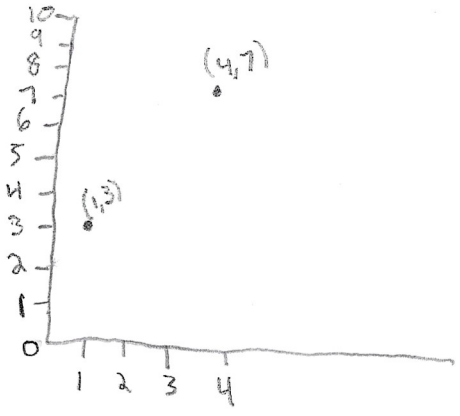
Bryan Tuck

CLUSTERING: K-Means

Please email your HW (scanned first page with answers to Problems 1 and 2, and your python code for Problem 3) to Dr. Katarina Jegdic at jegdick@uhd.edu by Wednesday, October 27th, at 11:59pm.

Problem 1: Draw points $(1, 3)$ and $(4, 7)$ in the (x, y)-coordinate system.



Find the Euclidean, Manhattan, and maximum distances between these two points using the distance formulas. (x_1, y_1) $(1,3)$ (x_2, y_2) $(4,7)$

Euclidean

$\sqrt{(1-4)^2+(3-7)^2}$

$= \sqrt{9+16}$

$= \sqrt{25}$

$= \boxed{5}$

Manhattan

$|1-4|+|3-7|$

$= 3+4$

$= \boxed{7}$

Maximum

$\max\{|1-4|, |3-7|\}$

$= \max\{3, 4\}$

$= \boxed{4}$

Problem 2: Find the centroid of the set $\{(1, 5, 6), (2, 3, 9), (1, 3, 4), (6, 4, 7), (2, 5, 4), (10, 4, 3), (1, 4, 3)\}$.

$\bar{X}$ = Avg of $\{1, 2, 1, 6, 2, 10, 1\} = 3.286$

$\bar{Y}$ = Avg of $\{5, 3, 3, 4, 5, 4, 4\} = 4.0$

$\bar{Z}$ = Avg of $\{6, 9, 4, 7, 4, 3, 3\} = 5.143$

centroid $= (\bar{X}, \bar{Y}, \bar{Z})$

$= \boxed{(3.286, 4, 5.143)}$