Task 1

(Neural Network)

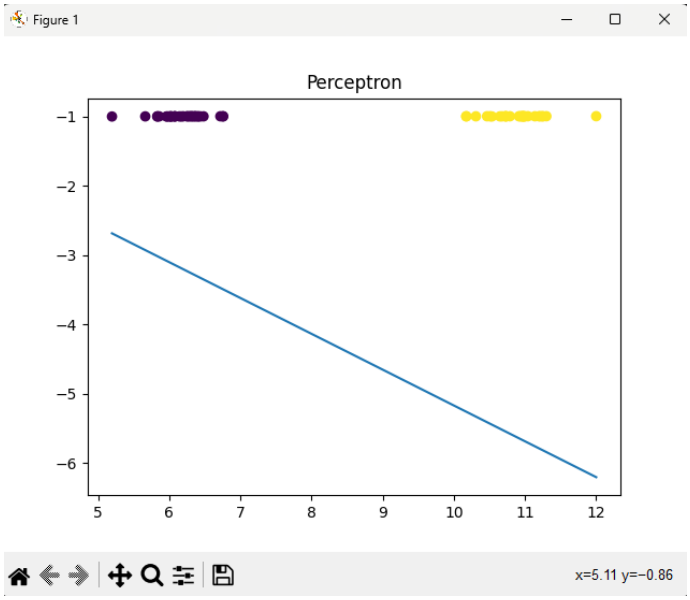
Run 1

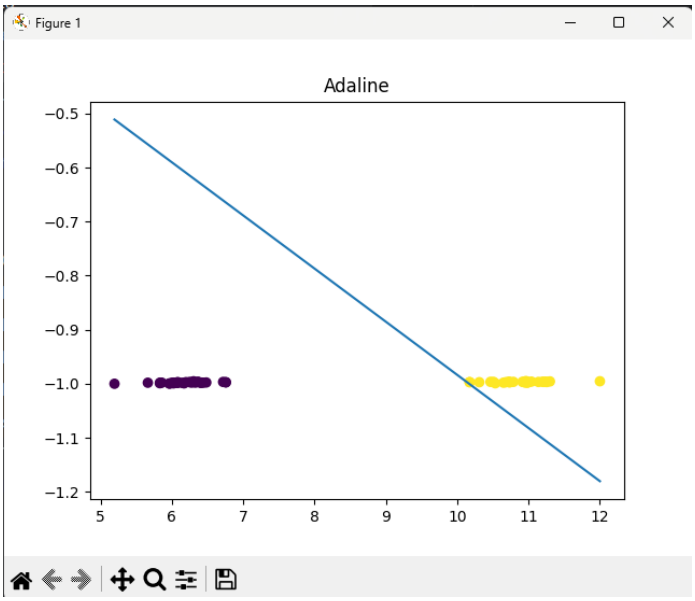
Classes:

Bombay , Cali

Features:

Minor axis , roundnes





Analysis:

- ➔ **Discrimination in (**Minor axis , roundnes**) with Adaline : good could discriminate between two classes (**Bombay, Cali**) but still a ratio of error exist**
- ➔ **Discrimination in (**Minor axis , roundnes**) with perceptron : Not good could not discriminate between two classes (**Bombay, Cali)

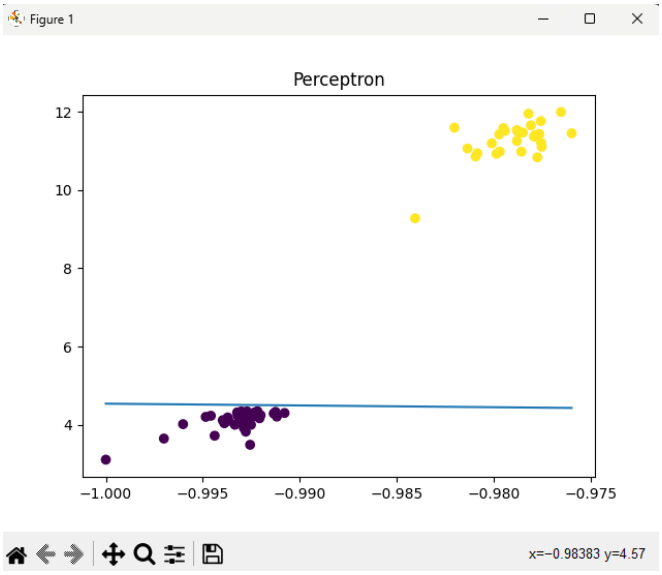
Run 2

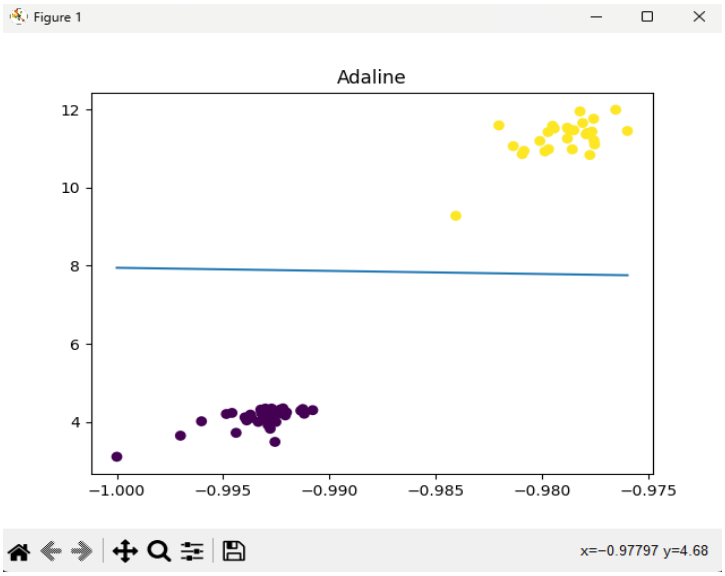
Classes:

Bombay , Cali

Features:

Major axis , Area





Analysis:

- **Discrimination in (**Major axis, Area**) Features with Adaline : good could discriminate between two classes (**Bombay , Cali **)**
- **Discrimination in (**Major axis, Area**) Features with perceptron : good could discriminate between two classes(**Bombay , Cali **)**

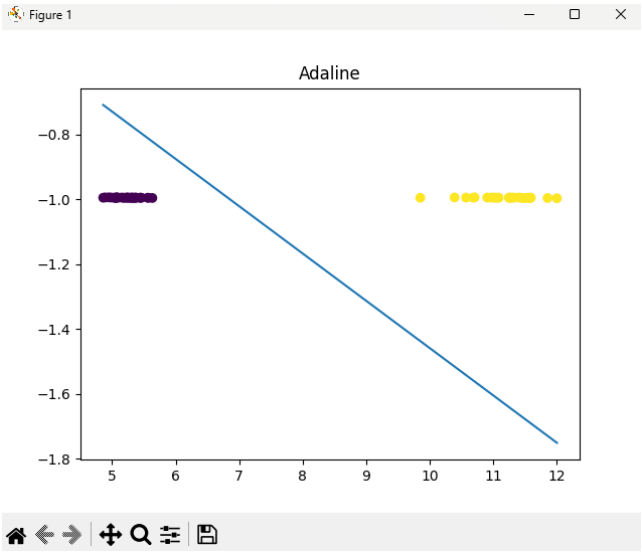
Run 3

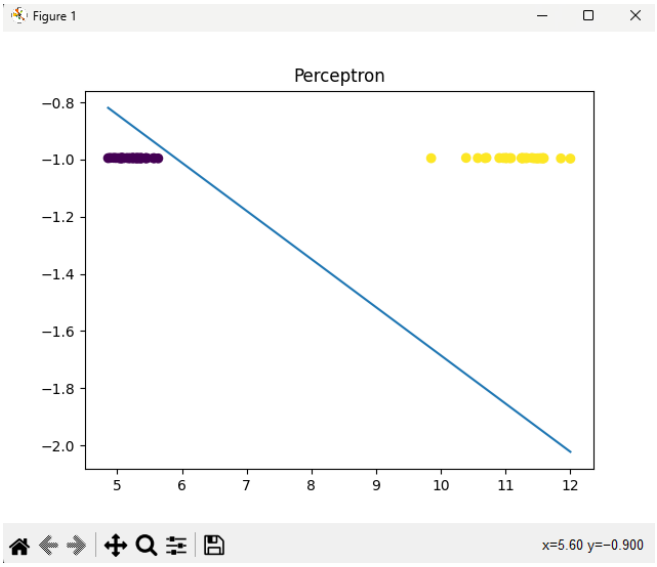
Classes:

Bombay Cali

Features:

Area perimeter





Analysis:

- **Discrimination in (**Area **,** perimeter**) Features with Adaline : good could discriminate between two classes(**Bombay , Cali **)**
- **Discrimination in (**Area **,** perimeter**) Features with perceptron : good could discriminate between two classes (**Bombay , Cali **)**

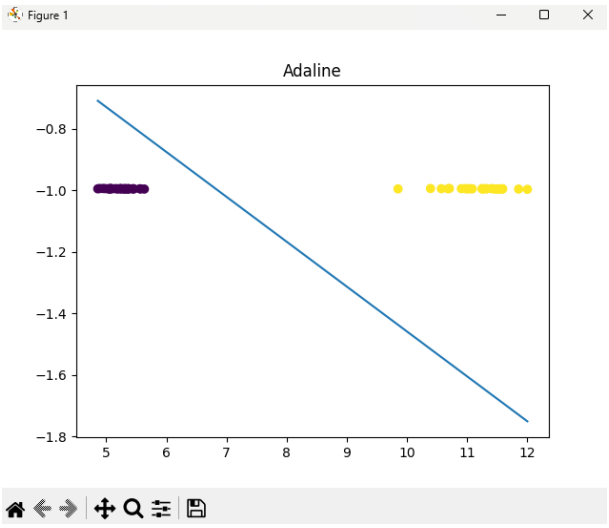
Run 4

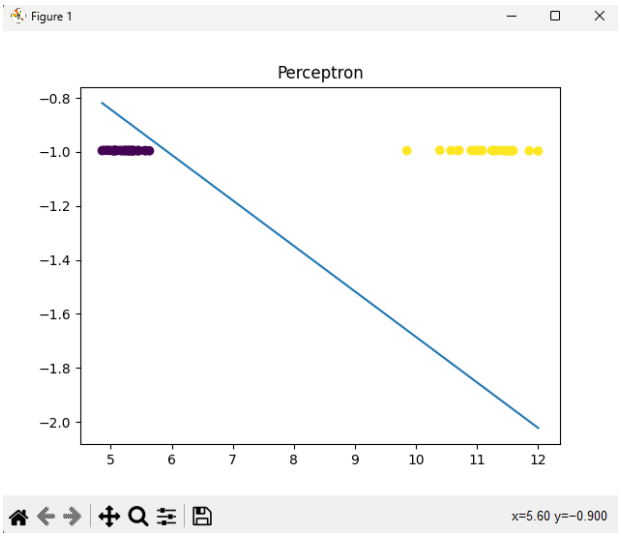
Classes:

Bombay , Sira

Features:

MajorAxis length , Roundness





Analysis:

- ➔ **Discrimination in (**MajorAxisLength**,** Roundness**) Features with Adaline : good could discriminate between two classes(**Bombay , Sira**)**
- ➔ **Discrimination in (**MajorAxisLength**,** Roundness**) Features with perceptron : good could discriminate between two classes (**Bombay , Sira**)**

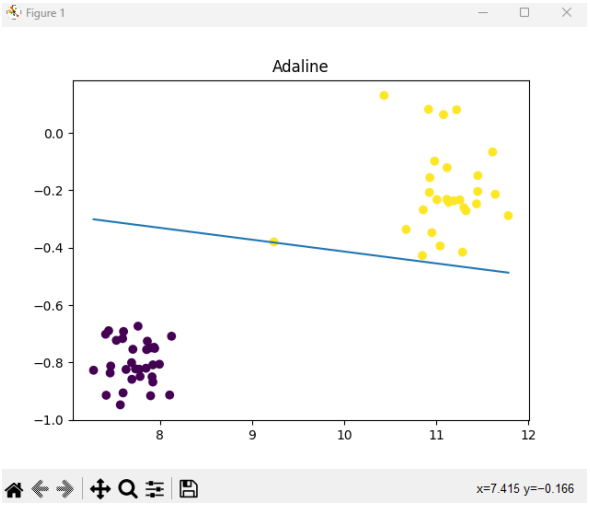
Run 5

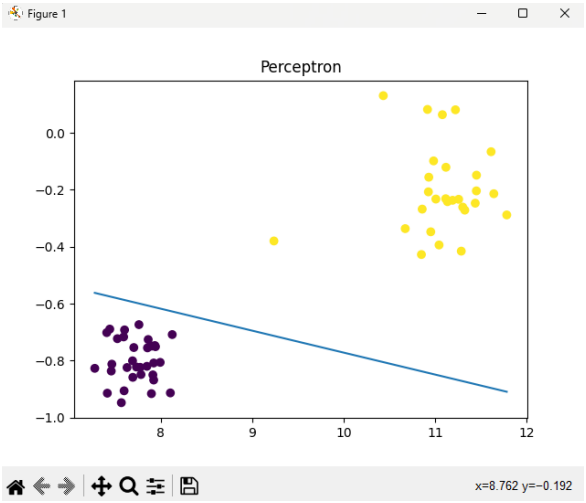
Classes:

Sira , Cali

Feature:

Perimeter , Minor axis

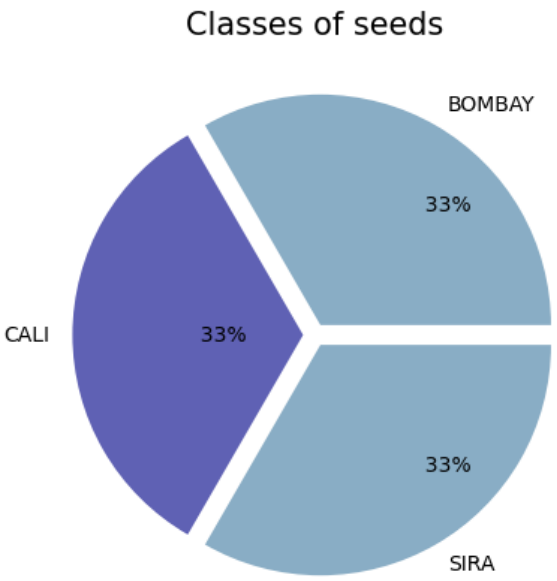




Analysis:

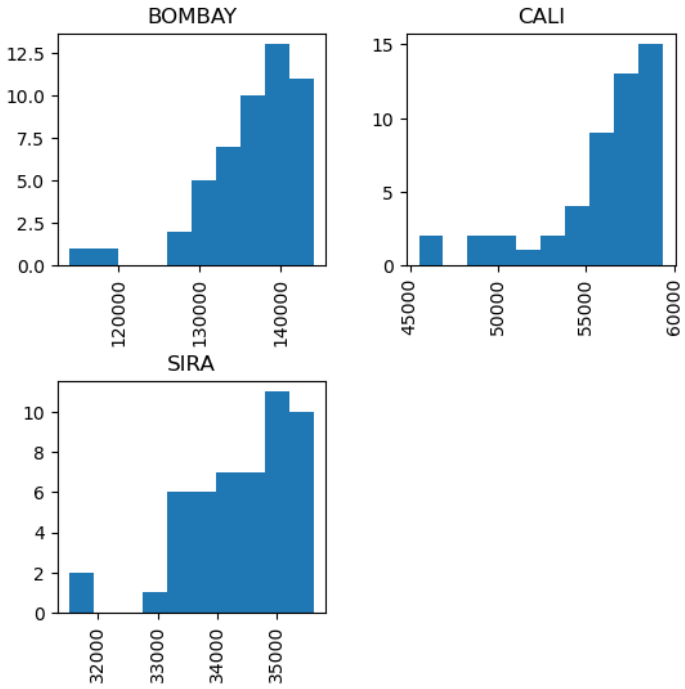
- ➔ **Discrimination in (**Perimeter**,** Minor axis**) Features with Adaline : good could discriminate between two classes(**Sira, Cali**) but still exist ratio of error**
- ➔ **Discrimination in (**Perimeter**,** Minor axis**) Features with perceptron : good could discriminate between two classes (**Sira, Cali**)**

Features Analysis:



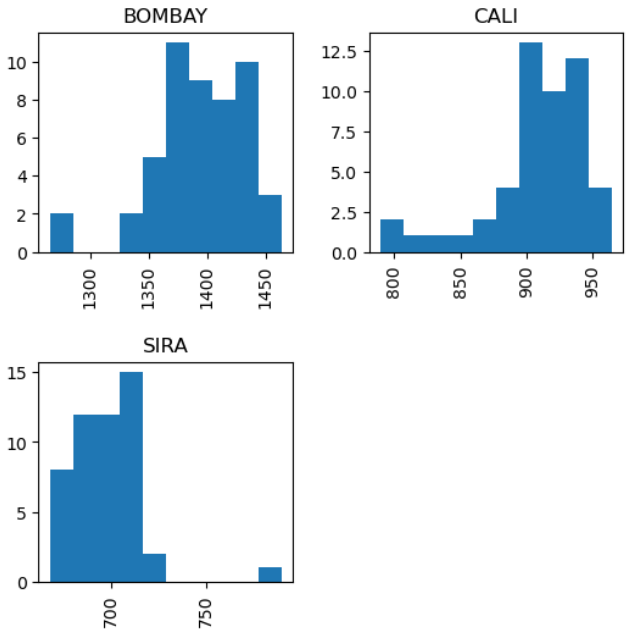
Classes Analysis:

→ Classes with **Area** Feature



- **BOMBAY has the larger size than other classes in Area feature**

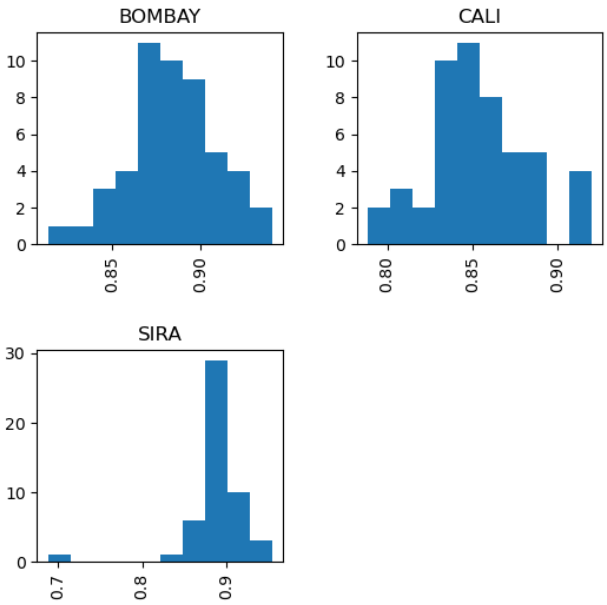
➔ Classes with **Perimeter** Feature



- **BOMBAY has the larger size than other classes in Perimeter Feature**

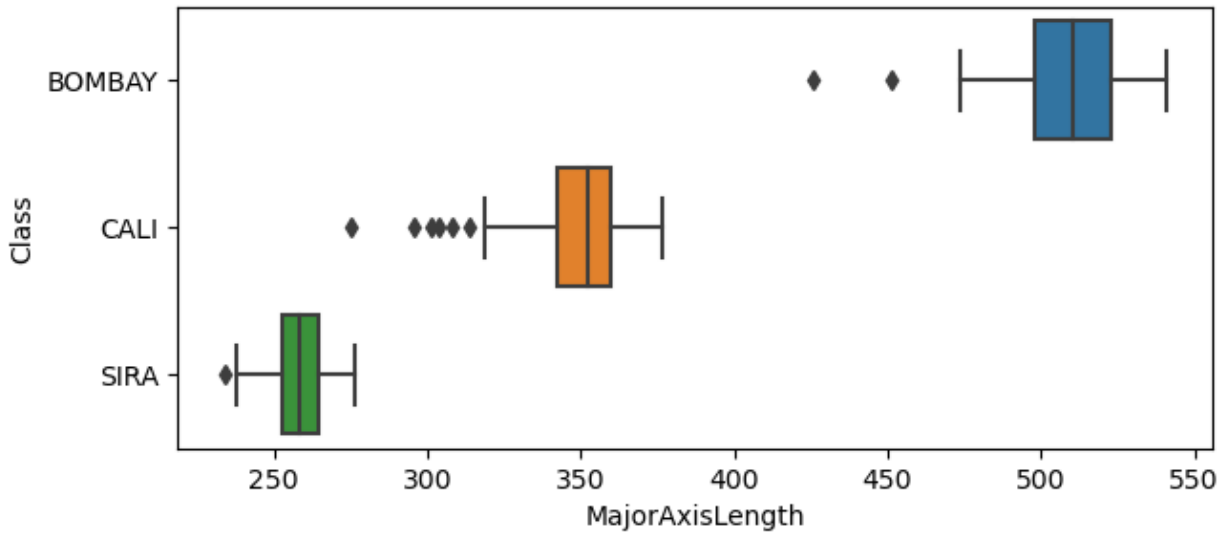
→Classes with **Roundness** feature:

- **SIRA** Class more Rounded than others



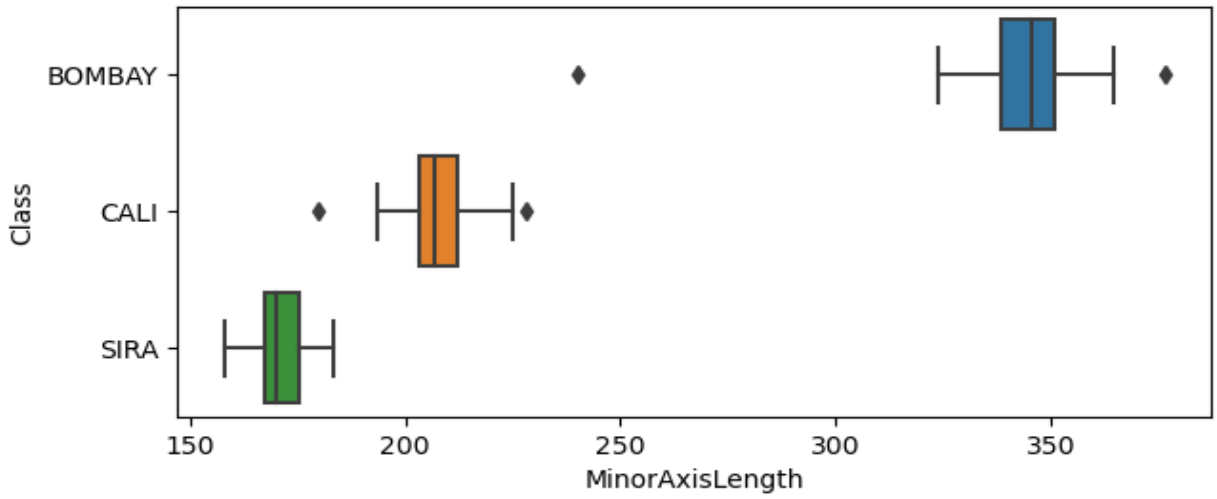
➔ Classes with **MajorAxisLength** feature:

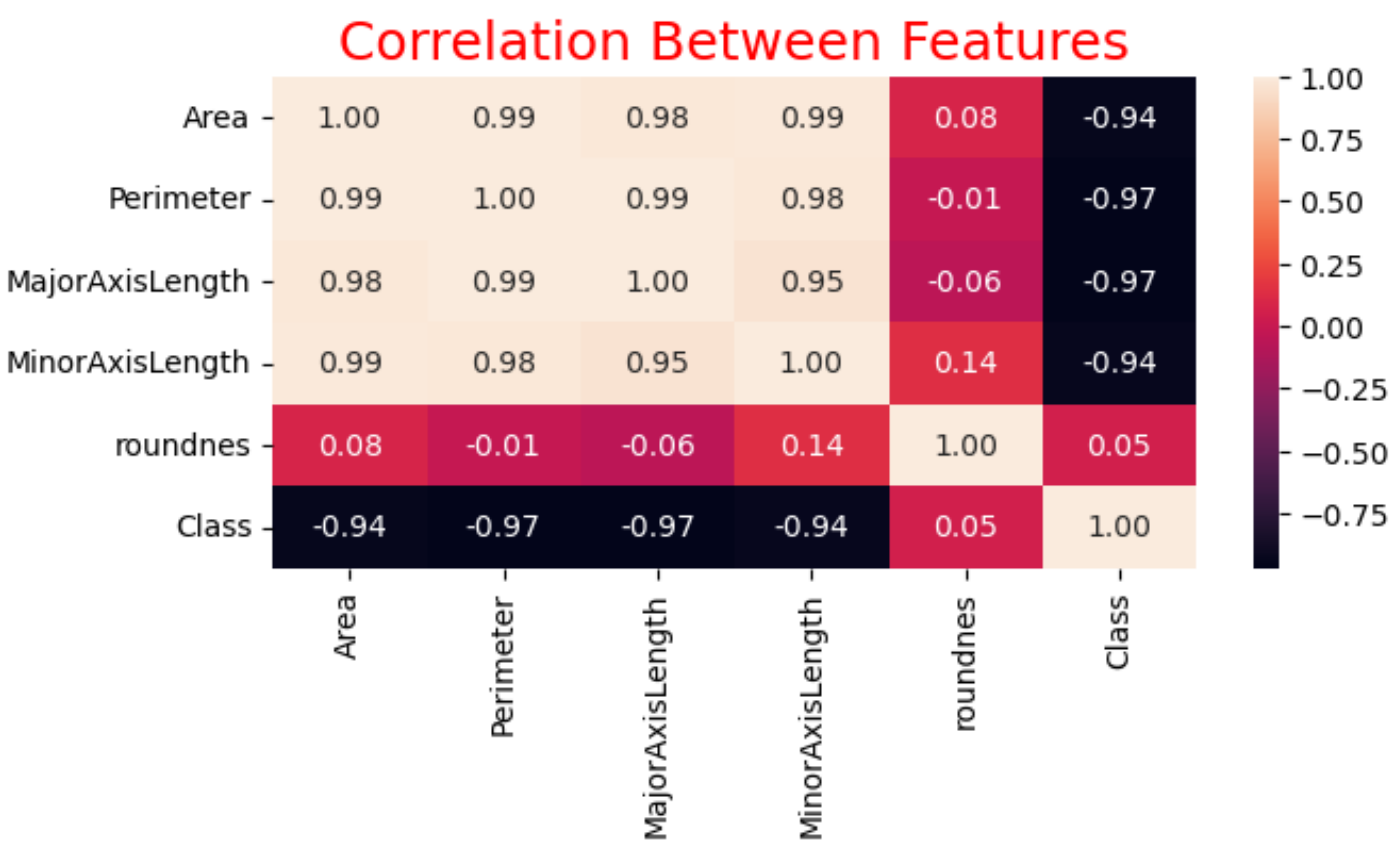
- CALI Has the most outliers in **MajorAxisLength**
- BOMBAY The tallest **MajorAxisLength**



→Classes with **MinorAxisLength** feature:

-BOMBAY The tallest **MinorAxisLength**




Correlation Between Features
Area
Perimeter
MajorAxisLength
MinorAxisLength
roundnes
Class
1.00 0.99 0.98 0.99 0.08 -0.94
0.99 1.00 0.99 0.98 -0.01 -0.97
0.98 0.99 1.00 0.95 -0.06 -0.97
0.99 0.98 0.95 1.00 0.14 -0.94
0.08 -0.01 -0.06 0.14 1.00 0.05
-0.94 -0.97 -0.97 -0.94 0.05 1.00
Area
Perimeter
MajorAxisLength
MinorAxisLength
roundnes
Class
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75