

Learning Report 2

Task 2.1

k	Time (s)	N	Nerrs	acc (%)
1	10.64	3994	143	96.4196
3	11.06	3994	126	96.8453
5	10.80	3994	139	96.5198
10	10.58	3994	150	96.2444
20	11.05	3994	164	95.8938

Figure 2.1.1: Classification experiment with KNN classifier results table

Task 2.2

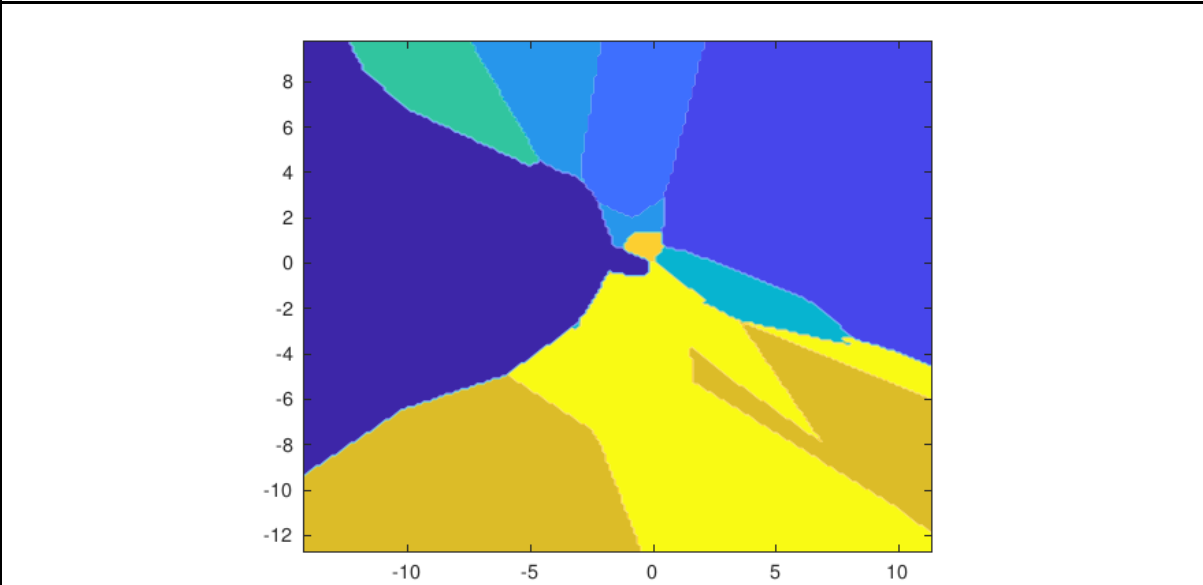


Figure 2.2.1: Cross-section image of decision regions with k-NN for k=1.

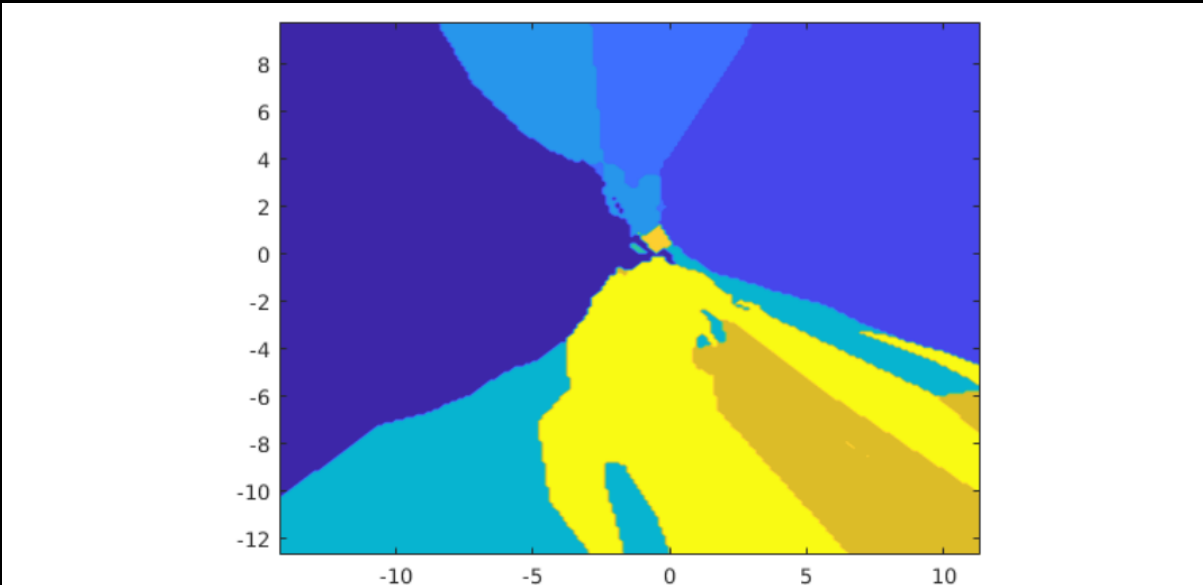


Figure 2.2.2: Cross-section image of decision regions with k-NN for k=3.

The sample size was reduced to N = 2000. This reduced sample size is due to the lack of memory and slowness when running.

Task 2.3

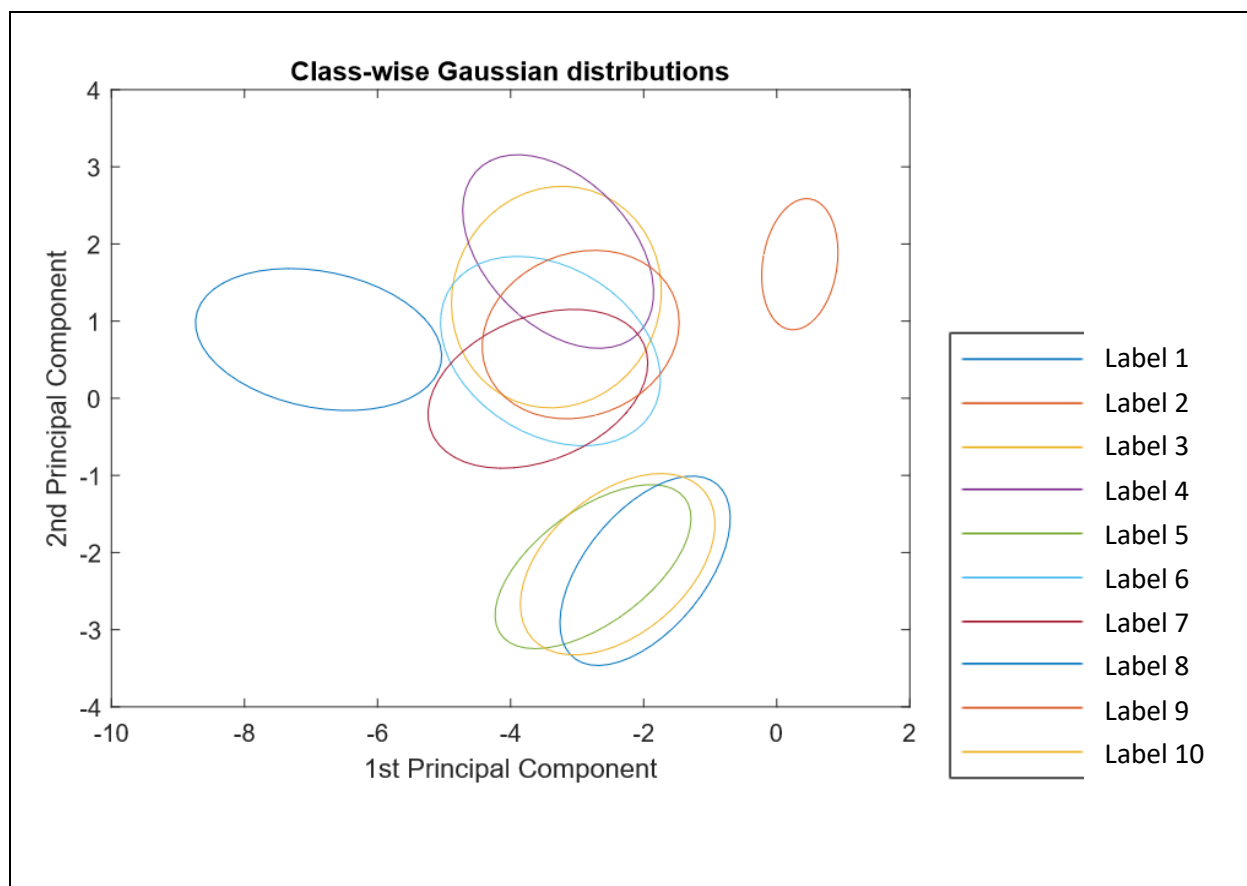


Figure 2.3.1: Class-wise Gaussian distributions

Task 2.4

```
>> main
1 : -2.346822e-01
2 : 1.772547e-01
3 : 5.439402e-02
4 : -4.235068e-01
5 : 5.903650e-01
6 : -3.005071e-01
7 : 3.234910e-01
8 : 5.536357e-01
9 : 1.429749e-01
10 : 4.448773e-01
All: 0
```

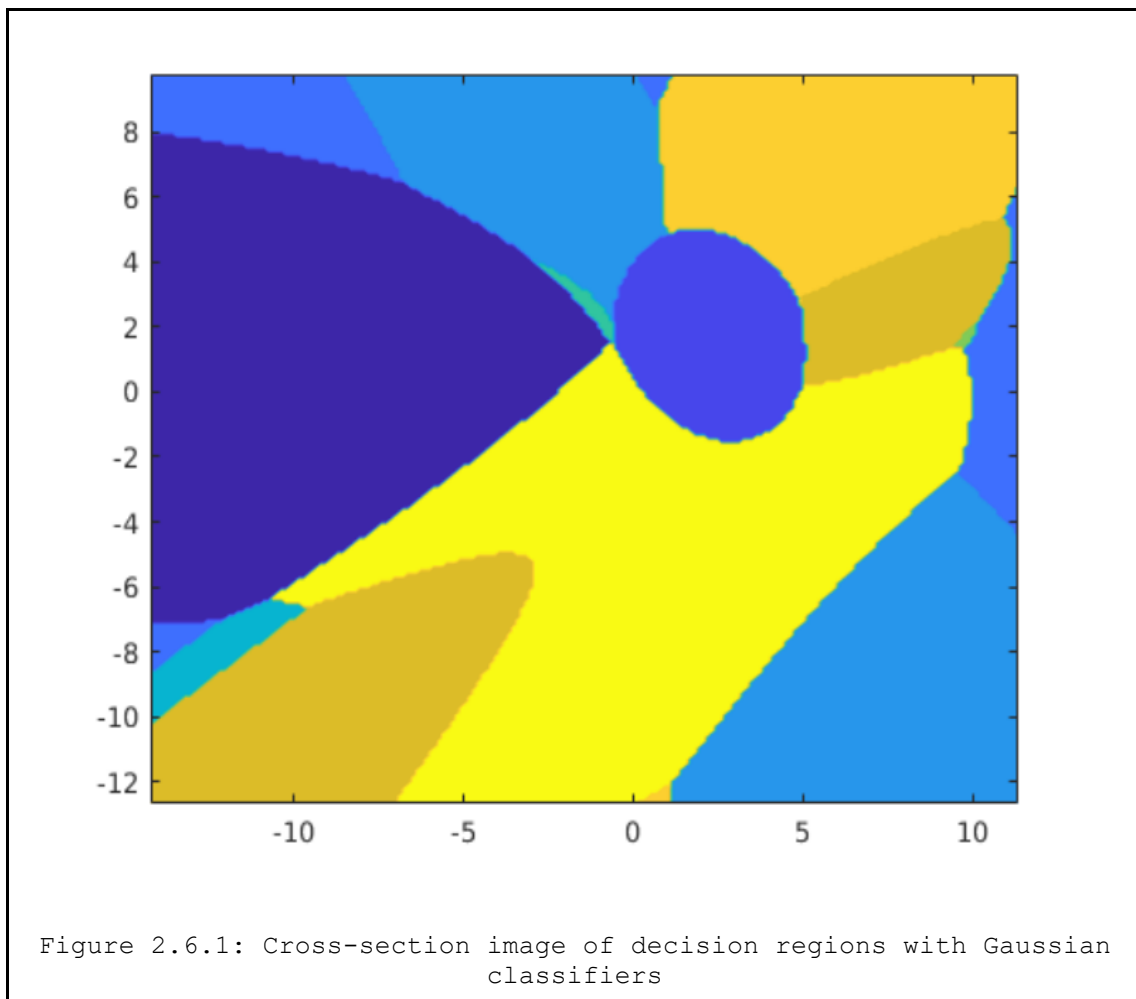
Figure 2.4.1: Correlations on 2D-PCA for each class

Task 2.5

N	Nerrs	acc	Time taken (s)
3994	226	0.9434	1.869967

Figure 2.5.1: Classification experiment with Gaussian distribution per class results table

Task 2.6



Task 2.7

Ratio	acc
0.9000	0.9432
0.8000	0.9434
0.7000	0.9424
0.6000	0.9417
0.5000	0.9424
0.4000	0.9417
0.3000	0.9419

Figure 2.7.1: Amount of training data on classification performance for Gaussian classifiers

Task 2.8

L	Time taken (s)	Number of test samples	Accuracy	Number of wrongly classified test samples
2	8.82	3994	0.7429	1027
5	19.37	3994	0.5829	1666
10	32.85	3994	0.4942	2020

Figure 2.5.1: K-Means clustering for multiple Gaussian classifiers per class experiment results table.