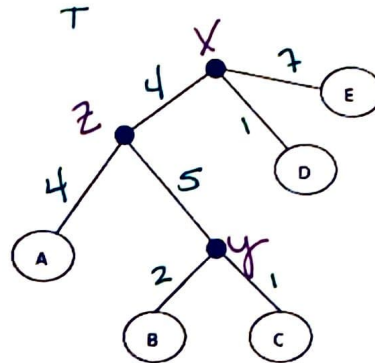


Practice problem. Add the appropriate weights to the given Phylogenetic tree T for the additive distance matrix D .

D

	A	B	C	D	E
A	0	11	10	9	15
B	-	0	3	12	18
C	-	-	0	11	17
D	-	-	-	0	8
E	-	-	-	-	0



Find neighbors E + D. Label common parent Y.

$$d_{AX} = \frac{1}{2} (d_{AE} + d_{AD} - d_{DE}) = 8$$

$$d_{BX} = \frac{1}{2} (d_{BE} + d_{BD} - d_{DE}) = 11$$

$$d_{CX} = \frac{1}{2} (d_{CE} + d_{CD} - d_{DE}) = 10$$

	A	B	C	X
A	0	11	10	8
B	-	0	3	11
C	-	-	0	10
X	-	-	-	0

Find neighbors B + C. Label common parent Y.

$$d_{AY} = \frac{1}{2} (d_{AB} + d_{AC} - d_{BC}) = 9$$

$$d_{XY} = \frac{1}{2} (d_{XB} + d_{XC} - d_{BC}) = 9$$

	A	Y	X
A	0	9	8
Y	-	0	9
X	-	-	0

Find neighbors A + X. Label common parent Z.

	Z	X
Z	0	4
X	-	0

$$d_{XZ} = \frac{1}{2} (d_{AX} + d_{YX} - d_{AY}) = 4$$