

Homework 2

1. Check whether the following norm L is legitimate:

$$L(v) = 0, \text{ if } v=0$$

$$L(v) = 1, \text{ if } v \neq 0$$

2. Find the nearest vector for each vector from the following group of vectors:

$$a = (0, -1, 1), \quad b = (0, 4, 0), \quad c = (2, 1, 4)$$

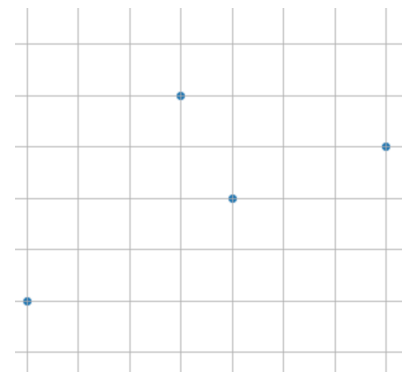
Measure distances using 3 metrics: L_1 , L_2 , L_∞ .

$$\|x\|_\infty = \max_j (|x_j|)$$

3. For x from $x_1=0$ to $x_2=8$ plot the function y using

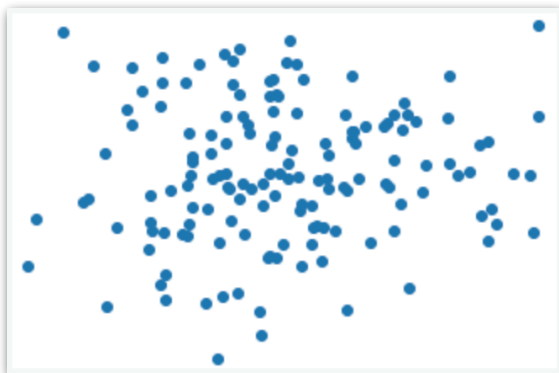
KNN. Take $k=2$ and the dataset of pairs (x, y) .

$$\text{data} = [(0, 1), (3, 5), (4, 3), (7, 4)]$$

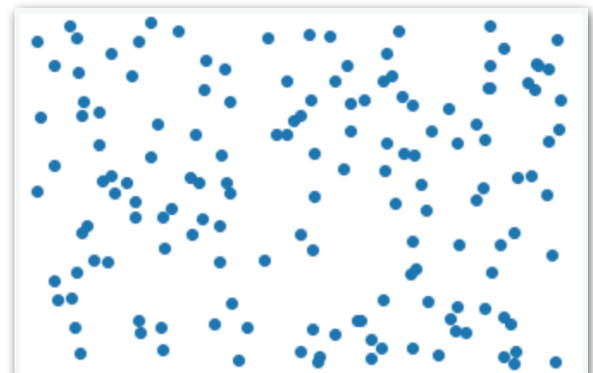


4. What would you use normalization or standardization for the datasets below. Why?

A



B



5. **Optional:**

Find clusters in the dataset contained in clusters.csv file. You can use k-means or any other available clustering methods.