
Question 1.1.2 While Euclidean distance is a more commonly known method to measure distance, it's not the only one! Another method is the Manhattan distance. How do we calculate the Manhattan distance between two points? What situation might Manhattan distance be more suitable than Euclidean distance? **(4 points)**

Hint: Consider why it's named *Manhattan distance*—think of a city grid!

Because it would fit better to calculate the straight distance between two locations

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Question 1.7.1 When doing Knn classification we split our data into training and test sets.

Why do we divide our data into training and test sets? Or in other words what is the point of the training set? What is the point of the test set? Answer both questions. **(7 points)**

Hint: Check out this section in the textbook.

Training set would help the model to identify key patterns in the data, while test set offers a way to evaluate the classifier on unseen data, and ultimately test the generalization capabilities of the model.

Question 1.7.2 Why do we only want to use the test set once? **(3 points)**

Question 1.8. Why do we choose `k` to be an odd number in k-NN? Explain. **(10 points)**

Because we want a way to break a tie when consider nearest neighbors.