# #1 (10 Points) Is the following function a proper distance function? Why? Explain your answer. Measure the distance between (0, 0, 0) and (0, 1, 0) 𝒅 (𝒙, 𝒚) = Ʃ ((𝒙𝒊― 𝒀𝒊) 𝟓)

The distance function should satisfy the following properties:

* Distance is always non-negative
* Distance is commutative, distance from A to B is the distance from B to A
* Triangle inequality holds, distance from A to C must be less than or equal to the distance from A to B and B to C

Distance between (0,0,0) and (0,1,0) according to given formula:

d(x,y) = (0 - 0)5 + (0 - 1)5+ (0 - 0)5

             = (0) + (-1) + (0)

             = -1

d(y,x) = (0 - 0)5 + (1 - 0)5 + (0 - 0)5

             = (0) + (1) + (0)

             = 1

Here, d(x,y) < 0  and  d(x,y) d(y,x), therefore d(x,y) = ((xi - yi) 5) is not valid.

Hence the formula is not a proper distance function.