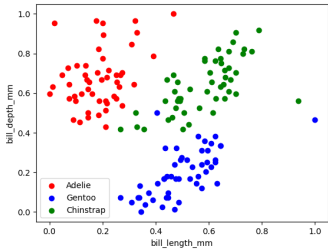
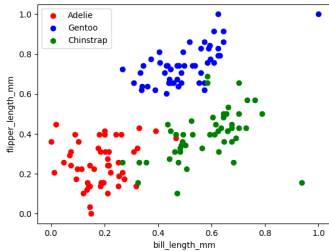
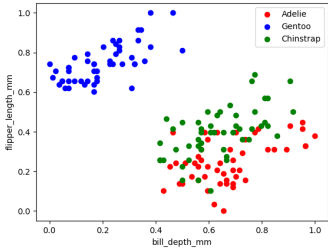
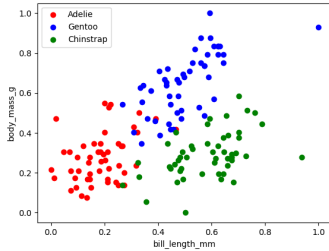
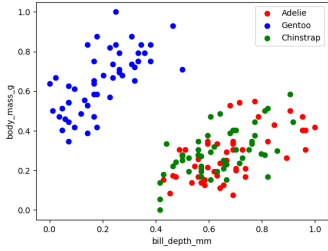
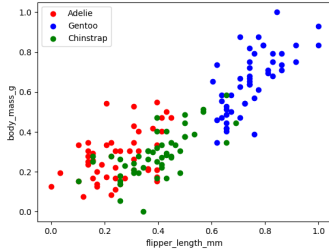
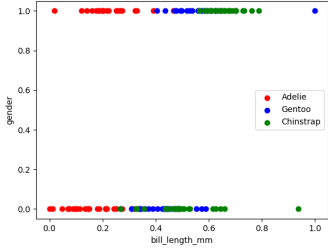
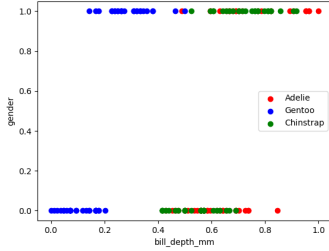
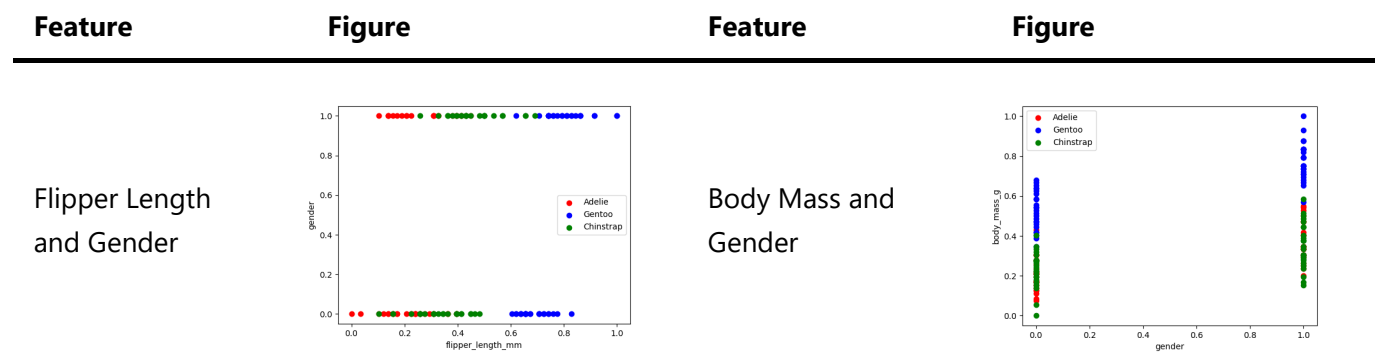


Team CS_H38

Name	ID
Mazen Mohamed Bakr	20191700479
Mohamed Ibrahim Mohamed	20191700490
Waleed Mohamed Mohamed	20191700747

Table of Figures

Feature	Figure	Feature	Figure
Bill Length and Bill Depth		Bill Length and Flipper Length	
Bill Depth and Flipper Length		Bill Length and Body Mass	
Bill Depth and Body Mass		Flipper Length and Body Mass	
Bill Length and Gender		Bill Depth and Gender	



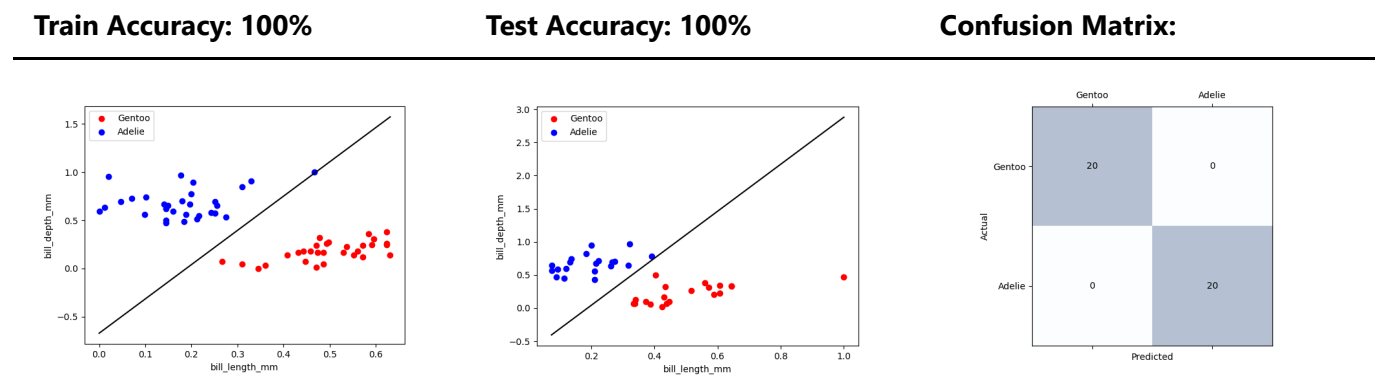
Introduction

The penguin dataset is a dataset that contains information about the penguins. The dataset contains 150 rows and 6 columns. The columns are: species, bill_length_mm, bill_depth_mm, flipper_length_mm, gender, body_mass

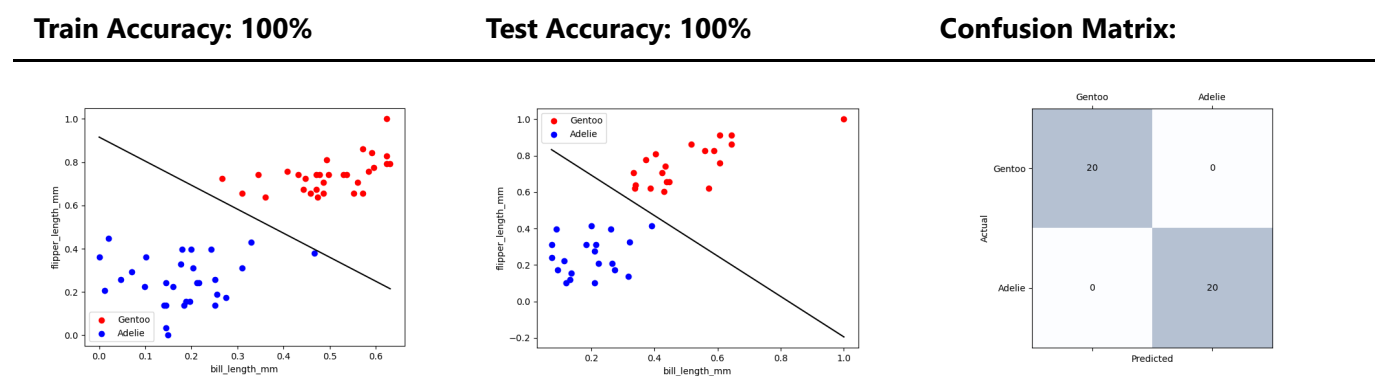
Note that all the experiments are done on 0.01 Learning Rate and 100 Epochs using bias

Adelie and Gentoo

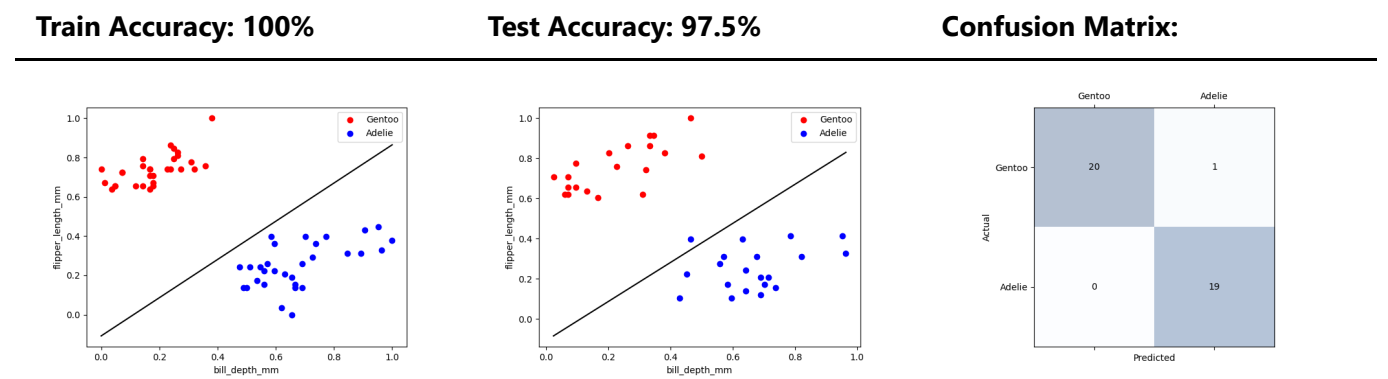
Bill Length and Bill Depth



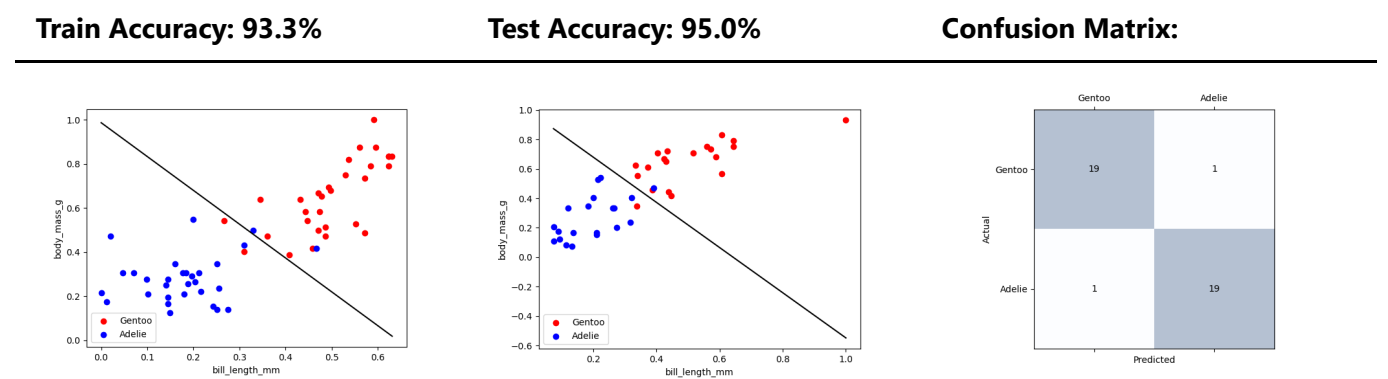
Bill Length and Flipper Length



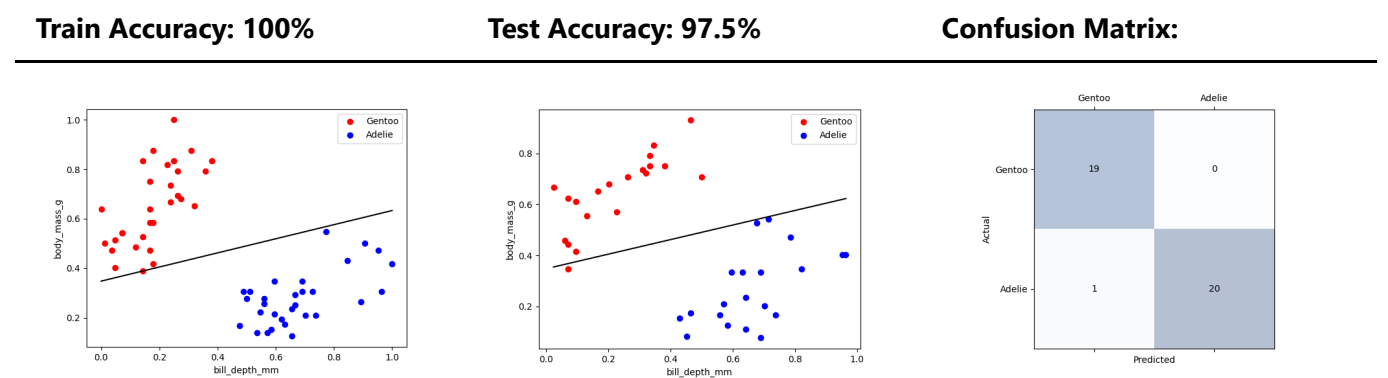
Bill Depth and Flipper Length



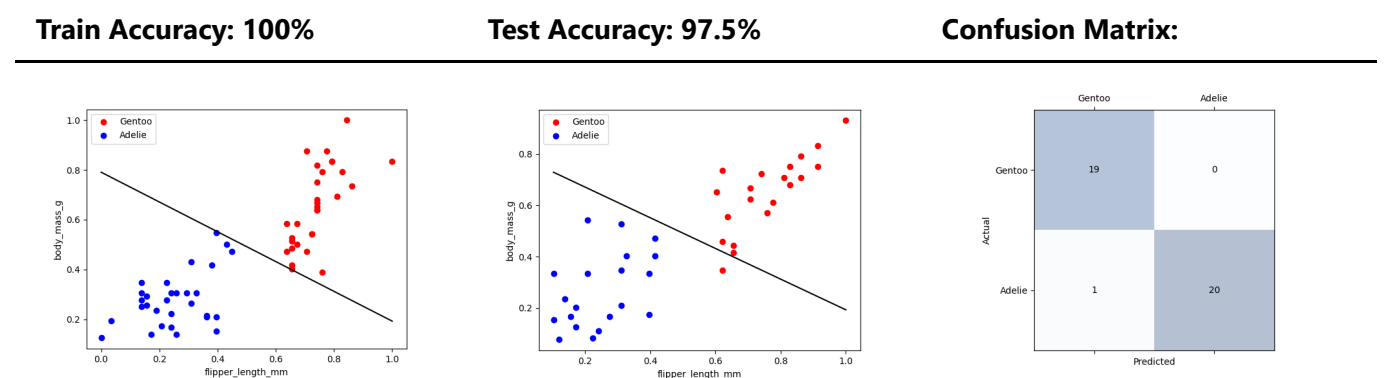
Bill Length and Body Mass



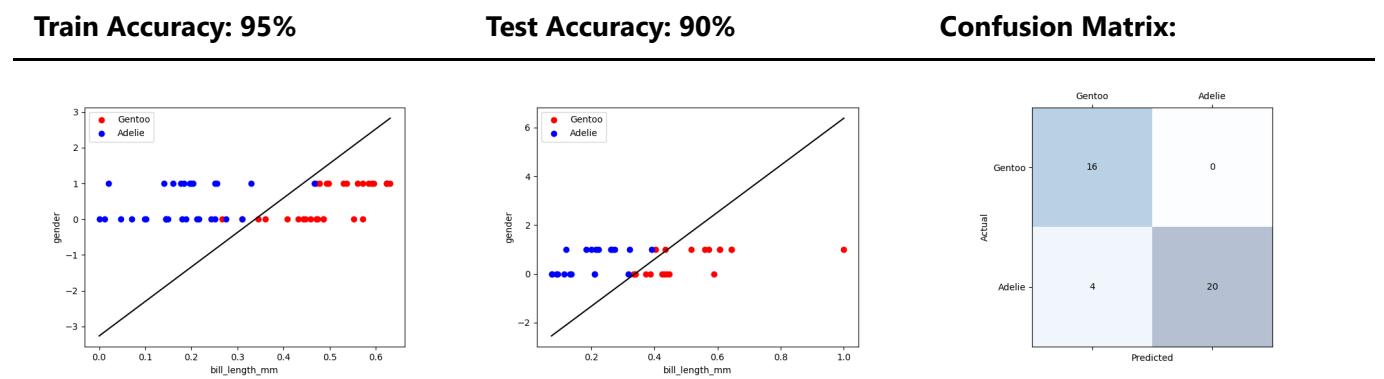
Bill Depth and Body Mass



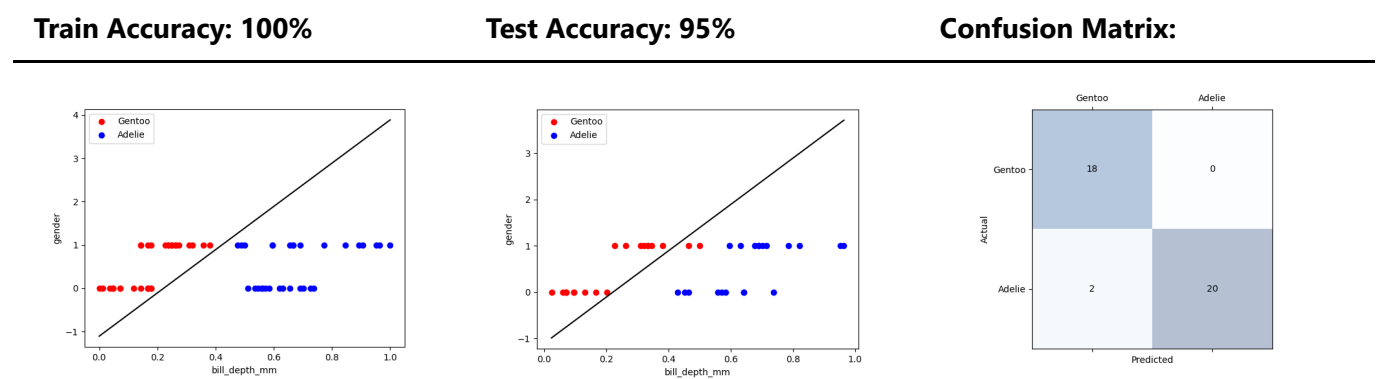
Flipper Length and Body Mass



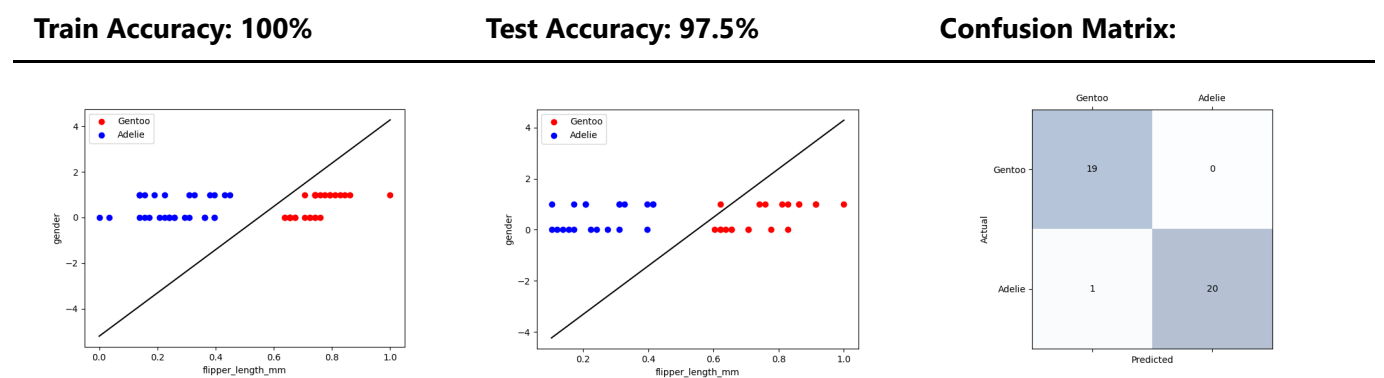
Bill Length and Gender



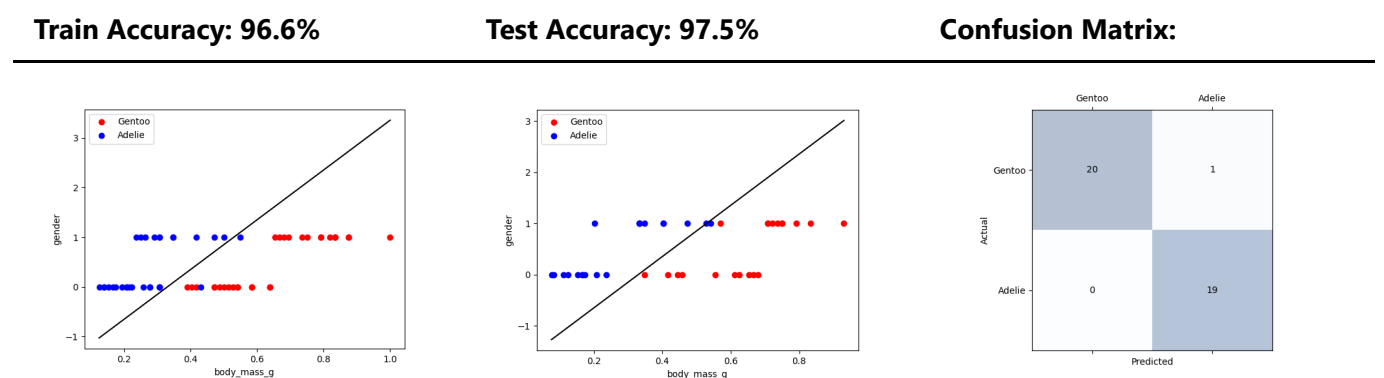
Bill Depth and Gender



Flipper Length and Gender



Body Mass and Gender



Conclusion

As we can see from the results, the Adelie and Gentoo penguins are very easy to distinguish. The Adelie penguins are smaller than the Gentoo penguins. The Adelie penguins have a smaller bill length and depth than the Gentoo penguins. The Adelie penguins have a smaller body mass than the Gentoo penguins. The Adelie penguins have a smaller flipper length than the Gentoo penguins.

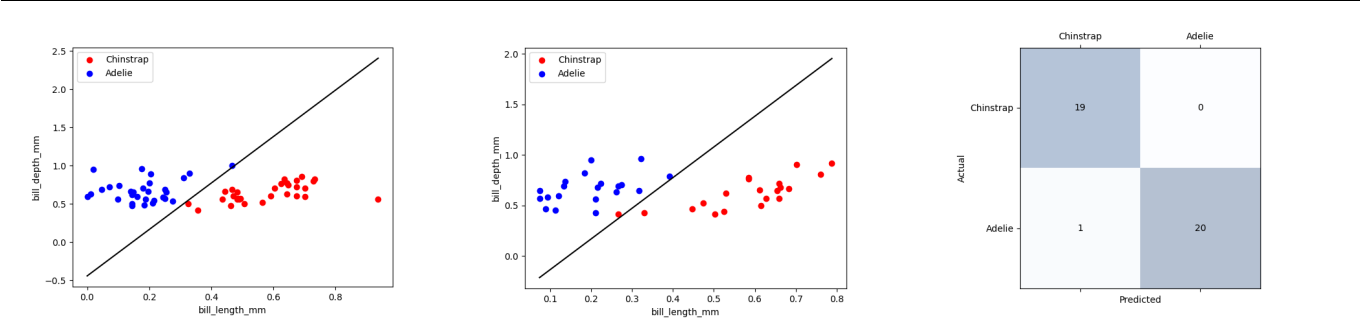
Adelie and Chinstrap

Bill Length and Bill Depth

Train Accuracy: 100%

Test Accuracy: 97.5%

Confusion Matrix:

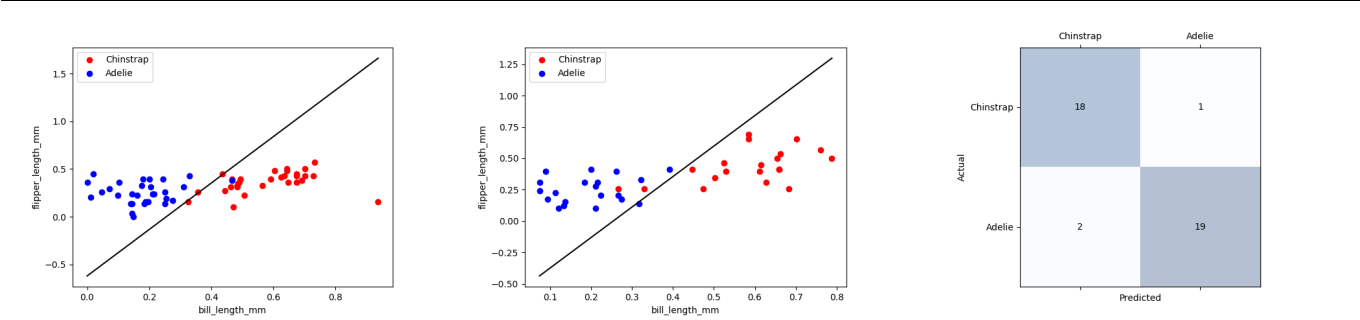


Bill Length and Flipper Length

Train Accuracy: 95%

Test Accuracy: 92.5%

Confusion Matrix:

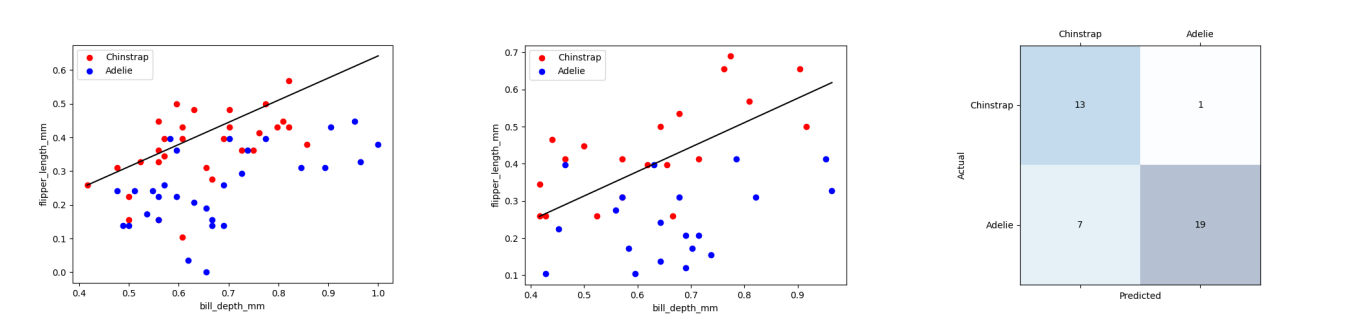


Bill Depth and Flipper Length

Train Accuracy: 68.3%

Test Accuracy: 80.0%

Confusion Matrix:

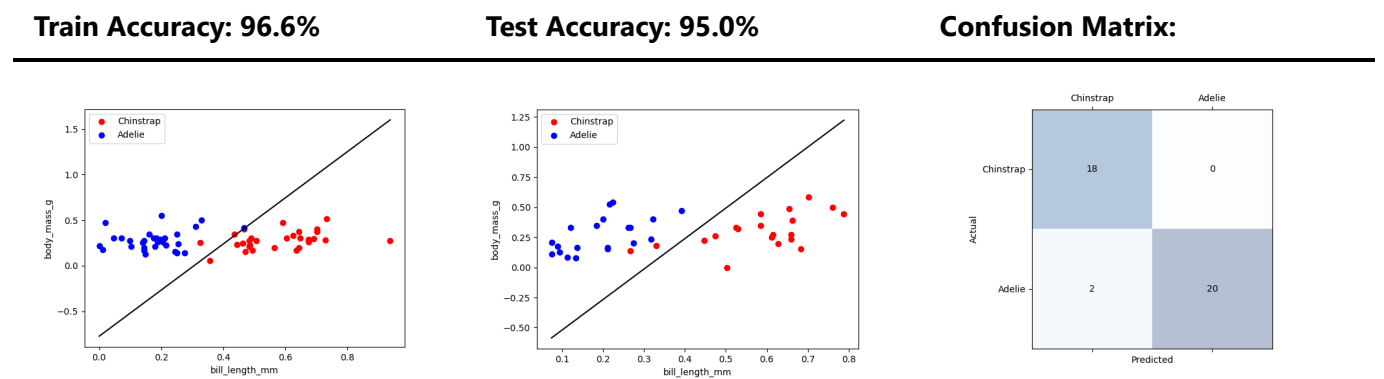


Bill Length and Body Mass

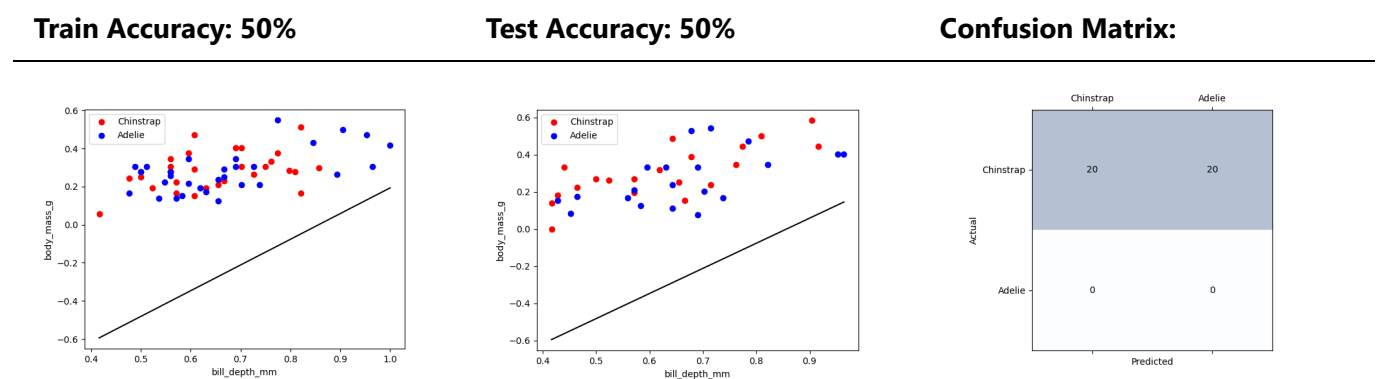
Train Accuracy: 96.6%

Test Accuracy: 95.0%

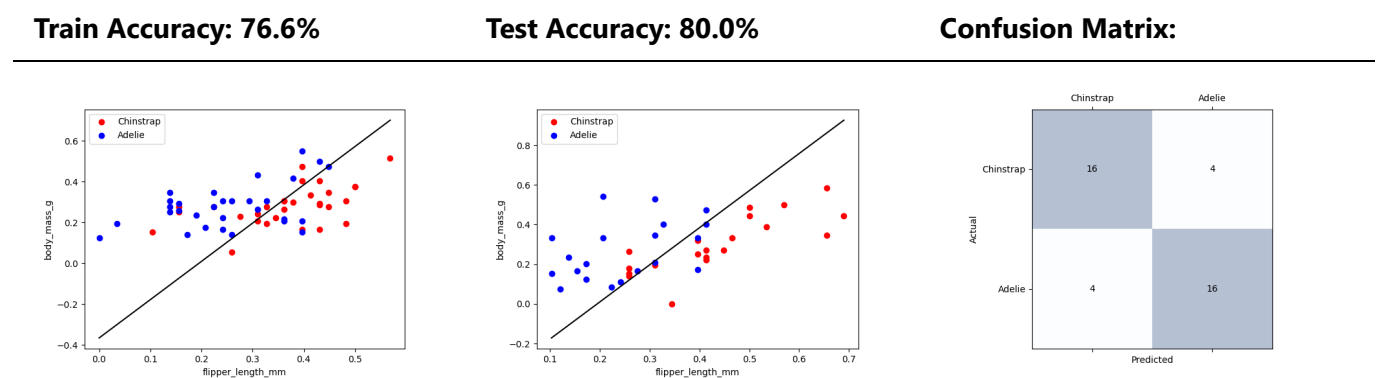
Confusion Matrix:



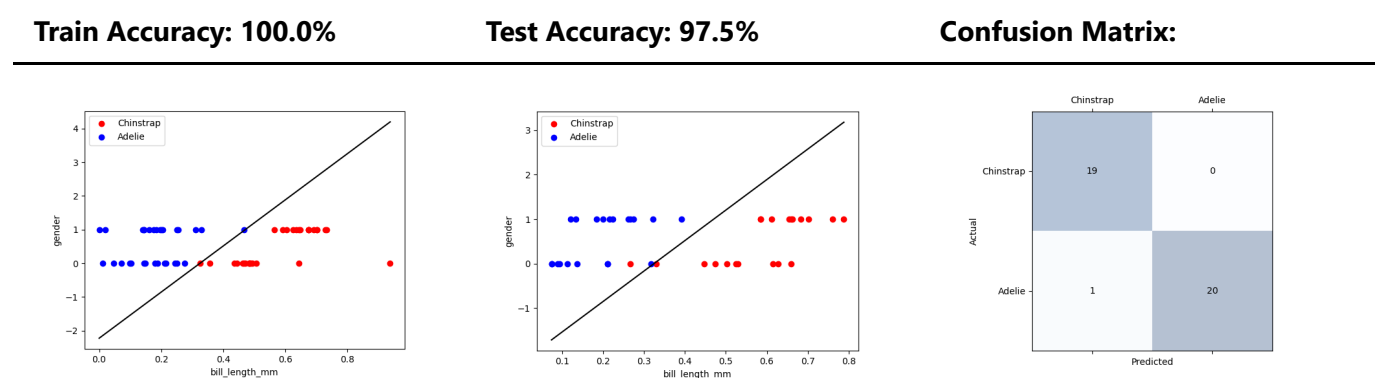
Bill Depth and Body Mass



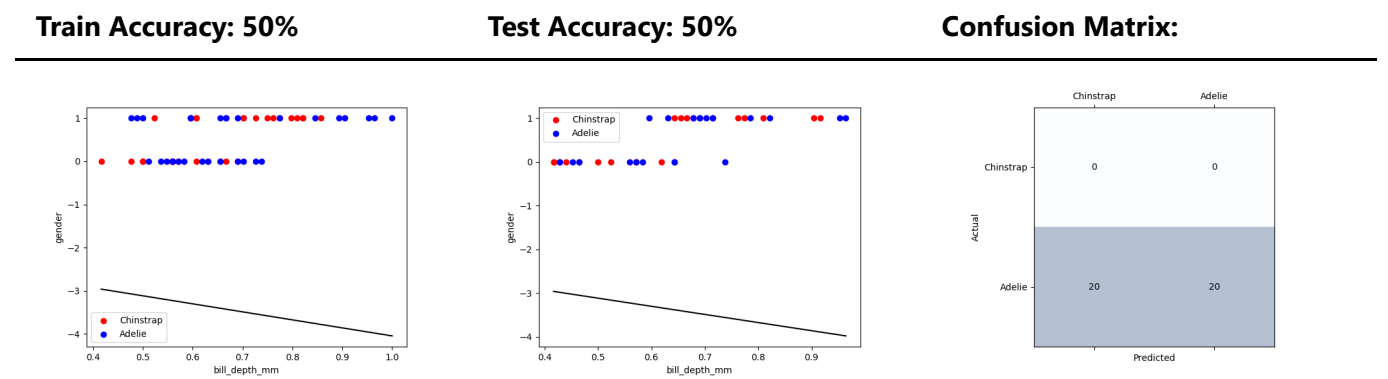
Flipper Length and Body Mass



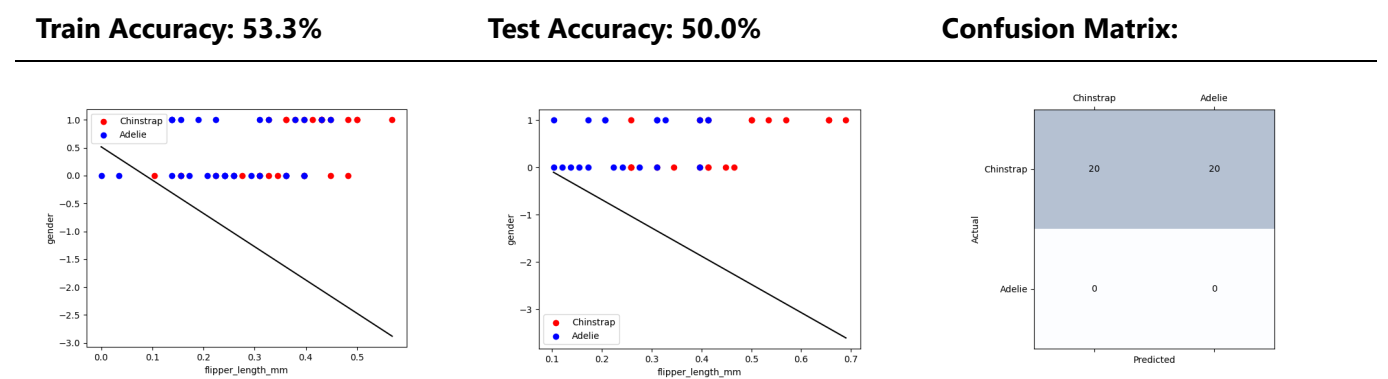
Bill Length and Gender



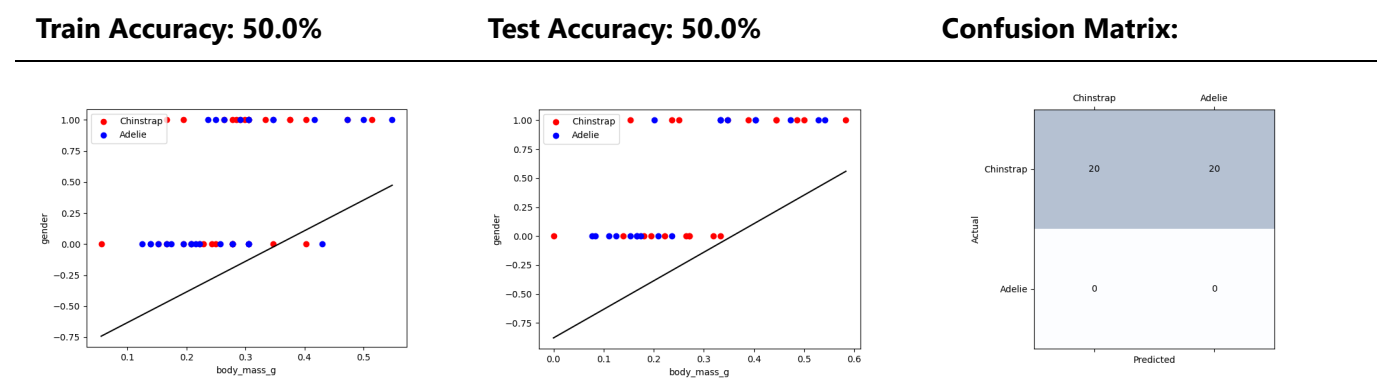
Bill Depth and Gender



Flipper Length and Gender



Body Mass and Gender

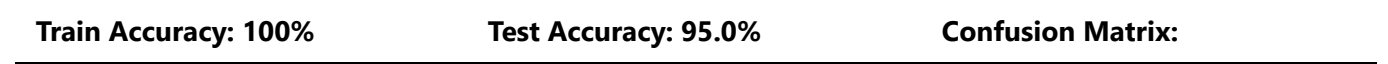


Conclusion

Adelie and Chinstrap penguins are hard to classify in most cases, but the features bill length and bill depth, bill length and gender were the best features to classify with.

Gentoo and Chinstrap

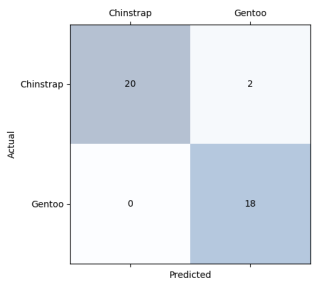
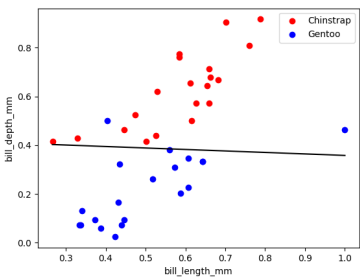
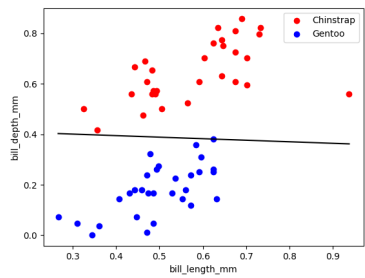
Bill Length and Bill Depth



Train Accuracy: 100%

Test Accuracy: 95.0%

Confusion Matrix:

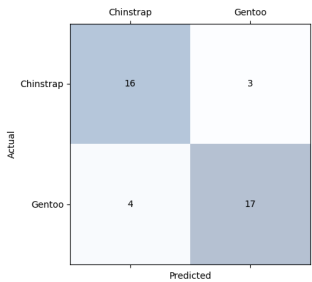
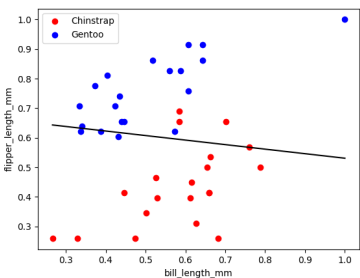
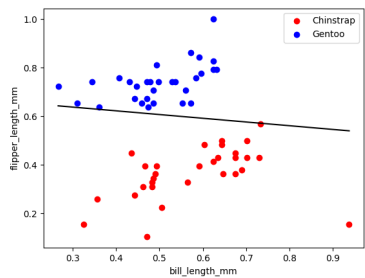


Bill Length and Flipper Length

Train Accuracy: 100%

Test Accuracy: 82.5%

Confusion Matrix:

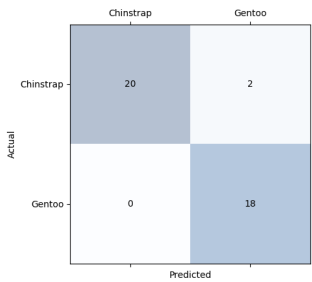
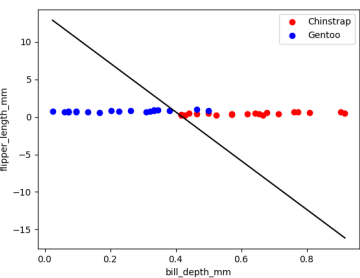
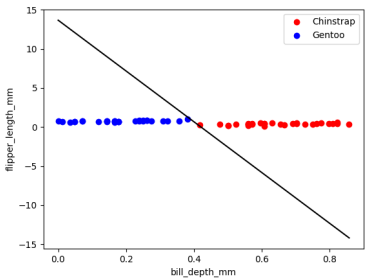


Bill Depth and Flipper Length

Train Accuracy: 100%

Test Accuracy: 95.0%

Confusion Matrix:

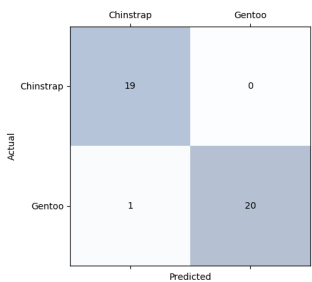
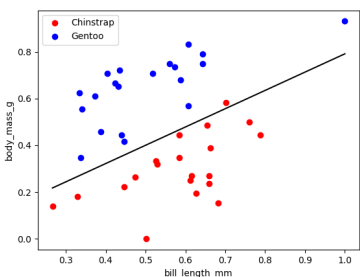
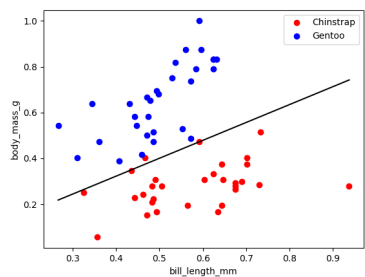


Bill Length and Body Mass

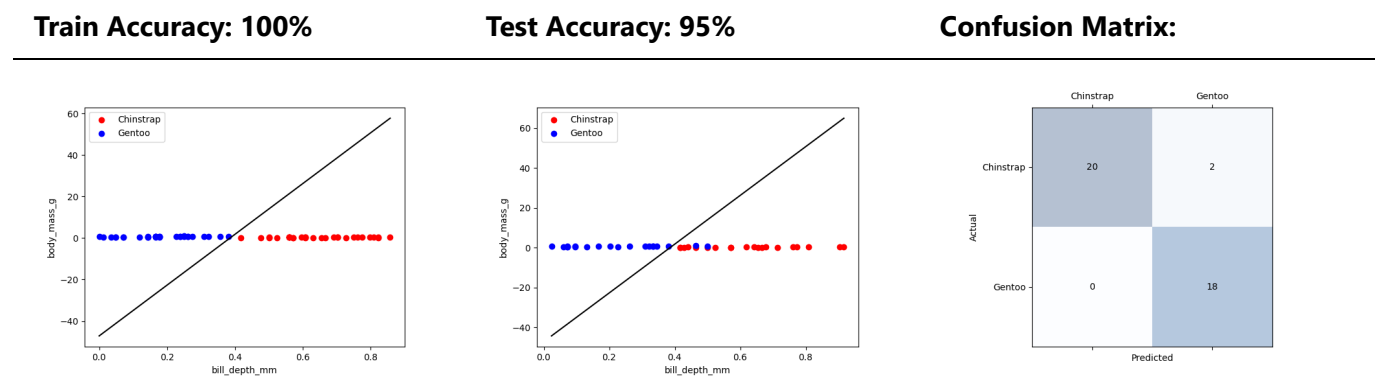
Train Accuracy: 98.3%

Test Accuracy: 97.5%

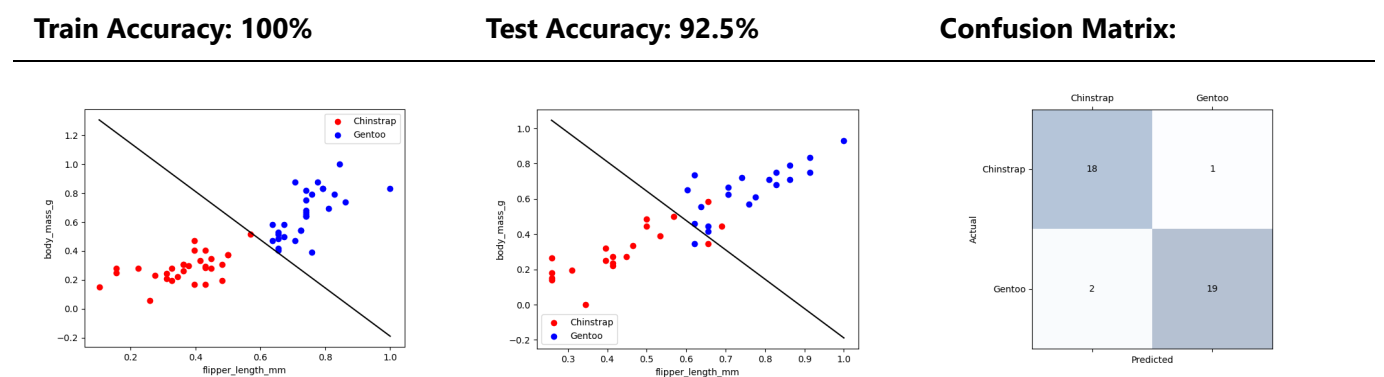
Confusion Matrix:



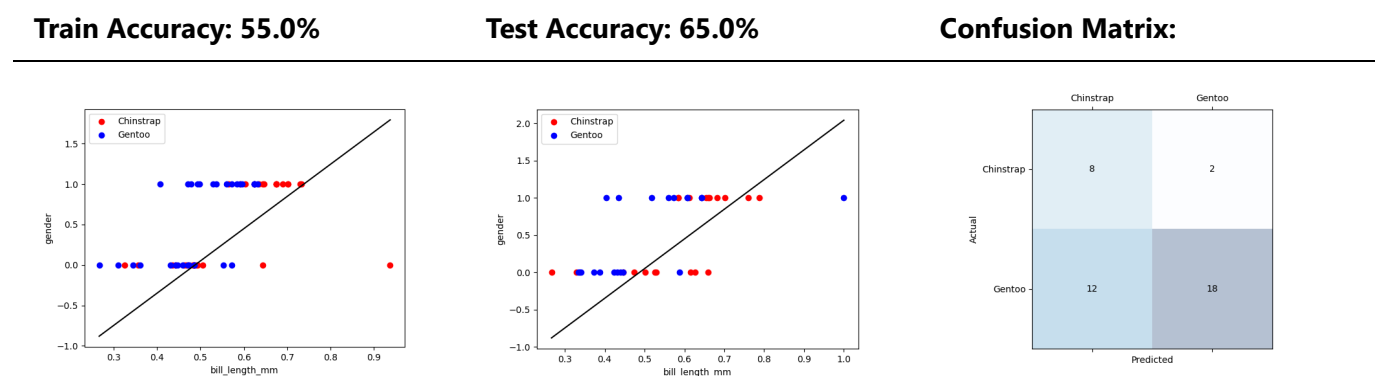
Bill Depth and Body Mass



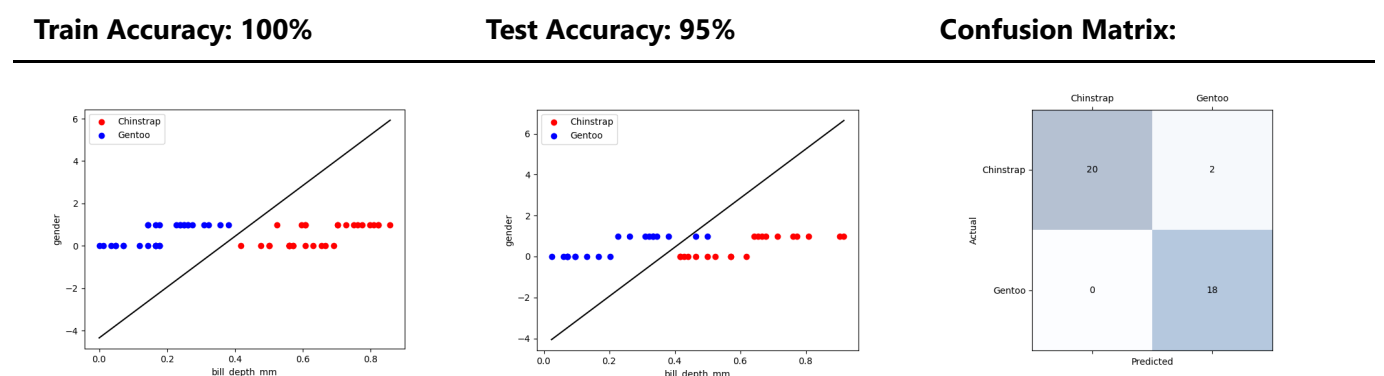
Flipper Length and Body Mass



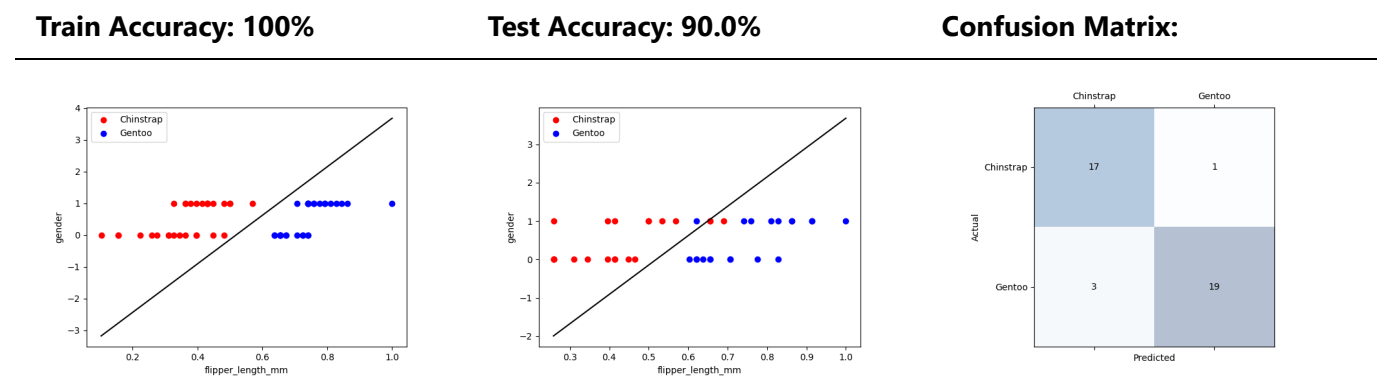
Bill Length and Gender



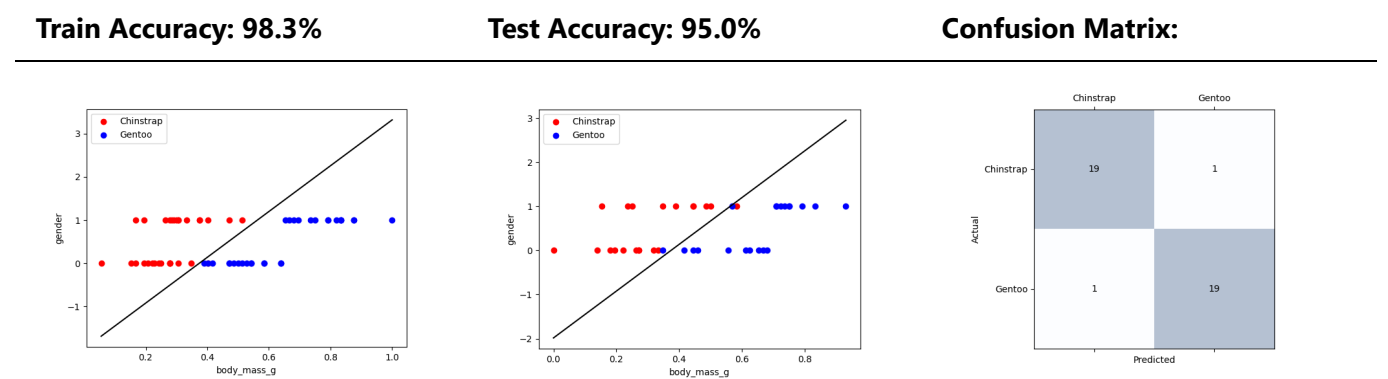
Bill Depth and Gender



Flipper Length and Gender



Body Mass and Gender



Conclusion

Gentoo and Chinstrap penguins are easier to classify than Adelie and Chinstrap, the features gender, bill depth and body_mass were the best features to classify with.

Overall Conclusion

Overall, Adelie and Chinstrap are the hardest to classify, Adelie and Gentoo are the easiest to classify. The best features to classify with are bill length and bill depth.