HIERARCHICAL CLUSTERING:

	A	B	C	D	E
A	0				
B	9	0			
C	3	7	0		
D	6	5	9	0	
E	11	10	2	8	0

Step-1

	A	B	CE	D
A	0			
B	9	0		
CE	3	7	0	
D	6	5	9	0

Step-2

	ACE	B	D
ACE	0		
B	3	0	
D	6	5	0

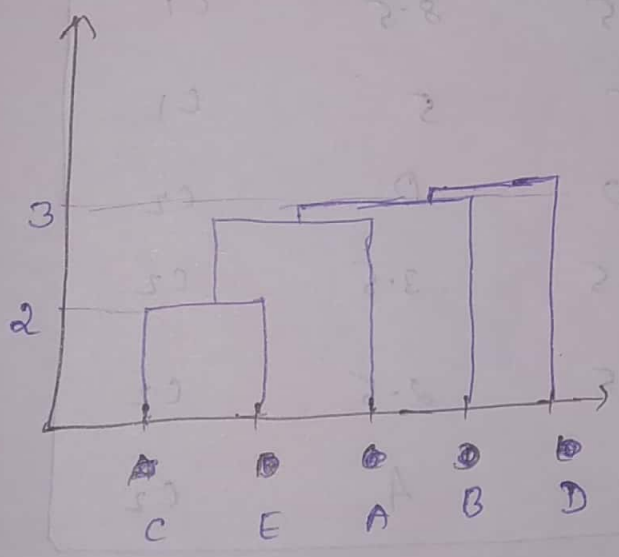
step-3

	ACEB	D
ACEB	0	
D	3	0

step-4

	ACEBD
ACEBD	0

DENDOGRAM



K-Means

x	1	1.5	3	5	3.5	4.5	3.5
y	1	2	4	7	5	5	4.5

Let K=2

(i) Initial two cluster

$c_1(1,1)$ $c_2(5,7)$

	$c_1(1,1)$	$c_2(5,7)$	cluster
(1,1)	0	10	c_1
(1.5,2)	1.5	8.5	c_1
(3,4)	5	5	c_1
(5,7)	10	0	c_2
(3.5,5)	6.5	3.5	c_2
(4.5,5)	7.5	2.5	c_2
(3.5,4.5)	6	4	c_2

Now

$$c_1 = \left(\frac{0+1.5+5}{3}, \frac{10+8.5+5}{3}\right) =$$

$$= (2.16, 7.83)$$

$$c_2 = \left(\frac{10+6.5+7.5+6}{4}, \frac{0+3.5+2.5+4}{4}\right)$$

$$= (7.5, 2.5)$$

(ii)

	$c_1(2.16, 7.83)$	$c_2(7.5, 2.5)$	cluster
(1, 1)	7.99	8	c_1
(1.5, 2)	6.49	6.5	c_1
(3, 4)	4.67	6	c_1
(5, 7)	5.67	7	c_1
(3.5, 5)	4.17	6.5	c_1
(4.5, 5)	5.17	5.5	c_1
(3.5, 4.5)	4.67	6	