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cs513-B
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Midterm
"I pledge my honor that I have abided by the Stevens Honor System."

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)

$$d(x, y) = \Sigma\ (|x_{i-}\ _{Y_i}|^{3})$$

Solution:

d(p1,p2)= (|0-0|+|0-1|+|0-0|)^3 = 1 -> d(p2,p1)= 1
d(p1,p3)= (|0-0|+|0-1|+|0-1|)^3 = 8 .
d(p1,p4)= (|0-1|+|0-1|+|0-1|)^3 = 27 .
.
d(p2,p3)= (|0-0|+|1-1|+|0-1|)^3 = 1 . all the same = communitive
d(p2,p4)= (|0-1|+|1-1|+|0-1|)^3 = 8

d(p3,p4)= (|0-1|+|1-1|+|1-1|)^3 = 1

All non-negative

Triangle Inequality does not hold:
d(p1, p4) = 27
d(p1,p2) + d(p2,p3) + d(p3,p4) = 1 +1 +1 = 3
27 is not equal or less than 3 -> Does not hold
Not a proper distance function

#2 (15 Points)

DONE - IN R PROGRAM Q2.r

#3

#4 (15 Points)

DONE - IN R PROGRAM Q4.r

#5 (15 Points)

- IN R PROGRAM Q5.r

 # 6(15 Points)

DONE - IN EXCEL Q6.xlsx

#7 (15 Points)

DONE - IN EXCEL Q7.xlsx