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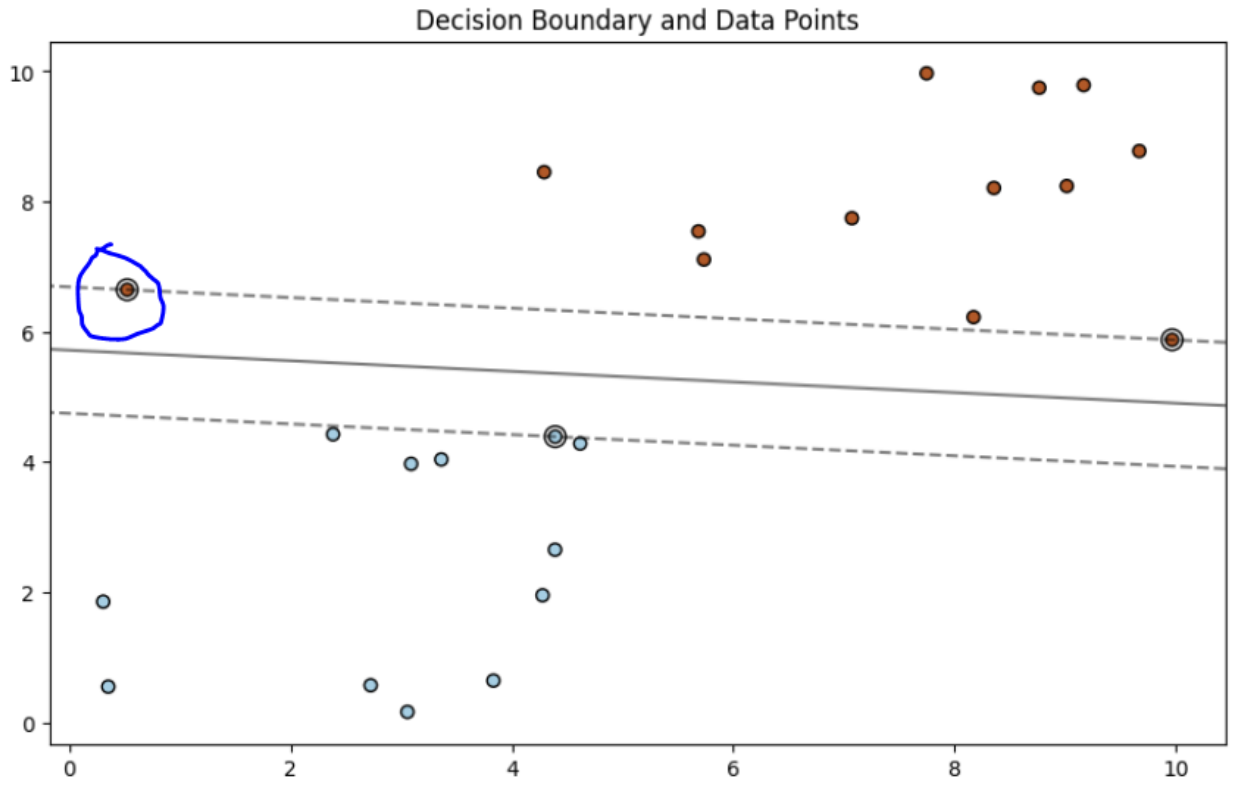
Fa21-bse-053

Report: (SVM)

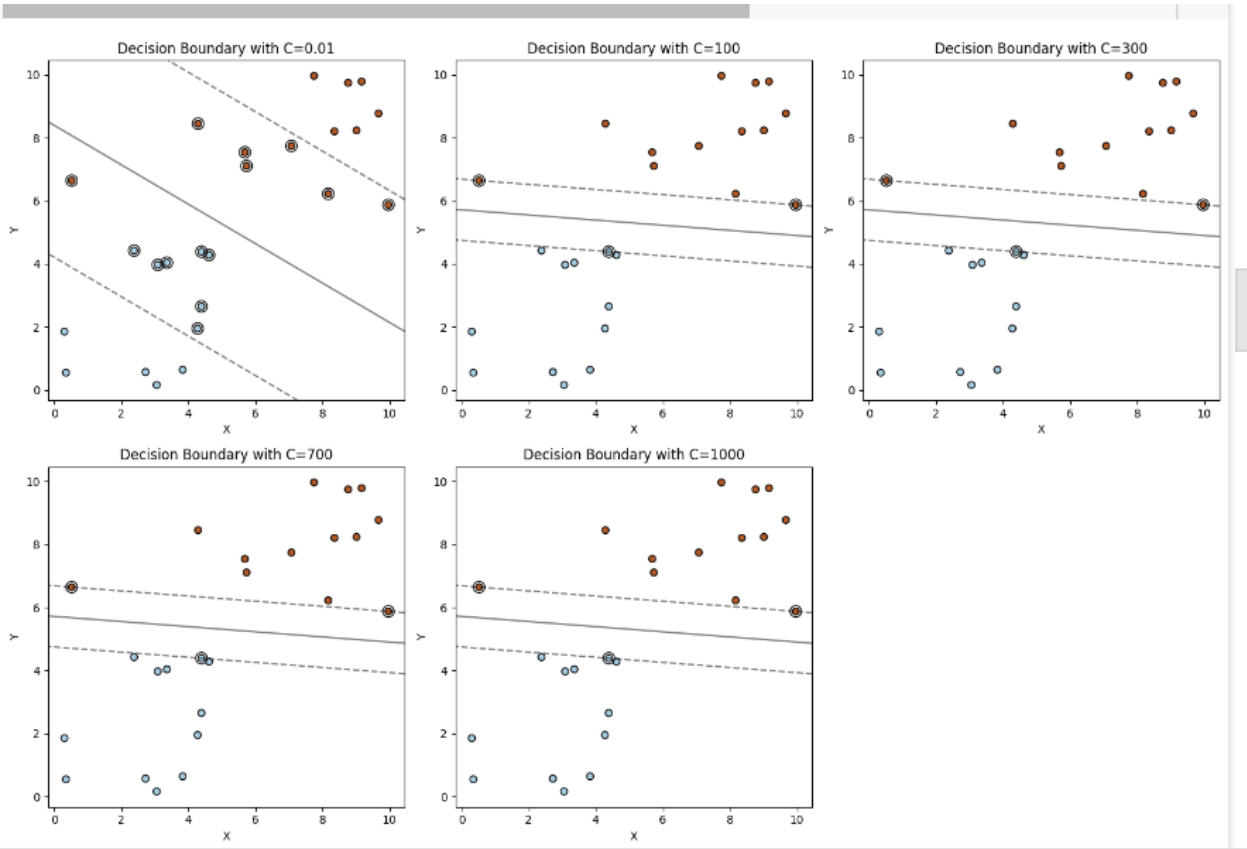
Q No. 1:



A) Yes, there is clear separation between the positive and negative classes. But I default parameter, model create a hard margin and don't allow misclassification.

B) Yes, there are outliners in the data. I have spotted in below image.

Q No. 2:



A) Yes in 1st case where value of C is 0.01, model handles the outlier by misclassifying the outliers.

B) When I increase the value of C our margin becomes hard, increasing the value of C in SVM tends to result in a harder margin.

Q No. 3:

A) Gaussian Kernel settings result in better performance.

B) Accuracy with Polynomial Kernel: The accuracy achieved with the polynomial kernel is 83.33%.

Effect of C and Degree with Polynomial Kernel:

1. When C is set to 100 and the polynomial degree is 2, the accuracy is 90%.
2. When C is set to 100 and the polynomial degree is 3, the accuracy is 80%.
3. When C is set to 100 and the polynomial degree is 4, the accuracy is 86.67%.

C) **Accuracy with Gaussian Kernel:** The accuracy achieved with the Gaussian kernel is 90%

Effect of C and Sigma with Gaussian Kernel:

1. When C is set to 100 and the sigma is set to 0.1, the accuracy is 66.67%.
2. When C is set to 100 and the sigma is set to 1, the accuracy is 86.67%.
3. When C is set to 100 and the sigma is set to 10, the accuracy is 90%

Q No. 4:

I have used search grid technique to find the best parameters.

Optimal C: 100 Optimal Kernel: poly

Accuracy on testing set: 0.9615384615384616