

HW4-2

(a) Single Link

$$(P_1 - P_2) = 0.1$$

	P_1	P_2	P_3	P_4	P_5
P_1	0.0	0.1	0.41	0.55	0.35
P_2		0.0	0.64	0.47	0.98
P_3			0.0	0.44	0.85
P_4				0.0	0.76
P_5					0.0

merge P_1, P_2

	P_1, P_2	P_3	P_4	P_5	
P_1, P_2	0.0	0.41	0.47	0.35	$P_1, P_2 \rightarrow P_3$
P_3		0.0	0.44	0.85	$P_1 \rightarrow P_3 = 0.41$
P_4			0.0	0.76	$P_2 \rightarrow P_3 = 0.64$
P_5				0.0	

$$0.35 (P_1, P_2 - P_5)$$

merge

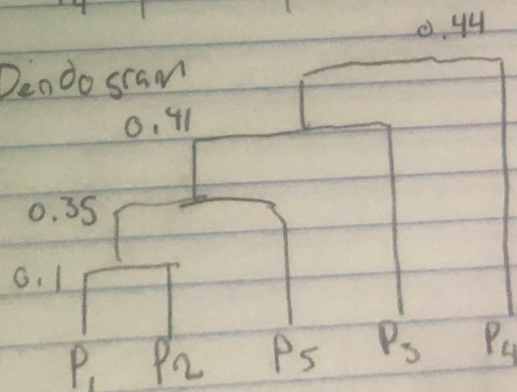
	P_1, P_2, P_5	P_3	P_4
P_1, P_2, P_5	0.0	0.41	0.47
P_3		0.0	0.44
P_4			0.0

$$0.35 (P_1, P_2, P_5 - P_3)$$

merge

	P_1, P_2, P_5, P_3	P_4
P_1, P_2, P_5, P_3	0.0	0.44
P_4		0.0

Dendrogram



(b) complete link

	$P_1 P_2$	P_3	P_4	P_5	
$P_1 P_2$	0.0	0.64	0.55	0.98	$P_1 P_2 \rightarrow P_3$
P_3		0.0	0.44	0.85	$P_1 \rightarrow P_3 = 0.41$
P_4			0.0	0.76	$P_2 \rightarrow P_5 = 0.64$
P_5				0.0	Select max = 0.64

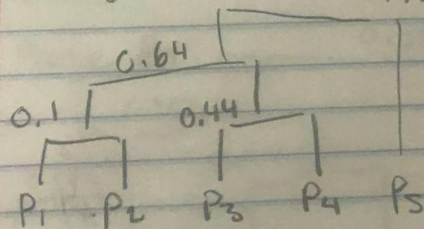
Minimum is 0.44 merge P_3 & P_4

	$P_1 P_2$	$P_3 P_4$	P_5
$P_1 P_2$	0.0	0.64	0.95
$P_3 P_4$		0.0	0.85
P_5			0.0

min is 0.64 merge $P_1 P_2$ & $P_3 P_4$

	$P_1 P_2 P_3 P_4$	P_5
$P_1 P_2 P_3 P_4$	0.0	0.95
P_5		0.0

merge P_5 0.95



dendrogram

(c) Group Average hierarchical clustering

	$P_1 P_2$	P_3	P_4	P_5
$P_1 P_2$	0.0	0.525	0.51	0.665
P_3		0.0	0.44	0.85
P_4			0.0	0.76
P_5				0.0

$$\begin{aligned}
 &P_1 P_2 \rightarrow P_3 \\
 &P_1 \rightarrow P_3 = 0.41 \\
 &P_2 \rightarrow P_3 = 0.64 \\
 &\quad \text{avg} = 0.525
 \end{aligned}$$

min is 0.44 (merge $P_3 P_4$)

	$P_1 P_2$	$P_3 P_4$	P_5
$P_1 P_2$	0.0	0.517	0.665
$P_3 P_4$		0.0	0.865
P_5			0.0

$$\begin{aligned}
 &P_1 P_2 \rightarrow P_4 \\
 &P_1 \rightarrow P_4 = 0.55 \\
 &P_2 \rightarrow P_4 = 0.44 \\
 &\quad \text{avg} = 0.51
 \end{aligned}$$

$$\begin{aligned}
 &P_1 P_2 \rightarrow P_3 \\
 &P_1 P_2 \rightarrow P_4 \\
 &\quad \text{avg} = 0.577
 \end{aligned}$$

Min is 0.517 (merge $P_1 P_2 P_3 P_4$)

	$P_1 P_2 P_3 P_4$	P_5
$P_1 P_2 P_3 P_4$	0.0	0.735
P_5		0.0

merge P_5

