The data set has four features and a label space magnitude of 3. All of the features are floats. There are 150 data points (of evenly supported labels) and I split the data into the 3 sets weighted like training = 80%, validation = 10%, test = 10%. This means that the validation and test sets each got 15 points of equally supported labels.

I found the best K to be 17.

I found the following results:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Precision | Recall | F1-score | support |
| Iris-setosa | 1 | 1 | 1 | 5 |
| Iris-versicolor | .6667 | .8 | .727 | 5 |
| Iris-virginica | .75 | .6 | .6667 | 5 |
| Macro Avg | .806 | .800 | .798 |  |
| Weighted Avg | .806 | .8 | .798 |  |

My true results were made by using the Euclidean distance. By using the Manhattan distance, I found that the results were much less together. They seem to cause strictly worse results than that of the Euclidean distance. As seen below

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Precision | Recall | F1-score | support |
| Iris-setosa | .625 | 1 | .780 | 5 |
| Iris-versicolor | .6 | .6 | .6 | 5 |
| Iris-virginica | 1 | .4 | .571 | 5 |
| Macro Avg | .742 | .6667 | .647 |  |
| Weighted Avg | .741 | .6667 | .647 |  |

The results of 3rd derivative distance were still mildly worse than the Euclidean and it comes to question whether that would be worthwhile, but it did perfect the Iris-setosa for the testing.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Precision | Recall | F1-score | support |
| Iris-setosa | 1 | 1 | 1 | 5 |
| Iris-versicolor | .571 | .8 | .6667 | 5 |
| Iris-virginica | .6667 | .4 | .5 | 5 |
| Macro Avg | .746 | .733 | .722 |  |
| Weighted Avg | .746 | .733 | .722 |  |