**Model Performance Results for Wine Dataset**

**Linear SVM**

Linear Kernel SVM Accuracy: **0.9444444**

Contingency Table:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Actual |  |  |
| Predicted | 1 | 2 | 3 |
| 1 | 19 | 0 | 0 |
| 2 | 2 | 18 | 0 |
| 3 | 0 | 1 | 14 |

Model Performance Metrics:

|  |  |  |  |
| --- | --- | --- | --- |
| Class | Recall | Precision | F1 |
| 1 | 1 | 0.90476191 | 0.95 |
| 2 | 0.9 | 0.94736842 | 0.92307692 |
| 3 | 0.93333333 | 1 | 0.96551724 |

**Radial SVM**

RBF Kernel SVM Accuracy: **0.9259259**

Contingency Table:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Actual |  |  |
| Predicted | 1 | 2 | 3 |
| 1 | 19 | 1 | 0 |
| 2 | 2 | 17 | 0 |
| 3 | 0 | 1 | 14 |

Model Performance Metrics:

|  |  |  |  |
| --- | --- | --- | --- |
| Class | Recall | Precision | F1 |
| 1 | 0.95 | 0.9047619 | 0.92682927 |
| 2 | 0.89473684 | 0.89473684 | 0.89473684 |
| 3 | 0.93333333 | 1 | 0.96551724 |

**KNN**

kNN Accuracy: **0.9444444**

Contingency Table:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Actual |  |  |
| Predicted | 1 | 2 | 3 |
| 1 | 19 | 0 | 0 |
| 2 | 2 | 18 | 0 |
| 3 | 0 | 1 | 14 |

Model Performance Metrics:

|  |  |  |  |
| --- | --- | --- | --- |
| Class | Recall | Precision | F1 |
| 1 | 1 | 0.9047619 | 0.95 |
| 2 | 0.9 | 0.94736842 | 0.92307692 |
| 3 | 0.93333333 | 1 | 0.96551724 |

KNN Accuracy Plot:

**A graph with lines and numbers

Description automatically generated**

The KNN model and Linear model for SVM has the same performance metrics and accuracy of 0.9444444

**Part 2 – NY Housing Data**

Model Comparison

R-squared on log-transformed scale for SVM model: 0.3654311

R-squared for Linear Model on log-transformed scale: 0.3015926

The SVM linear regression model performed better than the linear model based on the R-squared value. This can be due to the radial kernel that was used for this model and the tuning that was done.