

# Assignment 1

**Name: Darshak Rairakhia**

**ID: 1001637657**

In this assignment I have implemented Kernel K-NN classification from scratch and the functions to evaluate with a k-fold cross validation.

After comparing the accuracies for all the three datasets for Euclidean distance, Polynomial Kernel distance, Sigmoid Kernel distance and Radial basis kernel I got these results:

## **1. DATASET: Iris.data**

Maximum Accuracy for Euclidean distance: 100%

Maximum Accuracy for Polynomial Kernel distance: 100%

Maximum Accuracy for Radial Basis kernel distance: 93%

Maximum Accuracy for Sigmoid Kernel distance: 33.33%

## **2. DATASET: yeast\_csv.csv**

Maximum Accuracy for Euclidean distance: 32%

Maximum Accuracy for Polynomial Kernel distance: 36%

Maximum Accuracy for Radial Basis kernel distance: 38.51%

Maximum Accuracy for Sigmoid Kernel distance: 26.35%

## **3. DATASET: wdbc\_csv.csv**

Maximum Accuracy for Euclidean distance: 98.214%

Maximum Accuracy for Polynomial Kernel distance: 98.214%

Maximum Accuracy for Radial Basis kernel distance: 69.64%

Maximum Accuracy for Sigmoid Kernel distance: 60.71%

## References:

1. <https://machinelearningmastery.com/tutorial-to-implement-k-nearest-neighbors-in-python-from-scratch/>
2. <https://machinelearningmastery.com/implement-resampling-methods-scratch-python/>
3. [https://www.researchgate.net/profile/Kai\\_Yu7/publication/220578072\\_Kernel\\_Nearest\\_Neighbor\\_Algorithm/links/02e7e533620f1ac895000000/Kernel-Nearest-Neighbor-Algorithm.pdf](https://www.researchgate.net/profile/Kai_Yu7/publication/220578072_Kernel_Nearest_Neighbor_Algorithm/links/02e7e533620f1ac895000000/Kernel-Nearest-Neighbor-Algorithm.pdf)