Implement KNN Classifier

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Abstract—The abstract goes here.

I. INTRODUCTION

A. Background

KNN was first developed by Joseph Hodges and Evelyn Fix in the year 1951[1], in statistics the concept of k-nearest neighbors algorithm(k-NN) is involved in the non-parametric supervised learning method. Further developments in KNN are proceeded by Thomas Cover.[2] KNN is commonly used for regression and classification. Both in regression and classification the input consists of k-closest training examples in the data set. Remember the output depends on whether the use case is either regression or classification of K-NN.

B. Regression

The main difference between classification and regression is that in regression, the output is the property value for the object. The value is the total average of the neighbor's nearest values. If k=1, the output is assigned from that particular single nearest neighbor.

C. Classification

The main variation in the output of classifier and regression is that in classification, the output is the class membership. In classification, the object is classified based on the votes of its nearest neighbors. If k = 1, then the object will be in the class of that single nearest neighbor. The simple function of the kNN model is to predict the target class label. In other words, the class label is often described as a majority voting. The most common terms are technically considered "plurality voting" and "majority vote" The term "majority voting" means the majority needs to be greater the 50for making decisions. The classification problems with only two classes, like binary predictions, there is always a majority. A majority vote is also automatically a plurality vote. We don't require multi-class settings to make predictions via kNN in multi-class settings.

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II. CONCLUSION

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[1] Cover, T., & Hart, P. (1967). Nearest neighbor pattern classification. IEEE transactions on information theory, 13(1), 21-27.
[2] Duda, R. O., Hart, P. E., & Stork, D. G. (2012). Pattern classification. John Wiley & Sons. Chapter 4