**Lab 4 Results – Data Analytics**

Variables that contribute to the 1st PC:

|  |  |
| --- | --- |
| Variable | Contribution\_to\_PC1 |
| Flavanoids | 0.45555287 |
| Total phenols | 0.42346875 |
| Od280/od315 of diluted wines | 0.41661423 |
| Hue | 0.33923014 |
| Nonflavanoid Phenols | 0.32153734 |
| Proline | 0.29688628 |
| Malic acid | 0.27746313 |
| Magnesium | 0.14822516 |
| Alcohol | 0.13876588 |
| Color Intensity | 0.12149534 |

Summary results for classifier model for all attributes:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Actual |  |  |
| Predicted | 1 | 2 | 3 |
| 1 | 21 | 0 | 0 |
| 2 | 0 | 18 | 0 |
| 3 | 0 | 1 | 14 |

Accuracy: 0.9814815

|  |  |  |  |
| --- | --- | --- | --- |
|  | recall | precision | f1 |
| 1 | 1 | 1 | 1 |
| 2 | 1 | 0.94736842 | 0.97297297 |
| 3 | 0.93333333 | 1 | 0.96551724 |

Summary results for classifier model of first 3 PC’s

|  |  |  |  |
| --- | --- | --- | --- |
|  | Actual |  |  |
| Predicted | 1 | 2 | 3 |
| 1 | 15 | 2 | 0 |
| 2 | 0 | 25 | 0 |
| 3 | 0 | 0 | 12 |

|  |  |  |  |
| --- | --- | --- | --- |
|  | recall | precision | f1 |
| 1 | 0.88235294 | 1 | 0.9375 |
| 2 | 1 | 0.92592593 | 0.96153846 |
| 3 | 1 | 1 | 1 |

Accuracy: 0.962963

Summary results for classifier model of reduced variables

|  |  |  |  |
| --- | --- | --- | --- |
|  | Actual |  |  |
| Predicted | 1 | 2 | 3 |
| 1 | 21 | 2 | 0 |
| 2 | 0 | 16 | 0 |
| 3 | 0 | 1 | 14 |

|  |  |  |  |
| --- | --- | --- | --- |
|  | recall | precision | f1 |
| 1 | 0.91304348 | 1 | 0.95454545 |
| 2 | 1 | 0.84210526 | 0.91428571 |
| 3 | 0.93333333 | 1 | 0.96551724 |

Accuracy: 0.9444444

Classification model 1 which uses all of the attributes is the best model based on it having the highest accuracy of 98.15%. It also has near perfect precision, recall and F1- scores across all types.