/\*

PRASHIL SONI – S-00375453

Spring 2021 - Machine Learning, HW2

Date: 03/05/2021

\*/

**Machine Learning - Homework 1**

Table of testing accuracy using different k values

|  |  |
| --- | --- |
| Method | Test Accuracy (%) |
| K-NN | 98% |
| Naïve Bayes | 83% |
| Decision Trees | 80% |
| Random Forests | 96% |
| Support Vector Machines | 99% |
| **Majority Voting** | 98% |

Individual class accuracy

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Class | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Test Accuracy (%) | 100% | 97% | 100% | 97% | 99% | 98% | 99% | 96% | 99% | 98% |

From the table it’s clear that on 0th and 2nd digits I am getting 100% test accuracy and on 3rd digit the test accuracy is low compare to other digits.

For **K Neighbors Classifier** I try maximum parameters and I noticed that as K values are high accuracy is low. And come to one conclusion that 1is the number that give me better results compare to others.

I didn’t pass any input for **Decision Tree Classifier** because by passing input I lose accuracy significantly.

In **Random Forest Classifier** when number of tree is equal to 100 I got best of all accuracy.

For **Support Vector Machines** Radial Basis Function Kernel give best result compare to linear kernel. By passing linear kernel I got 97% of test accuracy on the other side Radial Basis Function Kernel give 99% test accuracy.

By all counts, it is clear that Support Vector Machines classifier give better test accuracy, on the other hand naïve Bayes and decision tree classifier gives worst test accuracy.