Team CS_H38

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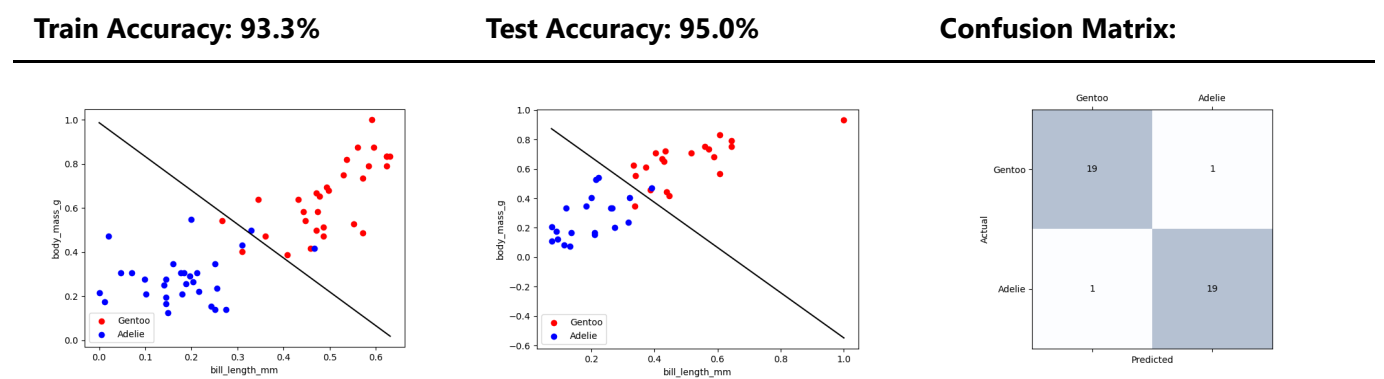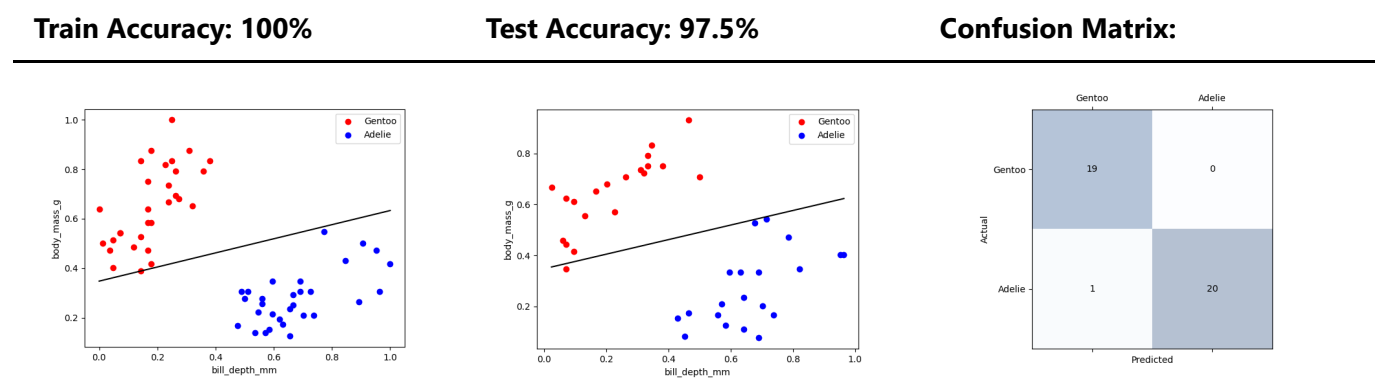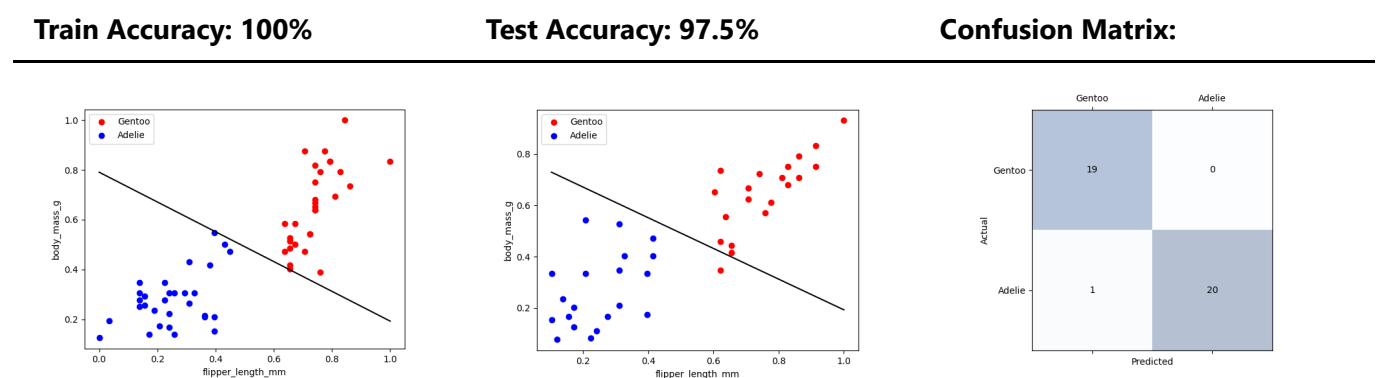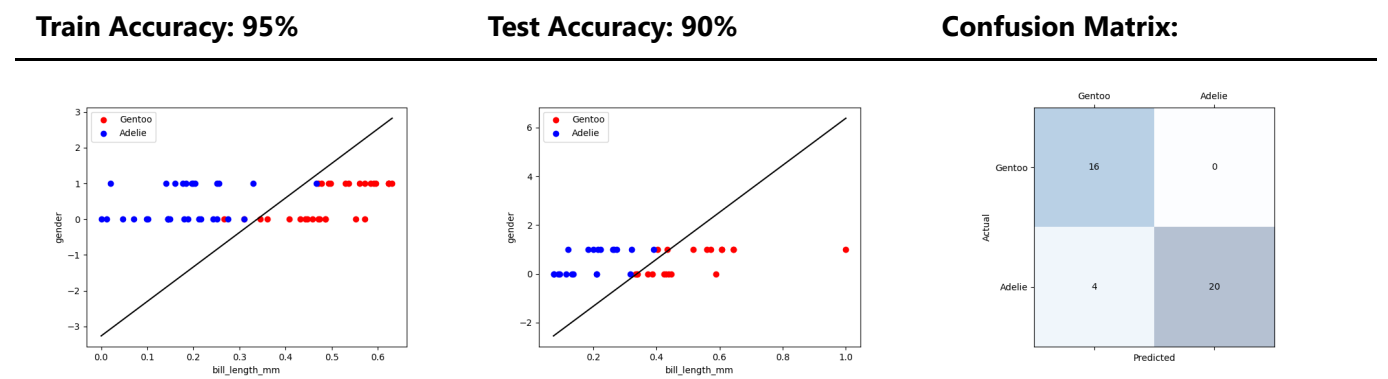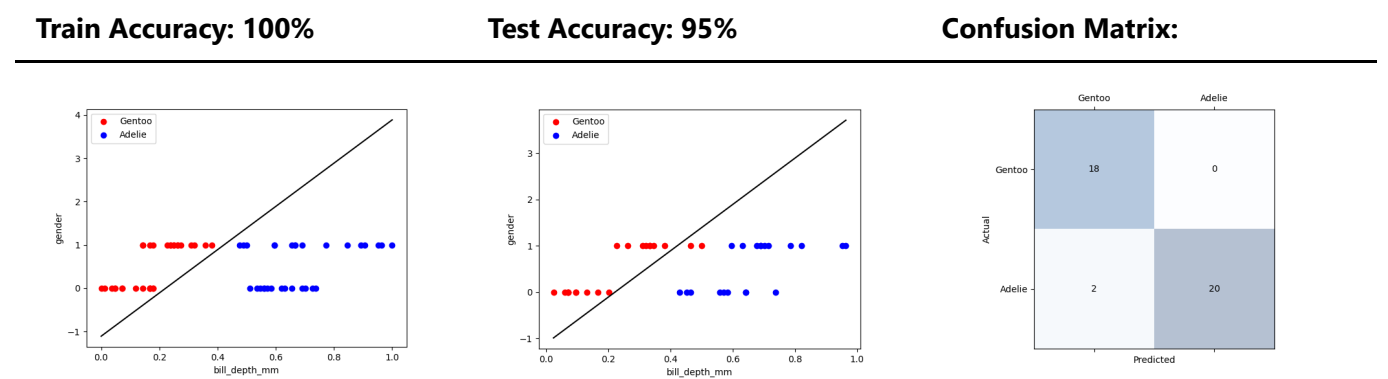
Feature	Figure	Feature	Figure
Flipper Length and Gender		Body Mass and Gender	

Introduction

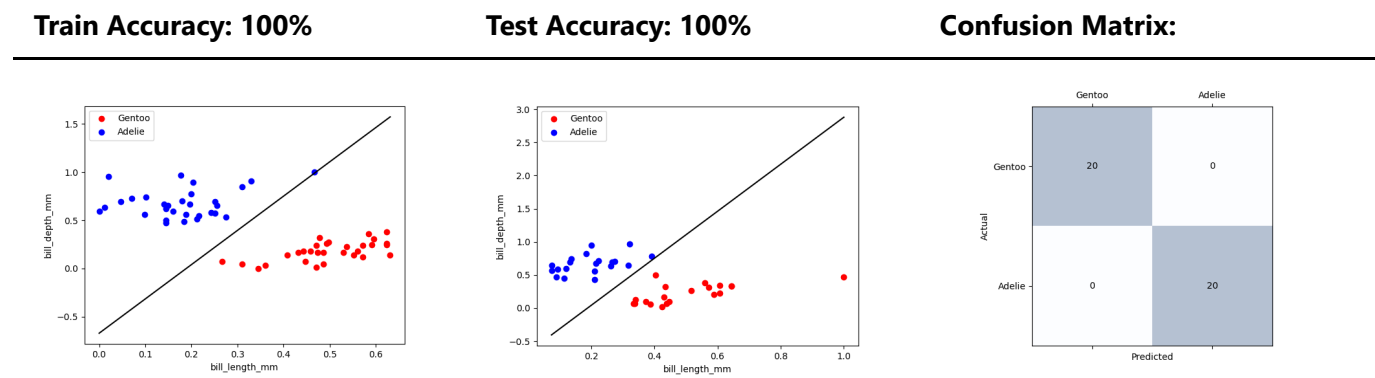The penguin dataset is a dataset that contains information about the penguins in the Palmer Archipelago, Antarctica. The dataset contains 344 rows and 8 columns. The columns are: species, island, bill_length_mm, bill_depth_mm, flipper_length_mm, body_mass
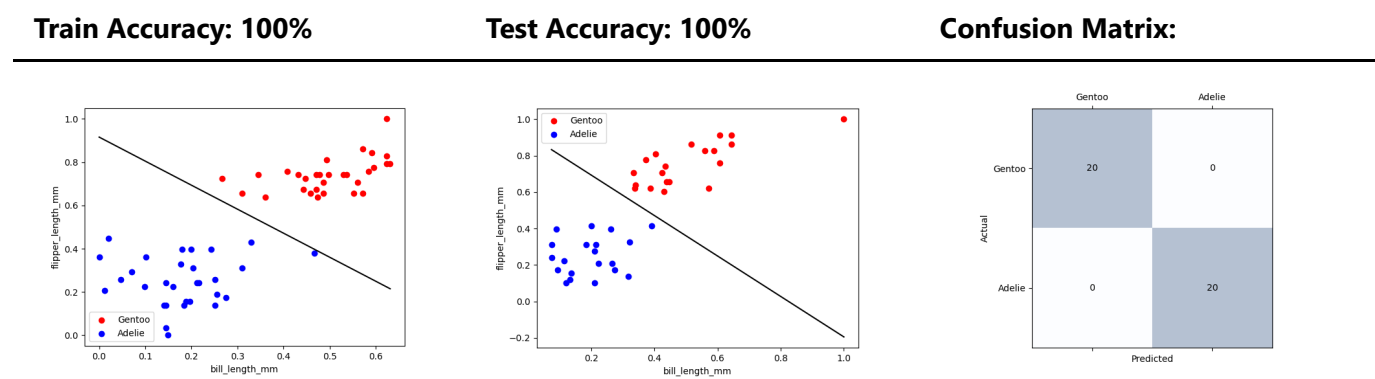
Note that all the experiments are done on 0.01 Learning Rate and 100 Epochs using bias
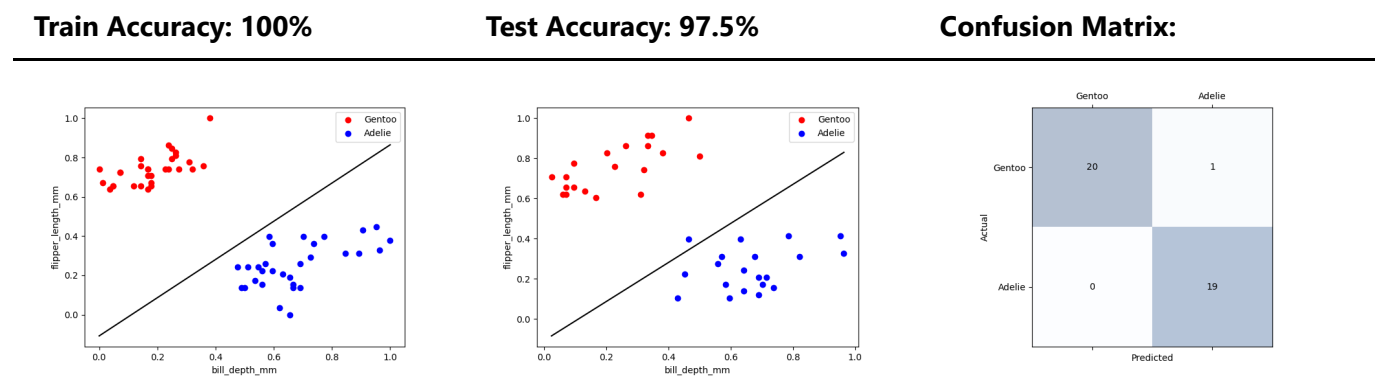
Adelie and Gentoo

Bill Length and Bill Depth

Train Accuracy: 100%	**Test Accuracy: 100%**	**Confusion Matrix:**

Bill Length and Flipper Length

Train Accuracy: 100%	**Test Accuracy: 100%**	**Confusion Matrix:**

Bill Depth and Flipper Length

Train Accuracy: 100%   **Test Accuracy: 97.5%**   **Confusion Matrix:**

Bill Length and Body Mass

Train Accuracy: 93.3%   **Test Accuracy: 95.0%**   **Confusion Matrix:**

Bill Depth and Body Mass

Train Accuracy: 100%   **Test Accuracy: 97.5%**   **Confusion Matrix:**

Flipper Length and Body Mass

Train Accuracy: 100%   **Test Accuracy: 97.5%**   **Confusion Matrix:**

Bill Length and Gender

Train Accuracy: 95%   **Test Accuracy: 90%**   **Confusion Matrix:**

Bill Depth and Gender

Train Accuracy: 100%   **Test Accuracy: 95%**   **Confusion Matrix:**

Flipper Length and Gender

Train Accuracy: 100%   **Test Accuracy: 97.5%**   **Confusion Matrix:**

Body Mass and Gender

Train Accuracy: 96.6%   **Test Accuracy: 97.5%**   **Confusion Matrix:**
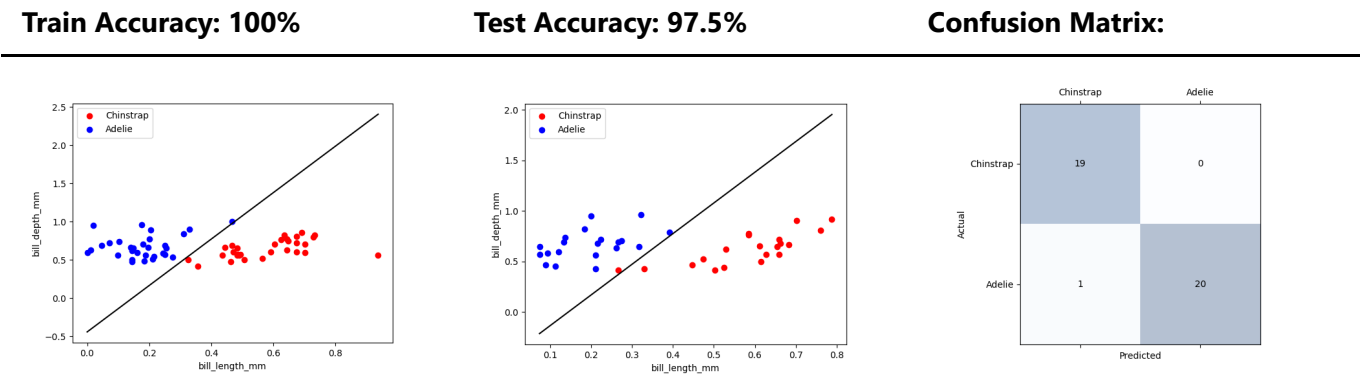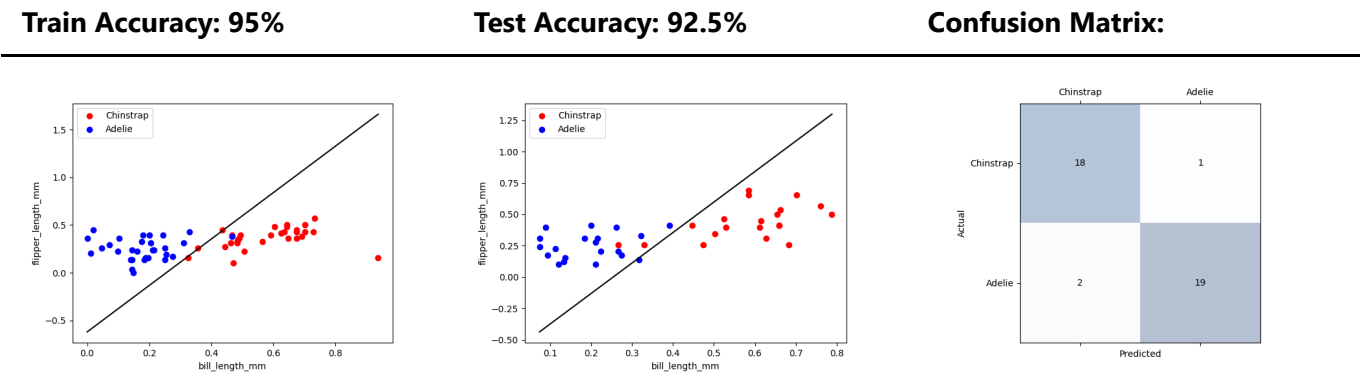

Conclusion

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. The Adelie penguins.
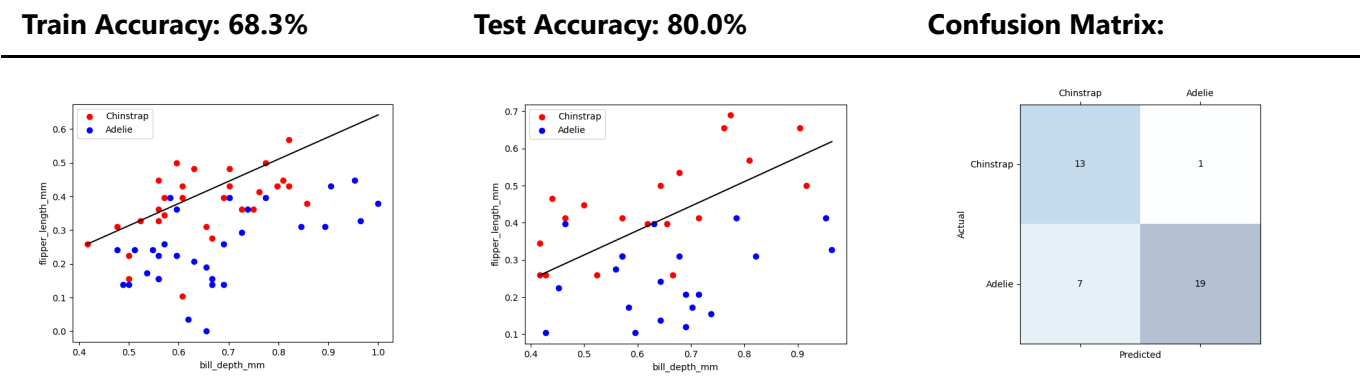
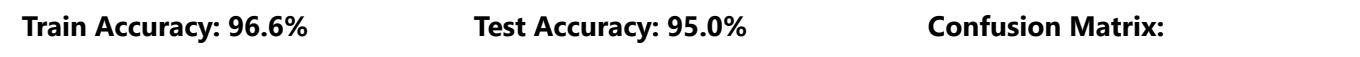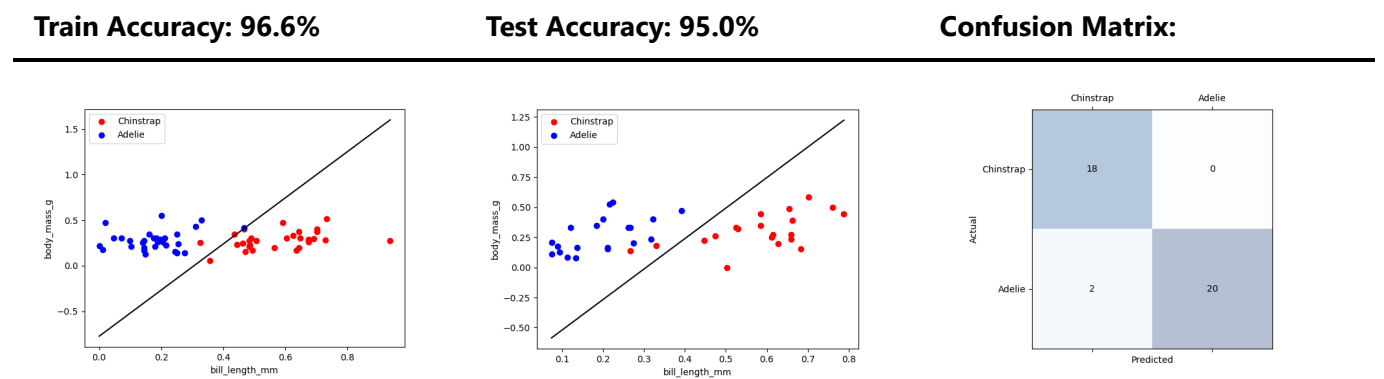# Adelie and Chinstrap

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:**

Train Accuracy: 96.6%   **Test Accuracy: 95.0%**   **Confusion Matrix:**

Bill Depth and Body Mass

Train Accuracy: 50%   **Test Accuracy: 50%**   **Confusion Matrix:**

Flipper Length and Body Mass

Train Accuracy: 76.6%   **Test Accuracy: 80.0%**   **Confusion Matrix:**

Bill Length and Gender

Train Accuracy: 100.0%   **Test Accuracy: 97.5%**   **Confusion Matrix:**

Bill Depth and Gender

Train Accuracy: 50%   **Test Accuracy: 50%**   **Confusion Matrix:**

Flipper Length and Gender

Train Accuracy: 53.3%   **Test Accuracy: 50.0%**   **Confusion Matrix:**

Body Mass and Gender

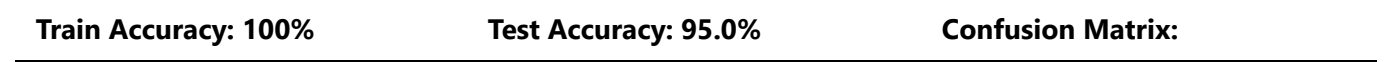**Train Accuracy: 50.0%**   **Test Accuracy: 50.0%**   **Confusion Matrix:**
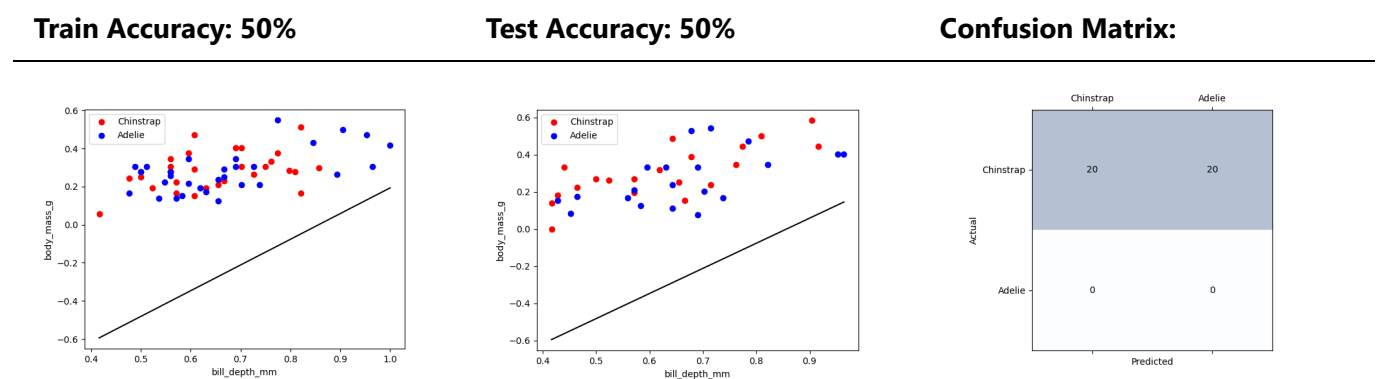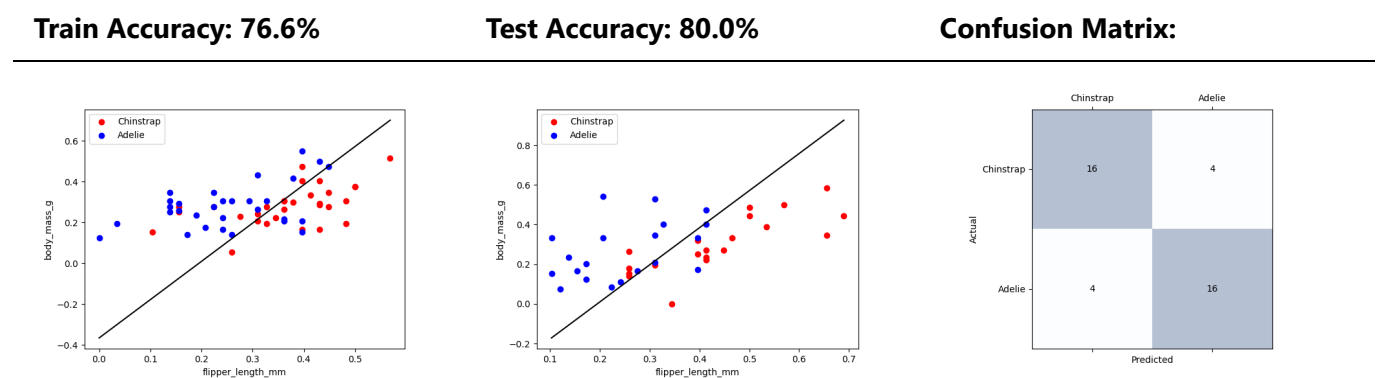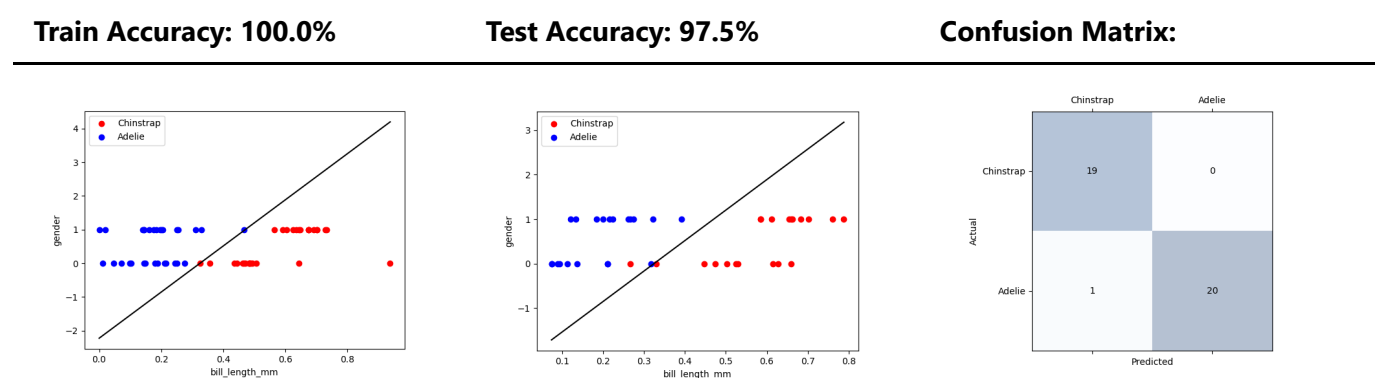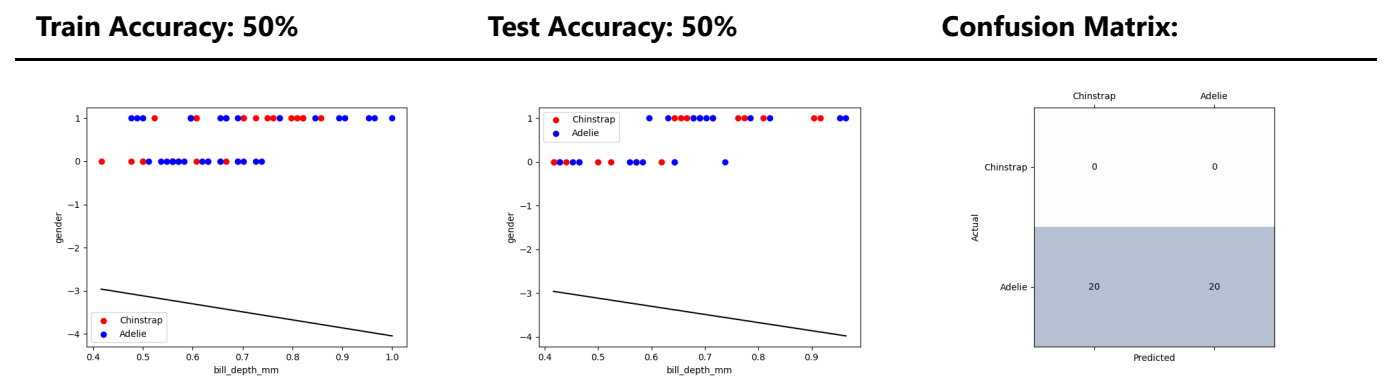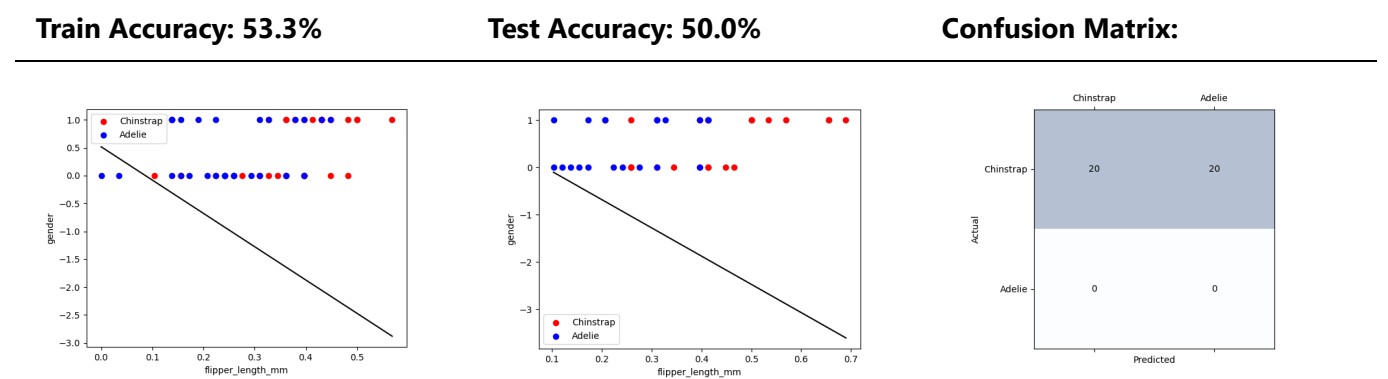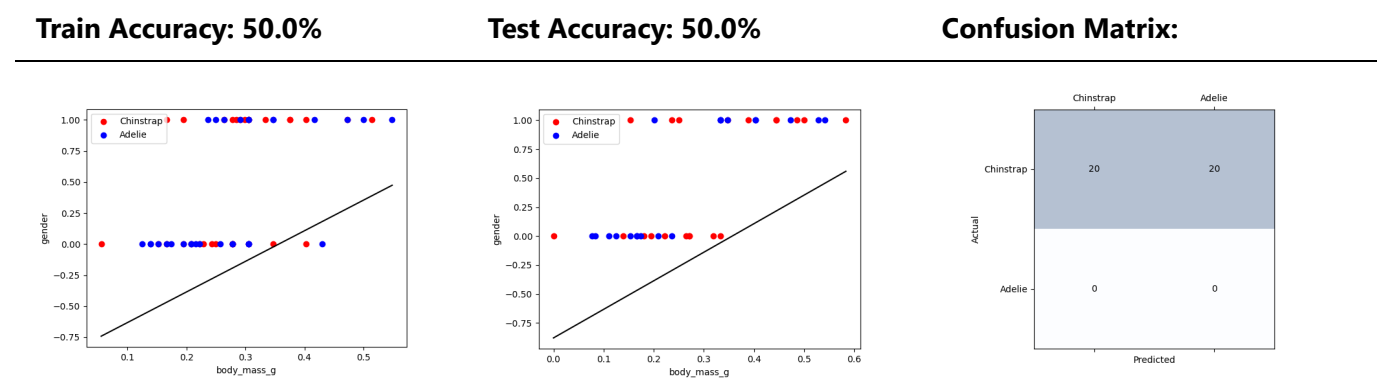
Conclusion

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.
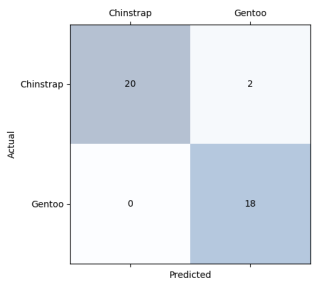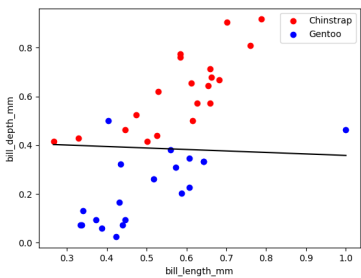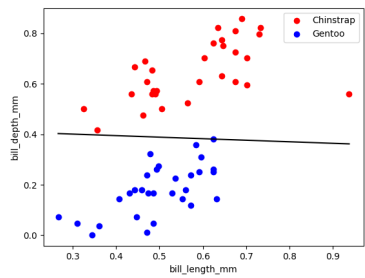
Gentoo and Chinstrap

Bill Length and Bill Depth

Train Accuracy: 100%   **Test Accuracy: 95.0%**   **Confusion Matrix:**

Train Accuracy: 100%   **Test Accuracy: 95.0%**   **Confusion Matrix:**
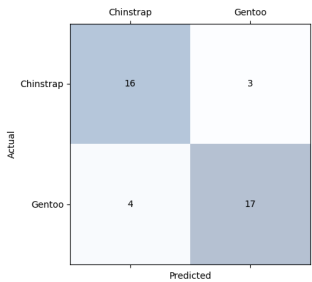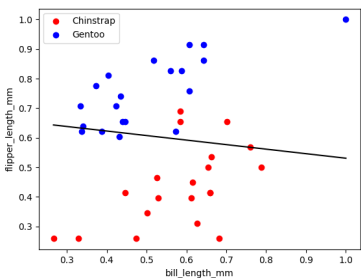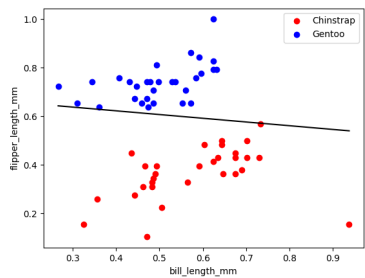

Bill Length and Flipper Length

Train Accuracy: 100%   **Test Accuracy: 82.5%**   **Confusion Matrix:**
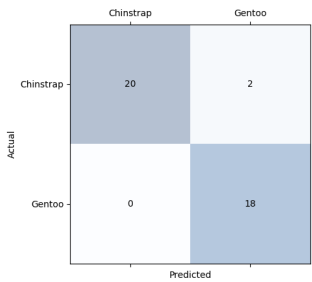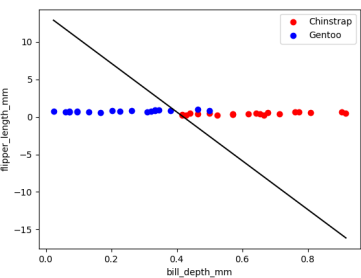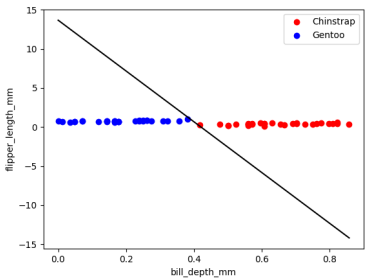

Bill Depth and Flipper Length

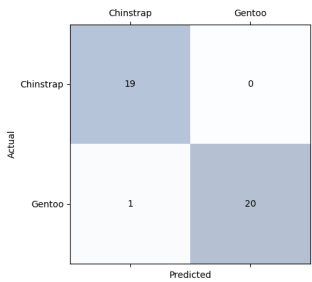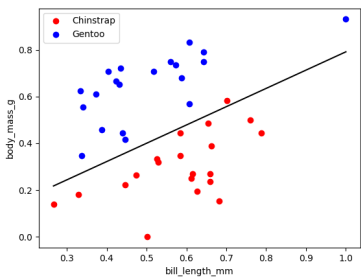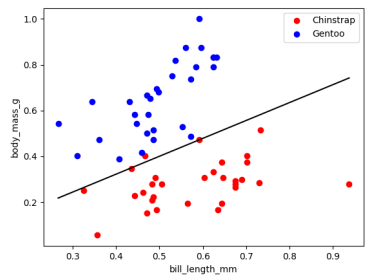**Train Accuracy: 100%**   **Test Accuracy: 95.0%**   **Confusion Matrix:**
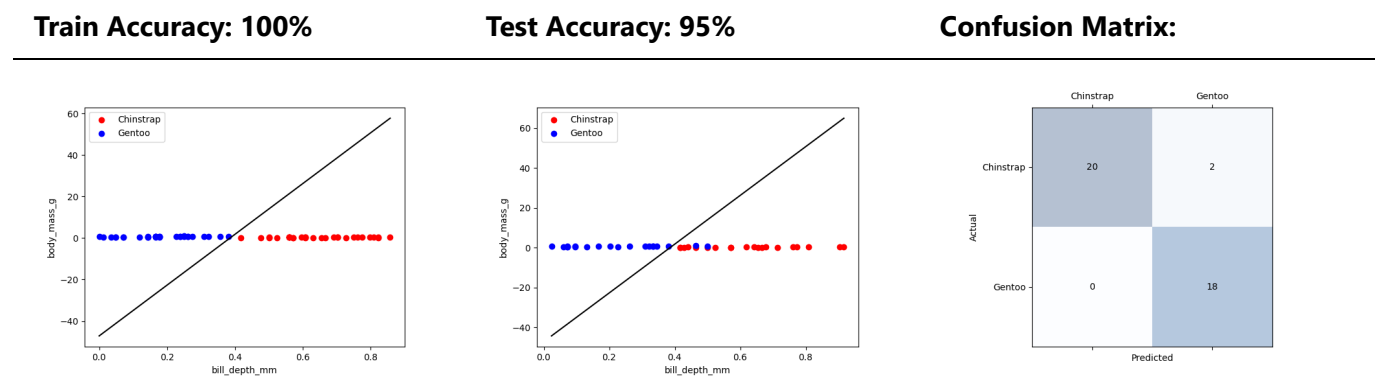

Bill Length and Body Mass
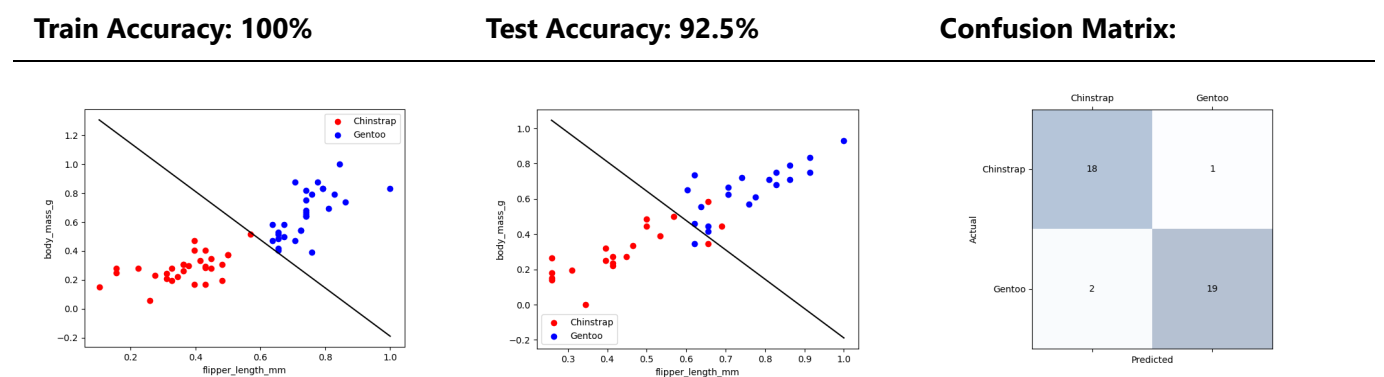
**Train Accuracy: 98.3%**   **Test Accuracy: 97.5%**   **Confusion Matrix:**

Bill Depth and Body Mass

Train Accuracy: 100%   **Test Accuracy: 95%**   **Confusion Matrix:**

Flipper Length and Body Mass

Train Accuracy: 100%   **Test Accuracy: 92.5%**   **Confusion Matrix:**

Bill Length and Gender

Train Accuracy: 55.0%   **Test Accuracy: 65.0%**   **Confusion Matrix:**

Bill Depth and Gender

Train Accuracy: 100%   **Test Accuracy: 95%**   **Confusion Matrix:**

Flipper Length and Gender

Train Accuracy: 100%   **Test Accuracy: 90.0%**   **Confusion Matrix:**

Body Mass and Gender

Train Accuracy: 98.3%   **Test Accuracy: 95.0%**   **Confusion Matrix:**
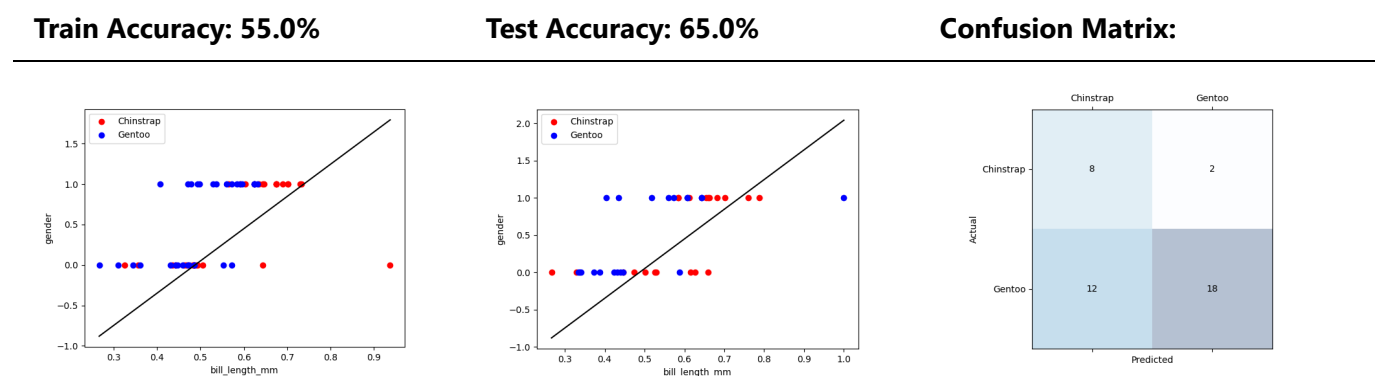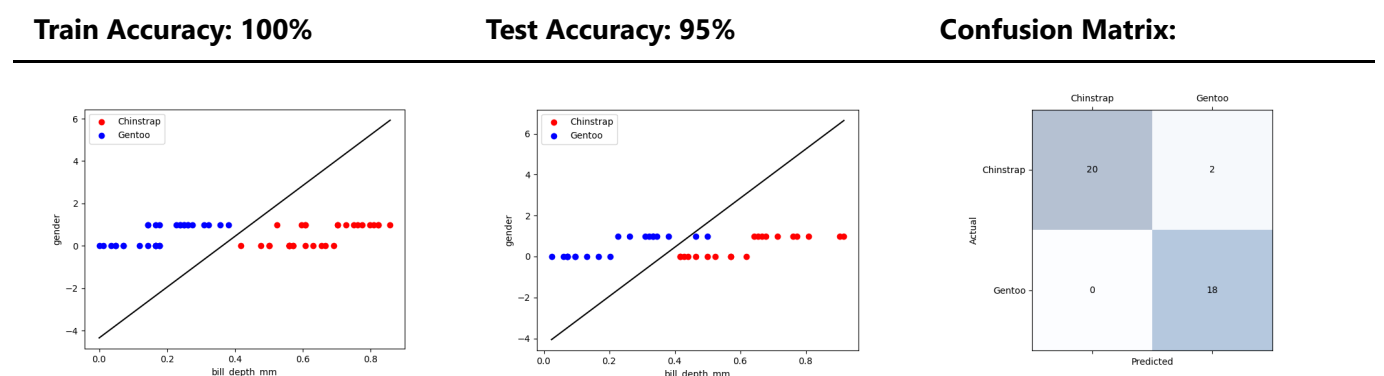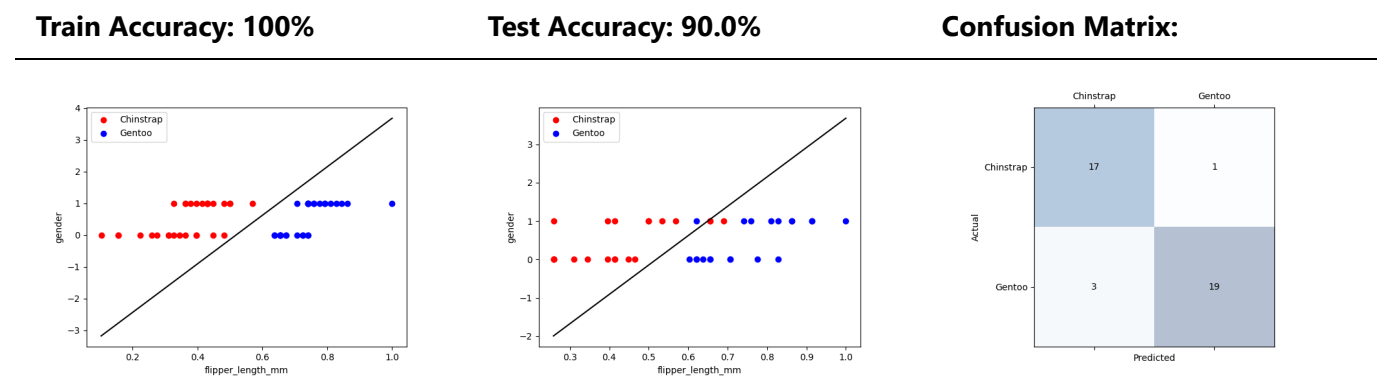
Conclusion

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.