

Exercise 9

T1: {P1,P2,P3,P5,P7}

T2: {P1,P4,P5,P6,P7}

T3: {P1,P4,P6}

T4: {P1,P4,P5,P6,P7}

T5: {P3,P5}

T6: {P1,P2,P3,P7}

T7: {P2,P7}

T8: {P1,P2,P3,P4,P6,P7}

K = 2

Random Prototype

	Cluster 1	Cluster 2
Prototype	T1: {P1,P2,P3,P5,P7}	T2: {P1,P4,P5,P6,P7}

$$J(A, B) = \frac{|A \cap B|}{|A \cup B|}$$

T3

T3: {P1,P4,P6}

$J(T3, T1) = 1 / 7 = 0.142$

$J(T3, T2) = 3 / 5 = \mathbf{0.6}$

Assigned to Cluster 2

T4

T4: {P1,P4,P5,P6,P7}

$J(T4, T1) = 3 / 7 = 0.428$

$J(T4, T2) = 5 / 5 = \mathbf{1.0}$

Assigned to Cluster 2

T5

T5: {P3,P5}

$J(T5, T1) = 2 / 5 = \mathbf{0.4}$

$J(T5, T2) = 1 / 6 = 0.167$

Assigned to Cluster 1

T6

T6: {P1,P2,P3,P7}

$J(T6, T1) = 4 / 5 = \mathbf{0.8}$

$$J(T6, T2) = 2 / 7 = 0.285$$

Assigned to Cluster 1

T7

T7: {P2,P7}

$$J(T7, T1) = 2 / 5 = \mathbf{0.4}$$

$$J(T7, T2) = 1 / 6 = 1.67$$

Assigned to Cluster 1

T8

T8: {P1,P2,P3,P4,P6,P7}

$$J(T8, T1) = 4 / 7 = 0.571$$

$$J(T8, T2) = 4 / 7 = \mathbf{0.571}$$

Assigned to Cluster 2

	Cluster 1	Cluster 2
Prototype	T1: {P1,P2,P3,P5,P7}	T2: {P1,P4,P5,P6,P7}
	T5: {P3,P5}	T3: {P1,P4,P6}
	T6: {P1,P2,P3,P7}	T4: {P1,P4,P5,P6,P7}
	T7: {P2,P7}	T8: {P1,P2,P3,P4,P6,P7}

Cluster 1 Prototype

$$J(T1, T5) = 2 / 5 = 0.4$$

$$J(T1, T6) = 4 / 5 = 0.8$$

$$J(T1, T7) = 2 / 5 = 0.4$$

$$\text{Total Similarity: } 0.4 + 0.8 + 0.4 = 1.6$$

$$J(T5, T1) = 2 / 5 = 0.4$$

$$J(T5, T6) = 1 / 5 = 0.2$$

$$J(T5, T7) = 0 / 4 = 0$$

$$\text{Total Similarity: } 0.4 + 0.2 = 0.6$$

$$J(T6, T1) = 4 / 5 = 0.8$$

$$J(T6, T5) = 1 / 5 = 0.2$$

$$J(T6, T7) = 2 / 4 = 0.5$$

$$\text{Total Similarity: } 0.8 + 0.2 + 0.5 = 1.5$$

$$J(T7, T1) = 2 / 5 = 0.8$$

$$J(T7, T5) = 0 / 4 = 0$$

$$J(T7, T6) = 2 / 4 = 0.5$$

$$\text{Total Similarity: } 0.8 + 0.5 + 0 = 1.3$$

Not changing the prototype on Cluster 1

Cluster 2 Prototype

$$J(T2, T3) = 3 / 5 = 0.6$$

$$J(T2, T4) = 5 / 5 = 1.0$$

$$J(T2, T8) = 4 / 7 = 0.571$$

$$\text{Total Similarity: } 0.6 + 1.0 + 0.571 = 2.171$$

$$J(T3, T2) = 3 / 5 = 0.6$$

$$J(T3, T4) = 3 / 5 = 0.6$$

$$J(T3, T8) = 3 / 6 = 0.5$$

$$\text{Total Similarity: } 0.6 + 0.6 + 0.5 = 1.7$$

$$J(T4, T2) = 5 / 5 = 1.0$$

$$J(T4, T3) = 3 / 5 = 0.6$$

$$J(T4, T8) = 4 / 7 = 0.571$$

$$\text{Total Similarity: } 1.0 + 0.6 + 0.571 = 2.171$$

$$J(T8, T2) = 4 / 7 = 0.571$$

$$J(T8, T3) = 3 / 6 = 0.5$$

$$J(T8, T4) = 4 / 7 = 0.571$$

$$\text{Total Similarity: } 0.571 + 0.5 + 0.571 = 1.642$$

Not changing the prototype on Cluster 2

	Cluster 1	Cluster 2
Prototype	T1: {P1,P2,P3,P5,P7}	T2: {P1,P4,P5,P6,P7}
	T5: {P3,P5}	T3: {P1,P4,P6}
	T6: {P1,P2,P3,P7}	T4: {P1,P4,P5,P6,P7}
	T7: {P2,P7}	T8: {P1,P2,P3,P4,P6,P7}