Neural Networks Task 1

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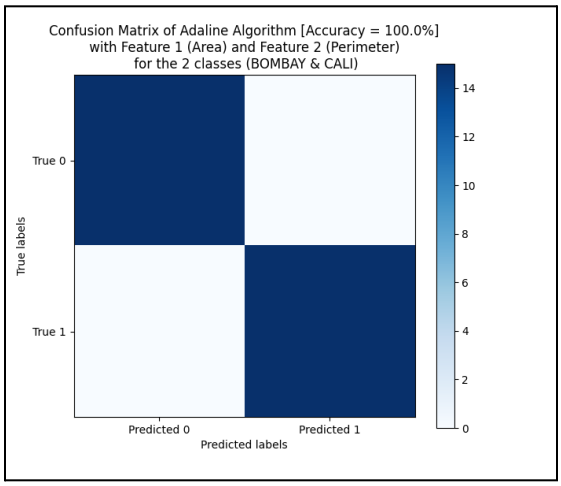
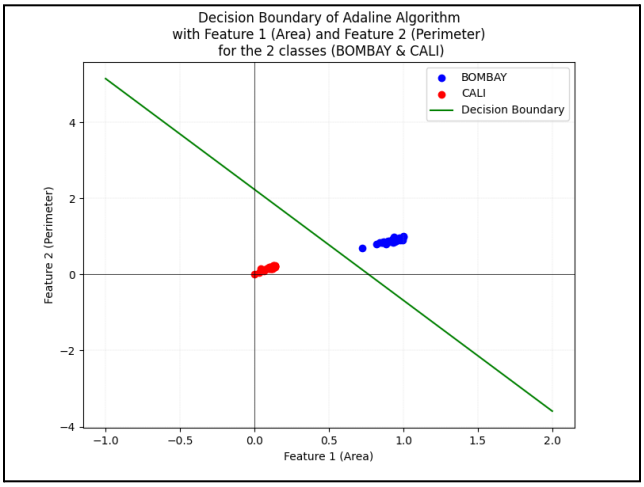
Combination Analysis

Combination #1: *Adaline Model*

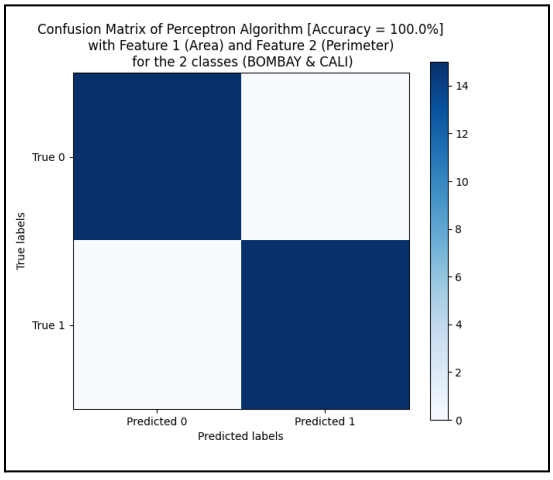
- Features: (Area, Perimeter)
- Classes: (Bombay, Cali)
- Accuracy: 100%

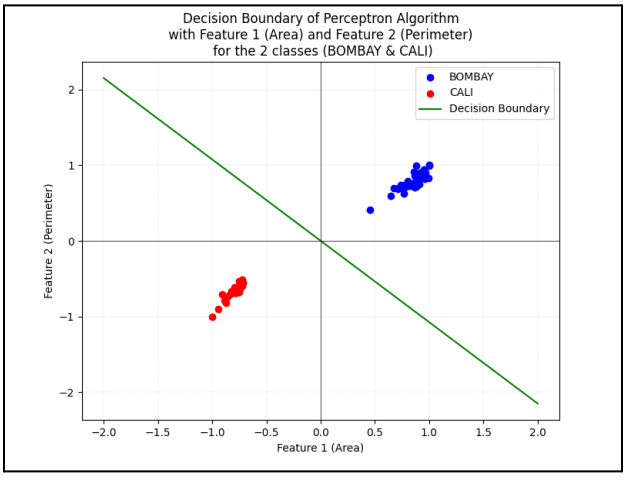




Combination #1: *Perceptron Model*

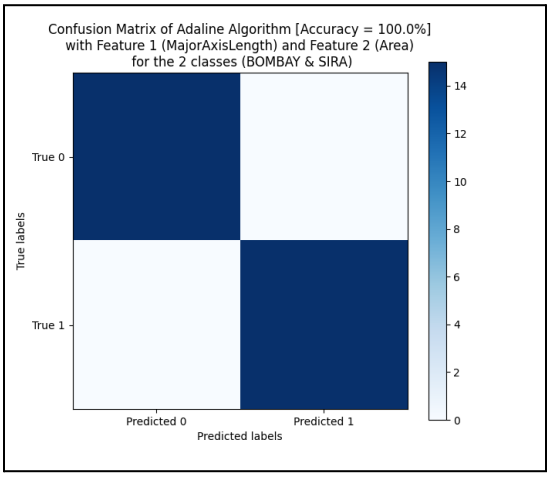
- Features: (Area, Perimeter)
- Classes: (Bombay, Cali)
- Accuracy: 100%

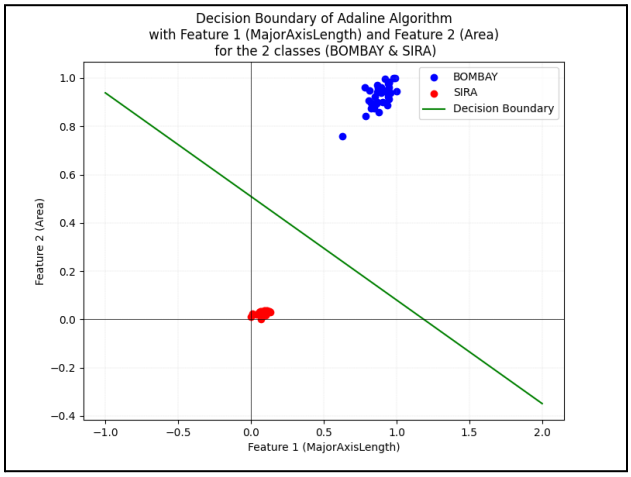




Combination #2: *Adaline Model*

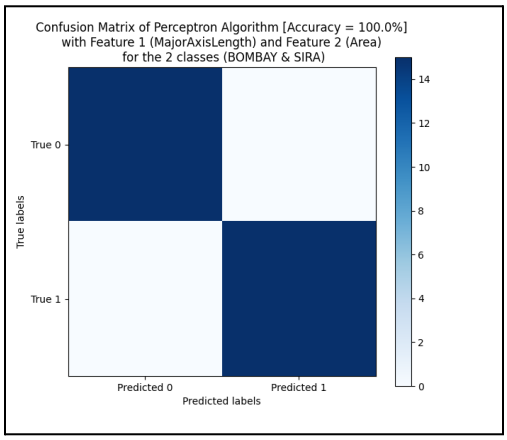
- Features: (MajorAxisLength, Area)
- Classes: (Bombay, Sira)
- Accuracy: 100%

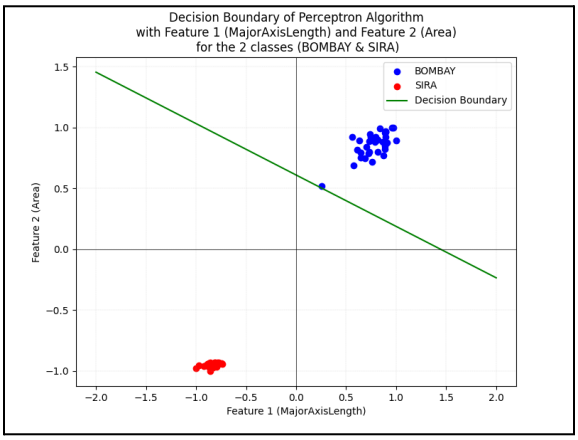




Combination #2: *Perceptron Model*

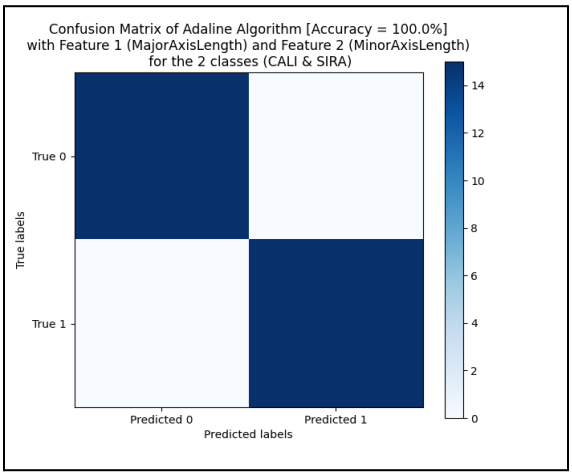
- Features: (MajorAxisLength, Area)
- Classes: (Bombay, Sira)
- Accuracy: 100%

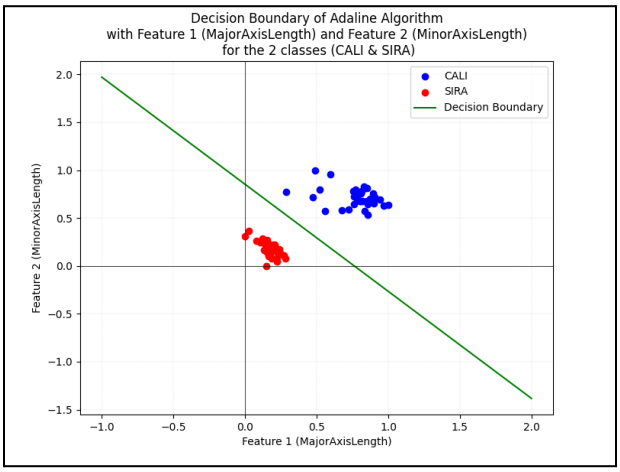




Combination #3: *Adaline Model*

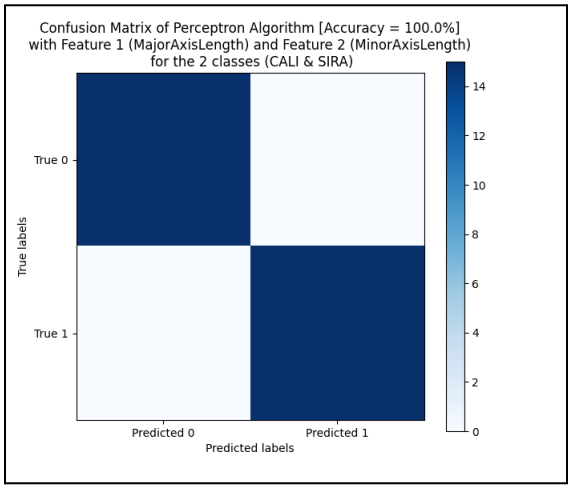
- Features: (MajorAxisLength, MinorAxisLength)
- Classes: (Cali, Sira)
- Accuracy: 100%

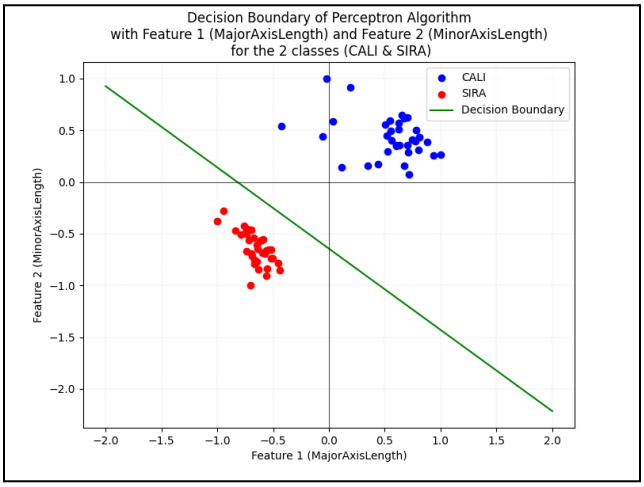




Combination #3: *Perceptron Model*

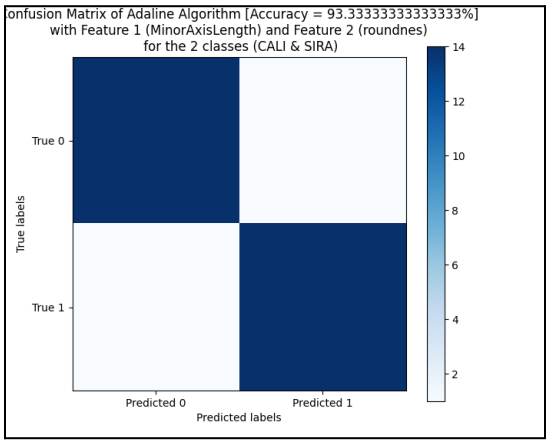
- Features: (MajorAxisLength, MinorAxisLength)
- Classes: (Cali, Sira)
- Accuracy: 100%

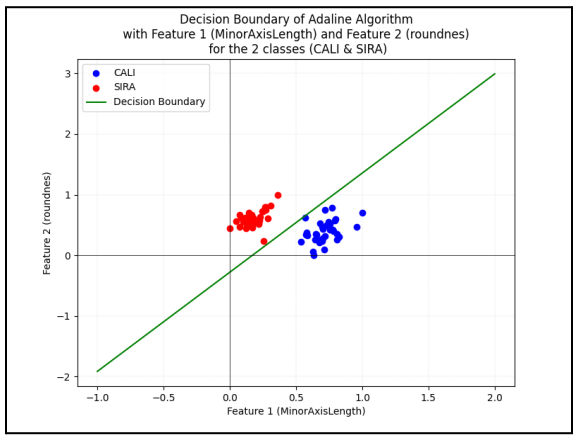




Combination #4: *Adaline Model*

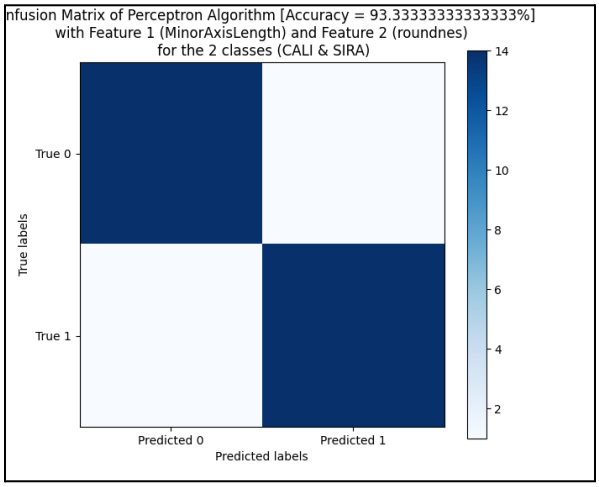
- Features: (MinorAxisLength, roundnes)
- Classes: (Cali, Sira)
- Accuracy: 93.3%

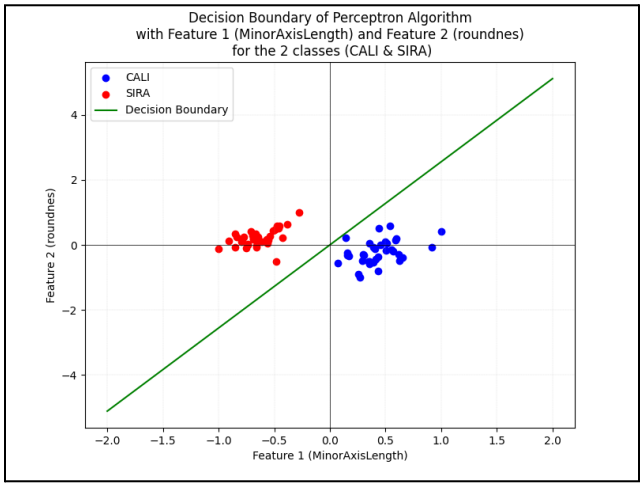




Combination #4: *Perceptron Model*

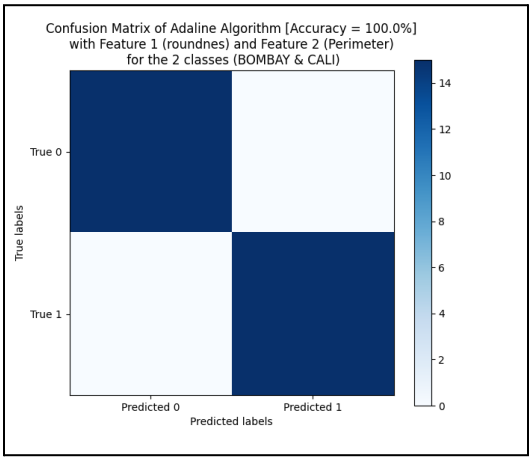
- Features: (MinorAxisLength, roundnes)
- Classes: (Cali, Sira)
- Accuracy: 93.3%

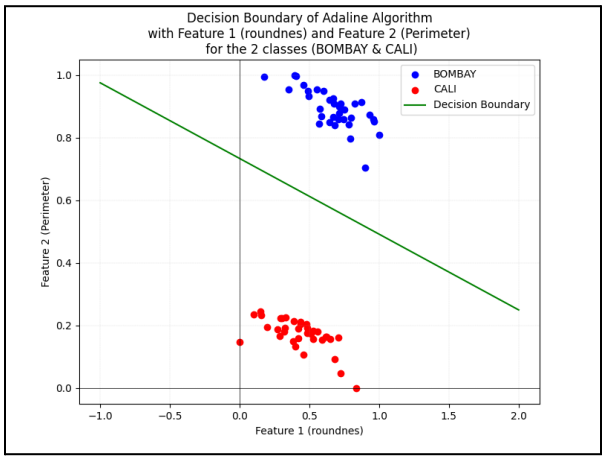




Combination #5: *Adaline Model*

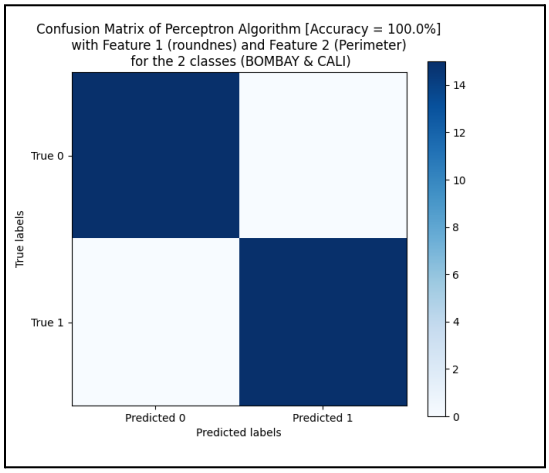
- Features: (roundnes, Perimeter)
- Classes: (Bombay, Cali)
- Accuracy: 100%

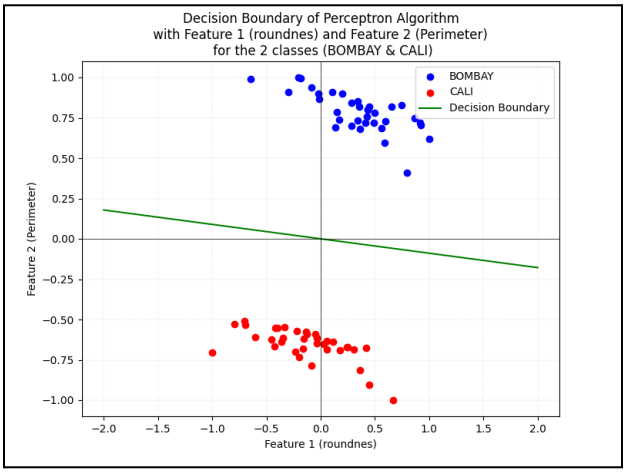




Combination #5: *Perceptron Model*

- Features: (roundnes, Perimeter)
- Classes: (Bombay, Cali)
- Accuracy: 100%





Conclusion

In conclusion, we deduce that the best features for the given algorithms - which are Adaline and Perceptron - and which gave the highest accuracy are all of them except the only combination of features that didn't get **100%** accuracy are *MinorAxisLength* and *Roundness* which only got **93%** accuracy.

All of the features used in this sample combination gave a **decision boundary** that divides (discriminates) between the two classes mentioned in the same combination. Still, they differ in how evenly spaced the classes are (regarding **SVM** and how it maximizes the margins).