

Report  
ZHANG Xinyu  
1155091989

#### Problem 1

1. priors of C1, C2, C3 are 0.34125, 0.3383333333333333, 0.3204166666666667 respectively.
2. estimated p1, p2, p3 are 0.3443223443223443, 0.6120689655172413, 0.40182054616384916 respectively.
3. confusion matrix:

Predict	1	2	3
Actual			
1	135	70	0
2	70	108	0
3	148	69	0

4. accuracy: 0.405,  
precision: 0.38243626062322944, 0.43724696356275305, N/A,  
recall: 0.6585365853658537, 0.6067415730337079, 0.0,  
f1 score: 0.4838709677419354, 0.5082352941176471, 0,  
average f1 score: 0.3307020872865275.

#### Problem 2

1. priors of C1, C2, C3 are 0.3420833333333333, 0.3279166666666667, 0.33 respectively.
2. estimated mean and variance:

class	1	2	3
mean	-0.0250564301151661	3.0494696695962	-2.85995397479745
variance	1.06049330476199	3.92568754938056	9.70644192436316

3. confusion matrix:

Predict	1	2	3
Actual			
1	194	11	15
2	42	162	2
3	37	13	124

4. accuracy:0.8,  
precision: 0.7106227106227107, 0.8709677419354839, 0.8794326241134752,  
recall: 0.8818181818181818, 0.7864077669902912, 0.7126436781609196,  
f1 score: 0.7870182555780934, 0.826530612244898, 0.7873015873015873,  
average f1 score: 0.8002834850415262.

#### Problem 3

1. priors of C1, C2, C3 are 0.3291666666666667, 0.3333333333333333, 0.3375 respectively.
2. estimated estimated p, mean and variance:

class	1	2	3
p	0.1	0.515	0.771604938271605
mean	1.024669286594	4.96953006840174	9.88859946986072
variance	0.249284410688529	6.96916705034848	20.6189191242356

### 3. confusion matrix:

Predict	1	2	3
Actual			
1	204	9	0
2	15	144	27
3	4	50	147

### 4. accuracy: 0.825,

precision: 0.9147982062780269, 0.7093596059113301, 0.8448275862068966,

recall: 0.9577464788732394, 0.7741935483870968, 0.7313432835820896,

f1 score: 0.9357798165137613, 0.7403598971722365, 0.784,

average f1 score: 0.8200465712286661.