

Question 2

Part A

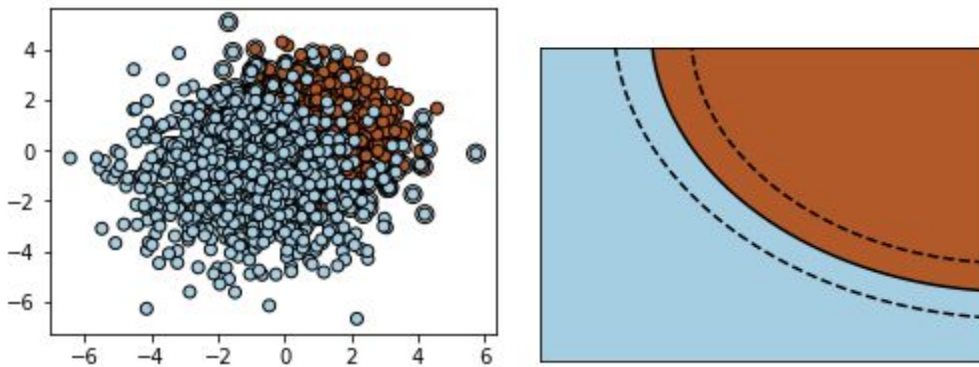


Figure 1

Number of Support Vectors for Fig: 1.0

702

Test Accuracy: 88.35

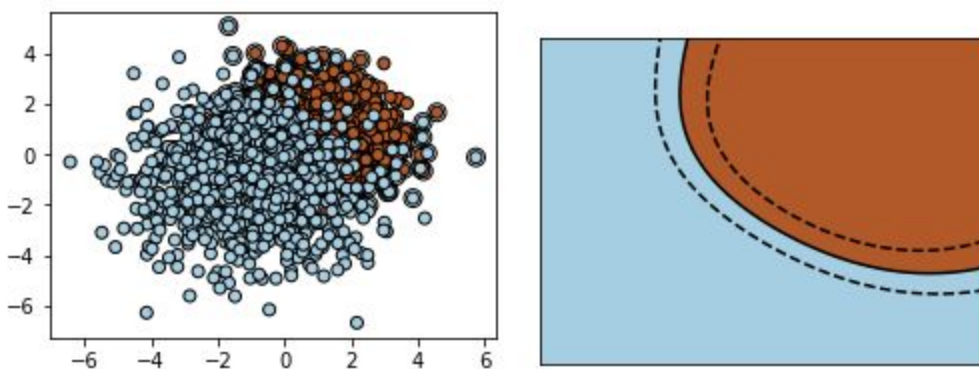


Figure 2

Number of Support Vectors for Fig: 2.0

584

Test Accuracy: 88.64999999999999

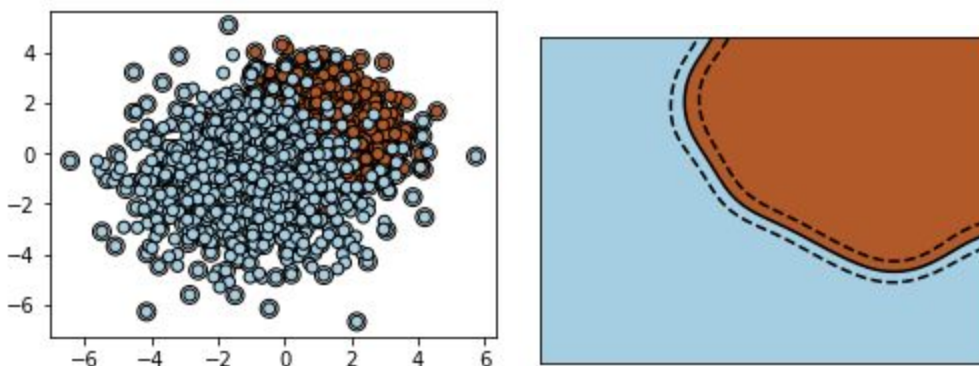


Figure 3

Number of Support Vectors for Fig: 3.0
615
Test Accuracy: 89.2

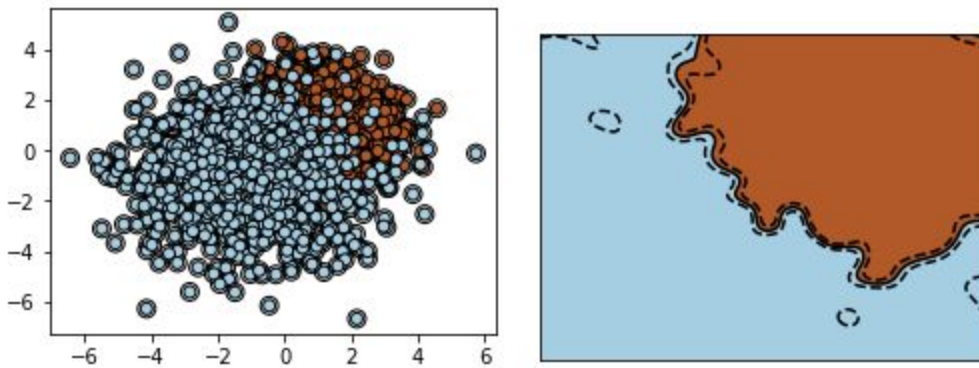


Figure 4

Number of Support Vectors for Fig: 4.0
1153
Test Accuracy: 90.5

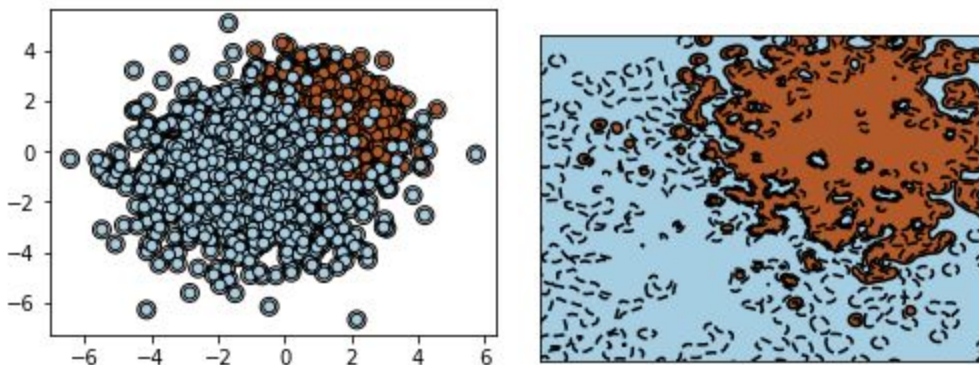


Figure 5

Number of Support Vectors for Fig: 5.0
1736
Test Accuracy: 95.65

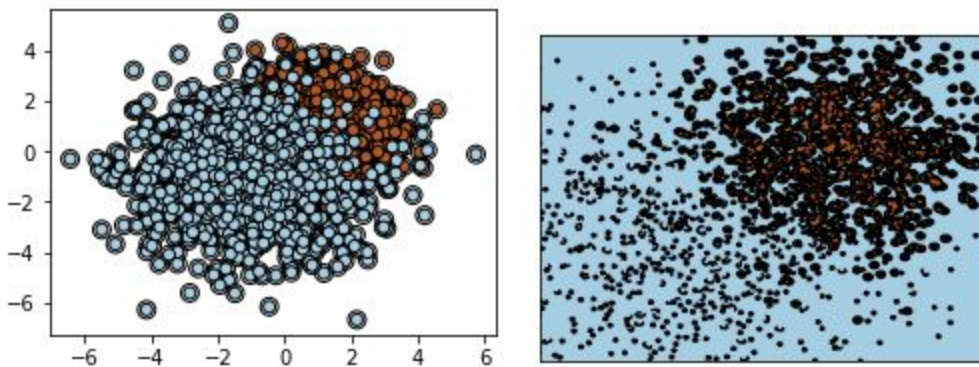


Figure 6

Number of Support Vectors for Fig: 6.0

1988

Test Accuracy: 99.8

Observations : As the gamma grew and the C stayed constant the test accuracy and the number of support vectors increased over the 6 iterations of the test. The plots of the support vectors got more concentrated as the gamma grew and the hyperplane became extremely accurate for predicting a label

Part B

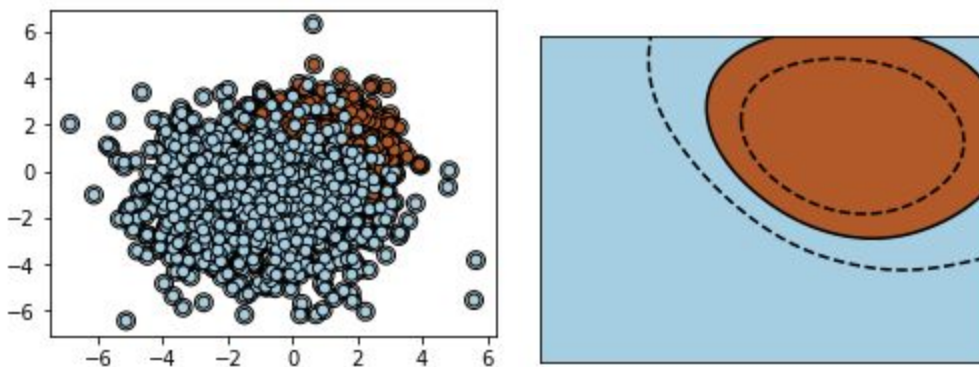


Figure 1

Number of Support Vectors for Fig: 1.0

1650

Test Accuracy: 85.89999999999998

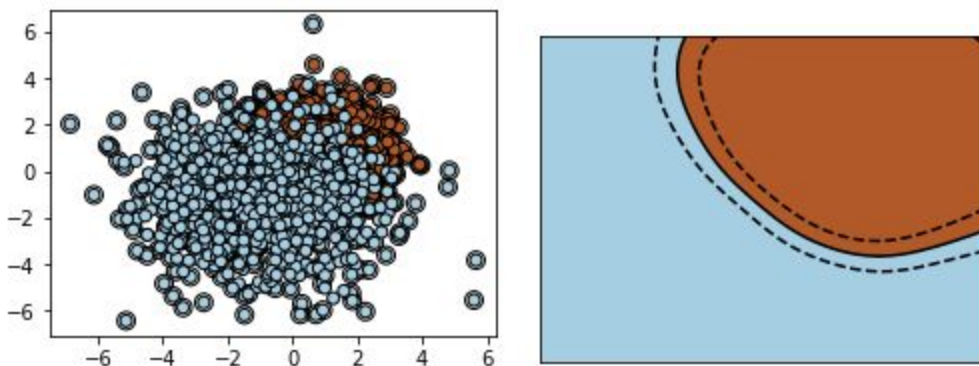


Figure 2

Number of Support Vectors for Fig: 2.0

859

Test Accuracy: 87.14999999999999

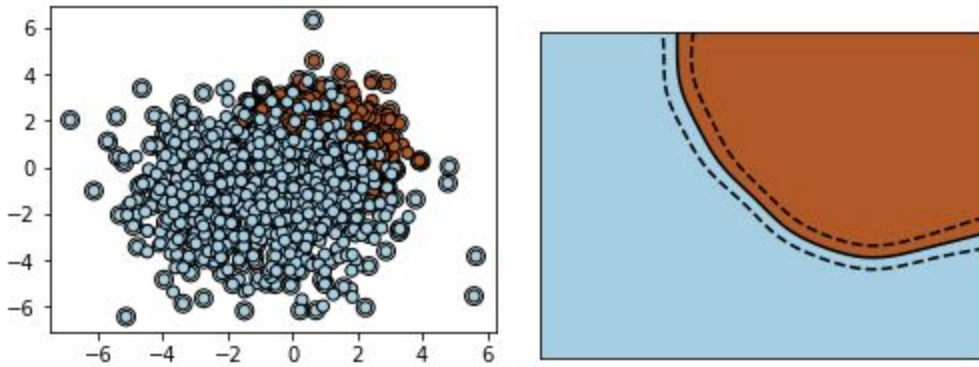


Figure 3

Number of Support Vectors for Fig: 3.0

693

Test Accuracy: 87.15

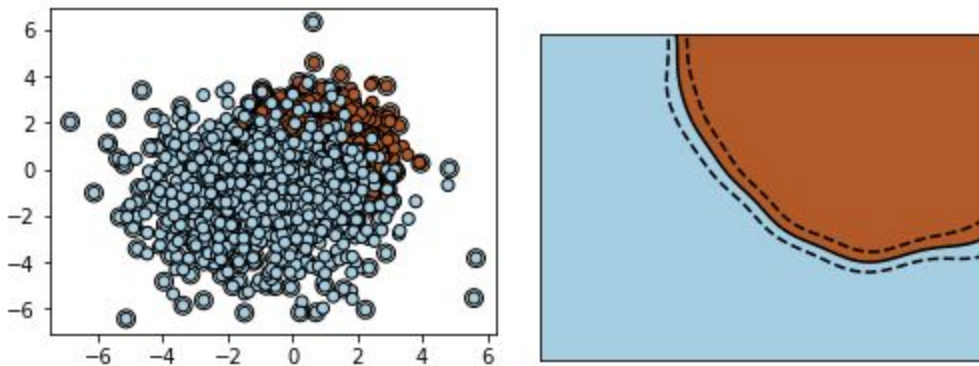


Figure 4

Number of Support Vectors for Fig: 4.0

654

Test Accuracy: 87.3

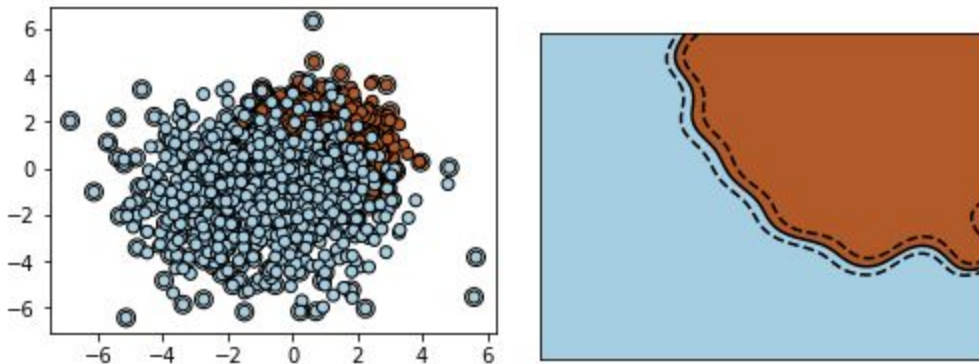


Figure 5

Number of Support Vectors for Fig: 5.0

633

Test Accuracy: 87.7

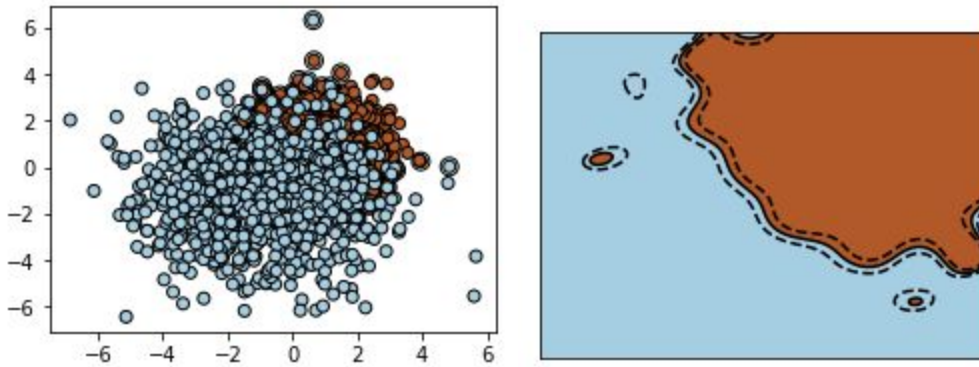


Figure 6

Number of Support Vectors for Fig: 6.0

593

Test Accuracy: 87.85

Observations : As gamma remained constant but C increased the number of support vectors went down and the accuracy of the test went up very slightly each iteration. The hyperplanes accuracy remained in the 85-88% accuracy range throughout the experiment

Part C

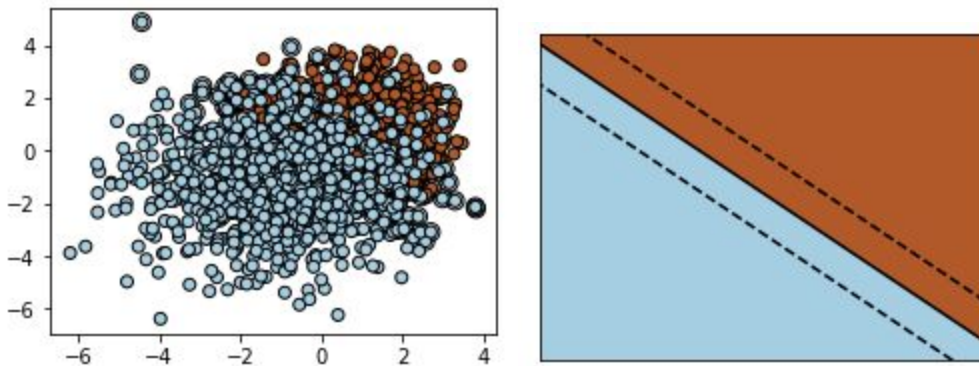


Figure 1

Number of Support Vectors for Fig: 1.0

788

Test Accuracy: 86.19999999999999

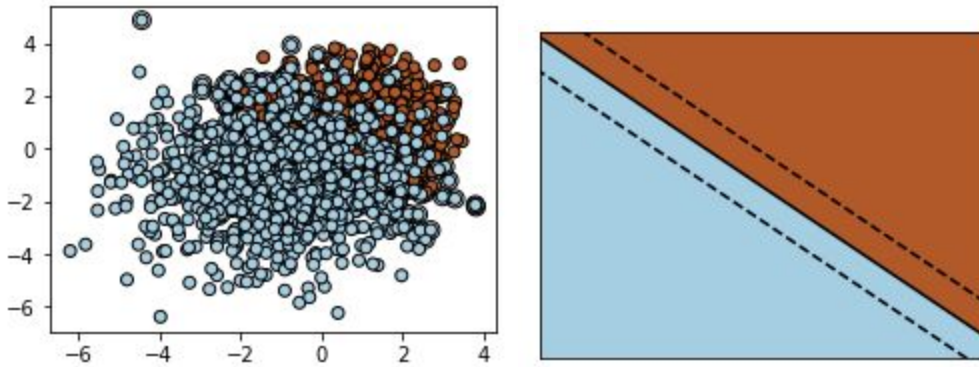


Figure 2

Number of Support Vectors for Fig: 2.0

710

Test Accuracy: 86.14999999999999

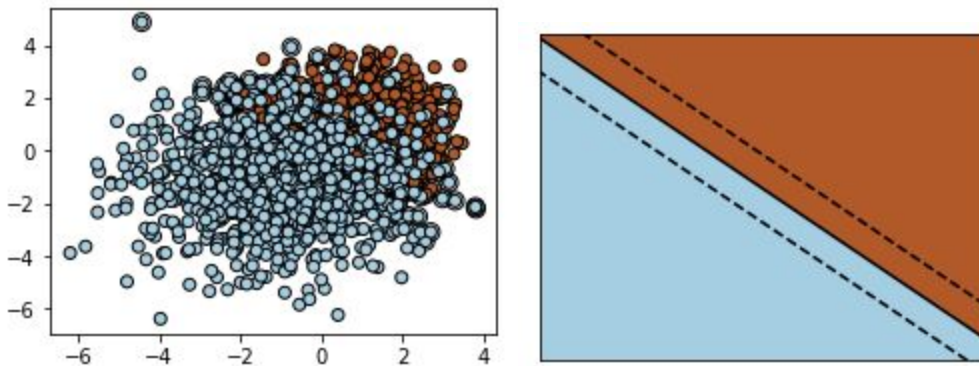


Figure 3

Number of Support Vectors for Fig: 3.0

700

Test Accuracy: 86.2

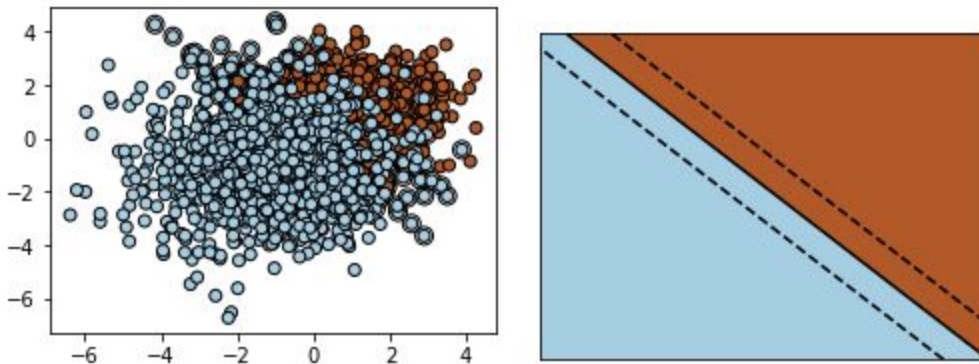


Figure 4

Number of Support Vectors for Fig: 4.0

699

Test Accuracy: 86.2

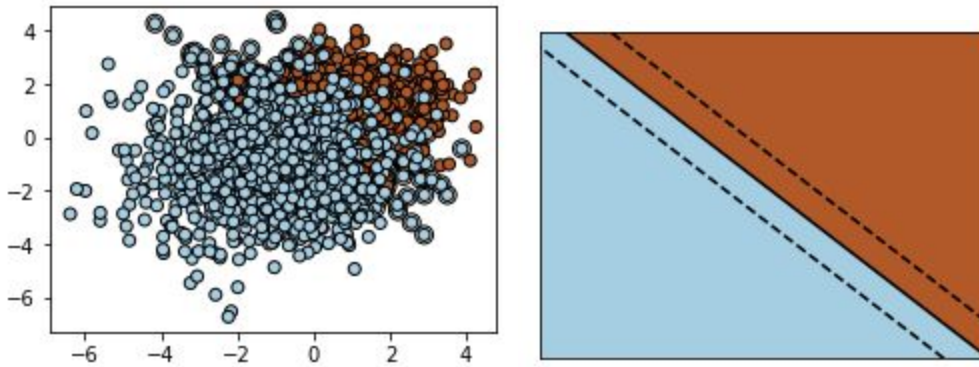


Figure 5

Number of Support Vectors for Fig: 5.0

699

Test Accuracy: 86.2

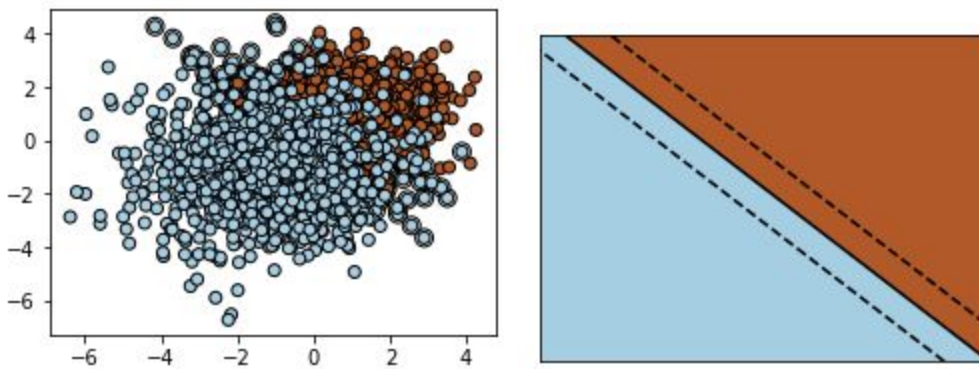


Figure 6

Number of Support Vectors for Fig: 6.0

699

Test Accuracy: 86.25