |  61 <= 5: 4 (17.0/8.0)
|  |  |  |  |  |  61 > 5: 6 (303.0/4.0)
|  |  |  |  |  20 > 9: 1 (15.0/3.0)
|  |  |  |  41 > 8: 4 (37.0/1.0)
|  |  |  9 > 2
|  |  |  |  45 <= 1: 2 (15.0)
|  |  |  |  45 > 1: 6 (15.0/9.0)
|  21 > 0
|  |  60 <= 5
|  |  |  62 <= 0
|  |  |  |  4 <= 7
|  |  |  |  |  12 <= 4: 4 (29.0/1.0)
|  |  |  |  |  12 > 4: 7 (16.0/10.0)
|  |  |  |  4 > 7
|  |  |  |  |  26 <= 12
|  |  |  |  |  |  19 <= 8: 7 (281.0/14.0)
|  |  |  |  |  |  19 > 8: 9 (17.0/8.0)
|  |  |  |  |  26 > 12
|  |  |  |  |  |  17 <= 2: 7 (25.0/10.0)
|  |  |  |  |  |  17 > 2: 9 (24.0/6.0)
|  |  |  62 > 0: 2 (15.0/7.0)
|  |  60 > 5
|  |  |  43 <= 3
|  |  |  |  42 <= 7
|  |  |  |  |  3 <= 3
|  |  |  |  |  |  20 <= 13: 9 (23.0/10.0)
|  |  |  |  |  |  20 > 13: 1 (33.0)
|  |  |  |  |  3 > 3
|  |  |  |  |  |  63 <= 0
|  |  |  |  |  |  |  29 <= 13
|  |  |  |  |  |  |  |  18 <= 12: 3 (247.0/9.0)
|  |  |  |  |  |  |  |  18 > 12
|  |  |  |  |  |  |  |  |  26 <= 10: 3 (18.0/9.0)
|  |  |  |  |  |  |  |  |  26 > 10: 5 (16.0/5.0)
|  |  |  |  |  |  |  29 > 13
|  |  |  |  |  |  |  |  21 <= 7: 4 (15.0/9.0)
```

```
|  |  |  |  |  |  |  |  21 > 7
|  |  |  |  |  |  |  |  |  26 <= 5
|  |  |  |  |  |  |  |  |  |  19 <= 7: 3 (22.0/3.0)
|  |  |  |  |  |  |  |  |  |  19 > 7: 9 (19.0/1.0)
|  |  |  |  |  |  |  |  |  26 > 5: 9 (120.0/7.0)
|  |  |  |  |  |  63 > 0: 2 (23.0/9.0)
|  |  |  |  42 > 7
|  |  |  |  |  35 <= 6: 3 (16.0/9.0)
|  |  |  |  |  35 > 6: 8 (52.0/2.0)
|  |  |  43 > 3
|  |  |  |  33 <= 1
|  |  |  |  |  19 <= 10
|  |  |  |  |  |  50 <= 0
|  |  |  |  |  |  |  53 <= 4: 7 (17.0/4.0)
|  |  |  |  |  |  |  53 > 4: 8 (16.0/9.0)
|  |  |  |  |  |  50 > 0
|  |  |  |  |  |  |  27 <= 5: 2 (147.0/11.0)
|  |  |  |  |  |  |  27 > 5
|  |  |  |  |  |  |  |  26 <= 1
|  |  |  |  |  |  |  |  |  |  36 <= 12: 2 (38.0/4.0)
|  |  |  |  |  |  |  |  |  |  36 > 12: 3 (16.0/9.0)
|  |  |  |  |  |  |  |  |  26 > 1: 8 (170.0/13.0)
|  |  |  |  |  19 > 10
|  |  |  |  |  |  12 <= 12: 8 (37.0/4.0)
|  |  |  |  |  |  12 > 12
|  |  |  |  |  |  |  20 <= 14: 8 (20.0/12.0)
|  |  |  |  |  |  |  20 > 14: 1 (149.0/11.0)
|  |  |  |  33 > 1
|  |  |  |  |  38 <= 0
|  |  |  |  |  |  27 <= 7: 4 (16.0/4.0)
|  |  |  |  |  |  27 > 7
|  |  |  |  |  |  |  12 <= 15: 8 (18.0/9.0)
|  |  |  |  |  |  |  12 > 15: 1 (47.0)
|  |  |  |  |  38 > 0: 4 (167.0/12.0)

Number of Leaves  :  51

Size of the tree :  101


Time taken to build model: 0.12 seconds

=== Stratified cross-validation ===
=== Summary ===

Correctly Classified Instances        2726               84.6584 %
Incorrectly Classified Instances       494               15.3416 %
Kappa statistic                          0.8295
Mean absolute error                      0.0427
Root mean squared error                  0.1562
Relative absolute error                 23.7404 %
Root relative squared error             52.0787 %
```

Total Number of Instances 3220

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	ROC Area	Class
0.947	0.004	0.962	0.947	0.954	0.992	0
0.8	0.021	0.813	0.8	0.806	0.948	1
0.812	0.016	0.849	0.812	0.83	0.953	2
0.817	0.025	0.796	0.817	0.806	0.958	3
0.801	0.024	0.78	0.801	0.79	0.961	4
0.885	0.013	0.885	0.885	0.885	0.97	5
0.918	0.008	0.929	0.918	0.924	0.987	6
0.895	0.016	0.864	0.895	0.879	0.973	7
0.794	0.023	0.789	0.794	0.792	0.958	8
0.791	0.021	0.799	0.791	0.795	0.952	9
Weighted Avg.	0.847	0.017	0.847	0.847	0.847	0.965

=== Confusion Matrix ===

a	b	c	d	e	f	g	h	i	j	<-- classified as
304	0	1	3	3	2	3	0	2	3	a = 0
0	260	12	8	14	6	6	1	11	7	b = 1
1	16	264	13	3	2	2	1	20	3	c = 2
1	7	6	277	7	10	0	6	12	13	d = 3
3	4	0	2	245	6	9	11	10	16	e = 4
1	0	0	11	5	285	2	1	6	11	f = 5
1	5	10	0	11	0	303	0	0	0	g = 6
0	0	4	6	16	1	0	291	2	5	h = 7
2	21	11	8	7	5	1	8	255	3	i = 8
3	7	3	20	3	5	0	18	5	242	j = 9

best num min obj = 2 (default)
##
##
##
#9 unpruned = TRUE

=== Run information ===

Scheme:weka.classifiers.trees.J48 -U -M 15
Relation: optesting_minus_1900
Instances: 3220
Attributes: 55
1
2
3
4
5
6
7

9
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11
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14
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49
50
51
52
53
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57
58
59
60
61
62
63
64
Test mode:10-fold cross-validation

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

J48 unpruned tree

```
36 <= 1
|   42 <= 7
|   |   21 <= 7: 5 (60.0/8.0)
|   |   21 > 7: 9 (105.0/7.0)
|   42 > 7
|   |   45 <= 0
|   |   |   53 <= 3: 8 (20.0/11.0)
|   |   |   53 > 3: 2 (15.0/1.0)
|   |   45 > 0
|   |   |   21 <= 5
|   |   |   |   30 <= 5: 6 (18.0/4.0)
|   |   |   |   30 > 5: 4 (15.0/4.0)
|   |   |   21 > 5: 0 (310.0/4.0)
36 > 1
|   21 <= 0
|   |   42 <= 8
|   |   |   5 <= 1
|   |   |   |   37 <= 9
|   |   |   |   |   27 <= 13: 2 (83.0/9.0)
|   |   |   |   |   27 > 13: 1 (41.0)
|   |   |   |   37 > 9
|   |   |   |   |   34 <= 3: 3 (24.0/1.0)
|   |   |   |   |   34 > 3: 4 (15.0/5.0)
|   |   |   5 > 1
|   |   |   |   20 <= 6: 5 (228.0/3.0)
|   |   |   |   20 > 6: 3 (15.0/9.0)
|   |   42 > 8
|   |   |   9 <= 2
|   |   |   |   41 <= 8
|   |   |   |   |   20 <= 9
|   |   |   |   |   |   61 <= 5: 4 (17.0/8.0)
|   |   |   |   |   |   61 > 5: 6 (303.0/4.0)
|   |   |   |   |   20 > 9: 1 (15.0/3.0)
|   |   |   |   41 > 8: 4 (37.0/1.0)
|   |   |   9 > 2
|   |   |   |   45 <= 1: 2 (15.0)
|   |   |   |   45 > 1: 6 (15.0/9.0)
|   21 > 0
|   |   60 <= 5
|   |   |   62 <= 0
|   |   |   |   4 <= 7
|   |   |   |   |   12 <= 4: 4 (29.0/1.0)
|   |   |   |   |   12 > 4: 7 (16.0/10.0)
|   |   |   |   4 > 7
|   |   |   |   |   53 <= 0
|   |   |   |   |   |   26 <= 12
|   |   |   |   |   |   |   19 <= 8: 7 (269.0/7.0)
|   |   |   |   |   |   |   19 > 8: 9 (15.0/7.0)
|   |   |   |   |   |   26 > 12
```

```
|  |  |  |  |  |  |  17 <= 2: 7 (23.0/8.0)
|  |  |  |  |  |  |  17 > 2: 9 (19.0/3.0)
|  |  |  |  |  53 > 0: 3 (21.0/15.0)
|  |  |  62 > 0: 2 (15.0/7.0)
|  |  60 > 5
|  |  |  43 <= 3
|  |  |  |  42 <= 7
|  |  |  |  |  3 <= 3
|  |  |  |  |  |  20 <= 13: 9 (23.0/10.0)
|  |  |  |  |  |  20 > 13: 1 (33.0)
|  |  |  |  |  3 > 3
|  |  |  |  |  |  63 <= 0
|  |  |  |  |  |  |  29 <= 13
|  |  |  |  |  |  |  |  18 <= 12: 3 (247.0/9.0)
|  |  |  |  |  |  |  |  18 > 12
|  |  |  |  |  |  |  |  |  26 <= 10: 3 (18.0/9.0)
|  |  |  |  |  |  |  |  |  26 > 10: 5 (16.0/5.0)
|  |  |  |  |  |  |  29 > 13
|  |  |  |  |  |  |  |  21 <= 7: 4 (15.0/9.0)
|  |  |  |  |  |  |  |  21 > 7
|  |  |  |  |  |  |  |  |  26 <= 5
|  |  |  |  |  |  |  |  |  |  19 <= 7: 3 (22.0/3.0)
|  |  |  |  |  |  |  |  |  |  19 > 7: 9 (19.0/1.0)
|  |  |  |  |  |  |  |  |  26 > 5: 9 (120.0/7.0)
|  |  |  |  |  |  63 > 0: 2 (23.0/9.0)
|  |  |  |  42 > 7
|  |  |  |  |  35 <= 6: 3 (16.0/9.0)
|  |  |  |  |  35 > 6: 8 (52.0/2.0)
|  |  |  43 > 3
|  |  |  |  33 <= 1
|  |  |  |  |  19 <= 10
|  |  |  |  |  |  50 <= 0
|  |  |  |  |  |  |  53 <= 4: 7 (17.0/4.0)
|  |  |  |  |  |  |  53 > 4: 8 (16.0/9.0)
|  |  |  |  |  |  50 > 0
|  |  |  |  |  |  |  27 <= 5: 2 (147.0/11.0)
|  |  |  |  |  |  |  27 > 5
|  |  |  |  |  |  |  |  26 <= 1
|  |  |  |  |  |  |  |  |  36 <= 12: 2 (38.0/4.0)
|  |  |  |  |  |  |  |  |  36 > 12: 3 (16.0/9.0)
|  |  |  |  |  |  |  |  26 > 1
|  |  |  |  |  |  |  |  |  62 <= 7: 8 (155.0/5.0)
|  |  |  |  |  |  |  |  |  62 > 7: 2 (15.0/7.0)
|  |  |  |  |  19 > 10
|  |  |  |  |  |  12 <= 12: 8 (37.0/4.0)
|  |  |  |  |  |  12 > 12
|  |  |  |  |  |  |  20 <= 14: 8 (20.0/12.0)
|  |  |  |  |  |  |  20 > 14: 1 (149.0/11.0)
|  |  |  |  33 > 1
|  |  |  |  |  38 <= 0
|  |  |  |  |  |  27 <= 7: 4 (16.0/4.0)
|  |  |  |  |  |  27 > 7
```

| | | | | | | 12 <= 15: 8 (18.0/9.0)
| | | | | | | 12 > 15: 1 (47.0)
| | | | | 38 > 0: 4 (167.0/12.0)

Number of Leaves : 53

Size of the tree : 105

Time taken to build model: 0.12 seconds

=== Stratified cross-validation ===
=== Summary ===

Correctly Classified Instances	2715	84.3168 %
Incorrectly Classified Instances	505	15.6832 %
Kappa statistic	0.8257	
Mean absolute error	0.0416	
Root mean squared error	0.155	
Relative absolute error	23.1102 %	
Root relative squared error	51.6606 %	
Total Number of Instances	3220	

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	ROC Area	Class
0.947	0.004	0.962	0.947	0.954	0.992	0
0.803	0.022	0.801	0.803	0.802	0.949	1
0.828	0.019	0.83	0.828	0.829	0.955	2
0.82	0.025	0.792	0.82	0.806	0.961	3
0.804	0.025	0.769	0.804	0.786	0.964	4
0.885	0.013	0.882	0.885	0.884	0.971	5
0.918	0.008	0.932	0.918	0.925	0.987	6
0.874	0.012	0.888	0.874	0.881	0.975	7
0.773	0.021	0.8	0.773	0.786	0.96	8
0.775	0.023	0.777	0.775	0.776	0.954	9
Weighted Avg.	0.843	0.017	0.844	0.843	0.843	0.967

=== Confusion Matrix ===

a	b	c	d	e	f	g	h	i	j	<-- classified as
304	1	1	3	3	2	3	0	1	3	a = 0
0	261	13	8	14	6	5	1	12	5	b = 1
1	18	269	12	3	2	2	1	14	3	c = 2
1	7	7	278	7	10	0	4	12	13	d = 3
3	4	0	2	246	6	9	7	10	19	e = 4
1	0	0	11	5	285	2	0	6	12	f = 5
1	5	10	0	11	0	303	0	0	0	g = 6
0	0	4	7	16	1	0	284	2	11	h = 7
2	21	17	9	8	5	1	8	248	2	i = 8
3	9	3	21	7	6	0	15	5	237	j = 9

##
##
##
#10