

Clustering (before)	1	2	3	3	4	5	5	7	10	11	13	14	15	17	20	21
1	1	2														
3			3	3	4	5	5									
8								7	10	11	13	14	15	17	20	21

The means for cluster 1,3,8 are 1,4,14

Clustering (After)	1	2	3	3	4	5	5	7	10	11	13	14	15	17	20	21
1	1	2														
4			3	3	4	5	5	7								
14									10	11	13	14	15	17	20	21

The Cost equals to:

$$\mathcal{L}(\Delta) = \sum_{i=1}^n ||x_i - \mu_{k(i)}||^2 = \sum_{k=1}^K \sum_{i \in C_k} ||x_i - \mu_k||^2$$

Cost:

1 2
 4 3 3 4 5 5 7
 14 10 11 13 14 15 17 20 21

Cost Before: 1 0
 3 $1+2^2+2^2$
 8 $1+2^2+3^2+5^2+6^2+7^2+9^2+12^2+13^2$
 $0+9+9+1+4+9+25+36+49+81+144+169$
 $\text{Cost} = 528$

Cost After: 1 1
 4 $1+1+1+1+3^2$
 14 $4^2+3^2+1^2+1+3^2+6^2+7^2$
 $1+7+121$
 $\text{Cost} = 129$