ASSIGNMENT 2

CS5691 Pattern Recognition and Machine Learning

CS5691 Assignment 2

Team Members:	
BE17B007	N Sowmya Manojna
PH17B010	Thakkar Riya Anandbhai
PH17B011	Chaithanya Krishna Moorthy

Indian Institute of Technology, Madras

Contents

1 Dataset 1A

1.1 K-nearest Neighbors Classifier

1.2 Naive-Bayes classifier

1.2.1 Same Covariance Matrix ($\sigma^2 I$)

1.2.2 Same Covariance Matrix (C)

1.2.3 Different Covariance Matrix

2 Dataset 1B

2.1 K-nearest Neighbors Classifier

2.2 Bayes Classifier, GMM, full covariance

Based on the accuracies obtained on the training, validation and test dataset, the best q_i for the three classes has been chosen as 5.

2.2.1 Training and Validation Accuracy

The training and validation accuracies obtained for varying q_i for each class is as follows:

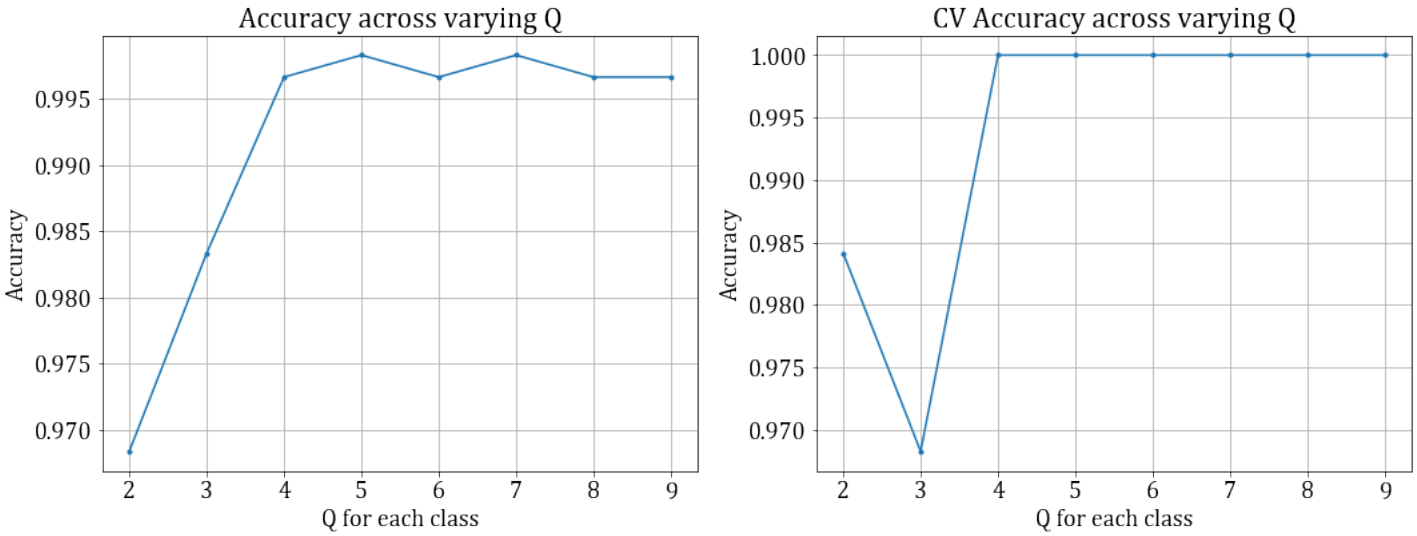

Figure 1: Training and Validation accuracy across q_i, on the left and right respectively

2.2.2 Testing Accuracy

The testing accuracy obtained for varying q_i for each class is as follows:

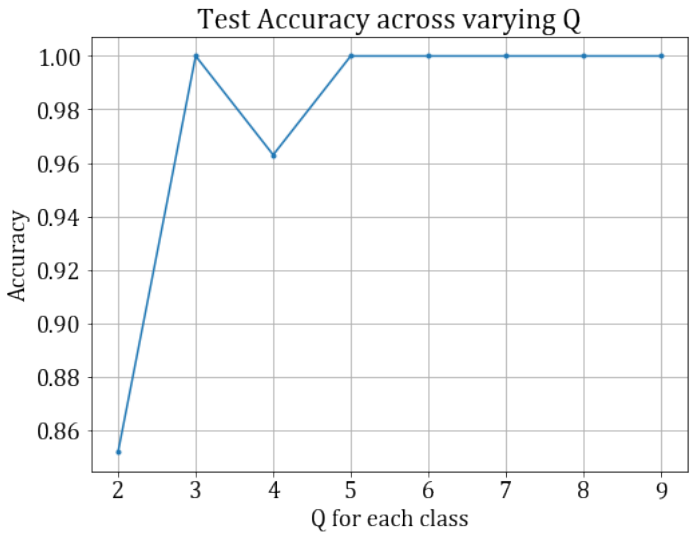

Figure 2: Testing accuracy across q_i

2.2.3 Contour Maps and Decision Surfaces

The contour maps and decision surfaces obtained, with $q_i = 5$ are as follows:

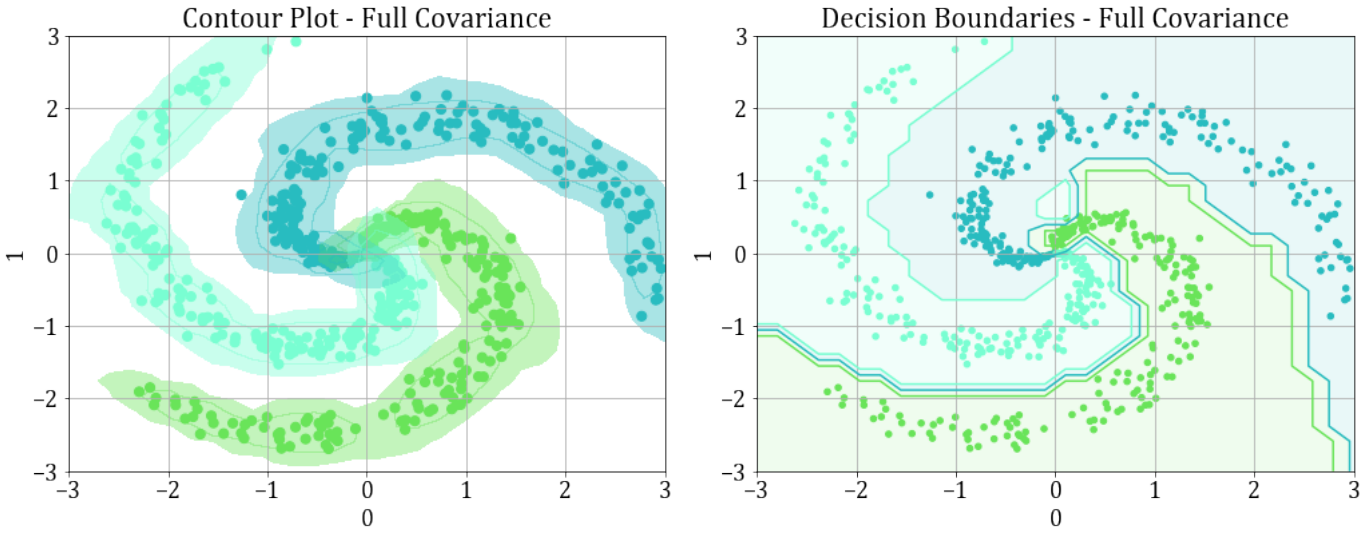

Figure 3: Contour Maps and Decision Surfaces obtained for $q_i = 5$, on the left and right respectively

2.3 Bayes Classifier, GMM, diagonal covariance

2.4 Bayes Classifier, KNN

3 Dataset 2A

3.1 Bayes Classifier, GMM, full covariance

3.2 Bayes Classifier, GMM, diagonal covariance

4 Dataset 2B

4.1 Bayes Classifier, GMM, full covariance

4.2 Bayes Classifier, GMM, diagonal covariance