Intro to ML

PS6 Report

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Questions:

1. X\_train\_1 size: (40, 4)

X\_train\_2 size: (42, 4)

X\_train\_3 size: (43, 4)

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| **Mean** | **Feature 1** | **Feature 2** | **Feature 3** | **Feature 4** |
| **Class 1** | -0.96 | 0.90 | -1.28 | -1.23 |
| **Class 2** | 0.020 | -0.71 | 0.25 | 0.14 |
| **Class 3** | 0.92 | -0.16 | 1.03 | 1.09 |

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| **Standard Deviation** | **Feature 1** | **Feature 2** | **Feature 3** | **Feature 4** |
| **Class 1** | 0.38 | 0.88 | 0.090 | 0.14 |
| **Class 2** | 0.59 | 0.70 | 0.26 | 0.24 |
| **Class 3** | 0.77 | 0.77 | 0.31 | 0.38 |

* 1. 92% accuracy

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   1. Sigma\_1 size: (4, 4)

Sigma\_2 size: (4, 4)

Sigma\_3 size: (4, 4)

A computer screen with numbers

Description automatically generated

* 1. All mean vector size: (4,)

A screenshot of a computer screen

Description automatically generated

* 1. Accuracy: 96%

The MLE based classifier performed slightly stronger at 96% percent vs the 92% of the naïve classifier. This could be because of the naïve classifier looking at features as independent. In this case, a couple of the features may be dependent on one another which could lead to misestimation on certain test instances.