EECE5644 Fall 2019 – Homework 3

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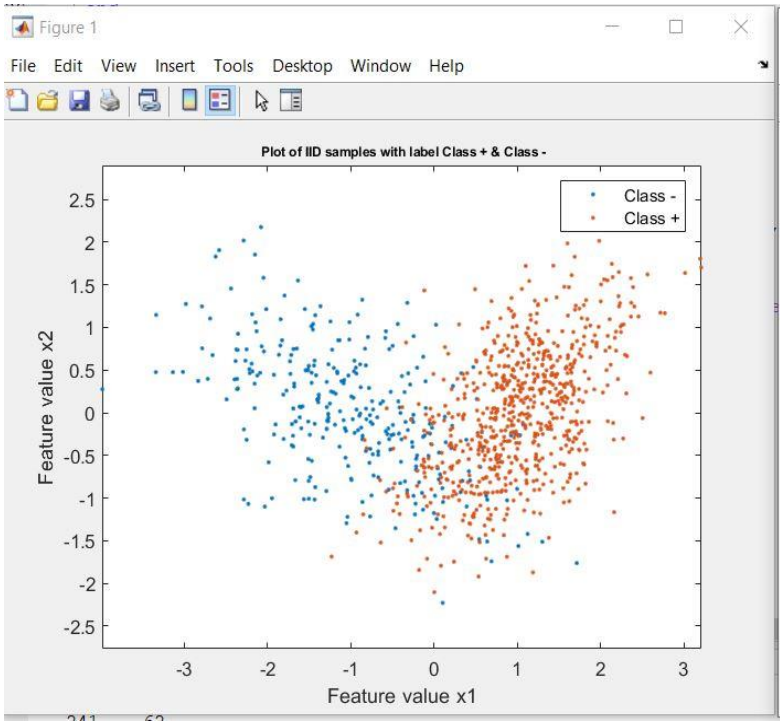
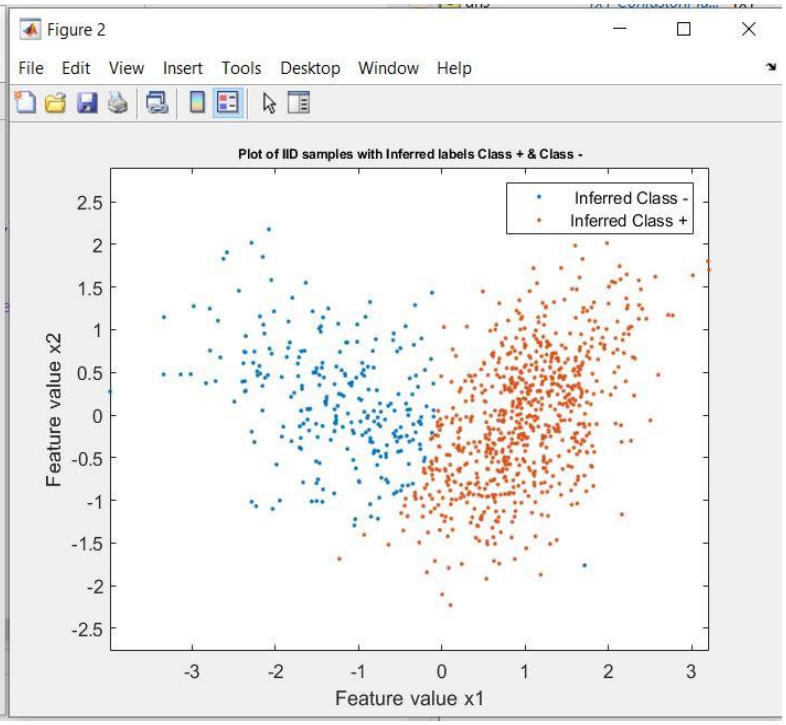
Question 2:

Plots and Results:

1. MAP- Classifier





Number of samples generated for Class –

303

Number of samples generated for Class +

696

The number of Misclassification errors: 79

Probability of error: 0.0791

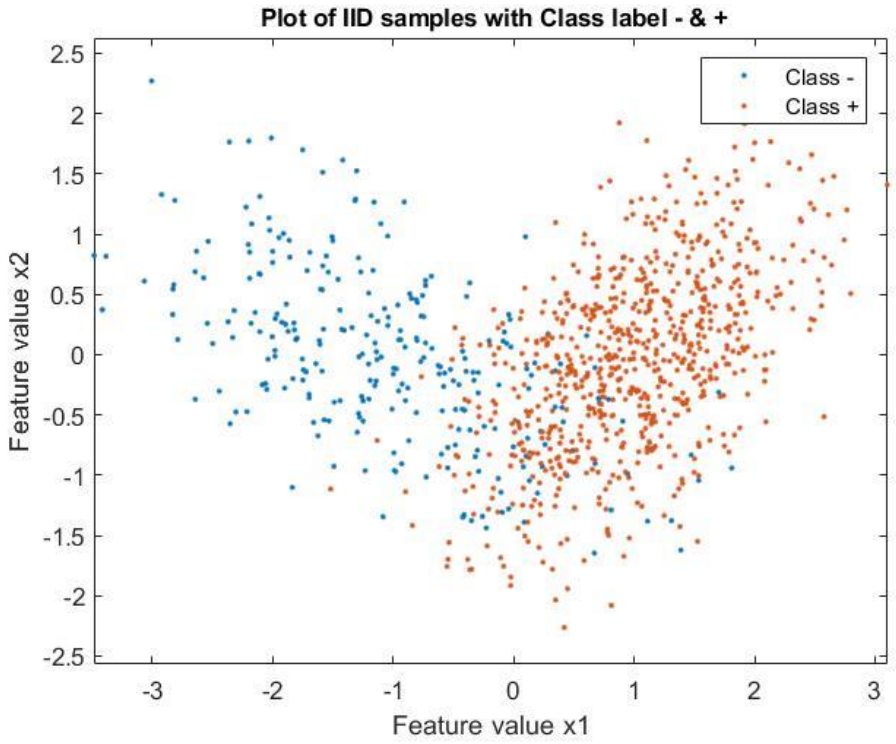
Number of samples inferred as Class –

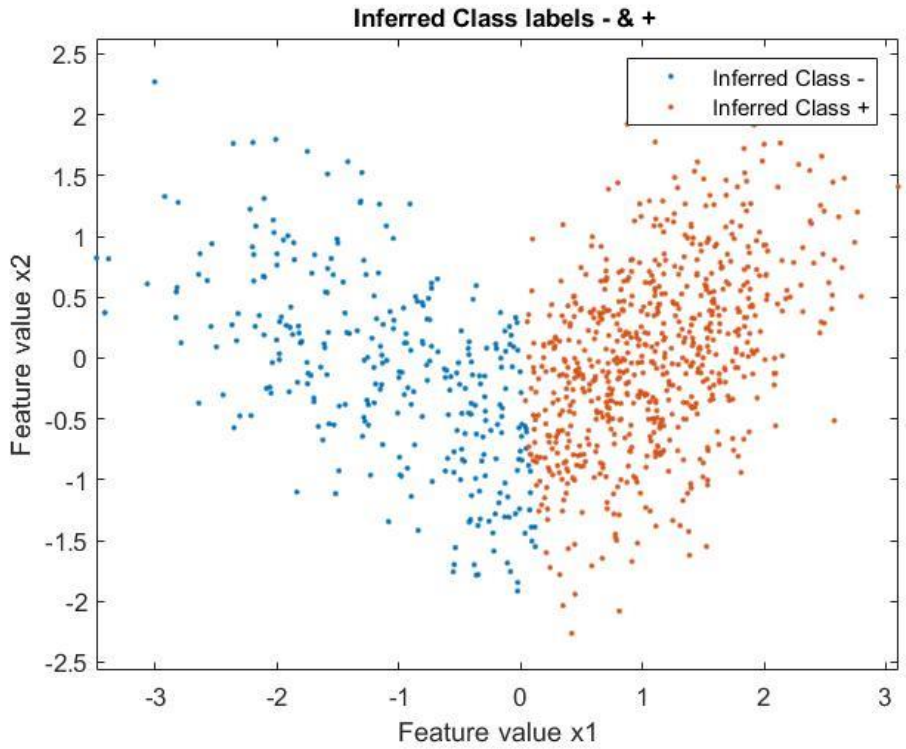
258

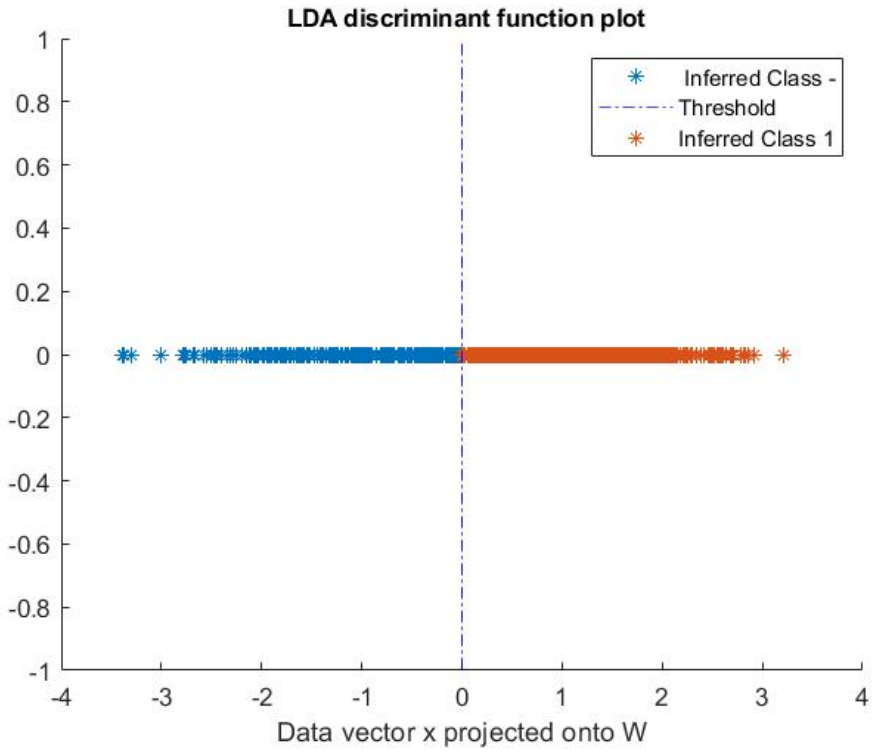
Number of samples inferred as Class +

741

2. LDA Classifier







Number of samples generated for Class –

266

Number of samples generated for Class +

733

The number of Misclassification errors: 109

Probability of error: 0.1091

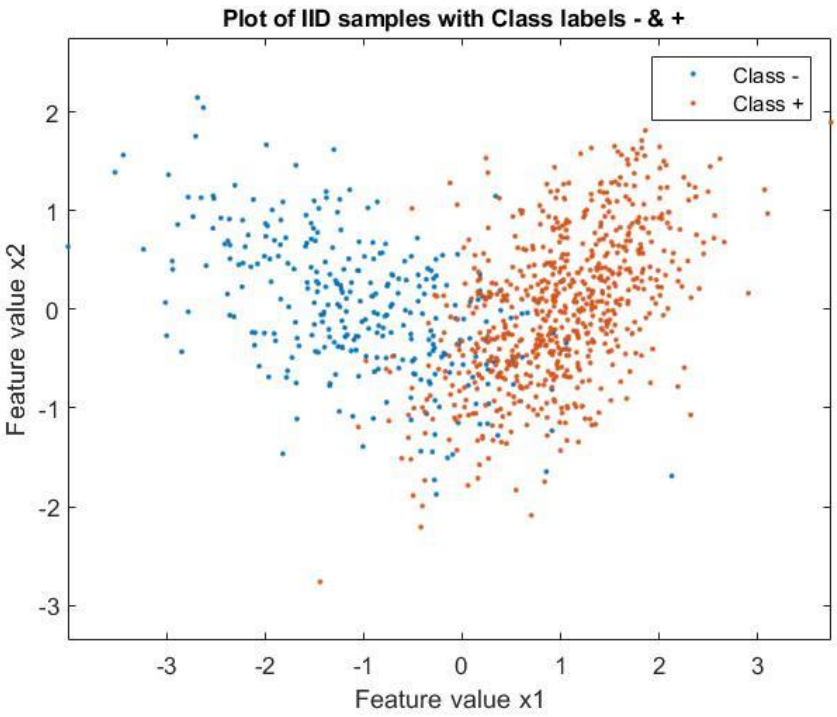
Number of samples inferred as Class –

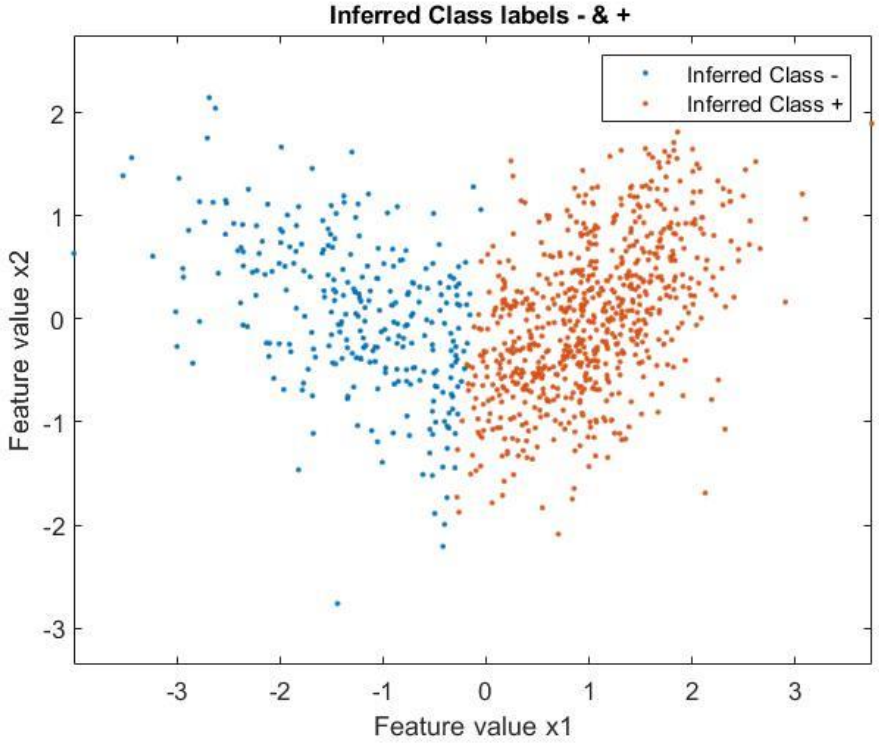
299

Number of samples inferred as Class +

700

3. Logistic Linear Classifier:





Number of samples generated for Class –

301

Number of samples generated for Class +

698

The number of Misclassification errors: 92

Probability of error: 0.0921

Number of samples inferred as Class –

279

Number of samples inferred as Class +

720

theta =

0.4581

3.2039

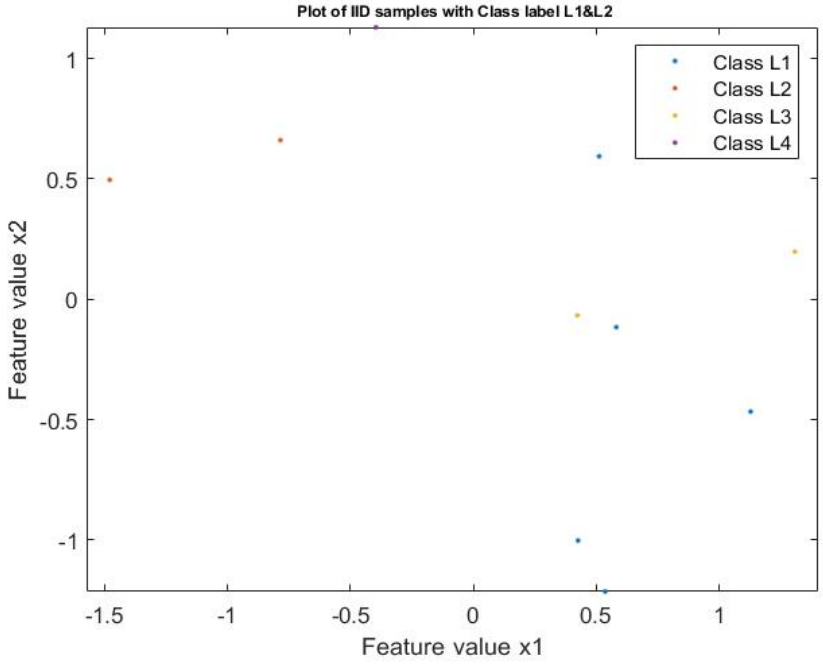
-0.3343

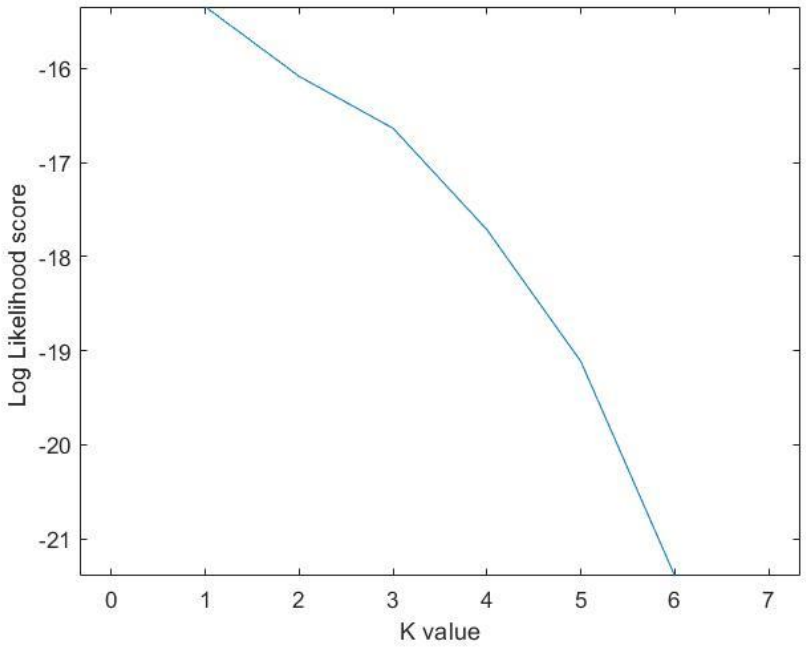
Classifiers	Number of Misclassifications	Probability of Error
1.MAP Classifier	79	0.0791
2. LDA Classifier	109	0.1091
3.Logistic Linear Classifier	92	0.0921

Question 1:

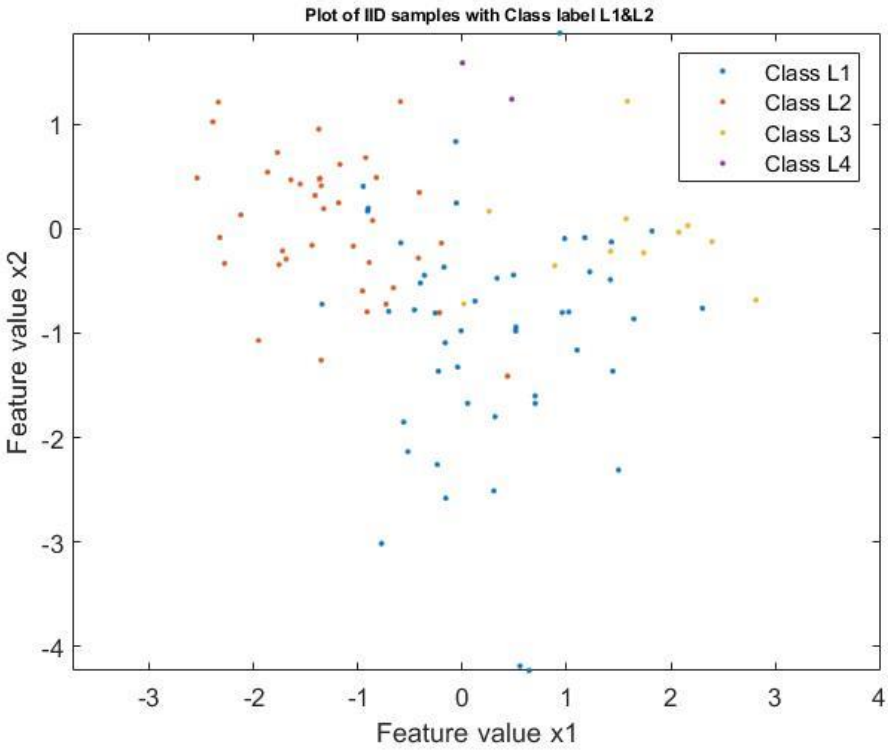
Plots and Results:

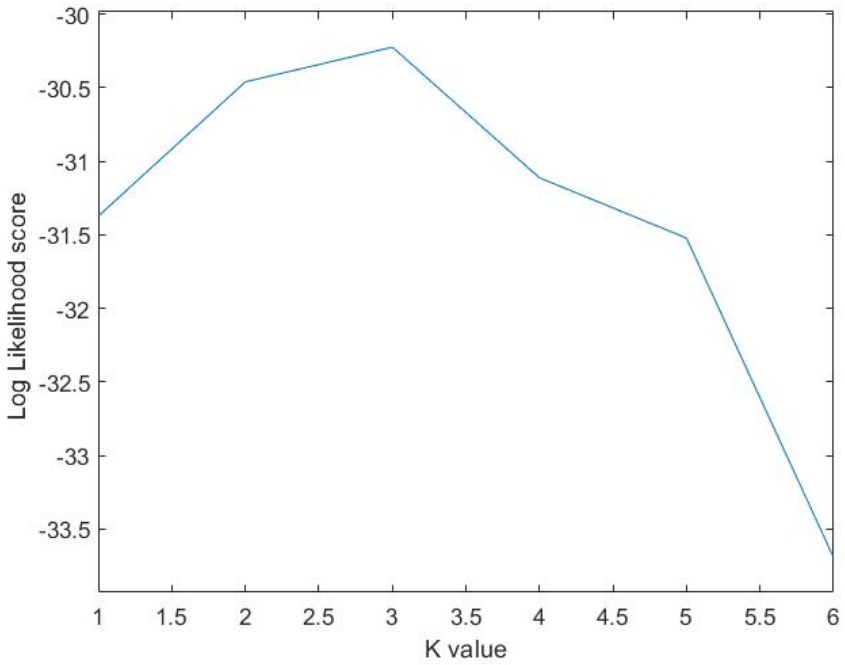
1.Data Set N=10 Samples



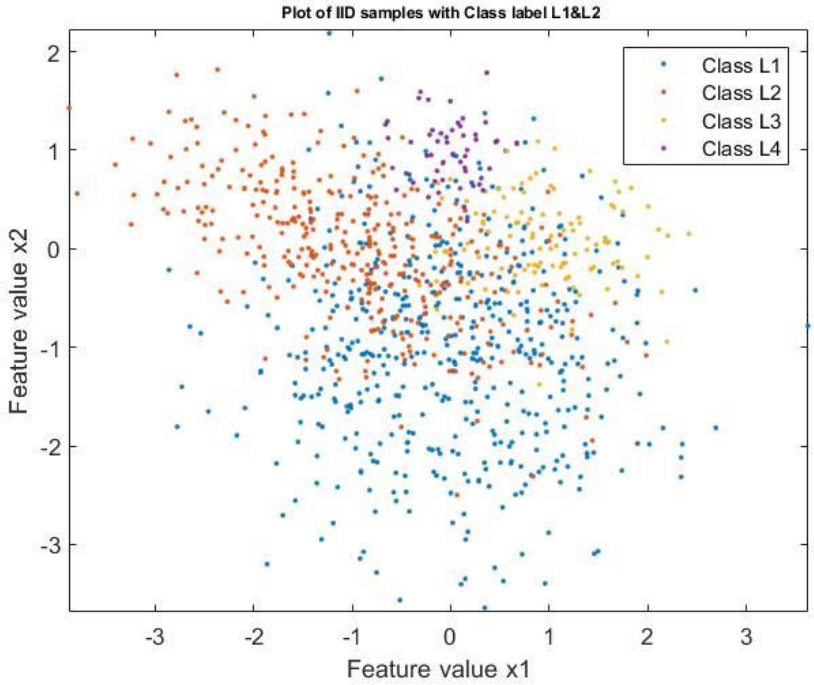


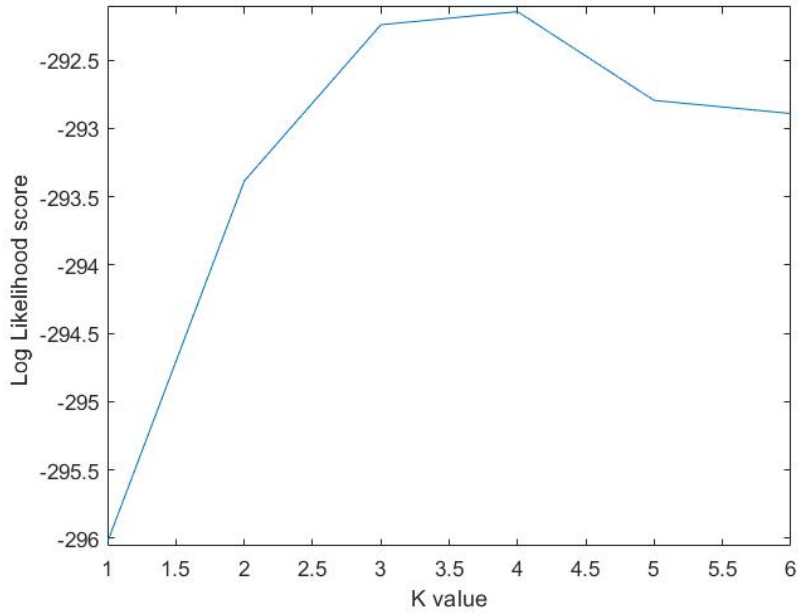
2. Data Set N=100 Samples



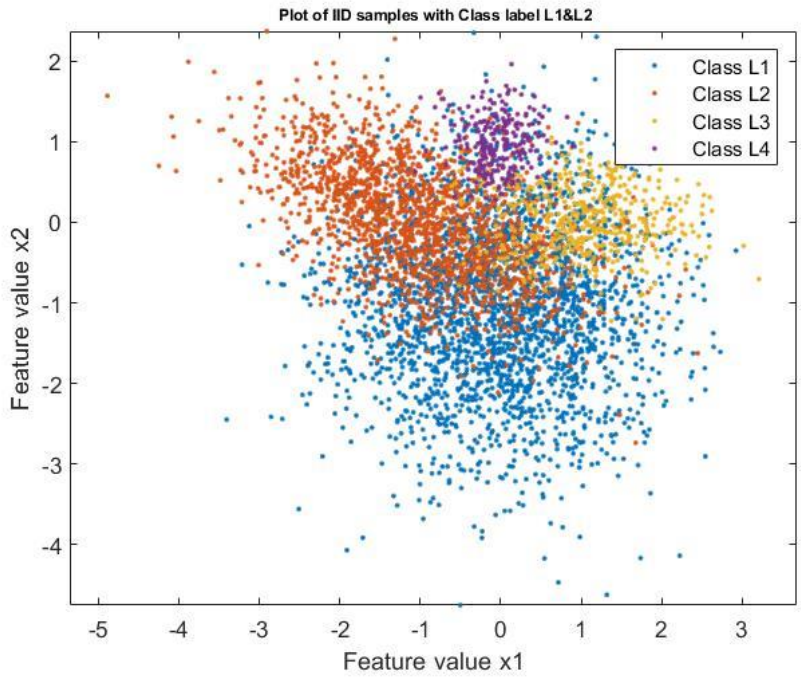


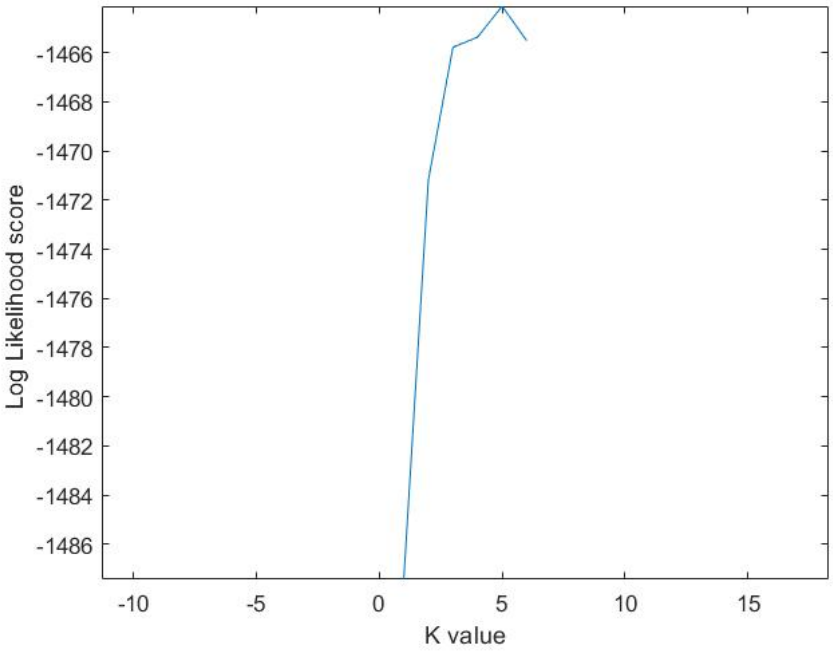
3. Data Set N=1000 Samples





4. Data Set N=10000 samples





Sample Size	GMM Order Selected
N = 10	1
N= 100	3
N= 1000	4
N= 10000	5

References

1. MATLAB Documentation
2. https://www.coursera.org/learn/machine-learning/lecture/licwf/advanced-optimization
3. https://www.visiondummy.com/2014/04/geometric-interpretation-covariance-matrix/
4. https://www.python-course.eu/expectation_maximization_and_gaussian_mixture_models.php