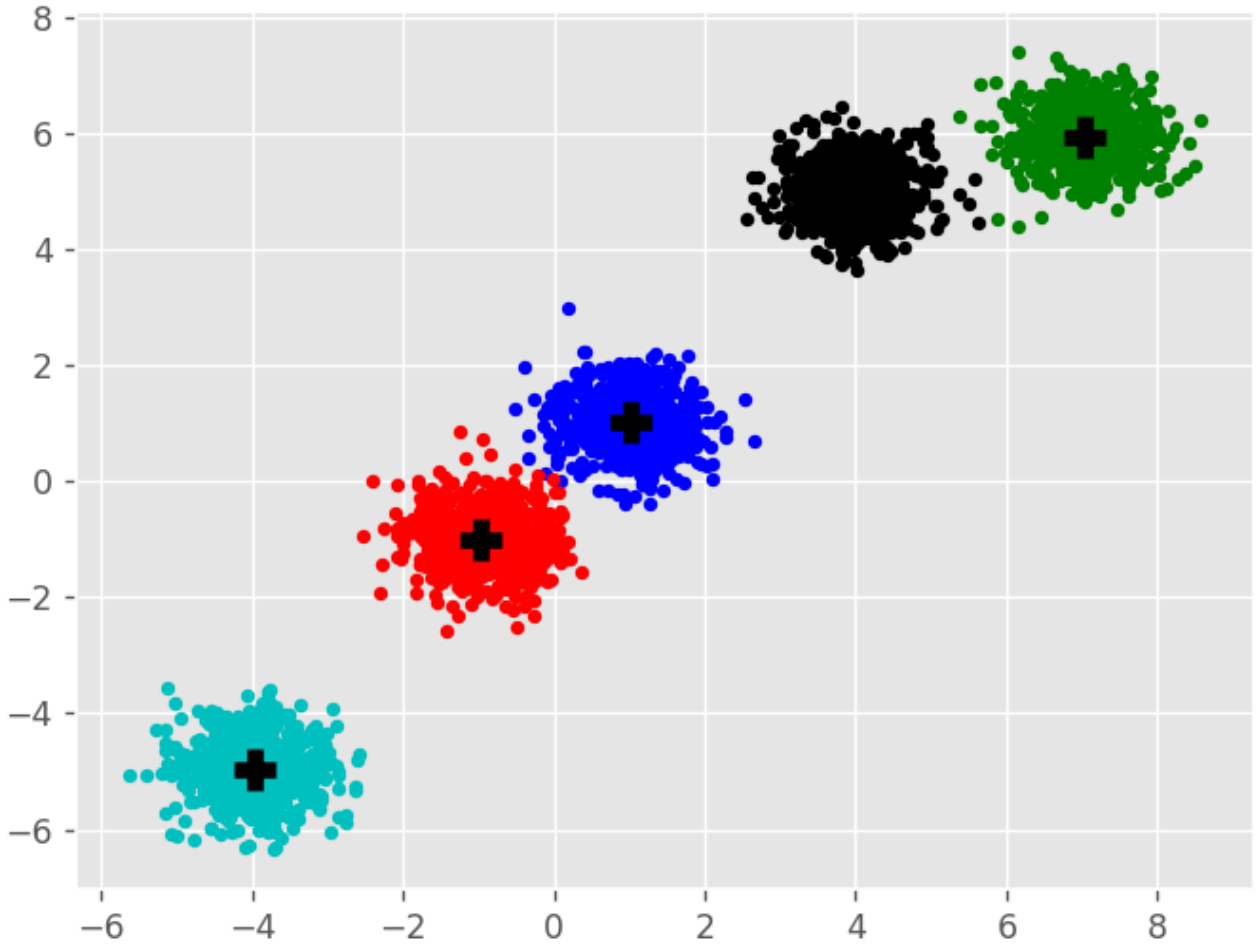
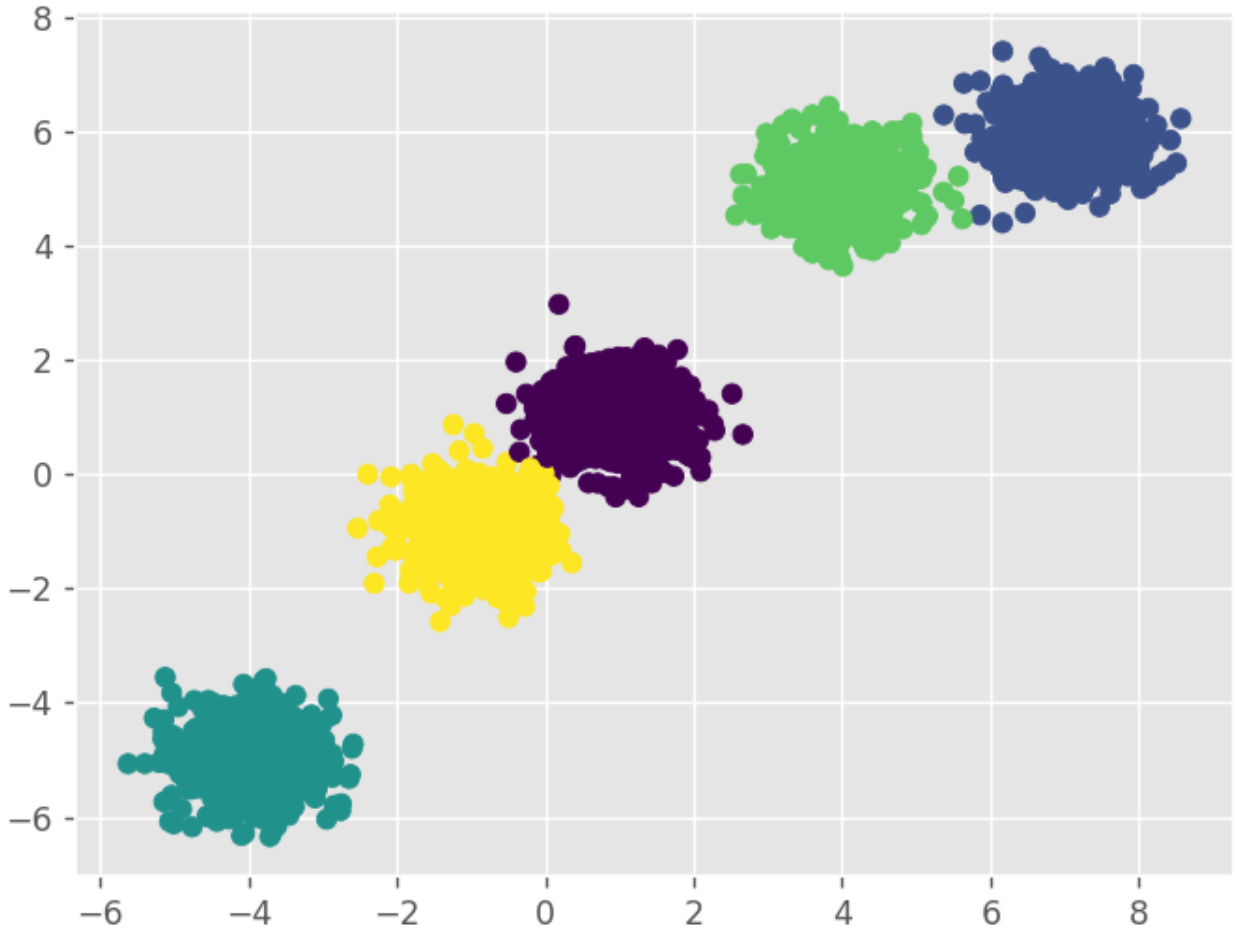
2021061

Q2 kmeans + silhouette analysis + fuzzy c means

Best K =5 followed by k = 3
with silhouette scores ~0.728 and ~0.720

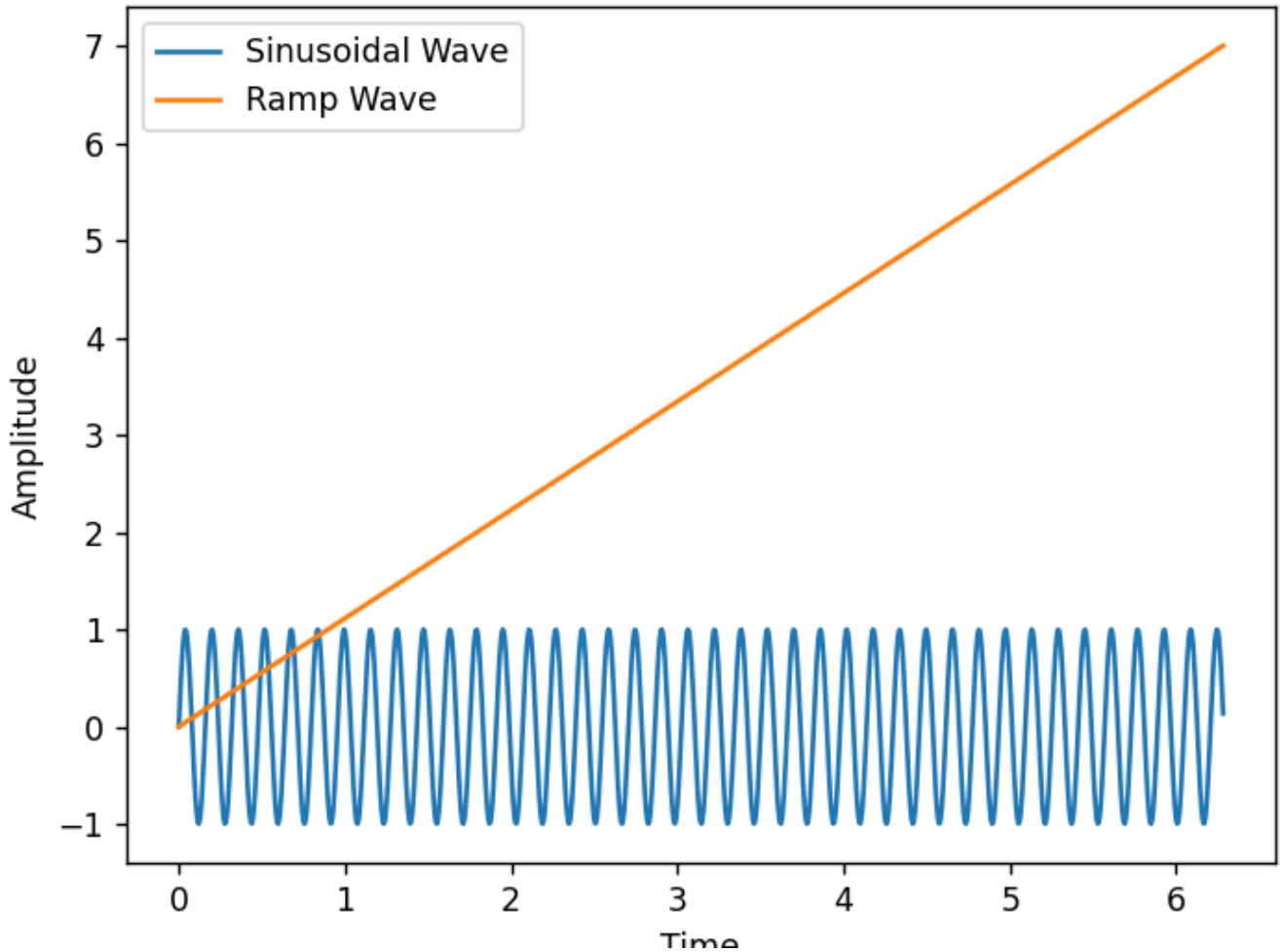


And with k=5, m=2, beta = 0.3 ; Fuzzy c means gives (similar results)

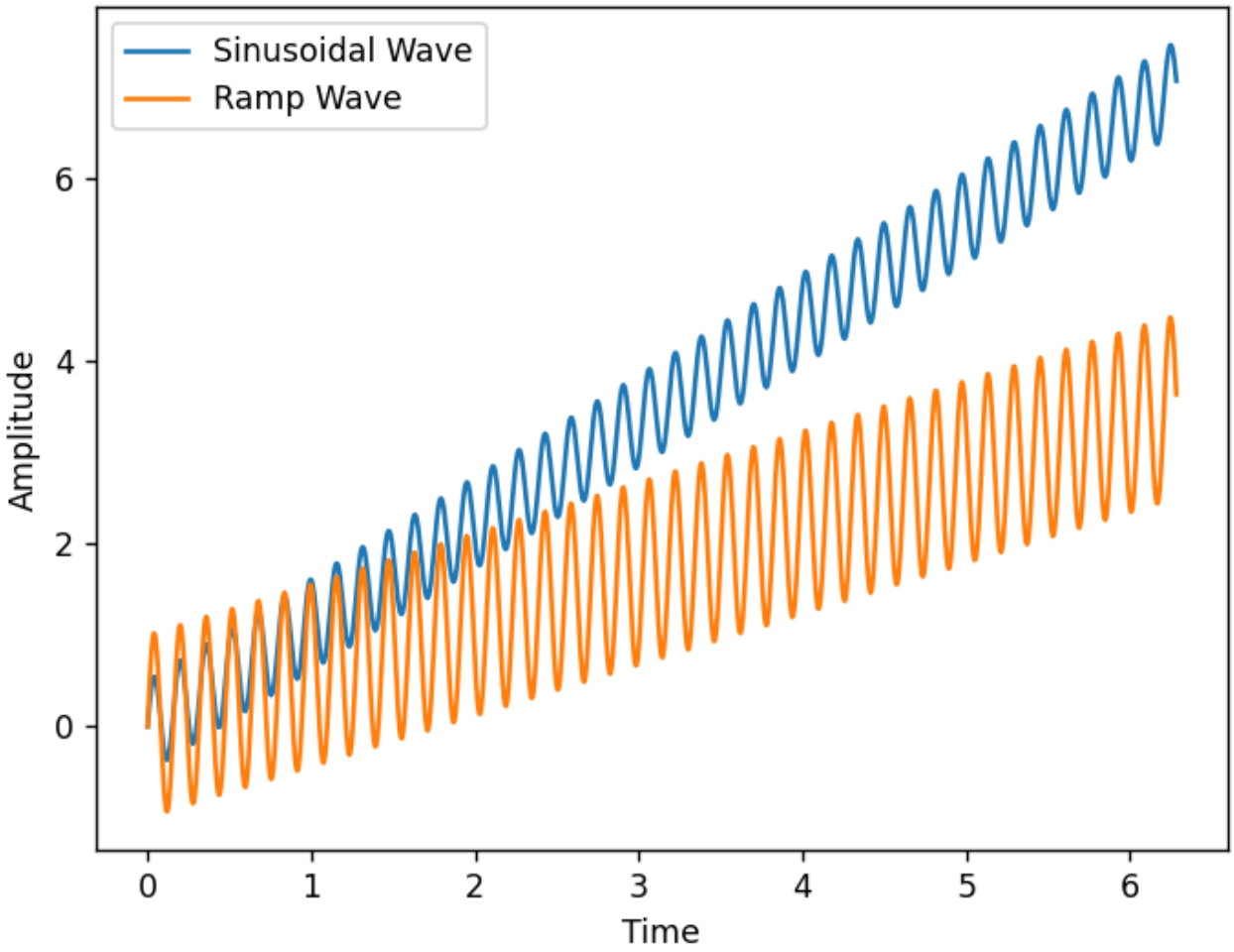


Q4 ICA

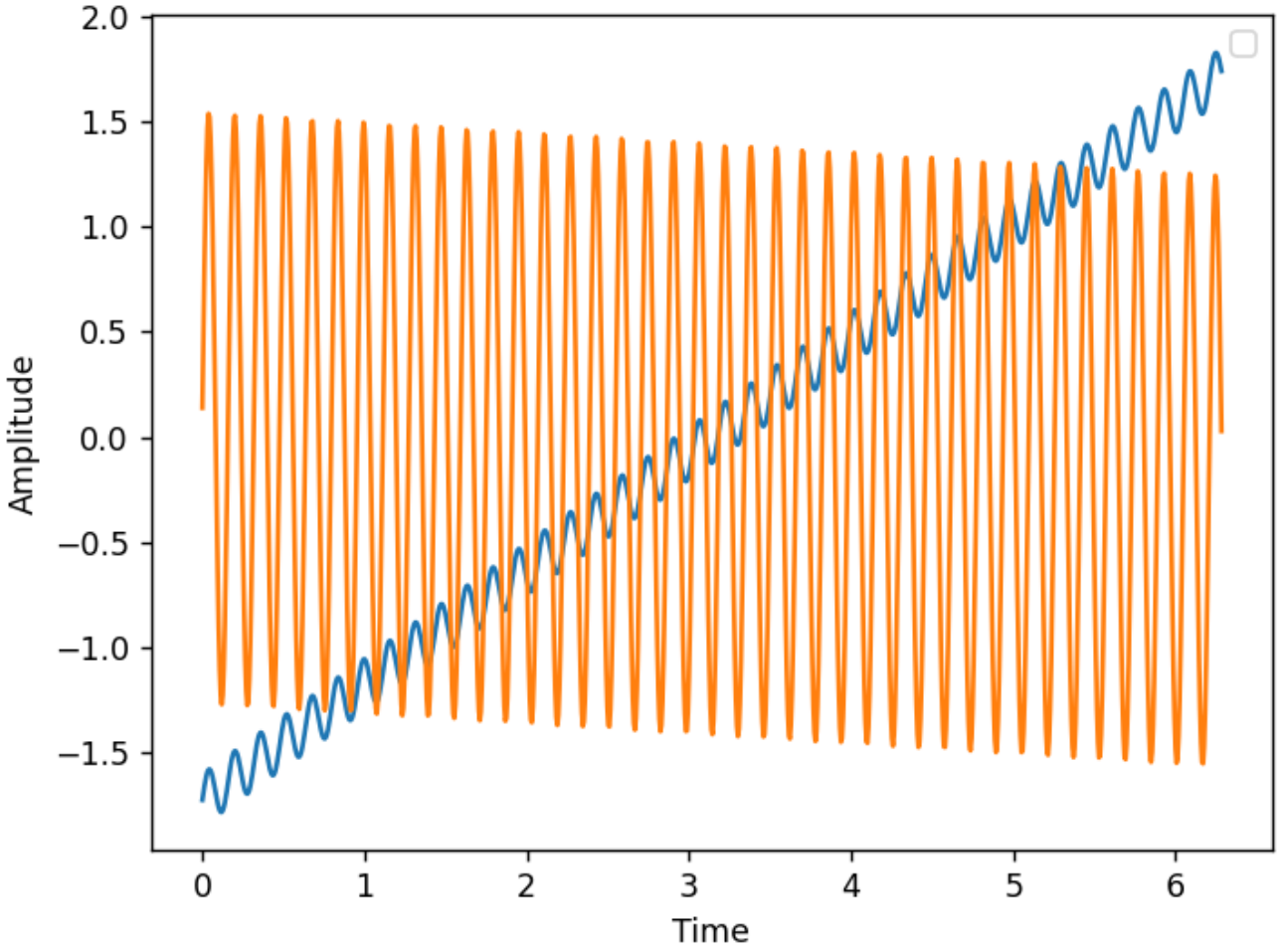
Independent sources



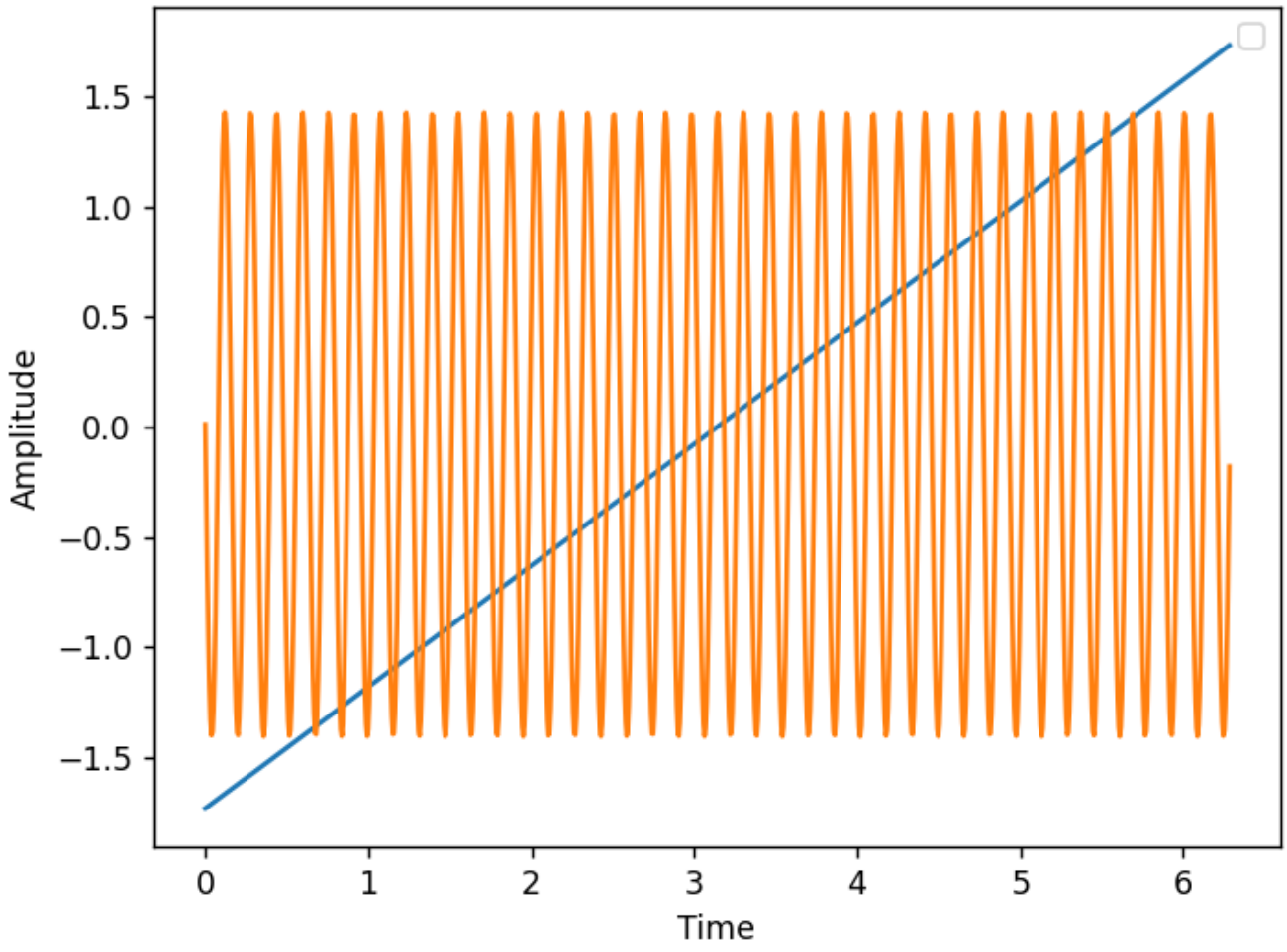
Mixed Signal 'hear' by 2 'listeners'


Sinusoidal Wave
Ramp Wave
Amplitude
Time
0
2
4
6
0
1
2
3
4
5
6

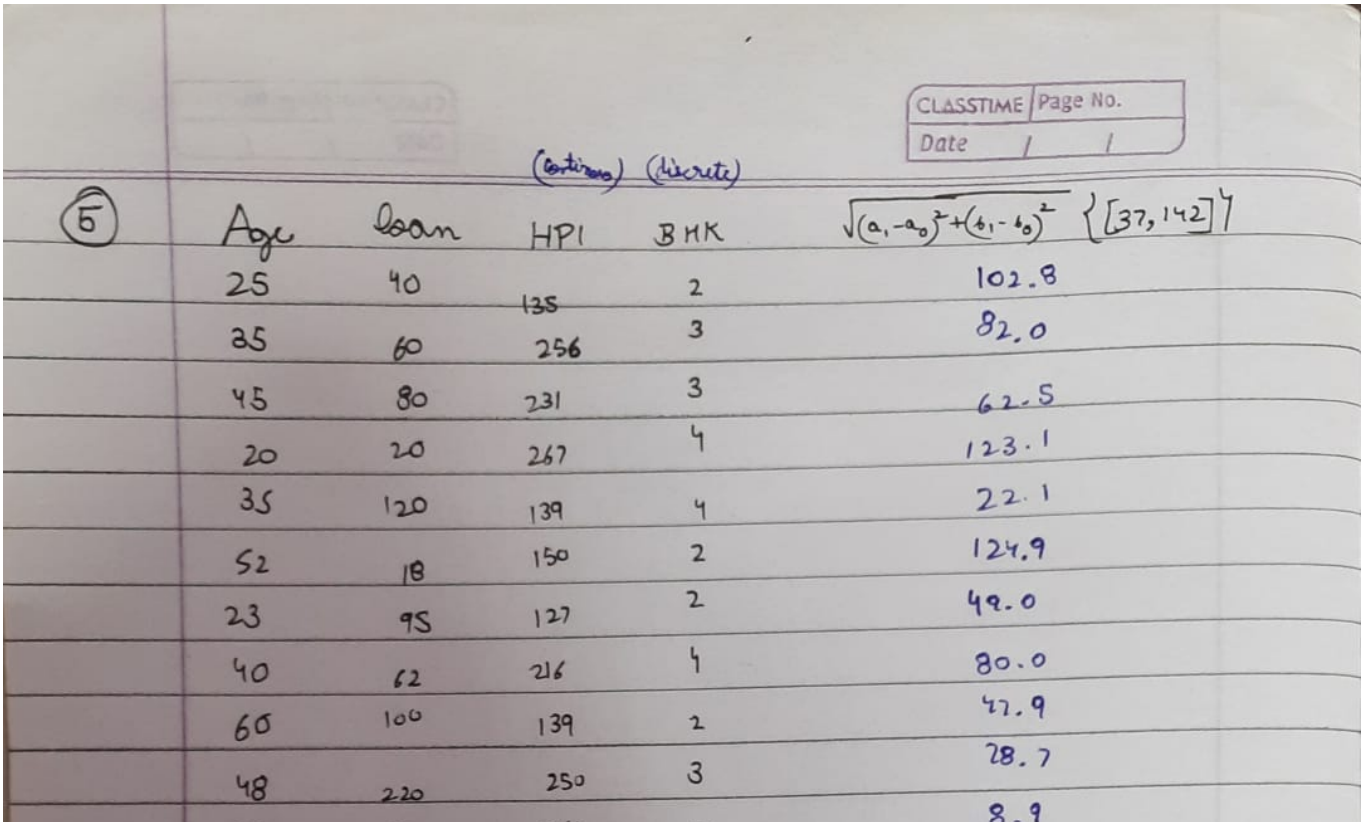
[After ICA] Unmixed signal ->



But with smaller tolerance



Q5



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(continuous) (discrete)

(5)

Age	loan	HPI	BHK	$\sqrt{(a_1-a_0)^2+(b_1-b_0)^2}$ {[37, 142]}
25	40	135	2	102.8
35	60	256	3	82.0
45	80	231	3	62.5
20	20	267	4	123.1
35	120	139	4	22.1
52	18	150	2	124.9
23	95	127	2	48.0
40	62	216	4	80.0
60	100	139	2	47.9
48	220	250	3	28.7
				8.9

33 150 264 4

For K=1

Neighbour(s) = {[33, 150, 264, 4]}

⇒ HPL = 264
BHK = 4

For K=2

Neighbours = {[33, 150, 264, 4],
[35, 120, 139, 4]}

⇒ HPI = 201.5 [= $\frac{264+139}{2} = \frac{403}{2}$]
BHK = 4 [= (4+4)/2]

For K=3

Neighbours = {[33, 150, 264, 4],
[35, 120, 139, 4],
[60, 100, 139, 2]}

HPI = 180.$\overline{6}$9 [= $\frac{264+139+139}{3} = \frac{542}{3}$]
BHK = 3 [$\frac{4+4+2}{3} = [3.34] = 3$]