

SMAI – Locally Linear Learning Machines (L3M)

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As the information and algorithm for identifying the regions is not available in Locally Linear Learning Machines, we implement “Mixture of Experts “for region identification and classification. Mixture of Experts is a combination of simpler methods to improve predictions. For region identification, we use Softmax function and identification of classes in the region, we use Logistic regression function. We use Weka library for region identification.

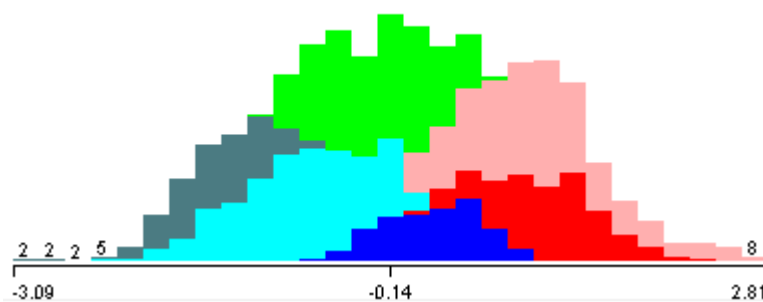
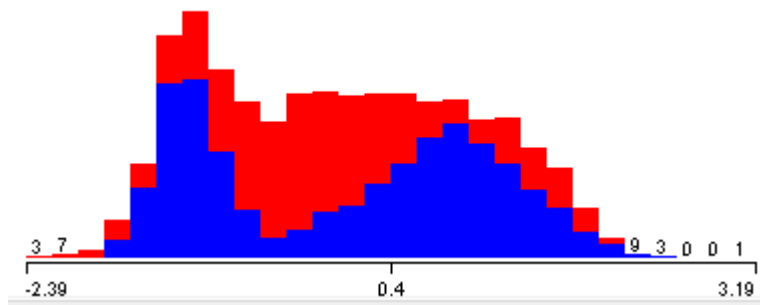
We compare our results with the results of AdaBoost, SVM – Linear, RBF and Decision Tree. The results for each of the dataset are available in the following sections.

Banana

Dimensions : 2

Classes : 2 (1,2)

Total records: 5300, Training - 400 (7. 5472%), Test: 4900 records



Time taken to build model: 4.32 seconds

Logistic Regression with ridge parameter of 1.0E-8
Coefficients...

Variable	Class region1	region2	region3	region4	region5
V1	10.4592	25.288	-8.2805	-21.2537	22.2848
V2	54.1684	15.5529	33.0239	7.1841	36.8221
Class	2.089	2.0118	-0.6089	2.6436	1.6972
Intercept	-11.7056	0.7661	10.0392	-14.4696	5.4836

Odds Ratios...

Variable	Class	region1	region2	region3	region4	region5
V1		34864.3918	9.603282197568042E10	0.0003	0	4765983132.1051
V2		3.349985176856391E23	5682452.2901	2.1983502533748E14	1318.3046	9.809707696703912E15
Class		8.0767	7.4764	0.544	14.0636	5.4587

```

Correctly Classified Instances      4850      98.9796 %
Incorrectly Classified Instances    50      1.0204 %
Kappa statistic                    0.9875
Mean absolute error                 0.0034
Root mean squared error             0.0559
Relative absolute error              1.2453 %
Root relative squared error         15.1224 %
Total Number of Instances          4900

```

=== Confusion Matrix ===

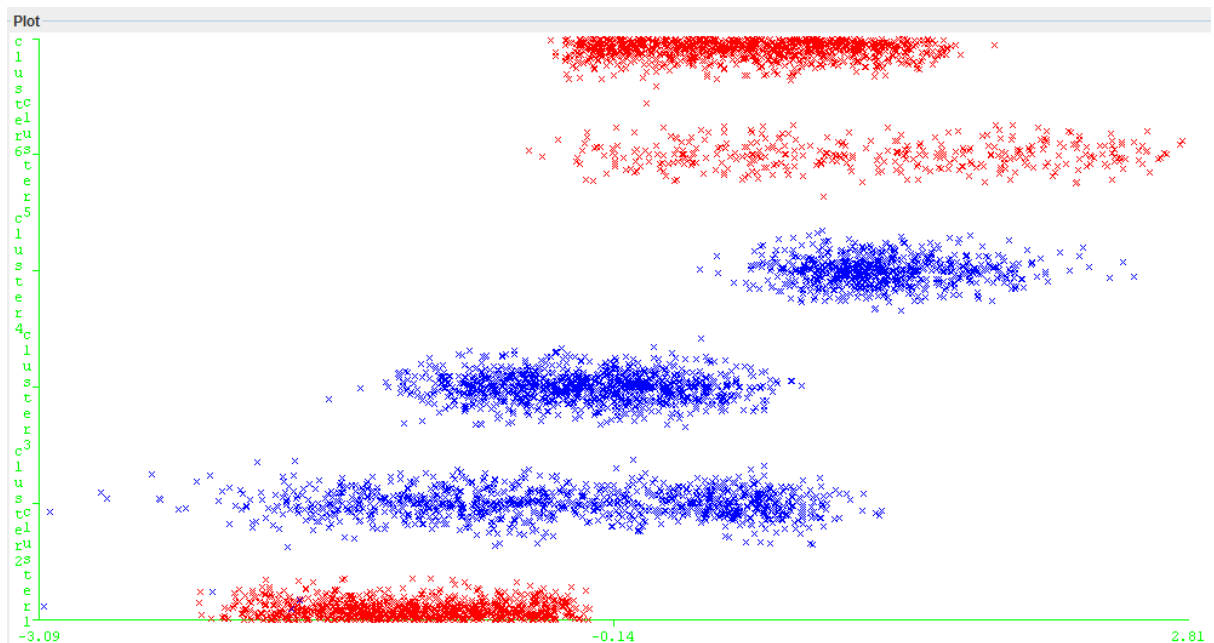
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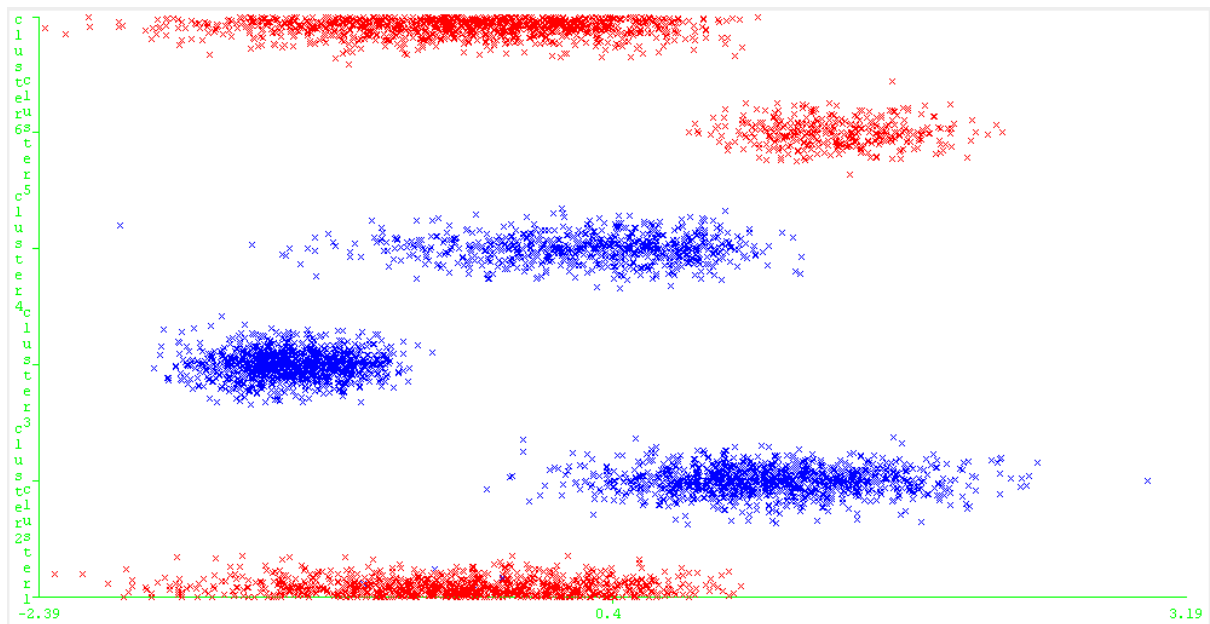
  a   b   c   d   e   f   <-- classified as
887   0   4   0   0   4   |   a = region1
 2 1000   3   3   0   0   |   b = region2
 0   0 986  25   0   0   |   c = region3
 0   4   2 669   0   1   |   d = region4
 0   2   0   0 336   0   |   e = region5
 0   0   0   0   0 972   |   f = region6

```

End System Time for our L3M is 1493351447180

Overall Accuracy of our L3M Classification : 98.98%





AdaBoost

Start System Time is 1493352133932

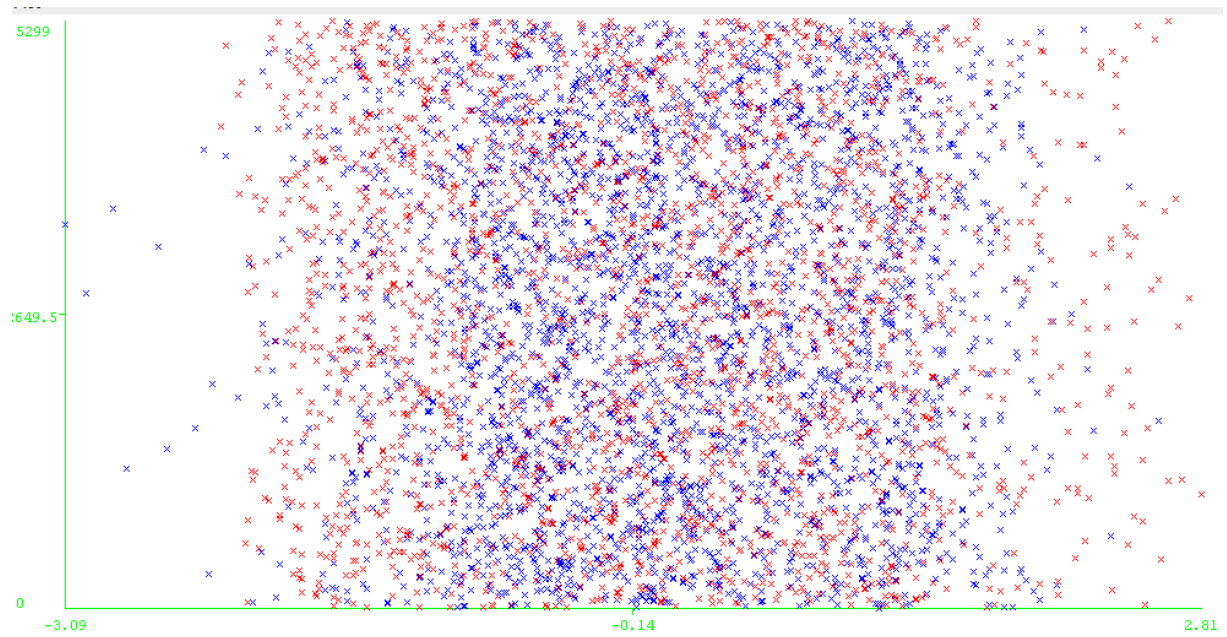
Correctly Classified Instances	3383	69.0408 %
Incorrectly Classified Instances	1517	30.9592 %
Kappa statistic	0.3632	
Mean absolute error	0.4212	
Root mean squared error	0.4525	
Relative absolute error	85.3233 %	
Root relative squared error	90.9474 %	
Total Number of Instances	4900	

=== Confusion Matrix ===

a	b	<-- classified as
2150	549	a = 1
968	1233	b = 2

End System Time is 1493352134547

Accuracy of AdaBoostM1: 69.04%



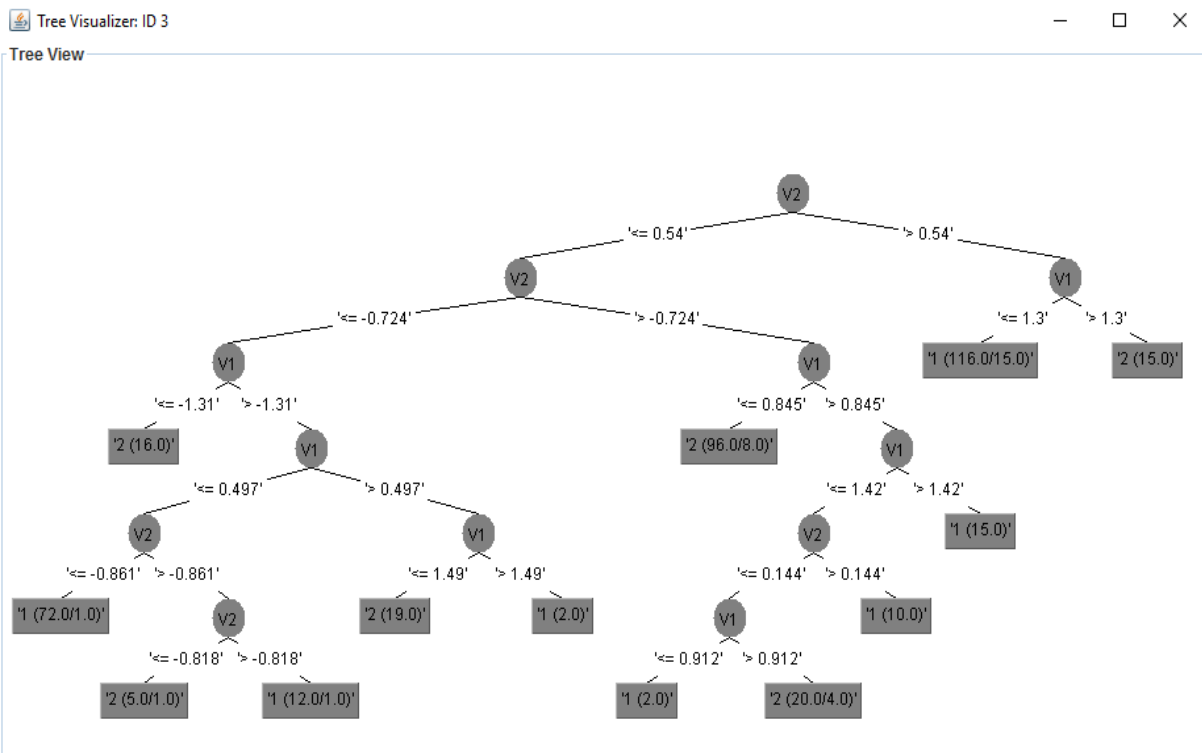
Start System Time for Decision Tree is 1493352139236

Correctly Classified Instances	4099	83.6531 %
Incorrectly Classified Instances	801	16.3469 %
Kappa statistic	0.6686	
Mean absolute error	0.2015	
Root mean squared error	0.3707	
Relative absolute error	40.8242 %	
Root relative squared error	74.5009 %	
Total Number of Instances	4900	

=== Confusion Matrix ===

a	b	<-- classified as
2338	361	a = 1
440	1761	b = 2

End System Time for Decision Tree is 1493352139485
Accuracy of Decision Tree : 76.35%



Start System Time for SVM is 1493352150699

Polynomial Kernel

Correctly Classified Instances	2699	55.0816 %
Incorrectly Classified Instances	2201	44.9184 %
Kappa statistic	0	
Mean absolute error	0.4492	
Root mean squared error	0.6702	
Relative absolute error	90.9869 %	
Root relative squared error	134.7048 %	
Total Number of Instances	4900	

=== Confusion Matrix ===

a	b	<-- classified as
2699	0	a = 1
2201	0	b = 2

End System Time for SVM is 1493360244102

RBF

Start System Time for SVM is 1493360299925

Correctly Classified Instances	2699	55.0816 %
Incorrectly Classified Instances	2201	44.9184 %
Kappa statistic	0	
Mean absolute error	0.4492	
Root mean squared error	0.6702	
Relative absolute error	90.9869 %	
Root relative squared error	134.7048 %	

Total Number of Instances 4900

=== Confusion Matrix ===

```
      a      b  <-- classified as
2699    0 |      a = 1
2201    0 |      b = 2
```

End System Time for SVM is 1493360301070

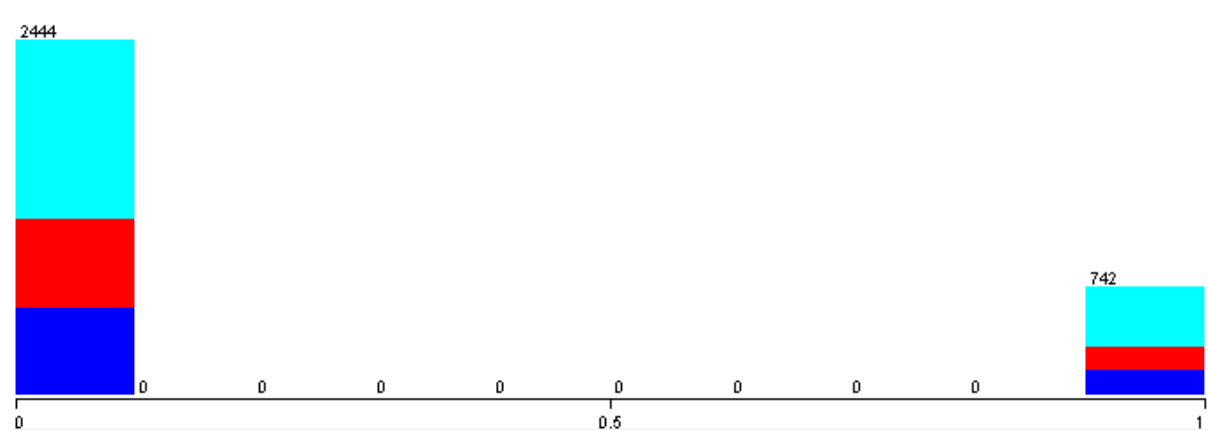
DNA dataset (StatLog)

3 Classes

180 Dimensions

Training Set : 2000

Test Set : 1186



Start System Time for our L3M is 1493352810038

L3M Classification Results

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Correctly Classified Instances	928	78.2462 %
Incorrectly Classified Instances	258	21.7538 %
Kappa statistic	0.7269	
Mean absolute error	0.0731	
Root mean squared error	0.2669	
Relative absolute error	27.6954 %	
Root relative squared error	73.4278 %	
Total Number of Instances	1186	

=== Confusion Matrix ===

```
      a      b      c      d      e      f  <-- classified as
119  10      4      2     12     18 |      a = region1
  4 287     18      9     12     22 |      b = region2
  3   6     25      1      6      0 |      c = region3
  7   9      5 249      8      4 |      d = region4
15   7      5     12    112     11 |      e = region5
11  14      6      8      9    136 |      f = region6
```

Logistic Regression with ridge parameter of 1.0E-8 Coefficients...

Variable	Class region1	region2	region3	region4	region5
attribute_0	-7.0683	-4.1585	-33.6067	-11.1388	-16.3349
attribute_1	3.8683	-20.5725	7.1988	12.5853	-5.1617
attribute_2	-8.4103	-13.629	2.019	-21.0988	-3.4048
attribute_3	-14.997	-29.9147	-23.4539	4.7957	-1.0074
attribute_4	5.7666	-10.0053	-4.0227	13.0794	-13.2545
attribute_5	-3.9018	-14.4207	24.4925	10.8335	-18.86
attribute_6	-19.0161	-12.6854	-39.785	-11.6793	1.604
attribute_7	-2.0281	1.2597	-36.2283	7.0602	4.4169
attribute_8	8.0304	10.9933	-18.2323	7.8551	12.6729
attribute_9	-14.4289	2.0138	-20.963	6.5411	1.0501
attribute_10	12.4442	-3.9592	-17.4193	31.5457	9.7394
attribute_11	-7.3086	-9.3466	-22.348	-5.2663	-13.8991
attribute_12	-12.8972	0.5978	23.6797	7.8194	11.0241
attribute_13	16.6051	11.2095	47.8442	11.1476	10.0166
attribute_14	10.2763	16.1934	52.9827	22.0645	8.5806
attribute_15	-3.4962	-4.335	-37.2018	-16.7354	-4.2454
attribute_16	7.417	6.3182	-9.8251	0.0737	-3.0957
attribute_17	15.4645	4.079	7.9135	1.8736	0.1777
attribute_18	-8.3378	-21.3528	17.4775	-9.8598	-9.6442
attribute_19	15.7389	12.0409	23.212	37.3348	25.6326
attribute_20	-7.5963	-5.7376	13.7394	-7.6789	-15.2815
attribute_21	-15.4746	15.001	9.2191	11.9171	7.6153
attribute_22	5.4788	5.9496	0.9759	2.6505	-8.2844
attribute_23	4.0201	-0.8005	31.4635	6.0943	-11.168
attribute_24	-2.4394	-25.5128	-6.5107	-10.6395	-6.3829
attribute_25	23.6209	17.4107	21.6462	6.5244	11.1868
attribute_26	4.4757	14.7247	22.745	-19.0825	-0.776
attribute_27	-0.9212	2.2244	-16.0379	9.0382	8.8844
attribute_28	2.8615	19.983	16.0953	32.1382	-1.647
attribute_29	7.4788	21.7032	23.4048	7.61	6.8733
attribute_30	-10.949	9.9143	-25.9945	-16.386	-7.9667
attribute_31	-0.1563	7.6446	-0.7584	-0.8045	3.0453
attribute_32	-1.2455	6.846	13.1533	-16.6958	-12.6831
attribute_33	-13.2194	-10.4526	-23.0295	-0.9698	9.463
attribute_34	14.3972	5.6368	-9.858	22.3271	14.5448
attribute_35	0.7846	-3.4879	-3.3135	2.7433	5.0269
attribute_36	-8.5083	4.2532	-0.4062	-7.8518	-2.622
attribute_37	11.9008	19.7392	35.2664	13.0763	2.6491
attribute_38	-4.1319	15.0191	-9.4705	6.2387	-8.7658
attribute_39	-1.9534	26.6862	14.2054	-4.0511	6.1861
attribute_40	18.9895	25.3658	20.0645	16.313	14.177
attribute_41	8.4641	34.0564	61.3251	5.8992	2.8551
attribute_42	4.116	-6.5134	16.5463	7.6918	3.807
attribute_43	19.1697	28.4578	5.8995	24.4426	3.7798
attribute_44	5.0716	13.6024	7.3825	1.2104	-4.8854
attribute_45	-12.3246	7.8531	-4.8466	-14.8683	1.0509
attribute_46	6.9659	47.9647	-11.6561	9.6401	15.081
attribute_47	3.4421	35.1848	-10.6632	1.568	-9.7896
attribute_48	-19.3367	-23.2917	-3.9567	-30.8135	-11.5858
attribute_49	-6.0397	-18.2786	47.0751	-4.2605	-14.8563
attribute_50	-0.7621	-0.293	15.3213	-23.6895	-12.408
attribute_51	-9.0125	-18.5196	-45.088	-16.4798	-17.7935
attribute_52	2.6954	-12.3549	-8.2776	5.6554	-9.8977
attribute_53	0.6214	-2.9091	14.0159	5.0985	-14.6574
attribute_54	-4.5349	-24.9895	-15.4523	-19.2784	0.1947
attribute_55	13.6391	-3.2073	20.9654	9.709	15.0481
attribute_56	5.7886	-13.9312	11.8584	-12.0732	-20.1811
attribute_57	-15.59	-24.623	-56.6501	-57.9405	-10.2221
attribute_58	-0.1893	-11.5616	-18.7514	-4.1842	5.6446
attribute_59	-10.5724	-21.1667	1.6571	-36.449	-20.8206
attribute_60	-24.3924	-5.7924	-0.6564	-25.2403	-8.4065
attribute_61	10.6227	0.4004	21.0215	23.4755	10.2428
attribute_62	-2.8412	-30.1289	-25.7574	-17.0629	5.0713
attribute_63	0.2379	-9.9655	-5.9578	-21.8482	-13.9126
attribute_64	9.935	7.3498	-20.4412	11.2503	2.0561
attribute_65	3.4749	-9.1162	28.2665	5.1748	-8.6739
attribute_66	0.2029	6.3784	-39.1242	-57.0621	-9.3867
attribute_67	16.8558	31.5909	-50.2422	16.4041	10.3407
attribute_68	9.0242	-2.0801	-41.1406	-7.2015	-2.9242
attribute_69	-11.8271	3.2878	-14.5376	-28.979	-1.5735
attribute_70	12.7601	17.3848	13.2483	2.0424	14.4694
attribute_71	8.7201	38.432	14.039	-34.1498	5.0574
attribute_72	-8.3126	-3.243	-0.5676	-81.818	-5.8895
attribute_73	16.3199	-8.0136	-2.7666	-9.8344	-1.9166
attribute_74	8.8443	36.9465	29.3193	-27.827	-6.7727
attribute_75	-6.0378	3.5012	24.8565	-31.4751	-9.2184
attribute_76	12.3096	8.1697	2.4387	-3.9629	-6.6746
attribute_77	15.8406	-14.0216	13.1945	-55.3687	-9.4404
attribute_78	-20.377	-14.6891	0.4004	23.1096	0.3719
attribute_79	7.9678	21.9756	20.2379	42.8201	15.1389
attribute_80	4.3811	32.4436	29.3041	31.8986	-5.8418
attribute_81	-3.4178	61.6069	18.7842	-106.0061	17.4493
attribute_82	15.6502	52.3886	43.5782	26.2344	16.4496
attribute_83	5.8388	13.4427	2.2851	-69.6146	-15.0477
attribute_84	-3.7442	-10.3182	-14.4146	84.2553	33.8868
attribute_85	14.3033	-6.7027	1.0405	-13.5825	-17.3792
attribute_86	2.2482	-5.1479	-49.7905	-44.8618	-133.9559
attribute_87	-15.673	-43.3618	-70.991	-65.1568	-916.3662
attribute_88	7.7025	-3.3093	-74.5932	-22.1066	-29.7546
attribute_89	19.3153	53.3519	86.6972	92.1191	54.8289
attribute_90	-11.8659	10.3504	-152.5739	13.978	-15.9997

attribute_91	12.494	11.9671	-124.3327	-17.1234	-44.2184
attribute_92	-2.4863	178.5326	62.0297	18.7821	13.8317
attribute_93	-7.3496	-46.0492	-11.0622	-3.8402	-8.0823
attribute_94	-1.2453	-124.5538	15.417	5.5392	-11.9554
attribute_95	-3.9932	-134.4465	16.3887	-11.3128	-18.4507
attribute_96	-0.278	-22.6225	-26.6157	-14.5965	9.9894
attribute_97	2.492	-188.6769	-77.8685	-1.3063	-15.7751
attribute_98	0.3318	-2.6383	-8.2771	25.2871	9.8755
attribute_99	-16.3438	0.3511	7.3357	-5.7513	-1.6506
attribute_100	3.969	-40.5575	-30.415	24.2737	-12.7207
attribute_101	-1.4796	-14.185	-8.0196	19.1294	-4.1539
attribute_102	-5.7442	-166.5986	-28.8052	-12.3623	-2.9099
attribute_103	14.4432	-174.3712	-26.6606	-9.2709	4.3628
attribute_104	-2.0801	9.1791	-19.6413	-17.0799	2.0869
attribute_105	-6.5603	6.6242	-11.3946	0.959	1.3066
attribute_106	3.136	3.9147	3.9931	10.538	6.3048
attribute_107	0.3767	-26.8095	-14.4567	-0.9892	-10.5261
attribute_108	-8.6334	-2.9375	-2.8589	-17.9082	4.6067
attribute_109	18.8419	5.6914	-1.8559	-3.3295	1.5592
attribute_110	-1.5054	16.6455	27.5617	-7.9414	-1.0682
attribute_111	-13.9579	-11.6128	-50.7974	-4.1715	-6.2073
attribute_112	6.7024	7.9782	-39.6391	15.578	5.6472
attribute_113	2.6394	21.0868	-8.4534	5.7304	-9.487
attribute_114	-13.9822	-22.6471	-33.5345	-16.5704	-9.1208
attribute_115	6.6705	-4.7471	-36.8899	-3.854	-1.4792
attribute_116	3.5103	-5.5467	-10.0613	-5.8526	5.9842
attribute_117	-14.4702	-23.7452	-6.4873	-5.5381	-10.8846
attribute_118	3.0984	-4.4259	-28.1335	-14.7388	-4.0545
attribute_119	-2.475	-1.3749	6.8244	-6.0044	-4.4907
attribute_120	-10.8713	-35.4942	-10.2815	-28.8046	-2.702
attribute_121	14.398	-13.0538	-13.5249	0.5829	-0.5364
attribute_122	-2.9714	-23.3402	-3.6575	-28.1529	-11.8719
attribute_123	1.0179	11.5563	3.8979	26.1751	1.1519
attribute_124	21.9152	-8.9103	16.322	25.7491	3.3989
attribute_125	12.2499	8.6147	32.8386	18.7668	12.3204
attribute_126	-2.862	-10.5698	-54.5586	3.8584	-1.867
attribute_127	19.8304	-1.6568	-0.3462	-0.0876	-4.009
attribute_128	6.0121	-11.1525	9.5542	18.6254	0.7112
attribute_129	-4.7483	-34.6966	-45.7	-11.1735	3.7924
attribute_130	-3.8681	-14.224	-37.3975	-15.1852	1.5522
attribute_131	-1.1928	-9.8163	-13.6695	-18.2213	-19.545
attribute_132	-9.9341	-18.1087	-7.3294	6.8041	3.6101
attribute_133	7.5868	-24.5419	-18.727	-17.6133	-9.5623
attribute_134	-3.5281	-36.2494	-11.975	-13.4509	-4.8821
attribute_135	-8.3143	-11.1061	-15.5958	-22.3273	9.1914
attribute_136	6.2885	6.1168	12.9472	-7.4384	9.9808
attribute_137	-2.4821	4.9893	45.5744	-27.68	-4.4057
attribute_138	-2.3404	8.456	6.8484	-0.9585	2.1863
attribute_139	9.8225	30.1289	-2.1115	1.7643	2.2326
attribute_140	4.7695	38.4419	47.6206	15.2725	10.8571
attribute_141	-14.3345	-5.6708	-27.2604	-10.5922	-15.9613
attribute_142	-0.3052	-9.9679	-46.334	-9.9976	-9.7807
attribute_143	-8.9732	15.3442	30.9657	7.2383	-8.1306
attribute_144	-5.1189	-11.3061	-41.2198	-2.3796	7.1037
attribute_145	9.8197	-15.2698	-29.0751	-3.0149	2.0277
attribute_146	7.3886	-11.5739	5.2477	-12.9763	3.1938
attribute_147	-18.3791	18.0315	-12.7042	3.8569	4.2967
attribute_148	12.4693	16.5328	-35.1628	12.0228	5.1796
attribute_149	5.0032	20.9996	22.1164	-0.0716	-5.7009
attribute_150	-0.7369	9.5997	17.3758	28.9187	3.9747
attribute_151	9.2299	40.404	25.9098	25.4214	-1.0151
attribute_152	3.1264	11.7034	14.3796	4.4386	2.2151
attribute_153	-11.9522	-24.3138	-6.8301	-0.5089	7.8753
attribute_154	-1.5895	-10.9183	22.4017	-2.8955	-3.8914
attribute_155	1.246	8.1337	19.2864	-0.0959	4.3807
attribute_156	4.8223	-22.5287	-0.011	10.0218	4.8755
attribute_157	20.4027	-10.5898	-6.9428	21.4316	-0.0672
attribute_158	5.8787	-8.2531	11.0406	8.488	2.8956
attribute_159	-7.1548	-8.409	-12.4902	14.3694	1.5938
attribute_160	9.1007	-13.6143	4.22	22.7892	-11.0216
attribute_161	5.8917	10.8154	15.8884	23.8277	-2.6091
attribute_162	-10.1131	-6.3779	-24.8894	-15.0869	-1.2531
attribute_163	11.703	2.691	-17.9976	13.1348	12.9183
attribute_164	9.694	4.7638	27.8571	-9.9086	7.2897
attribute_165	-8.1071	-9.9363	-10.8239	2.9353	10.0405
attribute_166	9.6206	32.5093	30.9571	31.0369	14.0654
attribute_167	-6.7135	14.2071	43.8216	14.3309	8.0062
attribute_168	-8.25	15.3661	9.8991	-6.432	-9.1016
attribute_169	12.3976	28.8235	-14.3273	9.3422	0.4769
attribute_170	2.3061	8.3323	14.5297	7.1829	-11.2554
attribute_171	-19.3035	-27.5639	-49.5052	3.9193	4.1642
attribute_172	-3.5112	-21.5879	-22.3622	0.7878	-4.6606
attribute_173	7.9402	-16.0914	-12.0241	13.6352	-2.5437
attribute_174	-17.2495	-17.2683	10.768	8.8871	7.5763
attribute_175	7.1889	3.752	26.6681	1.7394	15.5999
attribute_176	2.0412	12.679	41.0309	15.6588	20.7477
attribute_177	-14.0536	-6.5216	-32.2576	-24.7827	-11.3127
attribute_178	5.8173	9.2176	28.0455	-0.2111	-3.3282
attribute_179	-2.0348	2.8432	22.7292	-16.095	0.3965
attribute_180=1	-21.8636	19.1197	-0.9484	-16.8386	-33.8759
attribute_180=2	-14.2402	-2.5213	-37.4454	-12.1535	-24.1864
attribute_180=3	26.417	-12.1569	28.0635	21.2125	42.4824
Intercept	-47.4205	-57.5649	-103.6201	-89.2902	22.2207

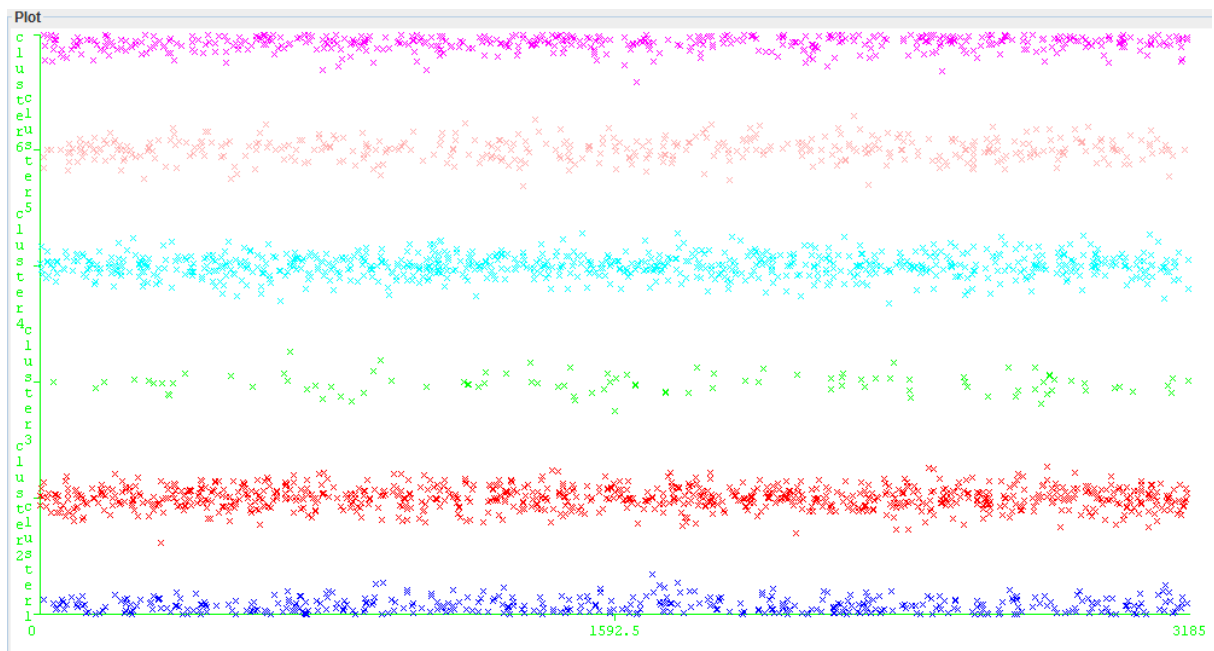
Odds Ratios...

Variable	Class region1	region2	region3	region4	region5
=====					

attribute_0	0.0009	0.0156	0	0	0
attribute_1	47.8601	0	1337.8873	292241.2392	0.0057
attribute_2	0.0002	0	7.5308	0	0.0332
attribute_3	0	0	0	120.9876	0.3652
attribute_4	319.4357	0	0.0179	478966.493	0
attribute_5	0.0202	0	4.334625983686682E10	50690.8384	0
attribute_6	0	0	0	0	4.973
attribute_7	0.1316	3.5243	0	1164.6945	82.8427
attribute_8	3073.0952	59476.7249	0	2578.7805	318973.489
attribute_9	0	7.492	0	693.0631	2.8579
attribute_10	253763.7722	0.0191	0	5.0130703217522586E13	16972.8707
attribute_11	0.0007	0.0001	0	0.0052	0
attribute_12	0	1.8181	1.9229225641510868E10	2488.3293	61337.1044
attribute_13	16273614.2873	73827.9135	6.0041859848136E20	69393.9579	22395.7765
attribute_14	29036.8548	10781922.6556	1.0235377405919663E23	3823717029.7146	5327.2756
attribute_15	0.0303	0.0131	0	0	0.0143
attribute_16	1664.1151	554.5755	0.0001	1.0765	0.0452
attribute_17	5201977.4293	59.0877	2733.9228	6.5118	1.1944
attribute_18	0.0002	0	38940470.6317	0.0001	0.0001
attribute_19	6843791.0802	169545.8995	1.2045600921939285E10	1.6380080527367036E16	1.3554794461933876E11
attribute_20	0.0005	0.0032	926739.2996	0.0005	0
attribute_21	0	3272132.9248	10088.1226	149806.5592	2029.08
attribute_22	239.5702	383.5985	2.6537	14.1607	0.0003
attribute_23	55.7062	0.4491	4.6175791925147086E13	443.3456	0
attribute_24	0.0872	0	0.0015	0	0.0017
attribute_25	1.8131790098414635E10	36423130.9091	2516539851.81	681.5969	72172.6477
attribute_26	87.8553	2482201.6424	7551262024.816	0	0.4602
attribute_27	0.398	9.2482	0	8418.446	7218.5628
attribute_28	17.4869	476974765.1978	9774740.8234	9.066282449658564E13	0.1926
attribute_29	1770.1011	2664271345.0241	1.4606977412791021E10	2018.3043	966.1217
attribute_30	0	20216.5508	0	0	0.0003
attribute_31	0.8553	2089.3578	0.4684	0.4473	21.0171
attribute_32	0.2878	940.0933	515720.2168	0	0
attribute_33	0	0	0	0.3791	12875.0095
attribute_34	1789073.0855	280.5571	0.0001	4971868064.391	2073536.2459
attribute_35	2.1914	0.0306	0.0364	15.5389	152.463
attribute_36	0.0002	70.327	0.6662	0.0004	0.0727
attribute_37	147383.0314	373779375.5176	2.0701819903327565E15	477506.7916	14.1411
attribute_38	0.0161	3332101.4837	0.0001	512.1911	0.0002
attribute_39	0.1418	3.887538227874289E11	1476849.3207	0.0174	485.9495
attribute_40	176621969.9556	1.038051504801299E11	517486491.7235	12152549.9291	1435438.0116
attribute_41	4741.3145	6.172839361678459E14	4.296693054842981E26	364.7283	17.3769
attribute_42	61.311	0.0015	15344435.2271	2190.2344	45.0153
attribute_43	211485797.6244	2.2859931432914634E12	364.8605	4.123513711509639E10	43.808
attribute_44	159.4261	808052.538	1607.6622	3.3548	0.0076
attribute_45	0	2573.7223	0.0079	0	2.8603
attribute_46	1059.8677	6.773570200741973E20	0	15368.8597	3544793.0505
attribute_47	31.2517	1.9080101948391205E15	4.797	0	0.0001
attribute_48	0	0	0.0191	0	0
attribute_49	0.0024	0	2.7825276369795577E20	0.0141	0
attribute_50	0.4667	0.746	4507846.6398	0	0
attribute_51	0.0001	0	0	0	0
attribute_52	14.812	0	0.0003	285.8305	0.0001
attribute_53	1.8615	0.0545	1221921.9638	163.7816	0
attribute_54	0.0107	0	0	0	1.215
attribute_55	838257.979	0.0405	1273931005.1467	16464.3858	3429965.4239
attribute_56	326.5491	0	141272.629	0	0
attribute_57	0	0	0	0	0
attribute_58	0.8275	0	0	0.0152	282.7537
attribute_59	0	0	5.2441	0	0
attribute_60	0	0.0031	0.5187	0	0.0002
attribute_61	41057.8676	1.4924	1347496215.2832	1.5678052474501005E10	28078.3917
attribute_62	0.0584	0	0	0	159.3882
attribute_63	1.2686	0	0.0026	0	0
attribute_64	20641.1202	1555.817	0	76902.9326	7.8158
attribute_65	32.2936	0.0001	1.8878409448352085E12	176.7657	0.0002
attribute_66	1.2249	588.964	0	0	0.0001
attribute_67	20910568.9946	5.24512356875683E13	0	13310421.8052	30966.3985
attribute_68	8301.7092	0.1249	0	0.0007	0.0537
attribute_69	0	26.7841	0	0	0.2073
attribute_70	348066.8111	35490330.2037	567112.8385	7.709	1923046.1193
attribute_71	6124.576	4.906663974086128E16	1250456.8145	0	157.1791
attribute_72	0.0002	0.039	0.5669	0	0.0028
attribute_73	12236200.8628	0.0003	0.0629	0.0001	0.1471
attribute_74	6935.0876	1.1108528279661218E16	5.409950757772266E12	0	0.0011
attribute_75	0.0024	33.155	6.237971818455657E10	0	0.0001
attribute_76	221822.8891	3532.4138	11.4582	0.019	0.0013
attribute_77	7576422.5612	0	537391.0641	0	0.0001
attribute_78	0	0	1.4924	1.0874001045130848E10	1.4505
attribute_79	2886.6218	3498592473.3786	615472309.1857	3.949603956575446E18	3756156.958
attribute_80	79.9274	1.230434541267392E14	5.328322618339063E12	7.135081194653194E13	0.0029
attribute_81	0.0328	5.69536087490194E26	143835430.3963	0	37856367.8066
attribute_82	6263157.5642	5.650689739977905E22	8.4285110755430973E18	2.4742207962077933E11	13931117.6475
attribute_83	343.3516	688769.6512	9.8271	0	0
attribute_84	0.0237	0	0	3.9049018475445284E36	5.210206448875532E14
attribute_85	1628765.1701	0.0012	2.8306	0	0
attribute_86	9.4709	0.0058	0	0	0
attribute_87	0	0	0	0	0
attribute_88	2213.9808	0.0365	0	0	0
attribute_89	244648705.592	1.4805613310255514E23	4.488475391429895E37	1.0158070638664662E40	6.484667292455247E23
attribute_90	0	31270.6197	0	1176492.1345	0
attribute_91	266732.3793	157493.6679	0	0	0
attribute_92	0.0832	3.433258139812722E77	8.692303185585191E26	143533630.859	1016368.7495
attribute_93	0.0006	0	0	0.0215	0.0003
attribute_94	0.2879	0	4960289.6943	254.4623	0
attribute_95	0.0184	0	13108085.704	0	0
attribute_96	0.7573	0	0	0	21793.9147
attribute_97	12.0849	0	0	0.2708	0
attribute_98	1.3934	0.0715	0.0003	9.595326841888405E10	19448.4899

attribute_99	0	1.4206	1534.0633	0.0032	0.1919
attribute_100	52.9332	0	0	3.482678484372827E10	0
attribute_101	0.2277	0	0.0003	203141074.0119	0.0157
attribute_102	0.0032	0	0	0	0.0545
attribute_103	1873345.2105	0	0	0.0001	78.4737
attribute_104	0.1249	9692.6015	0	0	8.0601
attribute_105	0.0014	753.1164	0	2.6091	3.6936
attribute_106	23.0106	50.1353	54.2203	37720.5619	547.1682
attribute_107	1.4574	0	0	0.3719	0
attribute_108	0.0002	0.053	0.0573	0	100.1546
attribute_109	152380742.4516	296.3205	0.1563	0.0358	4.755
attribute_110	0.2219	16944954.4908	9.330465300697972E11	0.0004	0.3436
attribute_111	0	0	0	0.0154	0.002
attribute_112	814.3839	2916.6113	0	5826959.9136	283.5057
attribute_113	14.0042	1438397530.8071	0.0002	308.1015	0.0001
attribute_114	0	0	0	0	0.0001
attribute_115	788.7596	0.0087	0	0.0212	0.2278
attribute_116	33.4592	0.0039	0	0.0029	397.1061
attribute_117	0	0	0.0015	0.0039	0
attribute_118	22.1628	0.012	0	0	0.0173
attribute_119	0.0842	0.2529	920.037	0.0025	0.0112
attribute_120	0	0	0	0	0.0671
attribute_121	1790416.9721	0	0	1.7911	0.5849
attribute_122	0.0512	0	0.0258	0	0
attribute_123	2.7675	104433.858	49.3012	2.3318842974572864E11	3.1643
attribute_124	3293360634.265	0.0001	12262147.6343	1.5230221418726324E11	29.9325
attribute_125	208963.5388	5512.1409	1.8264674076234544E14	141354061.2102	224223.9573
attribute_126	0.0572	0	0	47.3884	0.1546
attribute_127	409494008.1885	0.1907	0.7074	0.9162	0.0182
attribute_128	408.3411	0	14103.661	122716435.1465	2.0365
attribute_129	0.0087	0	0	0	44.3617
attribute_130	0.0209	0	0	0	4.7217
attribute_131	0.3034	0.0001	0	0	0
attribute_132	0	0	0.0007	901.4965	36.9695
attribute_133	1971.988	0	0	0	0.0001
attribute_134	0.0294	0	0	0	0.0076
attribute_135	0.0002	0	0	0	9812.6012
attribute_136	538.3672	453.395	419647.3537	0.0006	21608.2572
attribute_137	0.0836	146.8395	6.204607217210332E19	0	0.0122
attribute_138	0.0963	4703.3156	942.3764	0.3835	8.902
attribute_139	18443.4398	1.2156357808219645E13	0.1211	5.8375	9.3238
attribute_140	117.8546	4.9558428038651792E16	4.8015251348184655E20	4292998.9115	51900.2595
attribute_141	0	0.0034	0	0	0
attribute_142	0.737	0	0	0	0.0001
attribute_143	0.0001	4612202.3163	2.8068765921954812E13	1391.763	0.0003
attribute_144	0.006	0	0	0.0926	1216.5124
attribute_145	18393.4512	0	0	0.0491	7.5964
attribute_146	1617.3626	0	190.1311	0	24.38
attribute_147	0	67759605.8791	0	47.3174	73.4541
attribute_148	260224.8762	15139155.5609	0	166511.743	177.0029
attribute_149	148.8868	1318321283.0869	4027570031.148	0.9309	0.0033
attribute_150	0.4786	14759.8275	35172843.7042	3.6242826542027896E12	53.232
attribute_151	10197.7276	3.5254344436007546E17	1.7883915466400647E11	1.0974763227172354E11	0.3624
attribute_152	22.7908	120979.8484	1757933.7567	84.6539	9.1626
attribute_153	0	0	0.0011	0.0011	2631.3801
attribute_154	0.204	0	5357267062.6143	0.0553	0.0204
attribute_155	3.4765	3407.2542	237664782.9421	0.9085	79.8961
attribute_156	124.2557	0	0.9891	22512.8169	131.0344
attribute_157	725721098.9061	0	0.001	2030673527.8531	0.935
attribute_158	357.3488	0.0003	62353.5767	4856.3595	18.0938
attribute_159	0.0008	0.0002	0	1739987.8148	4.9225
attribute_160	8961.2364	0	68.0356	7892882258.9976	0
attribute_161	362.0118	49779.825	7948044.4002	2.229766962609532E10	0.0736
attribute_162	0	0.0017	0	0	0.2856
attribute_163	120929.9176	14.7469	0	506247.0213	407704.9553
attribute_164	16219.839	117.1945	1.25370630180274E12	0	1465.0875
attribute_165	0.0003	0	0	18.8268	22936.3242
attribute_166	15072.7075	1.3140827914201778E14	2.783034950846589E13	3.0140474155492992E13	1283873.3452
attribute_167	0.0012	1479381.0261	1.0751751806181186E19	1674285.9657	2999.3707
attribute_168	0.0003	4714057.9214	19911.7022	0.0016	0.0001
attribute_169	242219.7802	3.295228090268966E12	0	11409.3054	1.611
attribute_170	10.0354	4155.8533	2042597.2131	1316.7261	0
attribute_171	0	0	0	50.3659	64.3435
attribute_172	0.0299	0	0	2.1986	0.0095
attribute_173	2808.0334	0	0	835044.3975	0.0786
attribute_174	0	0	47476.9558	7238.1533	1951.3952
attribute_175	1324.6717	42.6077	3.8179080810054755E11	5.694	5955698.1725
attribute_176	7.7001	320926.8019	6.5989312941865165E17	6317260.2238	1024694838.231
attribute_177	0	0.0015	0	0	0
attribute_178	336.0642	10072.4442	1.5135271788946907E12	0.8097	0.0359
attribute_179	0.1307	17.171	7433073250.409	0	1.4867
attribute_180=1	0	201182933.7748	0.3874	0	0
attribute_180=2	0	0.0804	0	0	0
attribute_180=3	2.9700597469829205E11	0	1.5411189861163884E12	1631075171.9851	2.8174253889907507E18

Time taken to build model: 40.99 seconds



AdaBoost

Start System Time is 1493354549237

Correctly Classified Instances	932	78.5835 %
Incorrectly Classified Instances	254	21.4165 %
Kappa statistic	0.6447	
Mean absolute error	0.2767	
Root mean squared error	0.3345	
Relative absolute error	67.3369 %	
Root relative squared error	73.4911 %	
Total Number of Instances	1186	

=== Confusion Matrix ===

	a	b	c	<-- classified as
260	31	12		a = 1
28	129	123		b = 2
42	18	543		c = 3

End System Time is 1493354550433

Accuracy of AdaBoostM1: 78.58%

Start System Time for Decision Tree is 1493354556426

Correctly Classified Instances	1097	92.4958 %
Incorrectly Classified Instances	89	7.5042 %
Kappa statistic	0.879	
Mean absolute error	0.0589	
Root mean squared error	0.2155	
Relative absolute error	14.3287 %	

```
a    b    c    <-- classified as
0    0 303 |    a = 1
```

```

0 0 280 | b = 2
0 0 603 | c = 3

```

End System Time for SVM is 1493355065605

RBF

```

Correctly Classified Instances      789      66.5261 %
Incorrectly Classified Instances    397      33.4739 %
Kappa statistic                    0.3719
Mean absolute error                 0.2232
Root mean squared error             0.4724
Relative absolute error             54.3079 %
Root relative squared error         103.7999 %
Total Number of Instances          1186

```

=== Confusion Matrix ===

```

a  b  c  <-- classified as
83  0 220 | a = 1
0 103 177 | b = 2
0  0 603 | c = 3

```

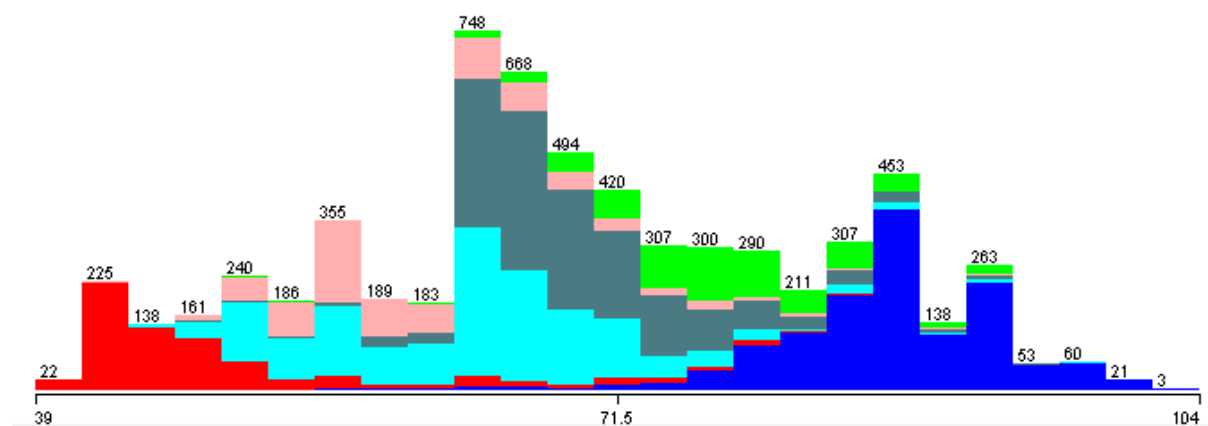
End System Time for SVM is 1493355366420

Landsat

36 Dimensions

7 Classes

Training : 4435 (,6892), Test : 2000)



Logistic Regression with ridge parameter of 1.0E-8
Coefficients...

Variable	Class	region1	region2	region3	region4	region5
attr0	0.4517	0.0858	0.3742	0.1702	0.0612	
attr1	0.2852	0.2989	0.0286	-0.0184	-0.0722	
attr2	0.0847	0.0687	-0.2272	0.0434	0.1239	
attr3	0.1769	0.3595	0.7115	0.0073	0.0589	

attr4	0.648	0.1486	-0.6275	0.0231	0.0793
attr5	0.3824	0.308	-0.0287	0.0578	0.0088
attr6	0.1684	0.1531	0.5029	0.0852	0.1706
attr7	0.1014	0.368	-0.3247	0.1145	0.0683
attr8	0.0166	0.1644	-0.516	0.0429	-0.0387
attr9	0.0919	0.2776	0.122	-0.0424	-0.0879
attr10	0.4698	0.2238	0.3775	0.1064	0.1253
attr11	0.0443	-0.1345	0.2329	0.0031	0.1033
attr12	0.2059	-0.0864	-0.5877	0.0107	-0.0914
attr13	0.1306	-0.0965	0.1133	0.1119	0.0225
attr14	0.3273	0.3246	-0.3648	0.0302	0.0541
attr15	0.1453	0.3124	-0.0651	0.0193	-0.0381
attr16	0.3601	-0.2928	0.0056	0.0579	-0.034
attr17	0.1478	0.2986	-0.1527	0.0324	0.0277
attr18	0.2546	0.4274	0.3784	0.1029	0.1545
attr19	0.4317	0.3332	0.5055	0.1048	-0.0201
attr20	0.2347	-0.2327	0.0725	0.0578	-0.0866
attr21	0.2313	0.0848	-0.6187	-0.0102	0.0197
attr22	0.3757	0.416	0.0857	0.0607	0.1015
attr23	0.1227	0.0647	-0.1188	0.068	0.0197
attr24	0.3239	0.4142	0.3197	0.0751	0.1075
attr25	0.1491	0.1995	-0.452	0.0047	-0.048
attr26	0.3072	0.3682	0.8256	0.0194	0.109
attr27	-0.0067	-0.1582	-0.4189	0.0925	0.1096
attr28	0.336	-0.269	-0.4066	0.0748	-0.0013
attr29	0.1275	0.1434	-0.5398	0.0095	-0.0271
attr30	0.2821	0.2824	0.1213	0.059	0.0666
attr31	0.1922	0.0296	0.1518	0.0097	0.0983
attr32	0.1713	0.0372	-0.1183	0.0675	-0.1449
attr33	0.1239	0.1423	-0.2692	0.0617	0.0655
attr34	0.4743	0.2332	-0.142	0.0846	0.204
attr35	0.3315	0.7432	-0.1245	0.0618	-0.0189
attr36=3	2.8423	12.308	48.6527	-1.6064	1.9173
attr36=2	24.4748	0.6182	-2.8159	15.0932	15.7811
attr36=1	-8.9826	5.2466	3.861	-2.8392	-1.7418
attr36=7	0.3169	-5.0321	7.5522	-1.8818	-4.1384
attr36=5	-14.957	6.7524	-114.2416	-2.1673	-3.4625
attr36=4	2.0621	-32.1011	14.6916	-1.5535	-5.2115
Intercept	-772.2873	-572.5663	-5.8654	-138.5382	-102.2002

Odds Ratios...

Variable	Class region1	region2	region3	region4	region5
attr0	1.5709	1.0896	1.4539	1.1855	1.0632
attr1	1.33	1.3484	1.029	0.9818	0.9303
attr2	1.0884	1.0711	0.7968	1.0443	1.1319
attr3	1.1935	1.4327	2.037	1.0073	1.0607
attr4	1.9116	1.1602	0.5339	1.0234	1.0826
attr5	1.4658	1.3607	0.9717	1.0595	1.0088
attr6	1.1834	1.1655	1.6535	1.0889	1.186
attr7	1.1067	1.4449	0.7227	1.1214	1.0707
attr8	1.0167	1.1787	0.5969	1.0439	0.9621
attr9	1.0963	1.32	1.1298	0.9585	0.9159
attr10	1.5996	1.2508	1.4586	1.1122	1.1335
attr11	1.0453	0.8741	1.2623	1.0031	1.1088
attr12	1.2286	0.9173	0.5556	1.0108	0.9127
attr13	1.1396	0.908	1.1199	1.1184	1.0227
attr14	1.3872	1.3834	0.6943	1.0306	1.0556
attr15	1.1564	1.3668	0.937	1.0195	0.9627
attr16	1.4335	0.7462	1.0056	1.0596	0.9666
attr17	1.1592	1.348	0.8584	1.033	1.0281
attr18	1.2899	1.5333	1.4599	1.1084	1.1671
attr19	1.5399	1.3954	1.6578	1.1104	0.9801
attr20	1.2645	0.7924	1.0752	1.0595	0.9171
attr21	1.2603	1.0885	0.5386	0.9899	1.0199
attr22	1.456	1.5159	1.0894	1.0626	1.1068
attr23	1.1305	1.0669	0.8879	1.0704	1.0199
attr24	1.3826	1.5132	1.3767	1.078	1.1135
attr25	1.1607	1.2207	0.6364	1.0048	0.9532
attr26	1.3596	1.4451	2.2833	1.0196	1.1152
attr27	0.9934	0.8537	0.6577	1.0969	1.1158
attr28	1.3994	0.7641	0.6659	1.0776	0.9987
attr29	1.136	1.1542	0.5829	1.0096	0.9733
attr30	1.3259	1.3263	1.129	1.0608	1.0688
attr31	1.2119	1.0301	1.164	1.0097	1.1033
attr32	1.1869	1.0379	0.8884	1.0699	0.8651
attr33	1.1319	1.1529	0.764	1.0637	1.0677
attr34	1.6069	1.2626	0.8676	1.0883	1.2263
attr35	1.3931	2.1027	0.883	1.0637	0.9813
attr36=3	17.1551	221470.1139	1.347785566752113E21	0.2006	6.8026
attr36=2	4.258595710485012E10	1.8556	0.0598	3588170.1962	7139458.066
attr36=1	0.0001	189.9141	47.5107	0.0585	0.1752
attr36=7	1.3729	0.0065	1904.915	0.1523	0.0159
attr36=5	0	856.1497	0	0.1145	0.0314
attr36=4	7.8623	0	2401387.1924	0.2115	0.0055

Time taken to build model: 17.52 seconds

L3M Classification Results

=====

Correctly Classified Instances : 1906.0

InCorrectly Classified Instances : 94.0

Standard Deviation : 0.10966470768413135

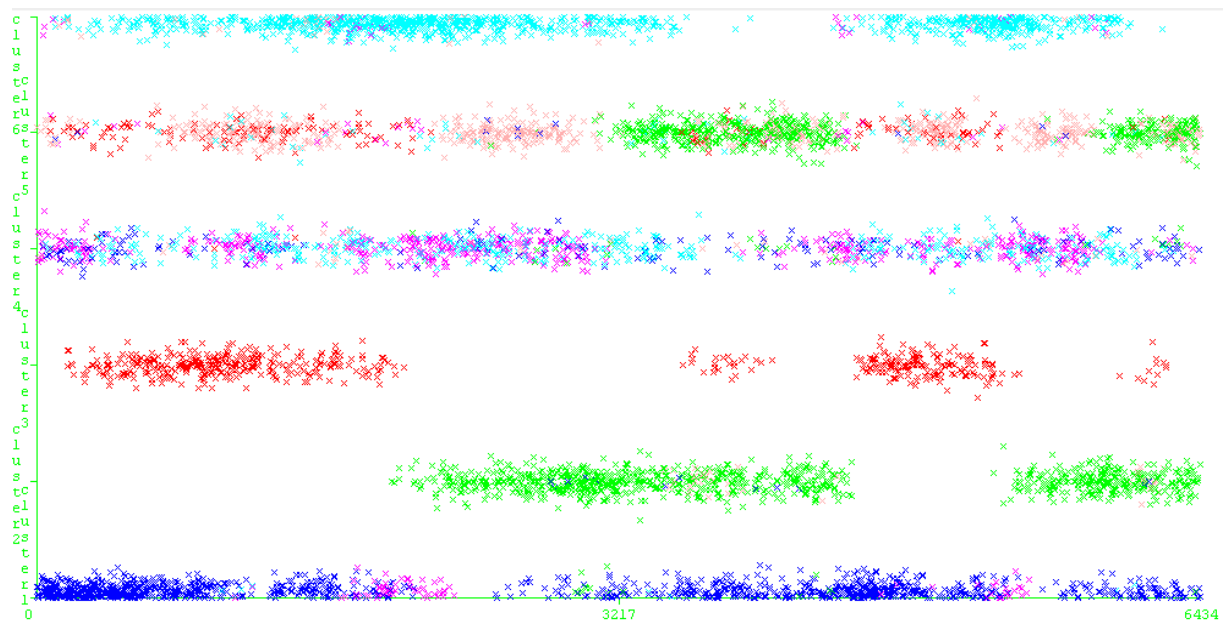
Correctly Classified Instances	1906	95.3	%
Incorrectly Classified Instances	94	4.7	%
Kappa statistic	0.943		
Mean absolute error	0.0176		
Root mean squared error	0.1097		
Relative absolute error	6.4129 %		
Root relative squared error	29.5779 %		
Total Number of Instances	2000		

=== Confusion Matrix ===

	a	b	c	d	e	f	<-- classified as
361	1	0	3	0	0		a = region1
2	301	0	1	4	0		b = region2
0	0	176	0	2	0		c = region3
6	5	0	352	10	10		d = region4
0	6	3	5	402	16		e = region5
0	0	0	9	11	314		f = region6

End System Time for our L3M is 1493355558947

Overall Accuracy of our L3M Classification : 95.30%



Start System Time is 1493355800885

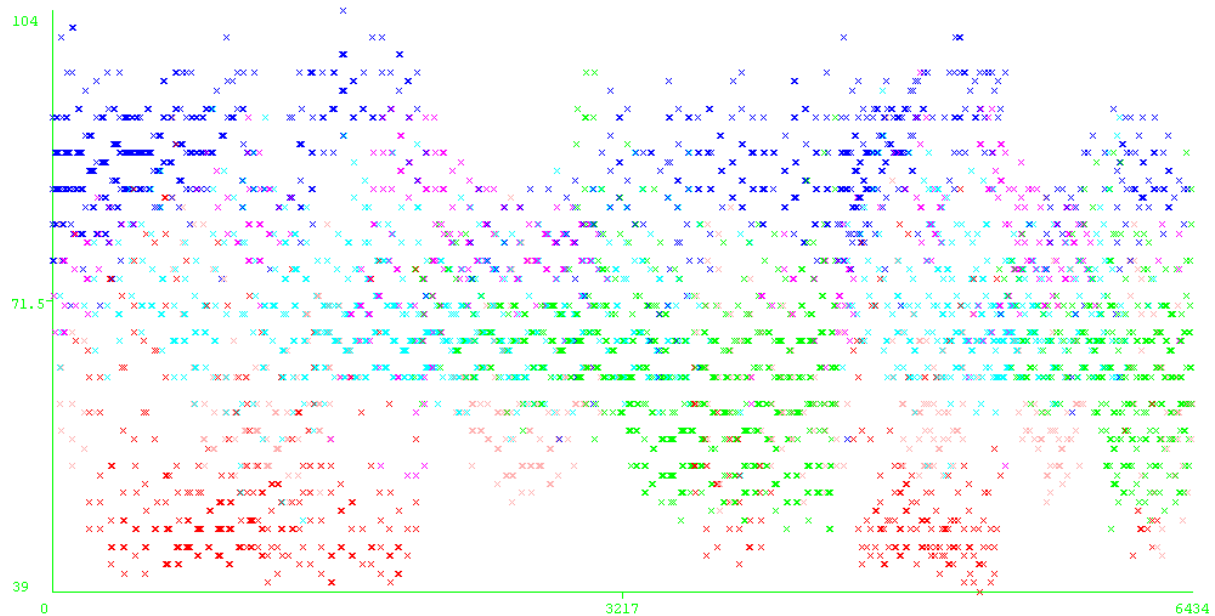
Correctly Classified Instances	835	41.75	%
Incorrectly Classified Instances	1165	58.25	%

Kappa statistic	0.2518
Mean absolute error	0.2246
Root mean squared error	0.3377
Relative absolute error	83.0124 %
Root relative squared error	91.6216 %
Total Number of Instances	2000

=== Confusion Matrix ===

a	b	c	d	e	f	<-- classified as
388	0	9	0	0	0	a = 3
2	0	222	0	0	0	b = 2
14	0	447	0	0	0	c = 1
50	0	420	0	0	0	d = 7
4	0	233	0	0	0	e = 5
106	0	105	0	0	0	f = 4

End System Time is 1493355801518
Accuracy of AdaBoostM1: 41.75%



Start System Time for Decision Tree is 1493355808466

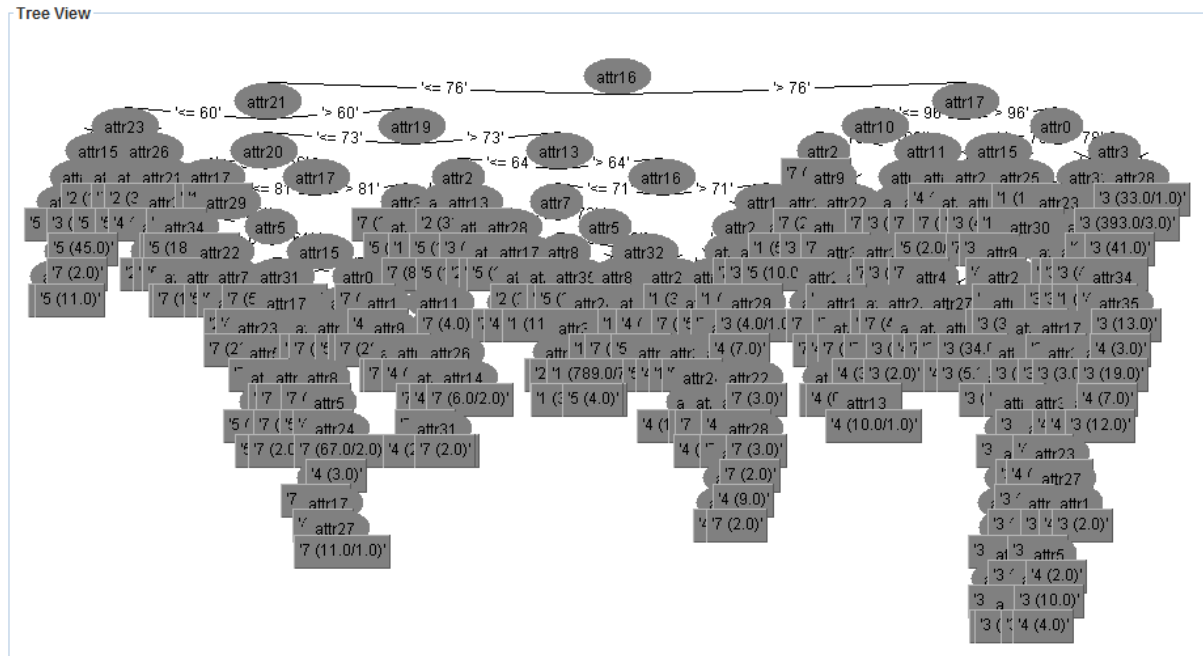
Correctly Classified Instances	1707	85.35	%
Incorrectly Classified Instances	293	14.65	%
Kappa statistic	0.82		
Mean absolute error	0.053		
Root mean squared error	0.2145		
Relative absolute error	19.6003 %		
Root relative squared error	58.1921 %		
Total Number of Instances	2000		

=== Confusion Matrix ===

a	b	c	d	e	f	<-- classified as
347	0	6	8	1	35	a = 3
1	216	1	2	1	3	b = 2
5	3	440	2	9	2	c = 1
10	1	3	391	15	50	d = 7

4	7	13	15	197	1		e = 5
35	1	1	54	4	116		f = 4

End System Time for Decision Tree is 1493355810382



Polynomial Kernel

Correctly Classified Instances	1102	55.1	%
Incorrectly Classified Instances	898	44.9	%
Kappa statistic	0.4215		
Mean absolute error	0.1497		
Root mean squared error	0.3869		
Relative absolute error	55.3109	%	
Root relative squared error	104.95	%	
Total Number of Instances	2000		

=== Confusion Matrix ===

a	b	c	d	e	f	<-- classified as
360	0	8	29	0	0	a = 3
0	51	0	173	0	0	b = 2
4	0	234	223	0	0	c = 1
12	0	1	457	0	0	d = 7
0	0	9	228	0	0	e = 5
35	0	0	176	0	0	f = 4

End System Time for SVM is 1493356056729

RBF

```
Start System Time for SVM is 1493355812464
```

Correctly Classified Instances	1702	85.1	%
--------------------------------	------	------	---

Incorrectly Classified Instances	298	14.9	%
Kappa statistic	0.8156		
Mean absolute error	0.0497		
Root mean squared error	0.2229		
Relative absolute error	18.3549	%	
Root relative squared error	60.4578	%	
Total Number of Instances	2000		

=== Confusion Matrix ===

	a	b	c	d	e	f	<-- classified as
379	0	2	4	1	11		a = 3
1	209	0	1	12	1		b = 2
3	0	457	0	1	0		c = 1
14	0	0	402	7	47		d = 7
3	4	19	35	172	4		e = 5
41	0	0	83	4	83		f = 4

End System Time for SVM is 1493355831318

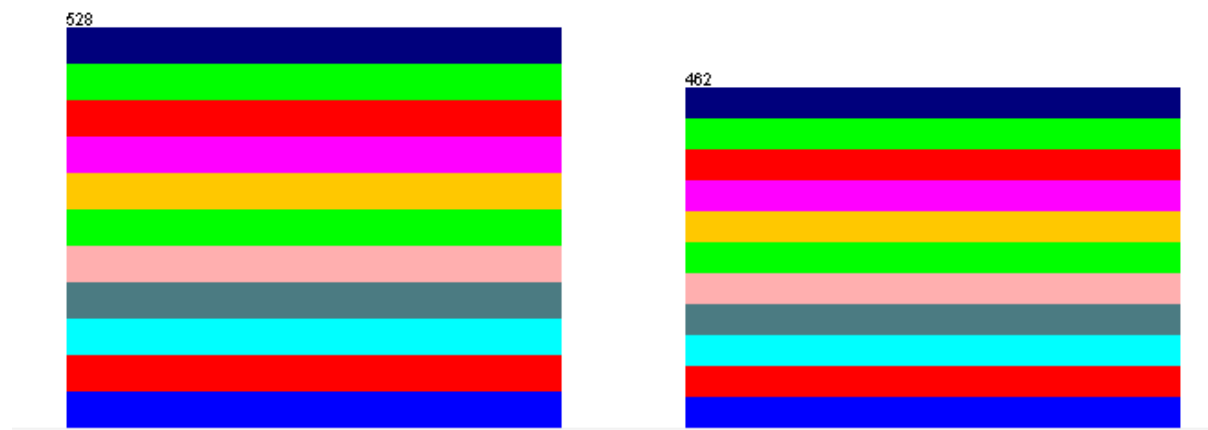
Vowel

Dimensions : 10

Classes : 11

Training : 528 (53.333%)

Test : 462



Start System Time for our L3M is 1493356293937

L3M Classification Results

=====

Correctly Classified Instances : 148.0

InCorrectly Classified Instances : 314.0

Standard Deviation : 0.47286160177910835

Correctly Classified Instances	148	32.0346 %
Incorrectly Classified Instances	314	67.9654 %
Kappa statistic	0.2511	
Mean absolute error	0.2274	
Root mean squared error	0.4729	
Relative absolute error	73.155 %	
Root relative squared error	108.243 %	
Total Number of Instances	462	

=== Confusion Matrix ===

a	b	c	d	e	f	<-- classified as
0	0	0	0	0	0	a = region1
22	68	0	2	39	0	b = region2
128	2	0	20	1	0	c = region3
2	1	0	53	0	0	d = region4
0	0	0	0	0	0	e = region5
2	7	0	35	53	27	f = region6

End System Time for our L3M is 1493356304622

Overall Accuracy of our L3M Classification : 32.03%

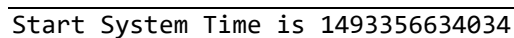
Coefficients...

Variable	Class region1	region2	region3	region4	region5
Train or Test	14.144	-0.5717	12.8952	9.3573	1.4355
Speaker Number=Andrew	-12.3282	13.3235	6.846	-5.6806	-11.5639
Speaker Number=Bill	-15.6586	-3.2444	-28.2491	-18.2686	-12.826
Speaker Number=David	-14.9292	-7.6988	-13.9028	-11.692	-15.628
Speaker Number=Mark	-40.8751	-0.8362	-21.194	-10.7901	-14.381
Speaker Number=Jo	16.6797	15.7227	-6.3323	4.634	13.2254
Speaker Number=Kate	0.3378	-11.522	16.9522	1.8268	11.6547
Speaker Number=Penny	7.1189	-4.5101	1.0274	0.2659	10.9
Speaker Number=Rose	3.0787	1.0523	-6.7281	2.2758	12.8766
Speaker Number=Mike	21.3877	-13.1719	18.5964	1.757	5.4521
Speaker Number=Nick	14.5151	-11.118	26.5034	-0.1134	2.2064
Speaker Number=Rich	26.7802	0.9278	8.6037	3.4543	6.7638
Speaker Number=Tim	22.218	6.0595	5.1386	2.884	3.0003
Speaker Number=Sarah	-14.7621	6.4088	-0.1556	11.3251	-2.2193
Speaker Number=Sue	-10.5531	8.5666	-10.4766	12.0503	-1.8116
Speaker Number=Wendy	-3.0095	0.0402	3.3708	6.0716	-7.6494
Sex	-0.2774	3.9396	-0.5856	9.6124	9.2441
Feature 0	4.0613	1.0496	-6.7339	-0.2492	0.1524
Feature 1	-5.6142	-5.2266	4.2221	-1.5039	-1.3288
Feature 2	-20.2072	-22.8799	14.5997	-6.0111	-4.7336
Feature 3	-3.1369	-4.5811	-2.1298	0.7731	1.9598
Feature 4	-1.296	1.1781	10.1431	2.9183	2.6238
Feature 5	2.9595	8.3215	6.2495	4.7043	5.0576
Feature 6	-3.4596	-29.0792	7.5074	-2.2514	-1.3815
Feature 7	-7.287	19.0942	17.4499	5.5926	3.6395
Feature 8	-11.4461	-14.652	10.9951	-5.1979	-6.6649
Feature 9	-19.9282	-8.0761	17.4626	-6.6998	-6.2625
Class=hid	4.7595	2.151	-3.7532	13.737	12.589
Class=hId	8.6061	17.1523	12.5456	10.2501	8.6072
Class=hEd	-2.9035	11.1601	8.8306	5.0746	2.7881
Class=hAd	-13.8407	6.3767	7.0478	-2.0233	-1.7381
Class=hYd	-7.1306	-4.7871	4.5156	-5.7332	-5.9217
Class=had	-7.9525	-14.9995	5.4594	-4.4271	-4.2511
Class=hOd	-6.6301	-4.2901	3.411	-4.7528	-3.7614
Class=hod	7.57	-5.3889	-9.916	-1.4423	1.2844
Class=hUd	7.0909	-7.5317	-12.352	-6.3472	-5.0559
Class=hud	11.4016	0.2295	-10.1272	-0.9765	-0.6196
Class=hed	-0.9708	-0.0722	-5.6615	-3.3594	-3.9209
Intercept	-2.9777	-23.4194	-47.3583	-7.8372	-1.3813

Odds Ratios...

Variable	Class region1	region2	region3	region4	region5
Train or Test	1388894.7654	0.5645	398378.6221	11582.4974	4.2019
Speaker Number=Andrew	0	611417.5588	940.066	0.0034	0
Speaker Number=Bill	0	0.039	0	0	0
Speaker Number=David	0	0.0005	0	0	0
Speaker Number=Mark	0	0.4334	0	0	0
Speaker Number=Jo	17534976.0569	6734062.0922	0.0018	102.9249	554285.4869
Speaker Number=Kate	1.4019	0	23028558.655	6.2138	115231.3838
Speaker Number=Penny	1235.0709	0.011	2.7938	1.3046	54178.1898
Speaker Number=Rose	21.7296	2.8641	0.0012	9.7354	391057.338
Speaker Number=Mike	1943318549.7239	0	119208851.7139	5.7952	233.2423
Speaker Number=Nick	2012924.7914	0	3.238046141040015E11	0.8928	9.0827
Speaker Number=Rich	4.2705523501295056E11	2.529	5451.9721	31.6372	865.9199
Speaker Number=Tim	4457961696.6994	428.16	170.4741	17.8852	20.0919

Time taken to build model: 2.6 seconds

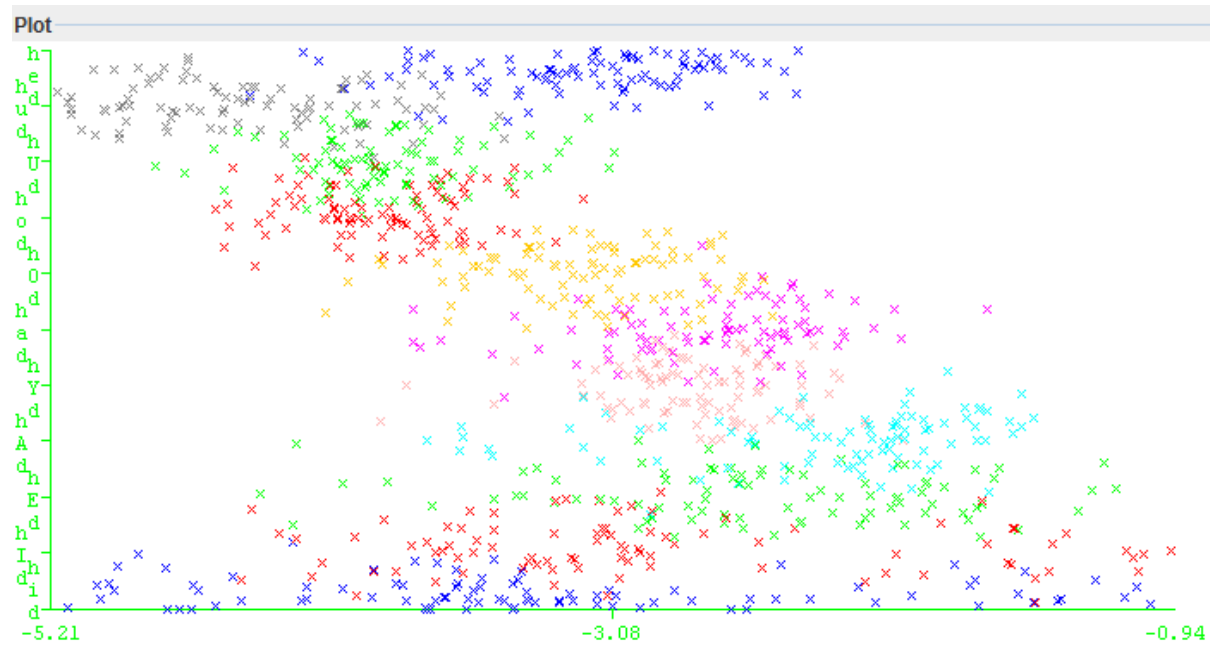


=== Confusion Matrix ===

```
a  b  c  d  e  f  g  h  i  j  k  <-- classified as
0  0  37  0  5  0  0  0  0  0  0  a = hid
0  0  27  0  15  0  0  0  0  0  0  b = hId
0  0  17  0  25  0  0  0  0  0  0  c = hEd
```

0	0	3	0	39	0	0	0	0	0	0		d = hAd
0	0	0	0	42	0	0	0	0	0	0		e = hYd
0	0	0	0	42	0	0	0	0	0	0		f = had
0	0	4	0	38	0	0	0	0	0	0		g = hOd
0	0	0	0	42	0	0	0	0	0	0		h = hod
0	0	0	0	42	0	0	0	0	0	0		i = hUd
0	0	6	0	36	0	0	0	0	0	0		j = hud
0	0	4	0	38	0	0	0	0	0	0		k = hed

End System Time is 1493356634395
Accuracy of AdaBoostM1: 12.77%



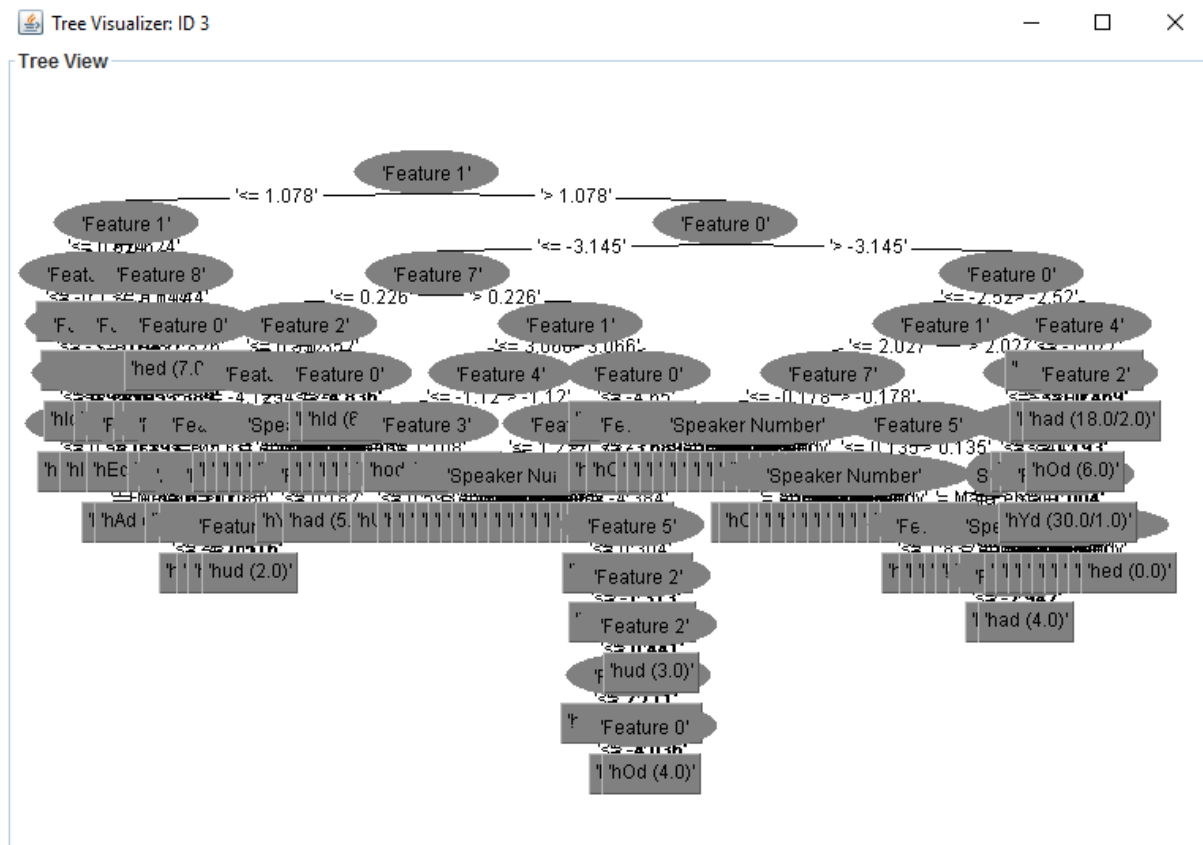
Start System Time for Decision Tree is 1493356639050

Correctly Classified Instances	163	35.2814 %
Incorrectly Classified Instances	299	64.7186 %
Kappa statistic	0.2881	
Mean absolute error	0.118	
Root mean squared error	0.3147	
Relative absolute error	71.364 %	
Root relative squared error	109.4816 %	
Total Number of Instances	462	

=== Confusion Matrix ===

a	b	c	d	e	f	g	h	i	j	k	<-- classified as
27	12	3	0	0	0	0	0	0	0	0	a = hid
0	17	13	2	0	9	0	0	1	0	0	b = hId
0	5	9	5	0	14	3	0	0	0	6	c = hEd
0	0	0	10	9	16	2	0	0	0	5	d = hAd
0	0	0	6	28	1	7	0	0	0	0	e = hYd
0	0	0	5	17	12	0	0	0	0	8	f = had
0	0	1	0	6	16	13	0	0	1	5	g = hOd
0	0	0	0	0	5	9	27	1	0	0	h = hod
0	1	0	0	0	8	6	15	5	5	2	i = hUd
2	4	2	1	0	9	1	3	1	15	4	j = hud
0	1	1	1	0	19	5	0	15	0	0	k = hed

End System Time for Decision Tree is 1493356639358
Accuracy of Decision Tree : 24.03%



Polynomial Kernel

Correctly Classified Instances	90	19.4805 %
Incorrectly Classified Instances	372	80.5195 %
Kappa statistic	0.1143	
Mean absolute error	0.1464	
Root mean squared error	0.3826	
Relative absolute error	88.5714 %	
Root relative squared error	133.095 %	
Total Number of Instances	462	

=== Confusion Matrix ===

a	b	c	d	e	f	g	h	i	j	k	<-- classified as
3	0	15	9	0	0	0	0	0	0	15	a = hid
0	5	13	12	0	1	0	0	0	0	11	b = hId
0	0	15	25	1	1	0	0	0	0	0	c = hEd
0	0	0	36	0	6	0	0	0	0	0	d = hAd
0	0	0	6	16	16	0	0	0	0	4	e = hYd
0	0	0	15	13	9	0	0	0	0	5	f = had
0	0	0	6	22	12	0	0	0	0	2	g = hOd
0	0	0	0	35	0	0	0	0	0	7	h = hod
0	0	0	8	10	2	0	0	0	0	22	i = hUd
0	0	6	0	0	5	0	0	3	0	28	j = hud

0 0 0 18 9 9 0 0 0 0 6 | k = hed

End System Time for SVM is 1493356641492

RBF

Correctly Classified Instances	209	45.2381 %
Incorrectly Classified Instances	253	54.7619 %
Kappa statistic	0.3976	
Mean absolute error	0.0996	
Root mean squared error	0.3155	
Relative absolute error	60.2381 %	
Root relative squared error	109.7616 %	
Total Number of Instances	462	

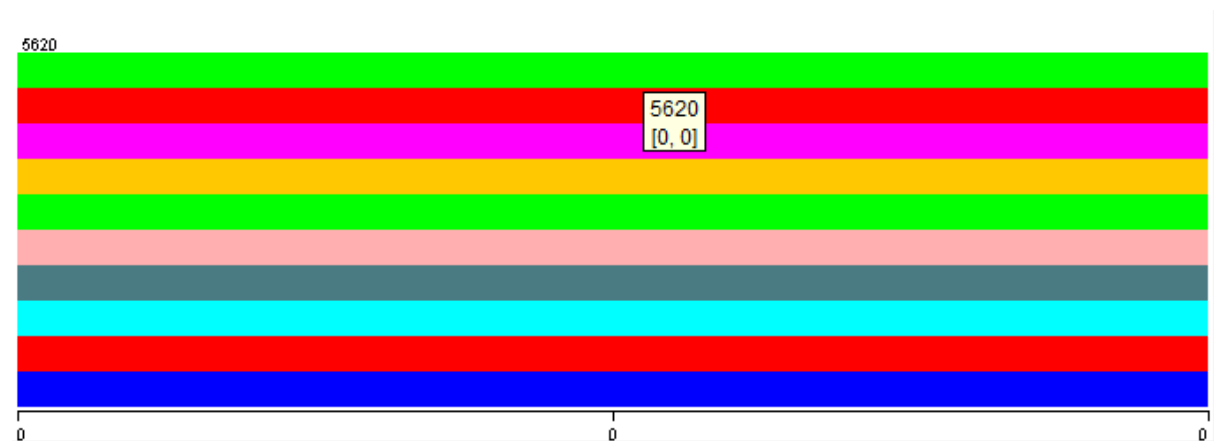
=== Confusion Matrix ===

	a	b	c	d	e	f	g	h	i	j	k	<-- classified as
35	3	4	0	0	0	0	0	0	0	0	0	a = hid
23	4	12	0	0	0	0	0	0	0	0	3	b = hId
0	2	18	11	0	0	0	0	0	0	0	11	c = hEd
0	0	0	31	0	9	0	0	0	0	0	2	d = hAd
0	0	0	5	14	17	6	0	0	0	0	0	e = hYd
0	0	6	0	8	18	2	0	0	0	0	8	f = had
0	0	3	1	22	6	5	0	0	0	0	5	g = hOd
0	0	0	0	6	0	0	19	15	2	0	0	h = hod
0	0	4	0	0	0	1	11	20	6	0	0	i = hUd
13	0	6	0	0	0	0	0	8	14	1	0	j = hud
0	0	11	0	0	0	0	0	0	0	31	0	k = hed

End System Time for SVM is 1493356908751

Optdigits

Dimensions : 64
Classes : 10
Training : 3823 (0.680249)
Test : 1797



Variable	region1	region2	region3	region4	region5
input2	368.7728	478.617	369.2928	364.0717	384.3094
input3	6.5531	-16.1384	6.3372	5.7256	-2.4685
input4	11.0474	8.8715	10.8513	13.5076	11.4897
input5	-6.6115	-6.8497	-5.9838	-6.8515	-1.6188
input6	-8.9383	-7.1849	-8.9218	-9.7447	-14.6758
input7	163.723	170.3662	168.5444	172.8043	171.2046
input8	-95.8888	-124.026	-196.2257	-94.406	-253.9416
input9	-338.2884	-270.27	-380.2683	-699.852	-507.5278
input10	-11.8954	-93.3427	-12.4197	-12.9535	-10.5871
input11	6.0903	2.6631	6.7577	4.5838	15.377
input12	6.1612	5.202	5.3117	5.8077	12.2098
input13	0.9515	1.6636	1.468	-0.7449	-2.5312
input14	9.3899	7.7973	9.4573	11.7676	0.2703
input15	-18.6229	-17.4842	-18.6969	-16.4353	-23.7442
input16	-82.3257	-81.1746	-152.7868	-71.756	-75.5096
input17	286.9279	92.1782	191.3116	236.3026	452.2453
input18	-7.2183	-16.3623	-7.1326	-10.3996	-25.2951
input19	-11.4591	-10.5776	-11.4665	-12.0599	-16.0228
input20	-2.3249	-1.6204	-2.7979	-3.407	-4.6313
input21	3.7077	2.6107	2.6815	2.4982	0.2001
input22	-30.7854	-32.0563	-30.6519	-31.2764	-35.9768
input23	20.6147	29.8649	23.2449	26.8663	34.3468
input24	196.8545	160.431	150.0148	157.4177	58.9393
input25	964.7875	880.6098	233.0858	-465.1305	249.2659
input26	-17.8656	-13.0568	-17.2026	-18.2918	-14.3895
input27	8.0366	8.161	7.3744	8.719	10.4927
input28	10.2252	10.7156	10.4756	9.4908	10.3319
input29	15.645	15.3434	17.105	15.6671	10.3924
input30	35.3199	36.9709	35.0781	36.2173	29.9634
input31	-17.6682	-5.2061	-3.5259	-5.6133	-6.1593
input32	339.4109	398.5667	268.7383	131.5344	593.2301
input33	1320.4977	445.7828	474.8957	707.9778	-3325.9835
input34	-7.0363	0.9173	-11.6116	1.005	8.763
input35	-25.055	-23.7854	-24.8095	-26.9395	-29.0417
input36	0.806	0.2678	0.2987	1.1159	0.4158
input37	63.0976	62.8822	62.3669	65.093	61.2011
input38	-5.6786	-4.0711	-2.5387	-2.3995	-3.688
input39	-66.0798	-15.6392	-19.0937	-19.6869	-29.0847
input41	-350.5494	-240.0661	-197.2647	-354.8018	-689.6397
input42	7.8477	12.7141	2.547	6.1692	5.6009
input43	10.3798	10.7664	8.9445	10.5148	14.5762
input44	4.492	5.1185	2.7759	6.1203	5.4734
input45	23.5931	25.6	22.7169	23.7617	20.0051
input46	-16.0288	-12.2927	-13.972	-16.5271	-18.9656
input47	27.9937	28.123	34.4736	23.4013	39.6622
input48	-210.9814	-321.5383	-342.4879	-457.0104	-241.9319
input49	235.0266	210.8465	204.7761	219.1587	236.0812
input50	27.2425	19.61	29.3157	7.2016	26.0686
input51	-38.0275	-37.4215	-38.2936	-39.6913	-35.3566
input52	6.3223	3.2053	4.6366	5.6309	6.6585
input53	-2.5986	-0.5969	-2.9436	-0.4825	-1.3876
input54	7.8761	7.5686	9.1168	4.9893	14.9473
input55	-33.6919	-34.4634	-33.8909	-93.3035	-33.2805
input56	108.0552	67.5627	91.921	303.1193	119.7337
input57	-2439.8058	-2405.1226	-3493.0266	-3144.5329	-2201.242
input58	78.2991	-5.6335	62.2207	70.3517	-66.1056
input59	9.096	-8.0582	10.194	8.4735	8.1048
input60	-9.5137	-11.3989	-9.2527	-14.483	-14.0626
input61	-9.4338	-8.2882	-8.8887	-11.4263	-11.6858
input62	3.1086	1.6729	3.3029	-8.627	1.3588
input63	37.0179	30.8378	37.706	54.9442	43.2626
input64	-51.862	-57.2033	-75.8659	-427.0321	-74.6676
class=0	139.4603	62.4867	92.7902	117.792	141.1248
class=1	255.6208	267.1133	244.2968	216.5987	294.6242
class=2	27.0482	124.4689	57.3207	15.3345	-71.438
class=3	-352.0156	-334.1281	-349.7065	-343.6876	-342.6968
class=4	148.6891	143.196	166.6945	139.3877	-96.0705
class=5	144.7778	133.1907	138.5449	123.1677	150.7383
class=6	255.7601	209.4041	240.0566	327.3497	348.8872
class=7	-1286.9104	-1262.9485	-1289.163	-1251.1376	-1262.8734
class=8	374.0552	372.7502	394.0676	379.7546	455.3836
class=9	311.4234	301.2427	322.738	293.6554	402.5958
Intercept	400.7723	477.4404	343.7864	440.4896	341.3368

Odds Ratios...

Variable	Class region1	region2	region3	region4	region5
input2	1.4321408684767446E160	7.256607082486243E207	2.4090223370280725E160	1.3011787570048422E158	8.006902396110575E166
input3	701.4279	0	565.1994	306.6083	0.0847
input4	62781.8459	7126.306	51603.4029	734956.1539	97707.3196
input5	0.0013	0.0011	0.0025	0.0011	0.1981
input6	0.0001	0.0008	0.0001	0.0001	0
input7	1.2705761841830729E71	9.752381373502657E73	1.577228371968296E73	1.1167868105763053E75	2.2553119891234843E74
input8	0	0	0	0	0
input9	0	0	0	0	0
input10	0	0	0	0	0
input11	441.5658	14.3402	860.621	97.8821	4765875.3547
input12	474.0034	181.6355	202.6952	332.8377	200755.2755
input13	2.5896	5.278	4.3405	0.4748	0.0796
input14	11966.3359	2433.9344	12801.0098	129000.7159	1.3103
input15	0	0	0	0	0
input16	0	0	0	0	0
input17	4.085037929696121E124	1.0776518116840988E40	1.2178311134235157E83	4.216135371083393E102	2.5564298798597347E196

input18	0.0007	0	0.0008	0	0
input19	0	0	0	0	0
input20	0.0978	0.1978	0.0609	0.0331	0.0097
input21	40.7584	13.6088	14.6066	12.1606	1.2215
input22	0	0	0	0	0
input23	897124352.4704	9.336030272582006E12	1.2448898813644667E10	4.6545822170979205E11	8.252982194646855E14
input24	3.11042532217903E85	4.7238294728869385E69	1.414431303624643E65	2.3207330588785633E68	3.953965093050007E25
input25	Infinity	Infinity	1.6899914553429574E101	0	1.7979967560826526E108
input26	0	0	0	0	0
input27	3092.2107	3501.8317	1594.5877	6117.8342	36050.6692
input28	27589.8075	45053.5377	35441.3933	13237.1935	30696.2118
input29	6230594.3918	4608566.4279	26827924.0234	6370010.1474	32610.6509
input30	2.1838664244698125E15	1.1383369604711936E16	1.7148288579549425E15	5.357742866942348E15	1.0302559834350191E13
input31	0	0.0055	0.0294	0.0036	0.0021
input32	2.5368248402161113E147	1.2454819043497229E173	5.147188973790723E116	1.332534052967912E57	4.330573641323708E257
input33	Infinity	3.990422121166648E193	1.7562870145553415E206	2.957027534311601E307	0
input34	0.0009	2.5026	0	2.732	6393.2983
input35	0	0	0	0	0
input36	2.239	1.3071	1.3481	3.0522	1.5156
input37	2.528940457860272E27	2.0388930104138405E27	1.217888161500518E27	1.8600150058889155E28	3.795784582903919E26
input38	0.0034	0.0171	0.079	0.0908	0.025
input39	0	0	0	0	0
input41	0	0	0	0	0
input42	2559.918	332403.8092	12.7684	477.7966	270.662
input43	32202.693	47400.0318	7665.8977	36856.0144	2139845.5816
input44	89.3038	167.0919	16.0525	455.0146	238.2693
input45	1.7634650258625607E10	1.312063856858676E11	7342408987.5354	2.0871795079259457E10	487660245.6499
input46	0	0	0	0	0
input47	1.4371893884901484E12	1.6354893447668428E12	9.369410293389455E14	1.4555750001504225E10	1.67910439838571264E17
input48	0	0	0	0	0
input49	1.1769185459943346E102	3.710802129556436E91	8.573253391047642E88	1.5115563470460208E95	3.3789467269502274E102
input50	6.780791180896476E11	328475607.0794	5.39064952147407E12	1341.5365	2.096211197008035E11
input51	0	0	0	0	0
input52	556.8511	24.6635	103.1981	278.912	779.3999
input53	0.0744	0.5505	0.0527	0.6172	0.2497
input54	2633.5996	1936.4728	9106.7347	146.8348	3101259.581
input55	0	0	0	0	0
input56	8.467675614748483E46	2.198514848290076E29	8.33291814580936E39	4.3956361601381225E131	9.992934522995965E51
input57	0	0	0	0	0
input58	1.0112283886410446E34	0.0036	1.0522670571454475E27	3.5757159117506975E30	0
input59	8919.9284	0.0003	26742.9339	4786.4087	3310.47
input60	0.0001	0	0.0001	0	0
input61	0.0001	0.0003	0.0001	0	0
input62	22.3895	5.3276	27.192	0.0002	3.8916
input63	1.1930221889145266E16	2.4700469745674594E13	2.3740435739995192E16	7.277434729307794E23	6.1473725642415749E18
input64	0	0	0	0	0
class=0	3.688392604805042E60	1.372913204953054E27	1.9873290431095267E40	1.4335631288397528E51	1.948523430010085E61
class=1	1.0344194956873926E111	1.0135612459635169E116	1.2496027859630407E106	1.168526979076357E94	8.987883149313593E127
class=2	5.583152487304464E11	1.1380055958998045E54	7.83522224108281E24	4567526.4556	0
class=3	0	0	0	0	0
class=4	3.757092619540517E64	1.5460108196120708E62	2.480195138265799E72	3.430152251260862E60	0
class=5	7.519459282389137E62	6.982318260838686E57	1.4766359065907662E60	3.0977124318449874E53	2.91609742538534E65
class=6	1.1889931117974326E111	8.7707328767403E90	1.7999673018719214E104	1.46610400787563E142	3.3097290809905606E151
class=7	0	0	0	0	0
class=8	2.8192145510108255E162	7.644509168550489E161	1.3848084467027226E171	8.420157458457269E164	5.896266158375887E197
class=9	1.7760730398465708E135	6.73020300377804E130	1.4565433455060335E140	3.411196596533113E127	7.000666311100704E174

Time taken to build model: 25.69 seconds

Start System Time for our L3M is 1493356996453

L3M Classification Results

=====

Correctly Classified Instances : 1680.0

InCorrectly Classified Instances : 117.0

Standard Deviation : 0.1457283511750596

Correctly Classified Instances	1680	93.4891 %
Incorrectly Classified Instances	117	6.5109 %
Kappa statistic	0.919	
Mean absolute error	0.0218	
Root mean squared error	0.1457	
Relative absolute error	8.1238 %	
Root relative squared error	39.8114 %	
Total Number of Instances	1797	

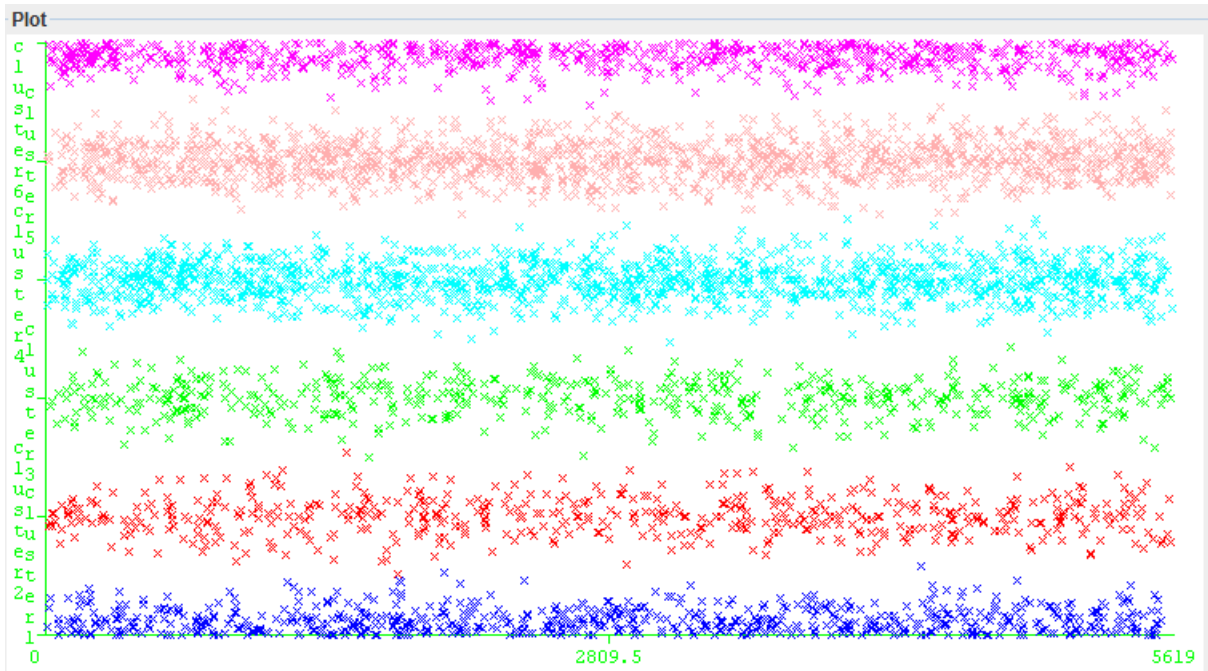
=== Confusion Matrix ===

a b c d e f <-- classified as

199	0	5	5	6	2	a = region1
1	165	0	3	2	4	b = region2
0	0	174	5	5	0	c = region3
2	3	5	435	13	5	d = region4
4	2	3	5	462	4	e = region5
8	3	10	2	10	245	f = region6

End System Time for our L3M is 1493357048787

Overall Accuracy of our L3M Classification : 93.49%



Start System Time is 1493357835012

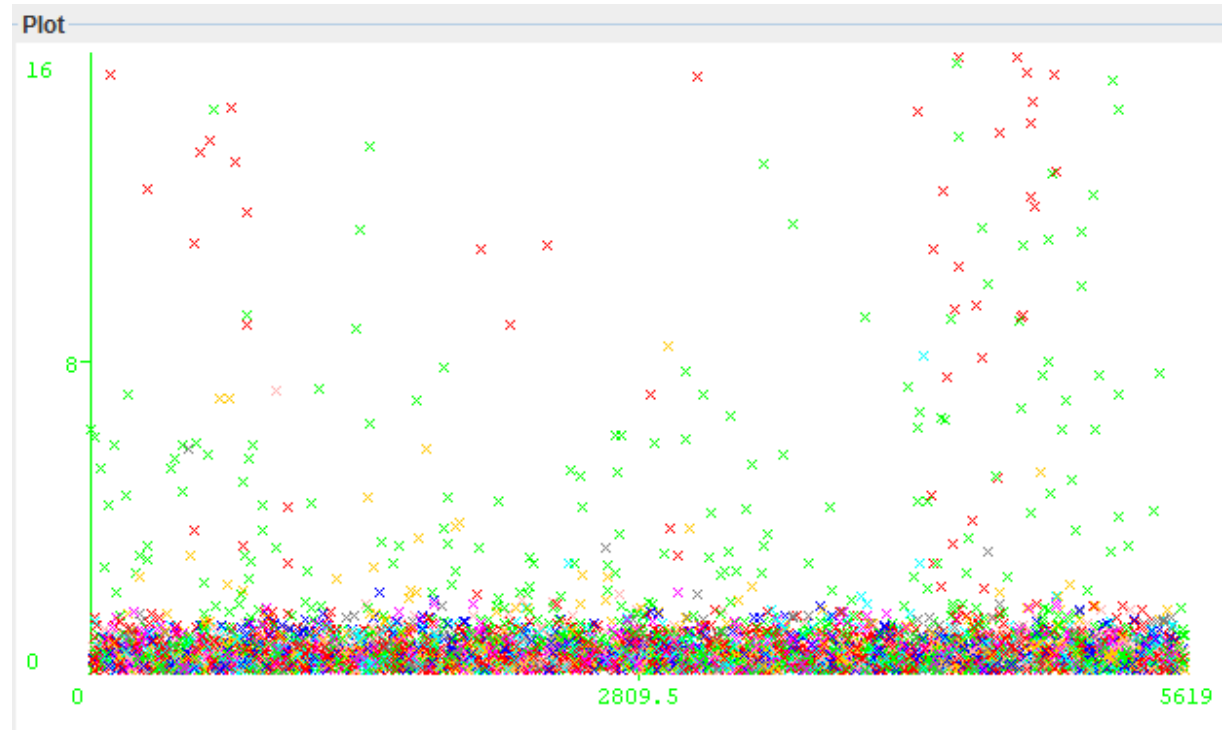
Correctly Classified Instances	348	19.3656 %
Incorrectly Classified Instances	1449	80.6344 %
Kappa statistic	0.1028	
Mean absolute error	0.1692	
Root mean squared error	0.2917	
Relative absolute error	94.017 %	
Root relative squared error	97.2466 %	
Total Number of Instances	1797	

=== Confusion Matrix ===

a	b	c	d	e	f	g	h	i	j	<-- classified as
0	0	0	3	0	0	175	0	0	0	a = 0
0	0	0	114	0	0	68	0	0	0	b = 1
0	0	0	113	0	0	64	0	0	0	c = 2
0	0	0	168	0	0	15	0	0	0	d = 3
0	0	0	43	0	0	138	0	0	0	e = 4
0	0	0	167	0	0	15	0	0	0	f = 5
0	0	0	1	0	0	180	0	0	0	g = 6
0	0	0	112	0	0	67	0	0	0	h = 7

0	0	0	38	0	0	136	0	0	0		i = 8
0	0	0	177	0	0	3	0	0	0		j = 9

End System Time is 1493357835408
Accuracy of AdaBoostM1: 19.37%



Start System Time for Decision Tree is 1493357838839

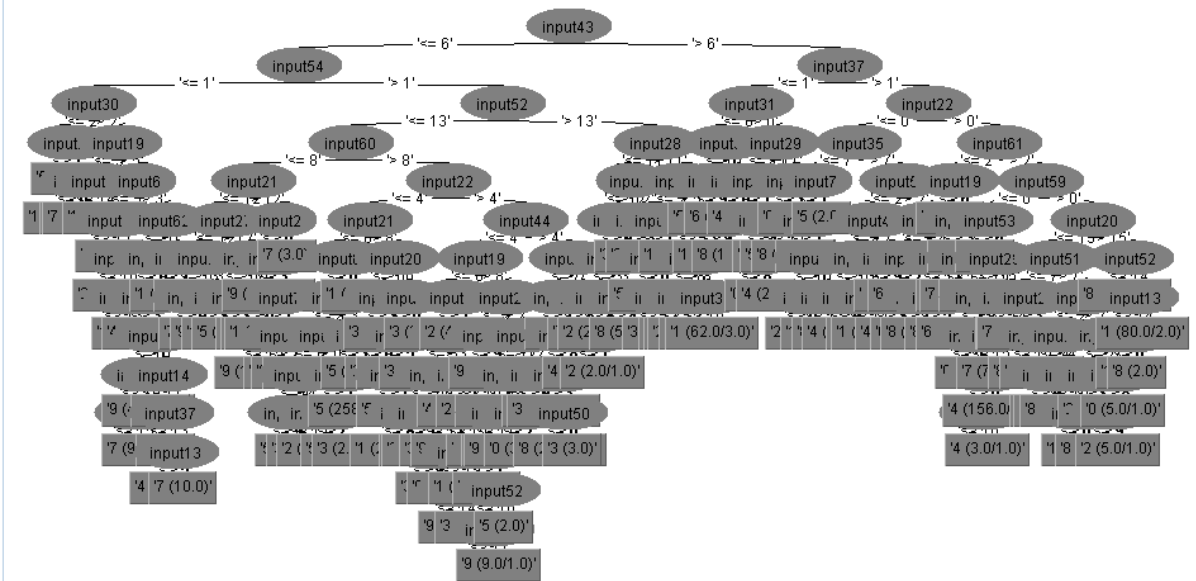
Correctly Classified Instances	1541	85.754 %
Incorrectly Classified Instances	256	14.246 %
Kappa statistic	0.8417	
Mean absolute error	0.0306	
Root mean squared error	0.1614	
Relative absolute error	16.9876 %	
Root relative squared error	53.8008 %	
Total Number of Instances	1797	

=== Confusion Matrix ===

a	b	c	d	e	f	g	h	i	j	<-- classified as
169	0	0	0	5	2	0	0	1	1	a = 0
0	164	1	2	0	0	2	8	2	3	b = 1
1	4	149	6	4	0	5	0	8	0	c = 2
0	11	6	147	1	0	0	4	7	7	d = 3
3	11	1	1	149	0	2	3	10	1	e = 4
2	1	1	4	5	159	4	1	1	4	f = 5
0	2	0	0	2	1	170	0	6	0	g = 6
0	0	0	1	8	0	1	141	13	15	h = 7
0	8	10	3	2	4	1	1	143	2	i = 8
3	1	7	5	5	5	0	3	1	150	j = 9

End System Time for Decision Tree is 1493357839395
Accuracy of Decision Tree : 52.56%

Tree View



Polynomial

Correctly Classified Instances	267	14.8581 %
Incorrectly Classified Instances	1530	85.1419 %
Kappa statistic	0.0521	
Mean absolute error	0.1703	
Root mean squared error	0.4127	
Relative absolute error	94.6029 %	
Root relative squared error	137.5513 %	
Total Number of Instances	1797	

=== Confusion Matrix ===

a	b	c	d	e	f	g	h	i	j	<-- classified as
0	0	0	178	0	0	0	0	0	0	a = 0
0	84	0	98	0	0	0	0	0	0	b = 1
0	0	0	177	0	0	0	0	0	0	c = 2
0	0	0	183	0	0	0	0	0	0	d = 3
0	9	0	172	0	0	0	0	0	0	e = 4
0	0	0	182	0	0	0	0	0	0	f = 5
0	6	0	175	0	0	0	0	0	0	g = 6
0	0	0	179	0	0	0	0	0	0	h = 7
0	21	0	153	0	0	0	0	0	0	i = 8
0	0	0	180	0	0	0	0	0	0	j = 9

End System Time for SVM is 1493358123042

RBF

Start System Time for SVM is 1493357840265

Correctly Classified Instances	1753	97.5515 %
Incorrectly Classified Instances	44	2.4485 %

```

Kappa statistic          0.9728
Mean absolute error      0.0049
Root mean squared error  0.07
Relative absolute error   2.7206 %
Root relative squared error 23.3263 %
Total Number of Instances 1797

```

=== Confusion Matrix ===

	a	b	c	d	e	f	g	h	i	j	<-- classified as
177	0	0	0	1	0	0	0	0	0	0	a = 0
0	180	0	0	0	0	0	0	0	1	1	b = 1
0	2	175	0	0	0	0	0	0	0	0	c = 2
0	0	2	175	0	2	0	2	1	1	1	d = 3
0	0	0	0	180	0	0	0	0	1	0	e = 4
0	0	0	0	0	180	0	0	0	0	2	f = 5
0	0	0	0	0	1	0	179	0	1	0	g = 6
0	0	0	0	0	0	3	0	169	0	7	h = 7
0	6	0	0	0	0	0	0	0	163	5	i = 8
0	0	0	2	0	2	0	0	0	1	175	j = 9

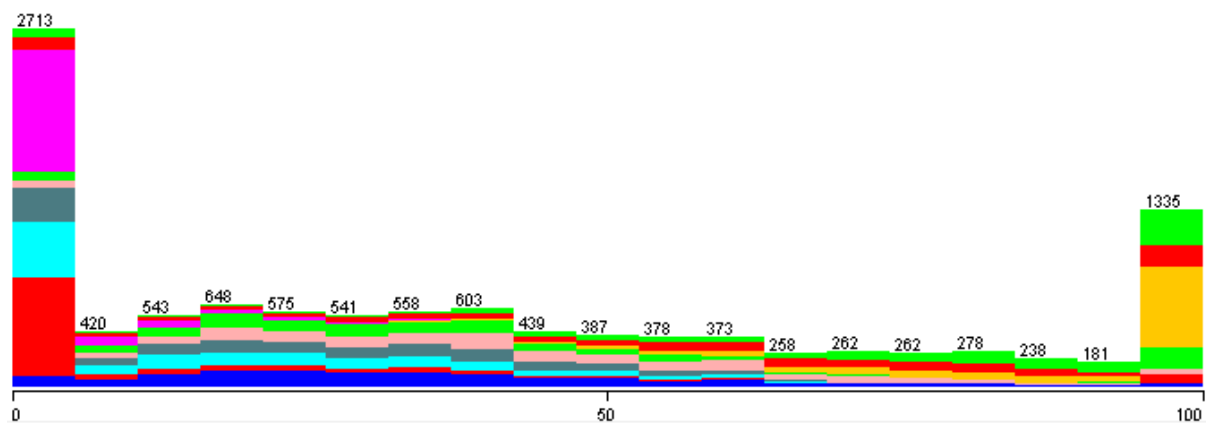
End System Time for SVM is 1493357845059

Pendigits

```

Dimensions : 16
Classes    : 10
Training   : 7494 (0.681769)
Test       : 3498

```



Coefficients...

Variable	Class region1	region2	region3	region4	region5
input1	0.195	0.0689	0.3596	0.2202	0.1233
input2	-0.4052	0.027	0.9056	-0.0183	-0.3829
input3	0.2346	-0.0053	0.1359	0.1677	0.1937
input4	0.6356	0.1883	1.2475	0.585	1.676
input5	0.1748	0.1215	-0.0931	-0.375	0.2913
input6	-0.1399	0.3255	-0.8531	-0.2783	-0.2743
input7	-0.0256	-0.0039	-0.3703	-0.0013	-0.058
input8	1.2393	-0.0651	0.8554	1.18	1.1102
input9	0.1452	-0.1892	-0.0555	0.2242	-0.0028
input10	-0.4434	-0.1481	-0.8963	-0.5674	-0.6377

input11	-0.3176	-0.3752	-0.3538	-0.275	-0.4496
input12	-0.0496	-0.2188	-0.3013	0.2405	-0.3786
input13	0.1258	0.0901	0.1763	0.1877	0.0516
input14	-0.9765	-0.1533	-0.9312	-0.7591	-0.9275
input15	0.2171	0.247	-0.0355	0.228	0.7961
input16	-0.5211	0.5921	-0.2292	-19.0145	-0.4028
class=0	-122.47	-89.3814	-105.8483	-144.9444	-87.7893
class=1	-94.7377	-70.9827	-90.5076	-114.1858	-66.6618
class=2	-199.9526	-185.7943	-212.6227	-235.4539	-169.7767
class=3	-82.2723	-71.5864	-104.8174	-83.2053	-72.054
class=4	-11.1915	-57.6068	-1.5055	-15.8414	-52.6113
class=5	630.3594	662.3303	629.6442	624.4528	549.4324
class=6	199.5357	69.4526	209.2244	207.0532	154.7663
class=7	-37.7418	-38.897	-44.3943	-41.3792	-14.226
class=8	-113.7984	-85.8843	-115.2065	-16.5356	-77.4009
class=9	-133.3497	-98.8625	-130.4245	-139.2286	-134.7693
Intercept	132.3036	44.901	41.3588	120.5915	-5.7688

Odds Ratios...

Variable	Class region1	region2	region3	region4	region5
input1	1.2153	1.0713	1.4328	1.2463	1.1312
input2	0.6669	1.0274	2.4734	0.9819	0.6819
input3	1.2644	0.9947	1.1456	1.1826	1.2137
input4	1.8882	1.2072	3.4816	1.795	5.3442
input5	1.191	1.1292	0.9111	0.6873	1.3382
input6	0.8694	1.3848	0.4261	0.7571	0.7601
input7	0.9747	0.9961	0.6905	0.9987	0.9437
input8	3.4532	0.937	2.3522	3.2542	3.035
input9	1.1563	0.8276	0.946	1.2513	0.9972
input10	0.6419	0.8624	0.4081	0.567	0.5285
input11	0.7279	0.6872	0.702	0.7596	0.6379
input12	0.9516	0.8035	0.7398	1.2719	0.6848
input13	1.134	1.0943	1.1928	1.2065	1.0529
input14	0.3766	0.8579	0.3941	0.4681	0.3955
input15	1.2425	1.2802	0.9652	1.2561	2.2168
input16	0.5939	1.8078	0.7952	0	0.6685
class=0	0	0	0	0	0
class=1	0	0	0	0	0
class=2	0	0	0	0	0
class=3	0	0	0	0	0
class=4	0	0	0.2219	0	0
class=5	5.77552394814748E273	4.429927208517138E287	2.824760411862522E273	1.5719057103328766E271	4.125136900559797E238
class=6	4.541888972640503E86	1.455018797006993E30	7.328537360764346E90	8.357607783753689E89	1.6373905625783728E67
class=7	0	0	0	0	0
class=8	0	0	0	0	0
class=9	0	0	0	0	0

Time taken to build model: 10.53 seconds

Correctly Classified Instances	3457	98.8279 %
Incorrectly Classified Instances	41	1.1721 %
Kappa statistic	0.9853	
Mean absolute error	0.0043	
Root mean squared error	0.0573	
Relative absolute error	1.6186 %	
Root relative squared error	15.7239 %	
Total Number of Instances	3498	

=== Confusion Matrix ===

a	b	c	d	e	f	<-- classified as
1077	0	0	4	6	0	a = region1
1	357	2	0	6	3	b = region2
1	0	352	1	1	0	c = region3
3	0	1	493	0	0	d = region4
9	1	0	0	785	0	e = region5
1	1	0	0	0	393	f = region6

Start System Time is 1493358949703

Correctly Classified Instances	723	20.669 %
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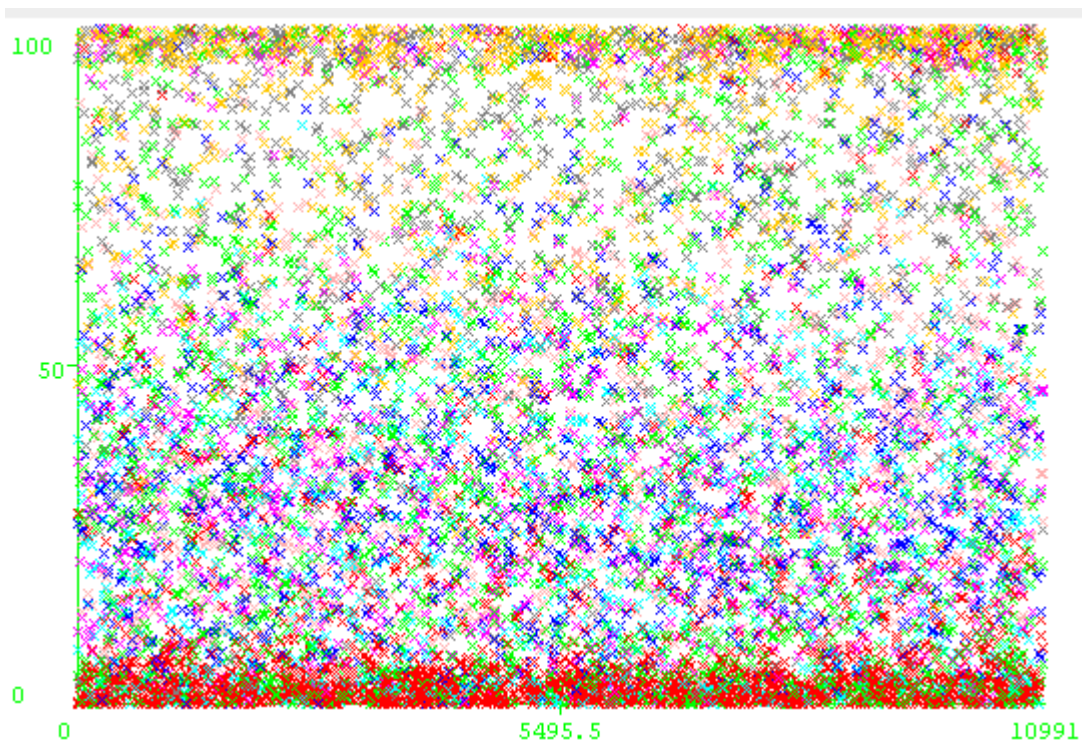
Incorrectly Classified Instances	2775	79.331 %
Kappa statistic	0.1147	
Mean absolute error	0.1662	
Root mean squared error	0.2885	
Relative absolute error	92.3348 %	
Root relative squared error	96.1696 %	
Total Number of Instances	3498	

=== Confusion Matrix ===

	a	b	c	d	e	f	g	h	i	j	<-- classified as
359	0	0	0	4	0	0	0	0	0	0	a = 0
0	0	0	0	364	0	0	0	0	0	0	b = 1
6	0	0	0	358	0	0	0	0	0	0	c = 2
8	0	0	0	328	0	0	0	0	0	0	d = 3
0	0	0	0	364	0	0	0	0	0	0	e = 4
169	0	0	0	166	0	0	0	0	0	0	f = 5
200	0	0	0	136	0	0	0	0	0	0	g = 6
284	0	0	0	80	0	0	0	0	0	0	h = 7
336	0	0	0	0	0	0	0	0	0	0	i = 8
5	0	0	0	331	0	0	0	0	0	0	j = 9

End System Time is 1493358950224

Accuracy of AdaBoostM1: 20.67%



Start System Time for Decision Tree is 1493358956735

Correctly Classified Instances	3220	92.0526 %
Incorrectly Classified Instances	278	7.9474 %
Kappa statistic	0.9117	
Mean absolute error	0.0174	
Root mean squared error	0.124	

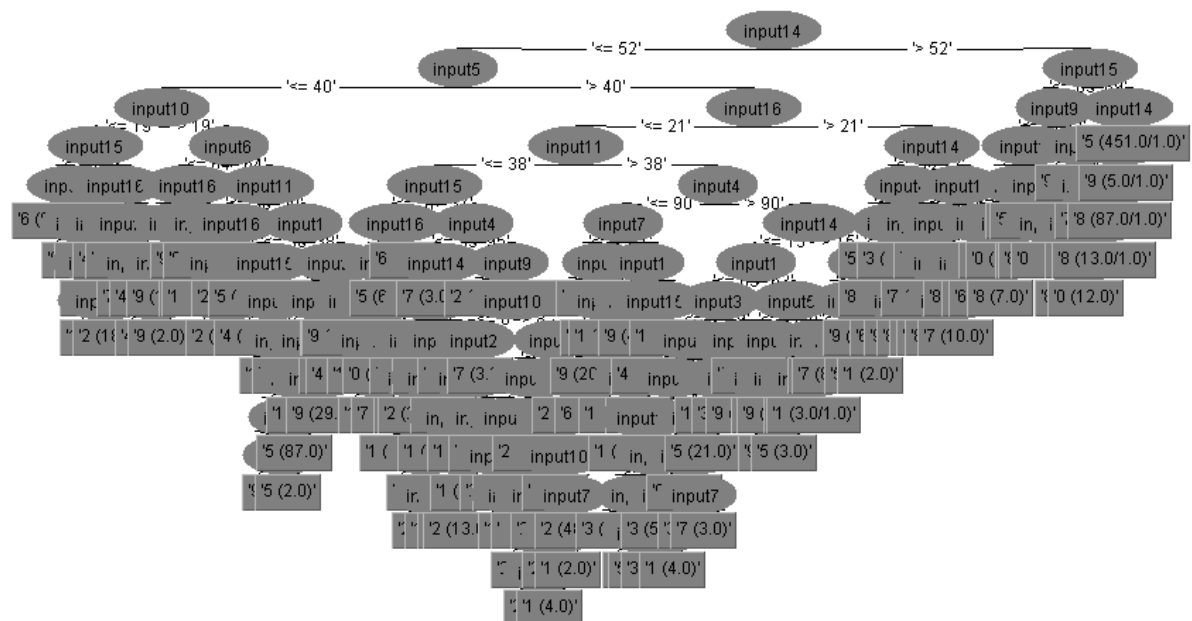
Relative absolute error	9.6826 %
Root relative squared error	41.3535 %
Total Number of Instances	3498

=== Confusion Matrix ===

	a	b	c	d	e	f	g	h	i	j	<-- classified as
347	1	0	0	0	0	0	0	2	13	0	a = 0
0	315	45	0	1	0	0	0	2	0	1	b = 1
0	21	339	0	0	0	0	0	2	0	2	c = 2
0	5	2	324	0	3	0	1	0	1	1	d = 3
0	3	2	0	348	3	2	0	0	6	1	e = 4
0	1	0	18	2	283	1	0	6	24	1	f = 5
6	2	0	0	1	3	318	2	0	4	1	g = 6
0	34	4	0	0	0	0	324	2	0	1	h = 7
2	0	1	0	0	2	2	8	320	1	1	i = 8
0	11	0	7	4	9	0	2	1	302	1	j = 9

End System Time for Decision Tree is 1493358958450
Accuracy of Decision Tree : 56.36%

Tree View



Start System Time for SVM is 1493358961300

Polynomial Kernel

Correctly Classified Instances	2833	80.9891 %
Incorrectly Classified Instances	665	19.0109 %
Kappa statistic	0.7888	
Mean absolute error	0.038	
Root mean squared error	0.195	
Relative absolute error	21.1269 %	
Root relative squared error	65.003 %	
Total Number of Instances	3498	

=== Confusion Matrix ===

	a	b	c	d	e	f	g	h	i	j	<-- classified as
323	0	8	0	0	0	0	20	0	12	0	a = 0
0	141	157	3	1	24	36	2	0	0	0	b = 1
0	2	359	0	0	0	0	0	3	0	0	c = 2
0	2	0	332	0	0	0	0	0	0	2	d = 3
0	0	6	0	334	0	22	0	0	0	2	e = 4
0	0	0	49	0	193	39	0	0	0	54	f = 5
0	0	0	0	0	0	336	0	0	0	0	g = 6
0	52	106	8	0	2	8	185	1	2	0	h = 7
5	0	3	0	0	5	1	0	322	0	0	i = 8
0	7	0	16	3	0	1	0	1	308	0	j = 9

End System Time for SVM is 1493358996315

RBF

Start System Time for SVM is 1493359289137

Correctly Classified Instances	3347	95.6832 %
Incorrectly Classified Instances	151	4.3168 %
Kappa statistic	0.952	
Mean absolute error	0.0086	
Root mean squared error	0.0929	
Relative absolute error	4.7972 %	
Root relative squared error	30.975 %	
Total Number of Instances	3498	

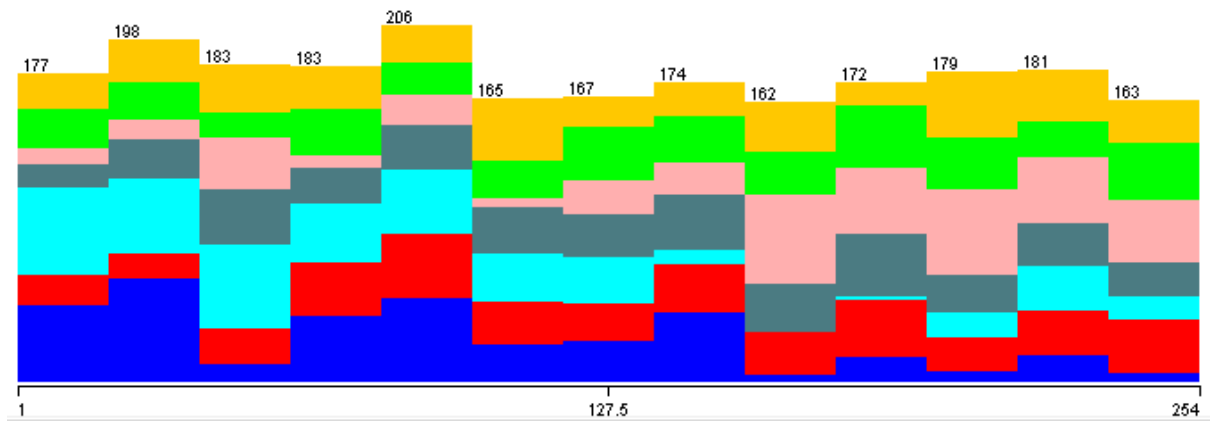
=== Confusion Matrix ===

	a	b	c	d	e	f	g	h	i	j	<-- classified as
343	0	0	0	0	0	0	0	0	20	0	a = 0
0	308	35	0	1	19	0	1	0	0	0	b = 1
0	3	361	0	0	0	0	0	0	0	0	c = 2
0	2	0	332	0	0	0	0	0	0	2	d = 3
0	0	0	0	352	10	2	0	0	0	0	e = 4
0	0	0	7	0	325	0	0	0	0	3	f = 5
0	1	0	0	0	0	335	0	0	0	0	g = 6
0	25	3	1	0	0	0	330	1	4	0	h = 7
2	0	0	0	0	2	0	0	332	0	0	i = 8
0	3	0	0	0	2	0	1	1	329	0	j = 9

End System Time for SVM is 1493359303330

Image Segmentation

Dimensions : 19
 Classes : 7
 Training : 210 (9%)
 Test : 2100



Variable	Class region1	region2	region3	region4	region5
region-centroid-col	0.2439	-0.182	0.2358	-0.0077	0.3347
region-centroid-row	0.2748	0.3484	0.1287	0.0118	0.7363
short-line-density-5	-104.1412	-572.3421	-69.6341	-23.547	-266.4772
short-line-density-2	-391.7592	-960.795	977.5752	222.5491	374.6997
vedge-mean	1.83	-7.4575	4.7561	1.3601	3.7736
vedge-sd	-7.6669	1.3548	1.0915	1.3266	-3.5663
hedge-mean	-1.642	-13.1993	4.0727	0.8506	-11.7453
hedge-sd	-13.6386	1.0412	0.6874	0.6819	-2.008
intensity-mean	0.3281	0.4997	-3.411	0.6365	1.4676
rawred-mean	0.4041	0.7202	-4.0244	0.7717	1.964
rawblue-mean	0.0916	0.2751	-2.8027	0.5253	1.0399
rawgreen-mean	0.5785	0.5899	-3.526	0.6352	1.5395
exred-mean	0.3948	3.4828	0.6927	0.4478	6.0793
exblue-mean	-2.3837	-1.6228	-2.6614	0.5311	-1.322
exgreen-mean	6.4422	1.1577	6.9382	-1.9764	-2.3174
value-mean	-11.8934	0.8344	5.2888	0.8723	-0.4643
saturation-mean	345.4979	319.8386	244.6546	-73.339	649.3814
hue-mean	3.3668	-2.9549	-28.2718	-24.3891	17.6013
class=brickface	-325.6713	-76.8359	-268.6299	9.8723	-51.939
class=sky	1214.7802	171.375	670.6346	-217.3599	-17.7625
class=foliage	-297.3159	-67.7099	-156.7952	-5.1791	-36.0543
class=cement	-243.9053	-76.7416	-90.7626	-8.7579	20.3831
class>window	-281.0321	-25.1409	-127.9373	7.274	-191.6191
class=path	110.648	-30.1278	-64.2431	-21.1161	-27.9465
class=grass	-177.5036	105.181	37.7335	235.2667	304.9383
Intercept	303.9777	-130.8818	53.5989	-201.9763	-475.935

Odds Ratios...

Variable	Class region1	region2	region3	region4	region5
region-centroid-col	1.2762	0.8336	1.266	0.9923	1.3976
region-centroid-row	1.3162	1.4168	1.1373	1.0119	2.0883
short-line-density-5	0	0	0	0	0
short-line-density-2	0	0	Infinity	4.48591798159259E96	5.370435613466451E162
vedge-mean	6.2336	0.0006	116.2874	3.8964	43.5352
vedge-sd	0.0005	3.876	2.9788	3.7683	0.0283
hedge-mean	0.1936	0	58.7155	2.3411	0
hedge-sd	0	2.8327	1.9885	1.9776	0.1343
intensity-mean	1.3884	1.6482	0.033	1.8899	4.339
rawred-mean	1.4979	2.0549	0.0179	2.1633	7.1275
rawblue-mean	1.0959	1.3166	0.0606	1.6909	2.8289
rawgreen-mean	1.7833	1.8038	0.0294	1.8874	4.6621
exred-mean	1.4842	32.5515	1.9991	1.5649	436.7239
exblue-mean	0.0922	0.1973	0.0698	1.7008	0.2666
exgreen-mean	627.7675	3.1825	1030.9406	0.1386	0.0985
value-mean	0	2.3033	198.1133	2.3925	0.6286
saturation-mean	1.1164024656976971E150	8.019340081572327E138	1.7870576342529216E106	0	1.0537916265667314E282
hue-mean	28.9845	0.0521	0	0	44070995.1672
class=brickface	0	0	0	19385.3639	0
class=sky	Infinity	2.6744124456361775E74	1.7901869417660956E291	0	0
class=foliage	0	0	0	0.0056	0
class=cement	0	0	0	0.0002	711619278.3859
class>window	0	0	0	1442.3261	0
class=path	1.1319714875128853E48	0	0	0	0
class=grass	0	4.781078726752334E45	2.4404117430530024E16	1.4962726484219859E102	2.7103880696859148E132

Time taken to build model: 4.79 seconds

Correctly Classified Instances	1948	92.7619 %
Incorrectly Classified Instances	152	7.2381 %
Kappa statistic	0.9046	
Mean absolute error	0.0237	
Root mean squared error	0.1486	
Relative absolute error	9.4419 %	
Root relative squared error	41.6376 %	

Total Number of Instances 2100

=== Confusion Matrix ===

	a	b	c	d	e	f	<-- classified as
290	0	4	2	1	2		a = region1
0	300	2	0	0	0		b = region2
0	3	481	26	4	9		c = region3
0	0	3	747	3	1		d = region4
1	2	9	12	75	39		e = region5
0	0	18	0	11	55		f = region6

AdaBoost

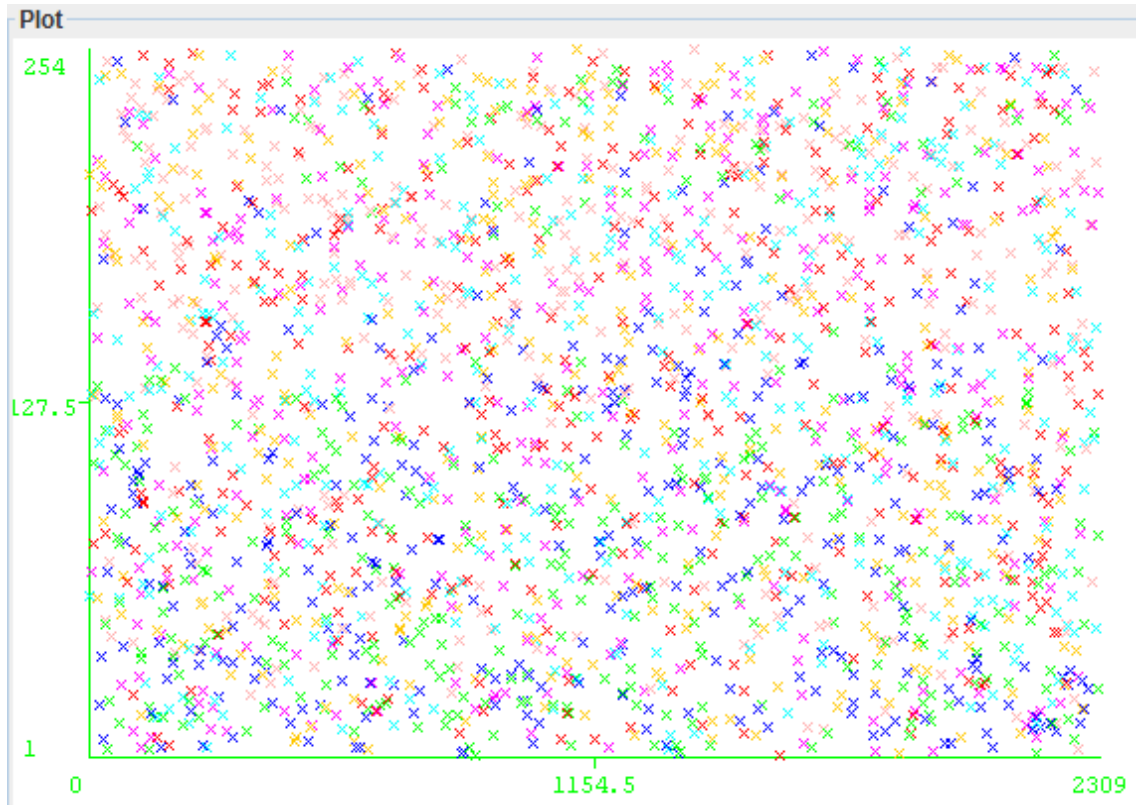
Start System Time is 1493359652759

Correctly Classified Instances	593	28.2381 %
Incorrectly Classified Instances	1507	71.7619 %
Kappa statistic	0.1639	
Mean absolute error	0.2056	
Root mean squared error	0.3216	
Relative absolute error	83.9397 %	
Root relative squared error	91.8121 %	
Total Number of Instances	2100	

=== Confusion Matrix ===

	a	b	c	d	e	f	g	<-- classified as
0	0	0	0	0	298	0	0	a = brickface
0	0	0	0	0	306	0	0	b = sky
0	0	0	0	0	298	0	0	c = foliage
0	0	0	0	0	295	5	0	d = cement
0	0	0	0	0	297	0	0	e = window
0	0	0	0	0	3	296	0	f = path
0	0	0	0	0	14	288	0	g = grass

End System Time is 1493359653111



Start System Time for Decision Tree is 1493359658632

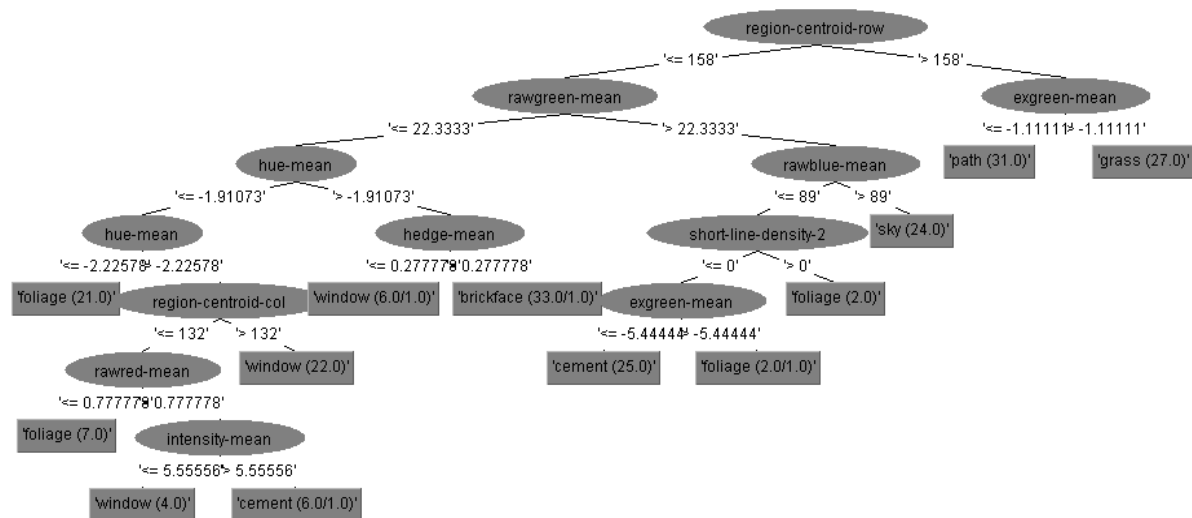
Correctly Classified Instances	1906	90.7619 %
Incorrectly Classified Instances	194	9.2381 %
Kappa statistic	0.8922	
Mean absolute error	0.0275	
Root mean squared error	0.1532	
Relative absolute error	11.2138 %	
Root relative squared error	43.7412 %	
Total Number of Instances	2100	

=== Confusion Matrix ===

	a	b	c	d	e	f	g		<-- classified as
290	0	0	2	6	0	0	0		a = brickface
0	306	0	0	0	0	0	0		b = sky
5	1	240	15	37	0	0	0		c = foliage
3	2	7	272	7	9	0	0		d = cement
8	0	21	55	213	0	0	0		e = window
0	0	0	0	0	299	0	0		f = path
2	0	12	0	0	2	286	0		g = grass

End System Time for Decision Tree is 1493359658916

Tree View



Polynomial

Start System Time for SVM is 1493359870806

Correctly Classified Instances	297	14.1429 %
Incorrectly Classified Instances	1803	85.8571 %
Kappa statistic	0	
Mean absolute error	0.2453	
Root mean squared error	0.4953	
Relative absolute error	100.1518 %	
Root relative squared error	141.4166 %	
Total Number of Instances	2100	

=== Confusion Matrix ===

a	b	c	d	e	f	g	<-- classified as
0	0	0	0	298	0	0	a = brickface
0	0	0	0	306	0	0	b = sky
0	0	0	0	298	0	0	c = foliage
0	0	0	0	300	0	0	d = cement
0	0	0	0	297	0	0	e = window
0	0	0	0	299	0	0	f = path
0	0	0	0	302	0	0	g = grass

End System Time for SVM is 1493359871330

RBF

Start System Time for SVM is 1493359661266

Correctly Classified Instances	1753	83.4762 %
Incorrectly Classified Instances	347	16.5238 %
Kappa statistic	0.8072	
Mean absolute error	0.0472	
Root mean squared error	0.2173	
Relative absolute error	19.2749 %	

Root relative squared error 62.0394 %
Total Number of Instances 2100

=== Confusion Matrix ===

	a	b	c	d	e	f	g	<-- classified as
226	0	8	7	57	0	0	0	a = brickface
0	306	0	0	0	0	0	0	b = sky
23	0	220	7	48	0	0	0	c = foliage
17	0	6	208	10	59	0	0	d = cement
36	0	46	20	195	0	0	0	e = window
0	0	0	0	0	0	299	0	f = path
1	0	2	0	0	0	299	0	g = grass

End System Time for SVM is 1493359663352
