CS4361/5361 Machine Learning
Fall 2020
k-nearest neighbors

1. Modify the knn.py program to allow an option to use Manhattan distance in addition to Euclidean distance.

2. Write the function root_kd(X) that returns the example that would be at the root of a k-d tree to classify data set X (use MNIST as an example). To do this, first find the attribute with the highest variance, and then return the example that has the median value for that attribute in the dataset.

3. Write the function nn_graph(X,k) that returns the k-nearest neighbor graph of dataset X. The function should return a X.shape[0] by k array of ints, where the elements in row i are the indices of the nearest neighbors of example i in the dataset.