Compute the centroids and the medoids of the clusters C1 = {x1, x2, x3}, C2 = {x4}; reassign the feature vectors based on the centroids/medoids of C1, C2.

```
x1 = <1, 0>
x2 = <0, 1>
x3 = <2, 2>
x4 = <2, 1>
```

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Centroid

$y_1 = avg(C_1) = \left(\frac{1+0+2}{3}, \frac{0+1+2}{3}\right) = (1,1)$

$y_2 = avg(C_2) = (2,1)$

distances to centroids

point \ Centroid	y_1	y_2
x_1	$\sqrt{0+1} = 1$	$\sqrt{1^2+1^2} = \sqrt{2}$
x_2	$\sqrt{1+0} = 1$	$\sqrt{2^2+0} = 2$
x_3	$\sqrt{1+1} = \sqrt{2}$	$\sqrt{0+1} = 1$
x_4	$\sqrt{1+0} = 1$	0

Assignments

$C_1 = \{x_1, x_2\}$

$C_2 = \{x_3, x_4\}$

Medoid

C_1 intra-distances

$d(x_1, x_2) = \sqrt{2}$

$d(x_1, x_3) = \sqrt{2}$ ⇒ with x_1 as medoid the sum of intradistance is minimal

$d(x_2, x_3) = \sqrt{5}$

$y_1 = x_1$
$y_2 = x_4$
} medoids

distance to medoids

point \ medoid	y_1 x_1	y_2 x_4
x_1	0	$\sqrt{2}$
x_2	$\sqrt{2}$	2
x_3	$\sqrt{5}$	1
x_4	$\sqrt{2}$	0

Assignments

$C_1 = \{x_1, x_2\}$

$C_2 = \{x_3, x_4\}$