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ECE1395

Pes71

Problem Set 6 Report

0)
```
Shape of X_train_1 =  (40, 4)
Shape of X_train_2 =  (42, 4)
Shape of X_train_3 =  (43, 4)
```

1a)

Means				
	X1	X2	X3	X4
Class 1	-0.95503645	0.90088791	-1.28335256	-1.23561636
Class 2	0.01955215	-0.71057179	0.25173138	0.1414382
Class 3	0.922201	-0.16355204	1.03422804	1.09007893

Standard Deviation				
	X1	X2	X3	X4
Class 1	0.3770712	0.87814359	0.08991421	0.14034398
Class 2	0.58516051	0.7013402	0.26411131	0.23502111
Class 3	0.76616627	0.76746488	0.314555	0.37592883

1b)
```
Accuracy of classifier =  88.0 %
```

2a)
```
Sigma 1 shape =  (4, 4)
[[0.1458284  0.26818473 0.00325823 0.01093794]
 [0.26818473 0.79090889 0.01216345 0.03357229]
 [0.00325823 0.01216345 0.00829186 0.0035682 ]
 [0.01093794 0.03357229 0.0035682  0.02020147]]
Sigma 2 shape =  (4, 4)
[[0.35076435 0.21090408 0.12086883 0.07852627]
 [0.21090408 0.50387511 0.0974818  0.10099519]
 [0.12086883 0.0974818  0.07145612 0.04965294]
 [0.07852627 0.10099519 0.04965294 0.05658212]]
Sigma 3 shape =  (4, 4)
[[0.6009872  0.27536213 0.21410379 0.08415526]
 [0.27536213 0.60302621 0.09624368 0.15322974]
 [0.21410379 0.09624368 0.10130068 0.03788715]
 [0.08415526 0.15322974 0.03788715 0.1446873 ]]
```

2b)
```
Class 1 Means =  [[-0.95503645]
 [ 0.90088791]
 [-1.28335256]
 [-1.23561636]]
Class 2 Means =  [[ 0.01955215]
 [-0.71057179]
 [ 0.25173138]
 [ 0.1414382 ]]
Class 3 Means =  [[ 0.922201  ]
 [-0.16355204]
 [ 1.03422804]
 [ 1.09007893]]
```

2c)
```
Accuracy of max likelihood classifier =  96.0 %
```

While my naïve classifier was fairly accurate at 88%, the max likelihood classifier is far more accurate at 96% correct classification.