**#1** (10 Points)

**Is the following function a proper distance function? Why? Explain your answer. Measure the distance between (0, 0, 0), (0, 1, 0), (0, 1, 1), and (1, 1, 1)**

Solution;

This function is **NOT** a proper distance function.

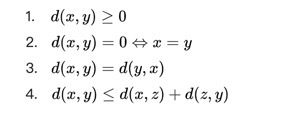
Let take 3 points A(0,0), B(0,1) and C(1,1). Distance between 3 points using formular above is:

Distance of AB = (|0 - 0|+|0 – 1|) ^3 = 1

Distance of BC = (|0 - 1|+|1 – 1|) ^3 = 1

Distance of AC = (|0 - 1|+|0 – 1|) ^ 3 = 8

AC>AB+BC, which does **NOT** satisfy the property 4 of the following properties:



Therefore, it is **NOT** a proper distance function.

**Measure the distance between (0, 0, 0), (0, 1, 0), (0, 1, 1), and (1, 1, 1)**

Let A = (0,0,0) B = (0,1,0) C = (0,1, 1) D= (1, 1 ,1)

Distance formula for a point in 3 Dimension = root{(x2-x1) ^2 + {(y2-y1) ^2 + {(z2-z1) ^2}

Distance between AB = 1

Distance between AC = 1.414

Distance between AD = 1.732

Distance between BC = 1

Distance between BD = 1.414

Distance between CD = 1