Alex Gibbons
Assignment 11
4/22/24

Student	A	B
1	1.0	1.0
2	1.5	2.0
3	3.0	4.0
4	5.0	7.0
5	3.5	5.0
6	4.5	5.0
7	3.5	4.5

$C_1 = 1$
$C_2 = 4$

$d(1, c_1) = 0$
$d(1, c_2) = \sqrt{(5-1)^2 + (7-1)^2} = 7.2$

$(C_1 = 1, C_2 = 4)$

Student	D from C_1	D from C_2	cluster
1	0	7.2	1
2	1.12	6.1	1
3	3.6	3.6	1
4	7.2	0	2
5	4.7	2.5	2
6	5.3	2.1	2
7	4.3	2.4	2

$d(2, c_1) = \sqrt{(1-1.5)^2 + (1-2.0)^2} = 1.12$
$d(2, c_2) = \sqrt{(5-1.5)^2 + (7-2.0)^2} = 6.1$
$d(3, c_1) = \sqrt{(1-3)^2 + (1-4)^2} = 3.6$
$d(3, c_2) = \sqrt{(5-3)^2 + (7-4)^2} = 3.6$
$d(4, c_1) = \sqrt{(1-5)^2 + (1-7)^2} = 7.2$
$d(4, c_2) = \sqrt{(5-5)^2 + (7-7)^2} = 0$
$d(5, c_1) = \sqrt{(1-3.5)^2 + (1-5)^2} = 4.7$
$d(5, c_2) = \sqrt{(5-3.5)^2 + (7-5)^2} = 2.5$
$d(6, c_1) = \sqrt{(1-4.5)^2 + (1-5)^2} = 5.3$
$d(6, c_2) = \sqrt{(5-4.5)^2 + (7-5)^2} = 2.1$
$d(7, c_1) = \sqrt{(1-3.5)^2 + (1-4.5)^2} = 4.3$
$d(7, c_2) = \sqrt{(5-3.5)^2 + (7-4.5)^2} = 2.4$

$C_1 = (1.0, 1.0 + 1.5, 2.0 + 3.0, 4.0)/3$
$C_1 = (1.8, 2.3)$
$C_2 = (5.0, 7.0 + 3.5, 5.0 + 4.5, 5.0 + 3.5, 4.5)/4$
$C_2 = (4.125, 5.375)$

$c_1 = (1.8, 2.3)$ $c_2 = (4.13, 5.38)$

$d(1,c_1) = \sqrt{(1.8-1)^2 + (2.3-1)^2} = 1.53$

$d(1,c_2) = \sqrt{(4.13-1)^2 + (5.38-1)^2} = 5.38$

$d(2,c_1) = \sqrt{(1.8-1.5)^2 + (2.3-2)^2} = 0.42$

Sto	D_{c_1}	D_{c_2}	cluster
1	1.53	5.38	1
2	0.42	4.28	1
3	2.08	1.78	2
4	5.64	1.84	2
5	3.14	0.74	2
6	3.82	0.53	2
7	2.78	1.48	2

$d(2,c_2) = 4.28$

$d(3,c_1) = 2.08$

$d(3,c_2) = 1.78$

$d(4,c_1) = 5.64$

$d(4,c_2) = 1.84$

$d(5,c_1) = 3.14$

$d(5,c_2) = 0.74$

$d(6,c_1) = 3.82$

$d(6,c_2) = 0.53$

$d(7,c_1) = 2.78$

$d(7,c_2) = 1.48$

$C_1 = (1.1 + 1.5, 2)/2$

$C_1 = (1.25, 1.5)$

$C_2 = (3.0, 4.0 + 5.0, 7.0 + 3.5, 5.0 + 4.5, 5.0 + 3.5, 4.5)/5$

$C_2 = (3.4, 5.1)$

$c_1 = (1.25, 1.5)$ $c_2 = (3.4, 5.1)$

Sto	D_{c_1}	D_{c_2}	cluster
1	0.56	5.02	1
2	6.56	3.92	1
3	3.05	1.42	2
4	6.66	2.20	2
5	4.76	0.41	2
6	4.78	0.61	2
7	3.75	0.72	2

$d(1,c_1) = 0.56$

$d(1,c_2) = 5.02$

$d(2,c_1) = 0.56$

$d(2,c_2) = 3.92$

$d(3,c_1) = 3.05$

$d(3,c_2) = 1.42$

$d(4,c_1) = 6.66$

$d(4,c_2) = 2.2$

$d(5,c_1) = 4.16$

$d(5,c_2) = 0.41$

$d(6,c_1) = 4.78$

$d(6,c_2) = 0.61$

$d(7,c_1) = 3.75$

$d(7,c_2) = 0.72$

No change in cluster. Clusters are finalized