Wine Project Report

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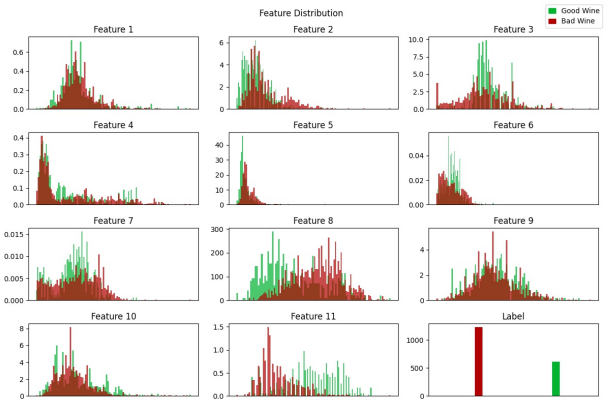
Contents



1 Preliminary Data Analysis

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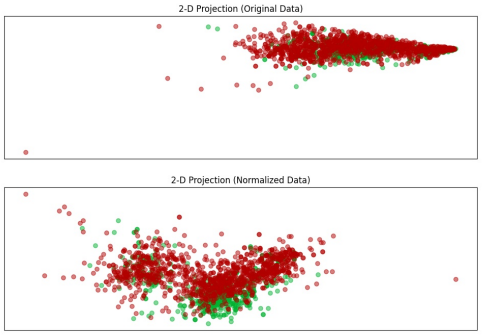

Table 1: MVG

π_T	PCA	Error Rate	DCF_{min}
0.7	8	16.803%	0.168
0.7	9	17.074%	0.171
0.6	9	17.183%	0.172
0.6	8	17.401%	0.174
0.7	7	17.510%	0.175
0.8	10	17.781%	0.178
0.7	10	17.836%	0.178
0.6	7	17.945%	0.179
0.5	9	18.162%	0.182
0.5	8	18.216%	0.182

Table 2: Naive Bayes MVG

π_T	PCA	Error Rate	DCF_{min}
0.7	9	18.597%	0.186
0.7	8	18.651%	0.187
0.8	10	19.195%	0.192
0.7	7	19.358%	0.194
0.7	6	19.413%	0.194
0.6	7	19.467%	0.195
0.6	5	19.521%	0.195
0.6	8	19.685%	0.197
0.8	8	19.739%	0.197
0.8	9	19.739%	0.197

Table 3: Tied Covariance MVG

π_T	PCA	Error Rate	DCF_{min}
0.5	9	17.346%	0.173
0.5	10	17.346%	0.173
0.6	7	18.380%	0.184
0.6	9	18.380%	0.184
0.6	10	18.380%	0.184
0.5	8	18.488%	0.185
0.5	7	18.651%	0.187
0.6	8	18.651%	0.187
0.7	7	19.304%	0.193
0.7	10	19.304%	0.193

Table 4: MVG (Normalized Samples)

π_T	PCA	Error Rate	DCF_{min}
0.5	6	13.859%	0.277
0.5	10	14.946%	0.299
0.5	7	15.761%	0.315
0.5	9	15.761%	0.315
0.5	8	17.391%	0.348
0.5	6	18.750%	0.375
0.5	9	18.750%	0.375
0.5	7	19.022%	0.380
0.5	5	19.565%	0.391
0.5	8	20.109%	0.402

Table 5: Naive Bayes MVG (Normalized Samples)

π_T	PCA	Error Rate	DCF_{min}
0.5	9	17.120%	0.342
0.5	10	17.391%	0.348
0.5	6	17.935%	0.359
0.5	7	18.478%	0.370
0.5	8	18.478%	0.370
0.5	4	21.467%	0.429
0.5	8	22.283%	0.446
0.5	7	22.826%	0.457
0.5	5	22.826%	0.457
0.5	6	23.098%	0.462

Table 6: Tied Covariance MVG (Normalized Samples)

π_T	PCA	Error Rate	DCF_{min}
0.5	6	10.326%	0.207
0.5	10	10.598%	0.212
0.5	9	10.870%	0.217
0.5	7	11.141%	0.223
0.5	4	12.228%	0.245
0.5	5	13.043%	0.261
0.5	8	13.043%	0.261
0.5	9	16.848%	0.337
0.5	10	16.848%	0.337
0.5	10	18.529%	0.371

Bias	γ	C	Error Rate
0	5	0.1	27.168%
0	5	1.0	27.223%
0	10	0.1	27.442%
0	10	1.0	27.497%
1.0	5	1.0	36.004%
1.0	10	1.0	36.114%
1.0	5	0.1	36.443%
1.0	10	0.1	36.443%

Table 7: Kernel SVM

λ	Error Rate
0	16.026%
1e-09	16.081%
1e-06	16.081%
0.001	15.587%
0.1	18.057%

Table 8: Logistic Regression

λ	PCA	Error Rate
0.001	10	15.587%
0	8	15.862%
1e-09	8	15.862%
1e-06	8	15.862%
0.001	8	15.917%
0	10	16.081%
1e-09	10	16.081%
1e-06	10	16.136%
0	6	16.630%
1e-09	6	16.630%

Table 9: Logistic Regression With PCA

λ	PCA	Error Rate
0.001	10	15.038%
0	10	15.258%
1e-09	10	15.258%
1e-06	10	15.258%
0	8	15.532%
1e-09	8	15.532%
1e-06	8	15.532%
0.001	8	15.532%
0.001	6	16.246%
0	6	16.301%

Table 10: Logistic Regression With PCA and Z-Normalization

Bias	C	Error Rate
0	0.1	17.728%
0	1	16.520%
1	0.1	35.565%
1	1	38.090%
5.0	0.1	15.862%
5.0	1	47.805%
10.0	0.1	15.642%
10.0	1	16.081%

Table 11: Linear SVM

Bias	C	PCA	Error Rate
10	0.1	10	15.313%
5	0.1	10	15.642%
5	0.1	6	15.971%
10	0.1	8	16.301%
5	0.1	8	16.356%
10	0.1	6	16.575%
0.1	0.1	8	18.057%
0.1	0.1	6	18.222%
0.1	0.1	10	18.551%
0	0.1	8	18.716%

Table 12: Linear SVM With PCA

Bias	C	PCA	Error Rate
1	0.1	10	14.709%
5.0	0.1	10	14.929%
10.0	0.1	10	14.929%
1	1	10	15.038%
5.0	1	10	15.038%
10.0	1	10	15.038%
1	1	8	15.258%
5.0	0.1	8	15.258%
5.0	1	8	15.258%
10.0	0.1	8	15.258%

Table 13: Linear SVM With PCA and Z-Normalization