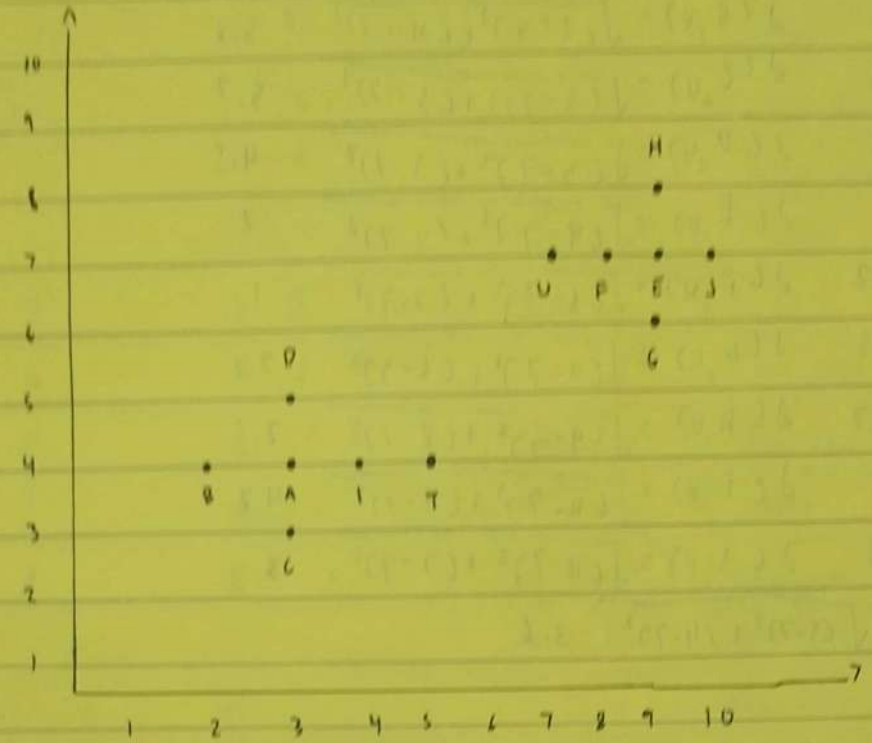
Dela Paz, Lance Kenneth F.

Exercise 3

1. Create a scatter plot



2. Compute all pairwise Euclidean distances between customers

3. Create a full distance matrix

	A (3,4)	B (2,4)	C (3,3)	D (3,5)	E (9,7)	F (8,7)	G (9,6)	H (9,8)	I (4,4)	J (10,7)	T (5,4)	U (7,7)
A (3,4)	0	1	1	1	6.7	5.8	6.3	7.2	1	7.6	2	5
B (2,4)	1	0	1.4	1.4	7.6	6.7	7.2	8	2	8.5	3	5.8
C (3,3)	1	1.4	0	2	7.2	6.4	6.7	7.8	1.4	8	2.2	5.7
D (3,5)	1	1.4	2	0	6.3	5.3	6	6.7	1.4	7.2	2.2	4.5
E (9,7)	6.7	7.6	7.2	6.3	0	1	1	1	5.8	1	5	2
F (8,7)	5.8	6.7	6.4	5.3	1	0	1.4	1.4	5	2	4.2	1
G (9,6)	6.3	7.2	6.7	6	1	1.4	0	2	5.3	1.4	4.5	2.2
H (9,8)	7.2	8	7.8	6.7	1	1.4	2	0	6.4	1.4	5.7	2.2
I (4,4)	1	2	1.4	1.4	5.8	5	5.3	6.4	0	6.7	1	4.2
J (10,7)	7.6	8.5	8	7.2	1	2	1.4	1.4	6.7	0	5.8	3
T (5,4)	2	3	2.2	2.2	5	4.2	4.5	5.7	1	5.8	0	3.6
U (7,7)	5	5.8	5.7	4.5	2	1	2.2	2.2	4.2	3	3.6	0

Solution

$d(A,T) = \sqrt{(3-5)^2 + (4-4)^2} = 2$ $\quad d(A,V) = \sqrt{(3-7)^2 + (4-7)^2} = 5$

$d(B,T) = \sqrt{(2-5)^2 + (4-4)^2} = 3$ $\quad d(B,V) = \sqrt{(2-7)^2 + (4-7)^2} = 5.8$

$d(C,T) = \sqrt{(3-5)^2 + (3-4)^2} = 2.2$ $\quad d(C,V) = \sqrt{(3-7)^2 + (3-7)^2} = 5.7$

$d(D,T) = \sqrt{(3-5)^2 + (5-4)^2} = 2.2$ $\quad d(D,V) = \sqrt{(3-7)^2 + (5-7)^2} = 4.5$

$d(E,T) = \sqrt{(9-5)^2 + (7-4)^2} = 5$ $\quad d(E,V) = \sqrt{(9-7)^2 + (7-7)^2} = 2$

$d(F,T) = \sqrt{(8-5)^2 + (7-4)^2} = 4.2$ $\quad d(F,V) = \sqrt{(8-7)^2 + (7-7)^2} = 1$

$d(G,T) = \sqrt{(9-5)^2 + (6-4)^2} = 4.5$ $\quad d(G,V) = \sqrt{(9-7)^2 + (6-7)^2} = 2.2$

$d(H,T) = \sqrt{(9-5)^2 + (8-4)^2} = 5.7$ $\quad d(H,V) = \sqrt{(9-7)^2 + (8-7)^2} = 2.2$

$d(I,T) = \sqrt{(4-5)^2 + (4-4)^2} = 1$ $\quad d(I,V) = \sqrt{(4-7)^2 + (4-7)^2} = 4.2$

$d(J,T) = \sqrt{(10-5)^2 + (7-4)^2} = 5.8$ $\quad d(J,V) = \sqrt{(10-7)^2 + (7-7)^2} = 3$

$d(T,V) = \sqrt{(5-7)^2 + (4-7)^2} = 3.6$

4. For each point A-V, list all of it's neighbours based on eps.
5. Create a table showing each point and the number of neighbors in its neighborhood.
6. For each point A-V, determine if it is a core point, non-core point and noise based on min_samples
7. simulate DBSCAN
8. Create a table showing each point and its cluster.

No. _____
Date _____

Customer	Neighbors within	Number of neighbours	Point Type	Cluster
A	B, C, D, I	4	Core	Green
B	A	1	Non core	Green
C	A	1	Non core	Green
D	A	1	Non core	Green
E	F, G, H, J	4	Core	Blue
F	E, U	2	Core	Blue
G	E	1	Non core	Blue
H	E	1	Non core	Blue
I	A, T	2	Core	Green
J	E	1	Non core	Blue
T	I	1	Non core	Green
U	F	1	Non core	Blue