Artificial Neural Network & Deep Learning

Task 1 (Dry Beans Classifying)

Team: 59

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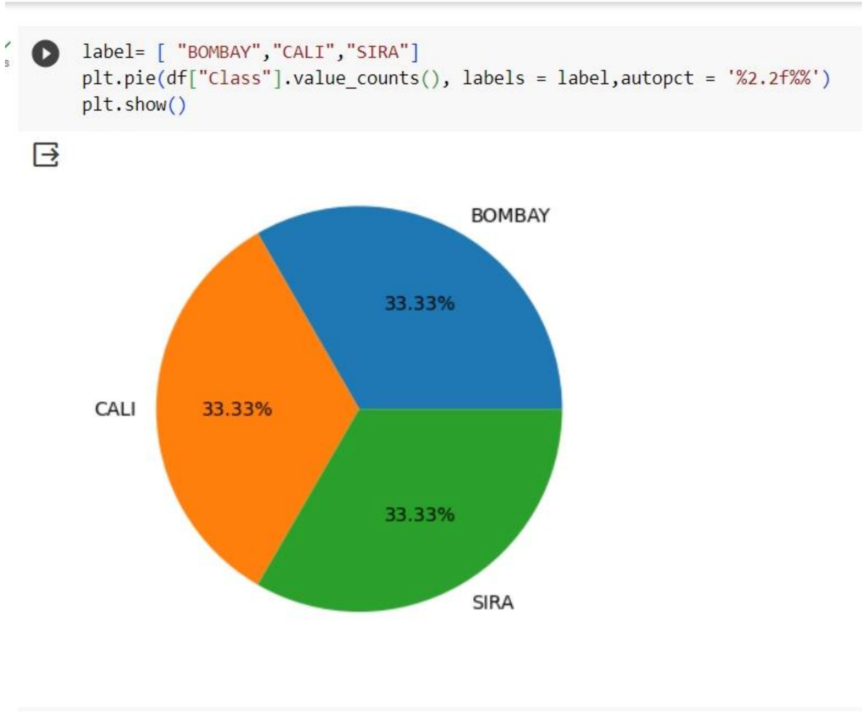
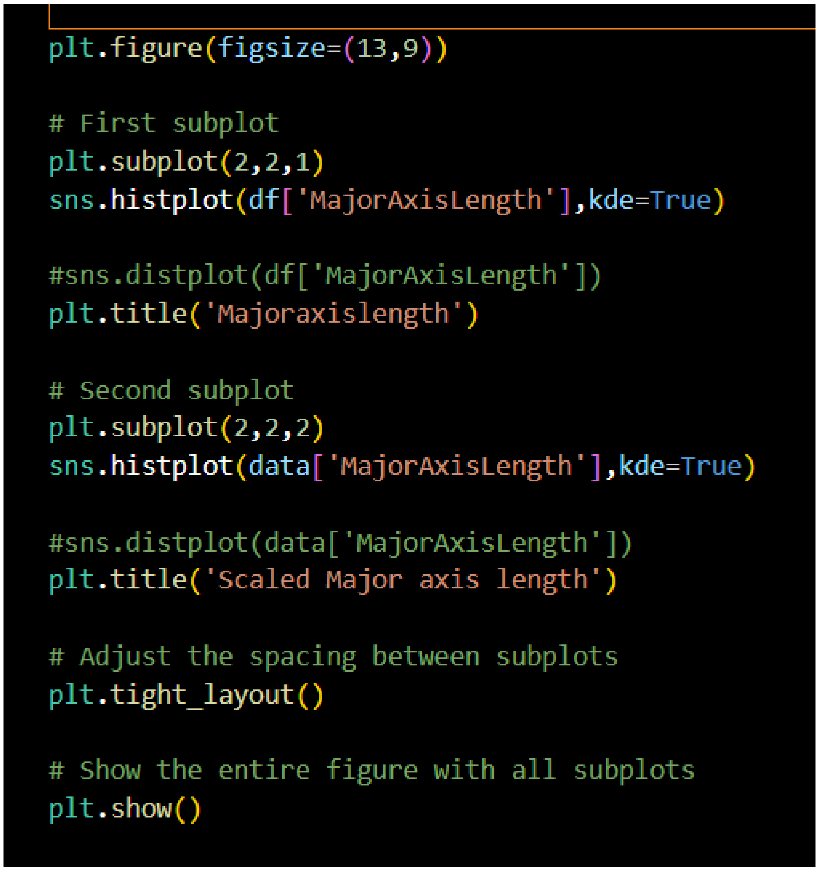
Some visualizations and screenshots:

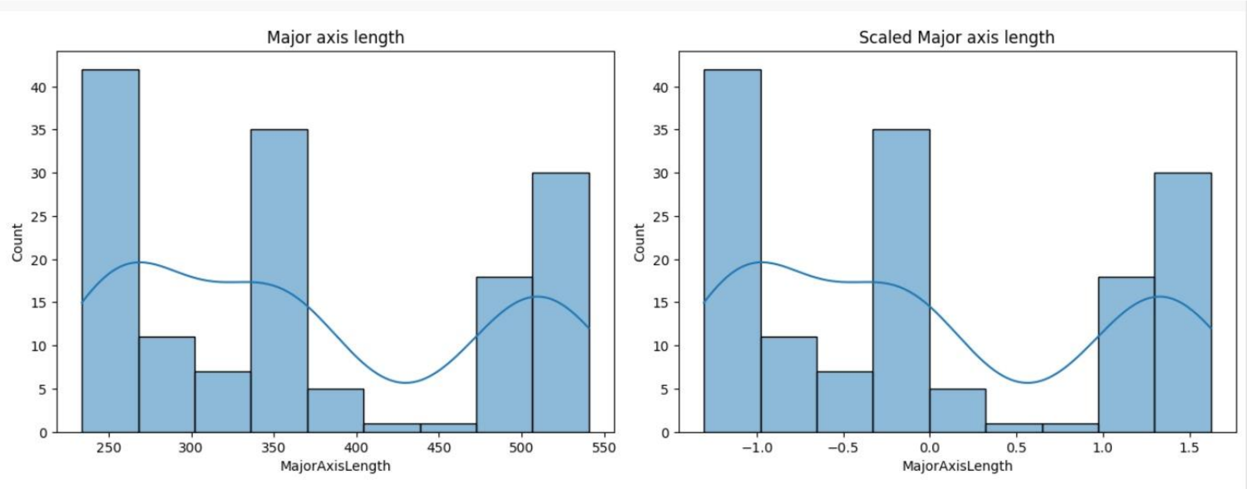


```
label= [ "BOMBAY","CALI","SIRA"]
plt.pie(df["Class"].value_counts(), labels = label,autopct = '%2.2f%%')
plt.show()
```

The graph shows that all the three classes are equal.

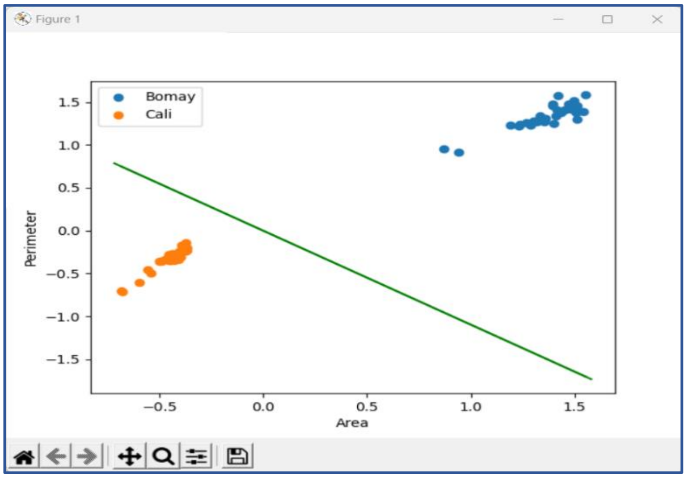


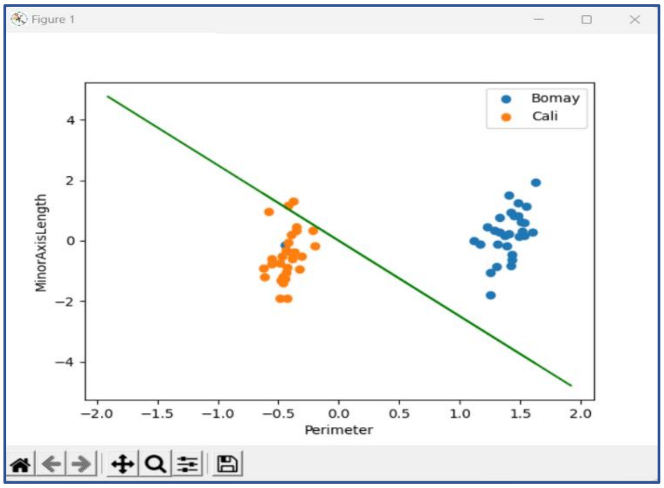
```
plt.figure(figsize=(13,9))

# First subplot
plt.subplot(2,2,1)
sns.histplot(df['MajorAxisLength'],kde=True)

#sns.distplot(df['MajorAxisLength'])
plt.title('Majoraxislength')

# Second subplot
plt.subplot(2,2,2)
sns.histplot(data['MajorAxisLength'],kde=True)

#sns.distplot(data['MajorAxisLength'])
plt.title('Scaled Major axis length')

# Adjust the spacing between subplots
plt.tight_layout()

# Show the entire figure with all subplots
plt.show()
```

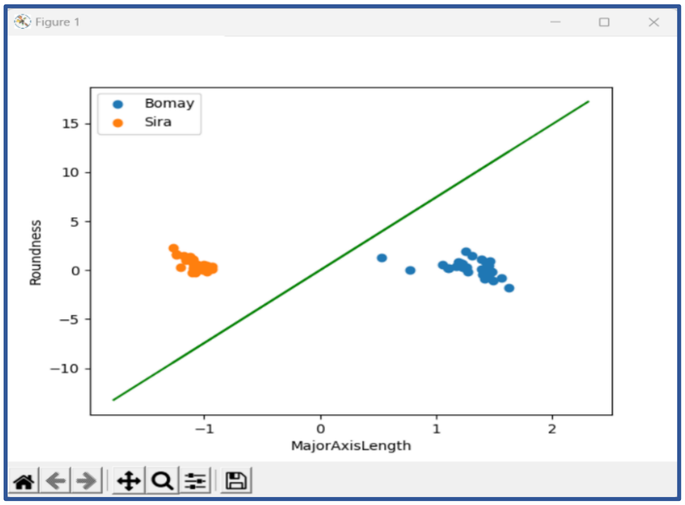


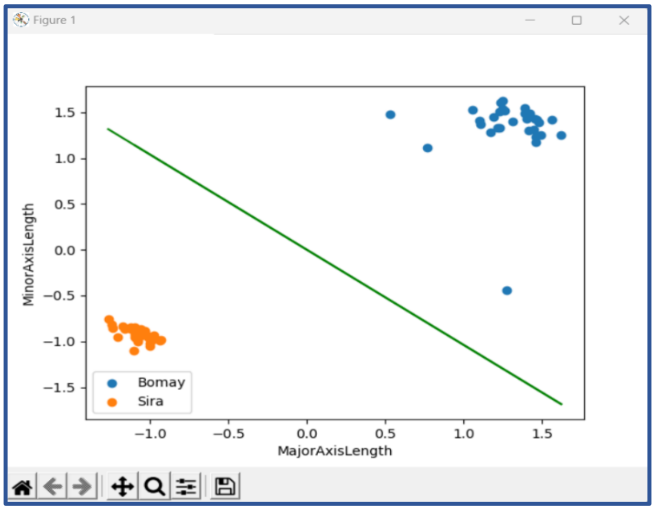
The data before scaling gives Nan values, so to solve this problem we scaled the date and the range became between 3 to -3.

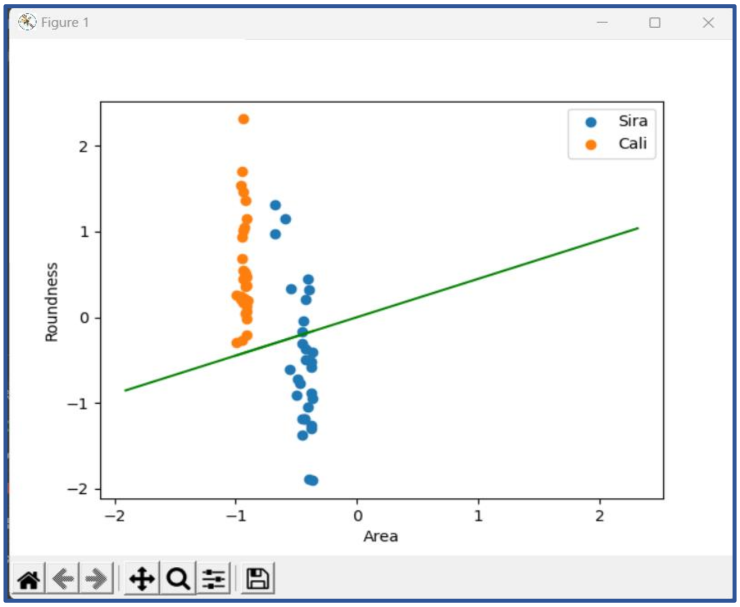
Adaline Algorithm:



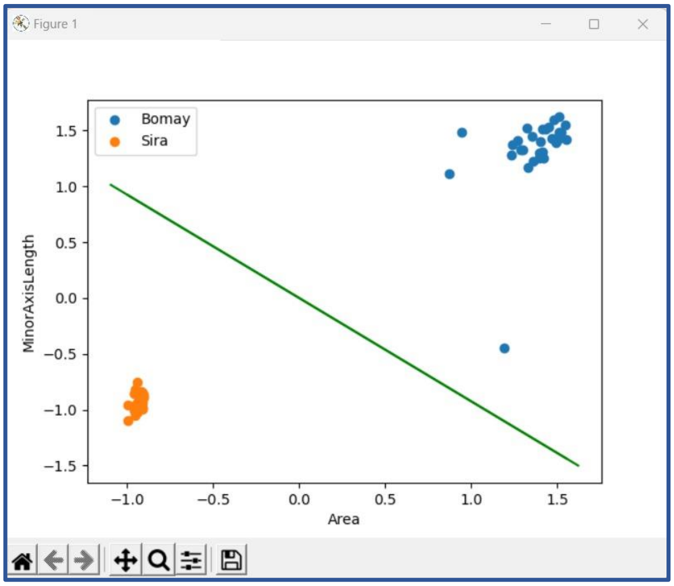


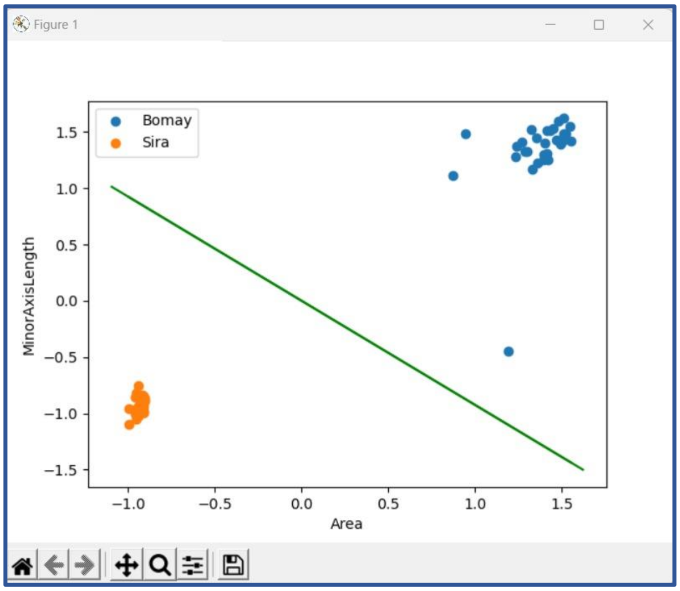


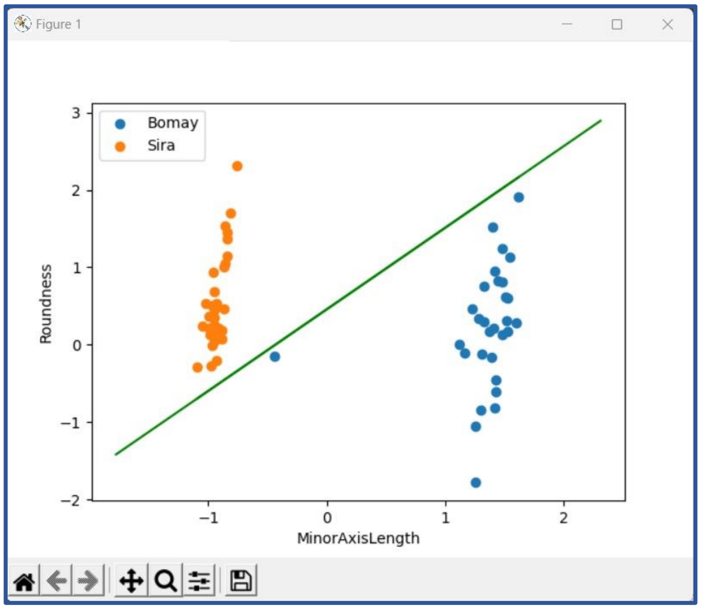


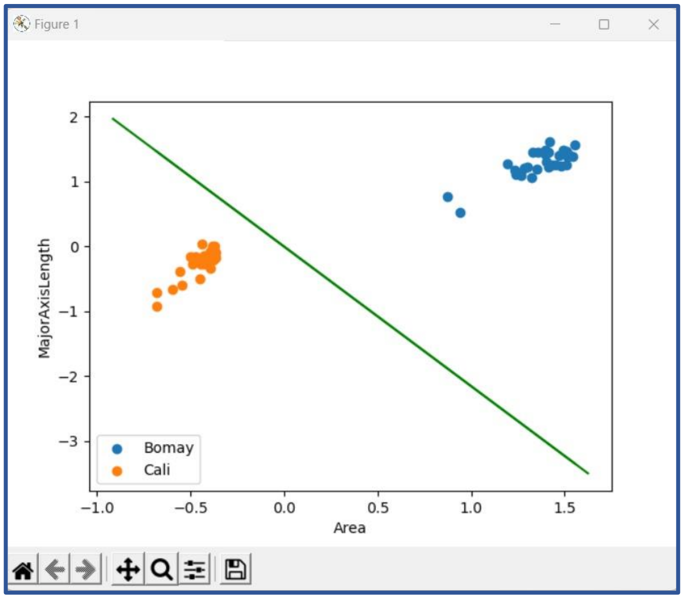


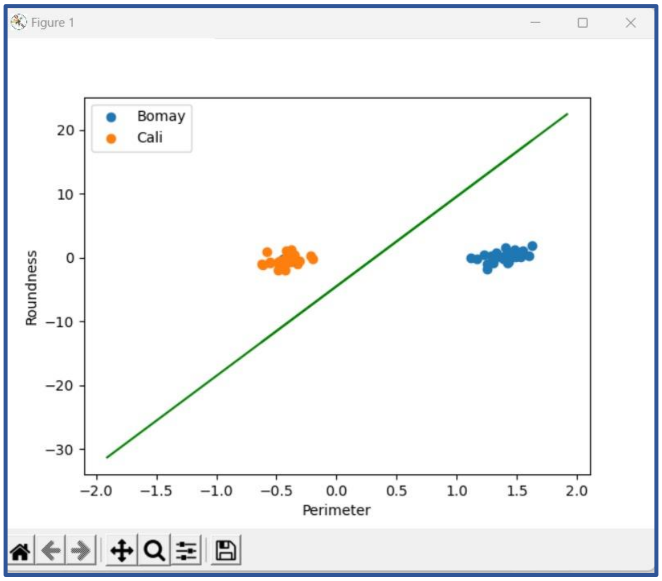
Perceptron Algorithm:











Conclusion:

When we used (Bombay & Cali) the features accuracy was almost (1), cause these classes features were different, so the classification were perfect for both (Adaline & Perceptron).

features achieved the highest accuracy: **Area& Roundness**