Silhouette HW

Pattern	X	Y
a	.8	.7
b	.9	.8
c	.6	.6
d	0	.2
e	.2	.1

Distances

a-b: $|.8-.9|+|.7-.8| = .2$
a-c: $|.8-.6|+|.7-.6| = .3$
a-d: $|.8-0|+|.7-.2| = 1.3$
a-e: $|.8-.2|+|.7-.1| = 1.2$
b-c $|.9-.6|+|.8-.6| = .5$
b-d: $|.9-0|+|.8-.2| = 1.5$
b-e: $|.9-.2|+|.8-.1| = 1.4$

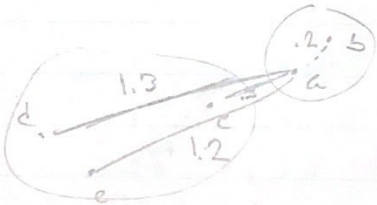
c-d: $|.6-0|+|.6-.2| = 1.0$
c-e: $|.6-.2|+|.6-.1| = .9$
d-e: $|0-.2|+|.2-.1| = .3$

sil(a)

$a(a) = \frac{.2}{1} = .2$

$b(a) = \min\left(\frac{1.3+1.2+.3}{3}\right) = .93$

$sil(a) = \frac{.93-.2}{.93} = .978$

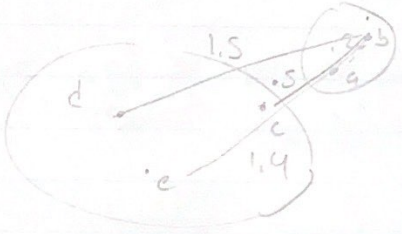


sil(b)

$a(b) = \frac{.2}{1} = .2$

$b(b) = \min\left(\frac{1.3+1.4+.5}{3}\right) = 1.13$

$sil(b) = \frac{1.13-.2}{1.13} = .82$

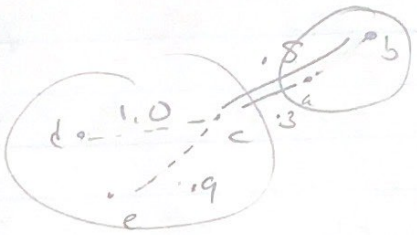


Sil(c)

$a(c) = \frac{1.0+.9}{2} = .95$

$b(c) = \min\left(\frac{.8+.3}{2}\right) = .55$

$sil(c) = \frac{.55-.95}{.95} = -.42$

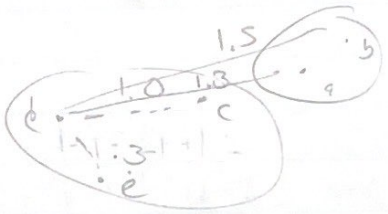


Sil(d)

$a(d) = \frac{1.0+1.3}{2} = .65$

$b(d) = \min\left(\frac{1.5+1.3}{2}\right) = 1.4$

$sil(d) = \frac{1.4-.65}{1.4} = .53$

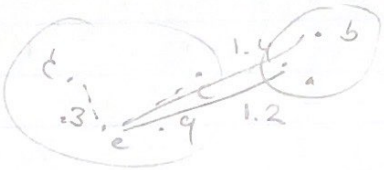


Sil(e)

$a(e) = \frac{.3+.9}{2} = .6$

$b(e) = \frac{1.4+1.2}{2} = 1.3$

$sil(e) = \frac{1.3-.6}{1.3} = .54$



A. Silhouette scores for each instance

sil(a) = .98 sil(d) = .53

sil(b) = .82 sil(e) = .54

sil(c) = -.42

B. Silhouette scores by cluster

$sil(C_1) = \frac{.98+.82}{2} = .9$

$sil(C_2) = \frac{-.42+.53+.54}{3} = .22$

C. Silhouette score for total clustering

$sil(total) = \frac{.98+.82-.42+.53+.54}{5} = .49$

Silhouette visualization