

## EXERCISE 2 Answer Key

Customer	Avg Bet (USD)	Visits/Month
A	10	1
B	20	2
C	55	6
D	70	8
E	60	10
F	35	4

### Pairwise Distances (Euclidean)

	A	B	C	D	E	F
A	0.00	10.05	45.28	60.41	50.80	25.18
B	10.05	0.00	35.23	50.36	40.79	15.13
C	45.28	35.23	0.00	15.13	6.40	20.10
D	60.41	50.36	15.13	0.00	10.20	35.23
E	50.80	40.79	6.40	10.20	0.00	25.71
F	25.18	15.13	20.10	35.23	25.71	0.00

Detailed pairwise values (sorted smallest to largest):

C - E : 6.40

A - B : 10.05

D - E : 10.20

B - F : 15.13

C - D : 15.13

C - F : 20.10

A - F : 25.18

E - F : 25.71

B - C : 35.23

D - F : 35.23

B - E : 40.79

A - C : 45.28

B - D : 50.36

A - E : 50.80

A - D : 60.41

### Single Linkage Merge Steps

Merge order	Cluster 1	Cluster 2	Distance
1 <sup>st</sup>	C	E	6.4
2 <sup>nd</sup>	A	B	10.05
3 <sup>rd</sup>	D	CE	10.20
4 <sup>th</sup>	F	AB	15.13
5 <sup>th</sup>	CDE	ABF	20.10

Step 1: Merge ['C'] and ['E'] → Result: ['C', 'E'] at distance 6.40

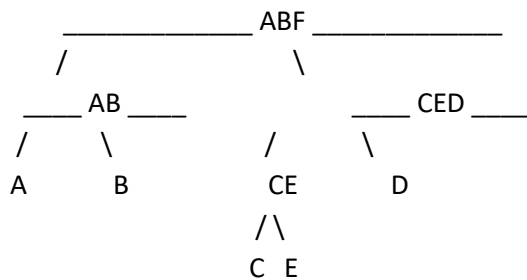
Step 2: Merge ['A'] and ['B'] → Result: ['A', 'B'] at distance 10.05

Step 3: Merge ['D'] and ['C', 'E'] → Result: ['C', 'D', 'E'] at distance 10.20

Step 4: Merge ['F'] and ['A', 'B'] → Result: ['A', 'B', 'F'] at distance 15.13

Step 5: Merge ['C', 'D', 'E'] and ['A', 'B', 'F'] → Result: ['A', 'B', 'C', 'D', 'E', 'F'] at distance 20.10

### Dendrogram



F is attached to AB to form ABF at an earlier step

## **Interpretation & Suggested Answers**

Cluster interpretation:

- ABF (A, B, F): Casual-to-mid players. Low to moderate bets and low-to-moderate visit frequency. Suggested actions: introductory promotions, encourage more frequent play, mid-tier loyalty incentives.

- CED (C, E, D): High-value players. Higher average bets and more frequent visits—priority candidates for VIP programs, personalized bonuses, and retention efforts.