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Appendix A: Categorization

Data sets have been categorized on to following order

•Dependent Variable: Status - Ceased, Closed

•Other Variables:

Factor 1 - Profession - Businessmen, Doctor, Engineer, Executive, Farmer, Lawyer, Lecturer, Manager, Other, Self Employee, Small Businessmen, Teacher

Factor 2 - Brand Name - Bajaj, Chevrolet, Isuzu, Mahindra & Mahindra, Maruti Suzuki, Mazda, Mitsubishi Motors, Nissan, Suzuki, Tafe, Tata Motors, Toyota

Factor 3 - Model Name - 800, 45D, ACE, ALTO, AR4S-UG, ATLAS, AUTO 4S, AUTO AR4S, AUTO RE 2 STROKE, BAJAJ 4 S, BAJAJ AUTO, BOLERO MAXI TRUCK, CONDOR, COROLLA, DBA-NZE141, DYNA, ELF 350, HIACE, KF-GM70-HALF-BODY, KG-LH172, KG-VWE25, LA-HA238, LP7155, PAJERO University of Moratuwa, Sri Lanka, JEEP, RE 205 LITAN, TOWNACE, UA-HR528, VANATTE Electronic Theses & Dissertations

Factor 4 - Manufacture Year - 1993 to 2012

Factor 5 - Vehicle Class - Dual purpose Motor vehicle, Farm vehicle, Heavy Motor Lorry, Light Motor Lorry, Motor Car, Motor Coach, Motor Lorry UP 1700kg, Motor Tricycle, Motorcycles UP 100CC

Factor 6 - Fuel Type - Diesel, Petrol

Factor 7 - Actual Value - <5,00,000(P), 5,00,000-9,99,999(Q), 10,00,000-14,99,999(R), 15,00,000-19,99,999(S), 20,00,000-24,99,999(T), 25,00,000-29,99,999(U), 30,00,000-34,99,999(V), >35,00,000(W)

Factor 8 - Lease Percentage - 60% to 100%

Factor 9 - Req. Amount - <5,00,000(p), 5,00,000-9,99,999(q), 10,00,000-14,99,999(r), 15,00,000-19,99,999(s), 20,00,000-24,99,999(t), 25,00,000-29,99,999(u), 30,00,000-34,99,999(v), >35,00,000(w)

Factor 10 - Monthly Income - <50,000(I), 50,000-99,999(II), 1,00,000-1,49,999(III), 1,50,000-1,99,999(IV), >2,00,000(V)

Factor 11 - Interest - 9 to 15

Factor 12 - Number of rentals - 12 to 60

Factor 13 - Installment - <20,000(i), 20,000-39,999(ii), 40,000-59,999(iii), 60,000-79,999(iv), 80,000-99,999(v), >1,00,000(vi)



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Appendix B: Variable Selection Procedure (Technology: Chi – Squared)

Status * Gender

Chi-Square Tests

-			Asymp. Sig. (2-	Exact Sig. (2-	Exact Sig. (1-
	Value	df	sided)	sided)	sided)
Pearson Chi-Square	2.691 ^a	1	.101		
Continuity Correction ^b	2.572	1	.109		
	21072	-			
Likelihood Ratio	2.700	1	.100		
Fisher's Exact Test				.107	.054
N of Valid Cases	6000				
	Universit	v of Mo	ratuwa. Sri l	lanka.	
a. 0 cells (.0%) expected count less than 5. The minimum expected count is 393.38.					
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b. Computed only for a 2x2 wable W. lib. mrt. ac. lk

Status * Age

Chi-Square Tests

	Value	df	Asymp. Sig. (2- sided)
Pearson Chi-Square	3.878 ^a	6	.693
Likelihood Ratio	3.877	6	.693
N of Valid Cases	6000		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 16.91.

Status * Profession

Chi-Square Tests

	Value	df	Asymp. Sig. (2- sided)
Pearson Chi-Square	679.354 ^a	11	.000
Likelihood Ratio	955.310	11	.000
N of Valid Cases	6000		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 29.82.

Status * District
Chi-SquareUniversity of Moratuwa, Sri Lanka.
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	Value	df	Asymp. Sig. (2- sided)
Pearson Chi-Square	4.115 ^a	7	.766
Likelihood Ratio	4.109	7	.767
N of Valid Cases	6000		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 44.06.

Status * BrandName

Chi-Square Tests

	Value	df	Asymp. Sig. (2- sided)
Pearson Chi-Square	157.472 ^a	11	.000
Likelihood Ratio	167.321	11	.000
N of Valid Cases	6000		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.35.

Status * ModelNameniversity of Moratuwa, Sri Lanka. Chi-Square Electronic Theses & Dissertations www.lib.mrt.ac.lk

	Value	df	Asymp. Sig. (2- sided)
Pearson Chi-Square	392.574 ^a	28	.000
Likelihood Ratio	457.831	28	.000
N of Valid Cases	6000		

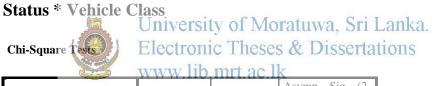
a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.02.

Status * Manuf.Year

Chi-Square Tests

	Value	df	Asymp. Sig. (2- sided)
Pearson Chi-Square	41.545 ^a	19	.002
Likelihood Ratio	41.803	19	.002
N of Valid Cases	6000		

a. 1 cells (2.5%) have expected count less than 5. The minimum expected count is 4.90.



	Value	df	Asymp. Sig. (2- sided)
Pearson Chi-Square	252.964 ^a	8	.000
Likelihood Ratio	269.882	8	.000
N of Valid Cases	6000		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.35.

Status * Fuel Type

Chi-Square Tests

	Value	df	Asymp. Sig. (2- sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Pearson Chi-Square	37.032 ^a	1	.000		
Continuity Correction ^b	36.705	1	.000		
Likelihood Ratio	36.967	1	.000		
Fisher's Exact Test				.000	.000
N of Valid Cases	6000				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 987.90.

b. Computed only for a 2x2 table



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Status * ActualValue

Chi-Square Tests

	Value	df	Asymp. Sig. (2- sided)
Pearson Chi-Square	311.275 ^a	7	.000
Likelihood Ratio	367.826	7	.000
N of Valid Cases	6000		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 99.68.

Status * Lease Percentage

Chi-Square Tests

	Value	df	Asymp. Sig. (2- sided)
Pearson Chi-Square	27.255 ^a	4	.000
Likelihood Ratio	27.262	4	.000
N of Valid Cases	6000		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 494.40.

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	Value	df	Asymp. Sig. (2- sided)
Pearson Chi-Square	197.350 ^a	7	.000
Likelihood Ratio	208.573	7	.000
N of Valid Cases	6000		
N of Valid Cases	6000		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 86.33.

Status * Monthly Income

Chi-Square Tests

	Value	df	Asymp. Sig. (2- sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Pearson Chi-Square	3.921 ^a	1	.048		
Continuity Correction ^b	3.571	1	.059		
Likelihood Ratio	3.892	1	.049		
Fisher's Exact Test				.057	.030
N of Valid Cases	6000				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 56.07.

b. Computed only for a 2x2 table



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Status * Interest

Chi-Square Tests

	Value	df	Asymp. Sig. (2- sided)
Pearson Chi-Square	134.384 ^a	2	.000
Likelihood Ratio	138.243	2	.000
N of Valid Cases	6000		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 561.59.

Status * No.of Rentals

Chi-Square Tests

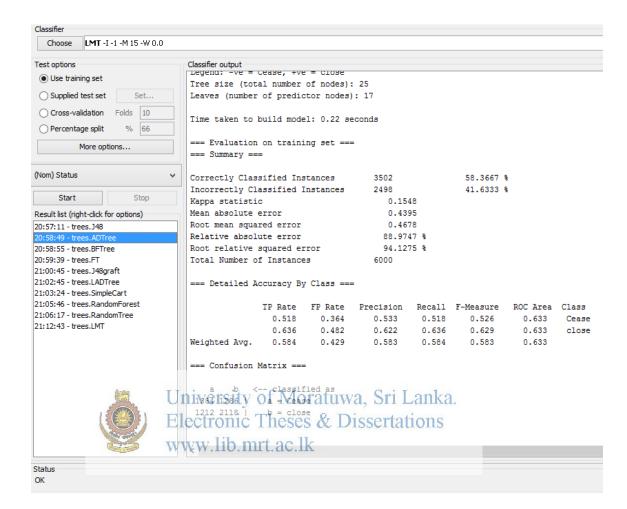
	Value	df	Asymp. Sig. (2- sided)
Pearson Chi-Square	88.824 ^a	4	.000
Likelihood Ratio	90.264	4	.000
N of Valid Cases	6000		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 425.42.

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	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	85.487 ^a	4	.000
Likelihood Ratio	87.334	4	.000
N of Valid Cases	6000		

Appendix C: Best Model Selection



ADTree

Correctly Classified Instances	Time Taken to Build the Model
58.3%	0.22 Seconds

Classifier	
Choose LMT -I -1 -M 15 -W 0.0	
Test options	Classifier output
Supplied test set Set	Number of Leaf Nodes: 4
Cross-validation Folds 10 Percentage split % 66	Time taken to build model: 31.04 seconds
More options	=== Evaluation on training set ===
(Nom) Status 🗸 🗸	Correctly Classified Instances 3555 59.25 %
Start Stop	Incorrectly Classified Instances 2445 40.75 %
	Kappa statistic 0.2096
Result list (right-click for options)	Mean absolute error 0.4362
20:57:11 - trees.J48	Root mean squared error 0.467
20:58:49 - trees.ADTree	Relative absolute error 88.3177 %
20:58:55 - trees.BFTree 20:59:39 - trees.FT	Root relative squared error 93.9777 % Total Number of Instances 6000
21:00:45 - trees.J48graft 21:02:45 - trees.LADTree 21:03:24 - trees.SimpleCart 21:05:46 - trees.RandomForest	=== Detailed Accuracy By Class ===
21:06:17 - trees.RandomTree	TP Rate FP Rate Precision Recall F-Measure ROC Area Class 0.763 0.544 0.529 0.763 0.625 0.637 Cease
21:12:43 - trees.LMT	0.763 0.544 0.529 0.763 0.625 0.637 Cease 0.456 0.237 0.706 0.456 0.554 0.637 close
	Weighted Avg. 0.593 0.374 0.627 0.593 0.586 0.637
	=== Confusion Matrix ===
	a b < classified as 2037 633 a = Cease 1812 1518 b = close
	c
Status OK	Jniversity of Moratuwa, Sri Lanka.
Alerando	Electronic Theses & Dissertations
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Correctly Classified Instances	Time Taken to Build the Model
59.25%	31.04 Seconds

Classifier	
Choose LMT -I -1 -M 15 -W 0.0	
Test options © Use training set O Supplied test set Set	Classifier output [Installment=II] ^ -0.34 + [Installment=v] * 0.5
Cross-validation Folds 10 Percentage split % 66 More options	Time taken to build model: 12.61 seconds === Evaluation on training set === === Summary ===
(Nom) Status Start Stop Result list (right-click for options) 20:57:11 - trees.J48 20:58:49 - trees.ADTree 20:58:55 - trees.BFTree 20:59:39 - trees.FT 21:00:45 - trees.J48graft 21:02:45 - trees.LADTree	Correctly Classified Instances 4539 75.65 % Incorrectly Classified Instances 1461 24.35 % Kappa statistic 0.5082 Mean absolute error 0.3044 Root mean squared error 0.419 Relative absolute error 61.6239 % Root relative squared error 84.3042 % Total Number of Instances 6000 === Detailed Accuracy By Class ===
21:03:24 - trees.SimpleCart 21:05:46 - trees.RandomForest 21:06:17 - trees.RandomTree 21:12:43 - trees.LMT	TP Rate FP Rate Precision Recall F-Measure ROC Area Class 0.738 0.229 0.721 0.738 0.73 0.821 Cease 0.771 0.262 0.786 0.771 0.779 0.821 close Weighted Avg. 0.757 0.247 0.757 0.757 0.757 0.821 === Confusion Matrix === a b < classified as
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Correctly Classified Instances	Time Taken to Build the Model
75.65 %	12.61 Seconds

Classifier	
Choose LMT -I -1 -M 15 -W 0.0	
Test options	Classifier output
Use training set	Size of the tree : 4826
O Supplied test set Set	
Cross-validation Folds 10	
O Percentage split % 66	Time taken to build model: 86.52 seconds
More options	=== Evaluation on training set ===
	=== Summary ===
Nom) Status 🗸 🗸 🗸	Correctly Classified Instances 4706 78.4333 %
	Incorrectly Classified Instances 1294 21.5667 %
Start Stop	Kappa statistic 0.5682
tesult list (right-click for options)	Mean absolute error 0.2798
0:57:11 - trees.J48	Root mean squared error 0.374
0:58:49 - trees.ADTree	Relative absolute error 56.6426 %
0:58:55 - trees.BFTree	Root relative squared error 75.2614 %
0:59:39 - trees.FT	Total Number of Instances 6000
1:00:45 - trees.J48graft	
1:02:45 - trees.LADTree	=== Detailed Accuracy By Class ===
1:03:24 - trees.SimpleCart	
1:05:46 - trees.RandomForest	TP Rate FP Rate Precision Recall F-Measure ROC Area Class
1:06:17 - trees.RandomTree	0.813 0.239 0.732 0.813 0.77 0.879 Cease
1:12:43 - trees.LMT	0.761 0.187 0.836 0.761 0.797 0.879 close
	Weighted Avg. 0.784 0.21 0.789 0.784 0.785 0.879
	Confusion Matrix
	a b < classified as
	a b $<$ classified as 2172 498 a = Cease
	$796\ 2534$ b = close
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Correctly Classified Instances	Time Taken to Build the Model
78.4%	86.52 Seconds

Test options	Classifier output
	Classifier output
Use training set	Size of the tree : 5684
O Supplied test set Set	
O Cross-validation Folds 10	Time taken to build model: 98.1 seconds
O Percentage split % 66	lime taken to bulla model: 98.1 Seconds
More options	=== Evaluation on training set ===
	=== Summary ===
(Nom) Status	Correctly Classified Instances 4706 78.4333 %
	Incorrectly Classified Instances 1294 21.5667 %
Start Stop	Kappa statistic 0.5682
Result list (right-click for options)	Mean absolute error 0.2798
20:57:11 - trees.J48	Root mean squared error 0.374
20:58:49 - trees.ADTree	Relative absolute error 56.6426 %
20:58:55 - trees.BFTree	Root relative squared error 75.2614 %
20:59:39 - trees.FT	Total Number of Instances 6000
21:00:45 - trees.J48graft 21:02:45 - trees.LADTree	
21:03:24 - trees.SimpleCart	=== Detailed Accuracy By Class ===
21:05:46 - trees.RandomForest	TP Rate FP Rate Precision Recall F-Measure ROC Area Class
21:06:17 - trees.RandomTree	0.813 0.239 0.732 0.813 0.77 0.879 Ceas
21:12:43 - trees.LMT	0.761 0.187 0.836 0.761 0.797 0.879 clos
	Weighted Avg. 0.784 0.21 0.789 0.784 0.785 0.879
	=== Confusion Matrix ===
	a b < classified as
	2172 498 a = Cease
	796 2534 b = close
	<
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Correctly Classified Instances	Time Taken to Build the Model
78.4%	98.1 Seconds

Classifier							
Choose LMT -I -1 -M 15 -W 0.	0						
Test options	Classifier output						
Use training set	#Processed examples: 199524						
O Supplied test set Set	#Ratio e/n: 2494.05						
O Cross-validation Folds 10	Time taken to build model: 5.35 sec	anda					
O Percentage split % 66	Time taken to build model. 5.55 sec	onus					
More options	=== Evaluation on training set === === Summary ===						
(Nom) Status	 Correctly Classified Instances 	3486	58.1	ş			
Start Stop	Incorrectly Classified Instances	2514	41.9	8			
Start Stop	Kappa statistic	0.1851					
Result list (right-click for options)	Mean absolute error	0.4405					
20:57:11 - trees.J48	Root mean squared error	0.468					
20:58:49 - trees.ADTree	Relative absolute error	89.1866 %					
20:58:55 - trees.BFTree	Root relative squared error	94.1653 %					
20:59:39 - trees.FT	Total Number of Instances	6000					
21:00:45 - trees. J48graft							
21:02:45 - trees.LADTree 21:03:24 - trees.SimpleCart	=== Detailed Accuracy By Class ===						
21:05:46 - trees.RandomForest							
21:06:17 - trees.RandomTree			call F-Measure				
21:12:43 - trees.LMT	0.736 0.543		.736 0.61	0.020	Cease		
	0.457 0.264 Weighted Avg. 0.581 0.388		.457 0.548 .581 0.575	0.625	close		
	Weighted Avg. 0.301 0.305	0.011 0	.301 0.373	0.025			
	=== Confusion Matrix ===						
	a b < classified as						
	1965 705 a = Cease						
And an	1809 1521 b = close						
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LAD Tree

Correctly Classified Instances	Time Taken to Build the Model
58.1%	5.35 Seconds

Classifier						
Choose LMT -I -1 -M 15 -W 0.0						
Test options Use training set Supplied test set	Classifier output [Accual value=v] * 0.03 + [Monthly Income=II] * 0.09					
Cross-validation Folds 10 Percentage split % 66	Time taken to build model: 89.46 seconds					
More options	=== Evaluation on training set === === Summary ===					
(Nom) Status	Correctly Classified Instances 3516 58.6 % Incorrectly Classified Instances 2484 41.4 % Kappa statistic 0.1925					
Result list (right-click for options)	Mean absolute error 0.4391					
20:57:11 - trees.J48 20:58:49 - trees.ADTree 20:58:55 - trees.BFTree 20:59:39 - trees.FT 21:00:45 - trees.J48graft	Root mean squared error 0.4684 Relative absolute error 88.8885 % Root relative squared error 94.2469 % Total Number of Instances 6000					
21:02:45 - trees.LADTree 21:03:24 - trees.SimpleCart	=== Detailed Accuracy By Class ===					
21:05:46 - trees.RandomForest 21:06:17 - trees.RandomTree 21:12:43 - trees.LMT	TP Rate FP Rate Precision Recall F-Measure ROC Area Class 0.726 0.526 0.525 0.726 0.61 0.634 Ceas 0.474 0.274 0.683 0.474 0.559 0.634 closs Weighted Avg. 0.586 0.386 0.613 0.586 0.582 0.634					
	=== Confusion Matrix === a b < classified as 1939 731 a = Cease 1753 1577 b = close					
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Correctly Classified Instances	Time Taken to Build the Model
58.6%	89.46 Seconds

Classifier						
Choose LMT -I -1 -M 15 -W 0.0						
Test options	Classifier output					
Use training set	Montniy income = v : Cease (0/0)					
○ Supplied test set Set	Size of the tree : 10900					
Cross-validation Folds 10	Time taken to build model: 0.07 seconds					
O Percentage split % 66						
More options	=== Evaluation on training set === === Summary ===					
(Nom) Status	Correctly Classified Instances 5019 83.65 %					
Start Stop	Incorrectly Classified Instances 981 16.35 % Kappa statistic 0.6757					
Result list (right-click for options)	Kappa statistic 0.6757 Mean absolute error 0.1892					
20:57:11 - trees. J48	Root mean squared error 0.3076					
20:58:49 - trees.ADTree	Relative absolute error 38.304 %					
20:58:55 - trees.BFTree	Root relative squared error 61.8904 %					
20:59:39 - trees.FT	Total Number of Instances 6000					
21:00:45 - trees.J48graft						
21:02:45 - trees.LADTree	=== Detailed Accuracy By Class ===					
21:03:24 - trees.SimpleCart						
21:05:46 - trees.RandomForest	TP Rate FP Rate Precision Recall F-Measure ROC Area Class					
21:06:17 - trees.RandomTree	0.92 0.23 0.762 0.92 0.834 0.941 Cease					
21:12:43 - trees.LMT	0.77 0.08 0.923 0.77 0.839 0.941 close					
	Weighted Avg. 0.837 0.147 0.851 0.837 0.837 0.941					
	=== Confusion Matrix ===					
	a b < classified as					
	2456 214 a = Cease					
	$767\ 2563\ b = close$					
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Correctly Classified Instances	Time Taken to Build the Model
83.65%	0.07 Seconds

Classifier							
Choose LMT -I -1 -M 15 -W 0.0							
Test options	Classifier output						
Use training set Supplied test set Set	Size of the Tree: 13						
O Cross-validation Folds 10	Time taken to build model: 12.02 seconds						
O Percentage split % 66							
More options	=== Evaluation on training set === === Summary ===						
(Nom) Status	✓ Correctly Classified Instances 3612 60.2 %						
Start Stop	Incorrectly Classified Instances 2388 39.8 % Kappa statistic 0.2105						
Result list (right-click for options)	Mean absolute error 0.4346						
20:57:11 - trees. 148	Root mean squared error 0.4661						
20:58:49 - trees.ADTree	Relative absolute error 87.976 %						
20:58:55 - trees.BFTree	Root relative squared error 93.7957 %						
20:59:39 - trees.FT	Total Number of Instances 6000						
21:00:45 - trees.J48graft							
21:02:45 - trees.LADTree	=== Detailed Accuracy By Class ===						
21:03:24 - trees.SimpleCart							
21:05:46 - trees.RandomForest	TP Rate FP Rate Precision Recall F-Measure ROC Area Class						
21:06:17 - trees.RandomTree	0.657 0.442 0.544 0.657 0.595 0.651 Cease						
21:12:43 - trees.LMT	0.558 0.343 0.67 0.558 0.609 0.651 close						
	Weighted Avg. 0.602 0.387 0.614 0.602 0.603 0.651						
	=== Confusion Matrix ===						
	a b < classified as 1753 917 a = Cease 1471 1859 b = close						
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SimpleCart

Correctly Classified Instances	Time Taken to Build the Model
60.2 %	12.02 Seconds

Classifier									
Choose LMT -I -1 -1	M 15 -W 0.0								
Test options Use training set Supplied test set Cross-validation Fol	Set	Classifier output	econda						
O Percentage split More options.	% 66	=== Evaluation === Summary ===	on traini						
(Nom) Status	v	Correctly Class			5019 981		83.65 16.35	8 8	
StartStopKajResult list (right-click for options)Mei20:57:11 - trees.J48Roi20:58:49 - trees.ADTreeRoi20:58:55 - trees.BFTreeRoi20:59:39 - trees.FTToi21:00:45 - trees.J48graftToi		Kappa statistic Mean absolute error Root mean squared error Relative absolute error Root relative squared error Total Number of Instances === Detailed Accuracy By Class ===			0.66 0.25 0.32 51.47 65.79 6000	43 7 6 %	10.00	•	
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Correctly Classified Instances	Time Taken to Build the Model
83.65 %	5.42 Seconds