
Algorithm 1 K-Means Clustering Algorithm

Require: Dataset D , number of clusters K , maximum number of iterations $MaxIter$

Ensure: Cluster assignments for each data point and cluster centers

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1: Randomly select  $K$  data points as initial cluster centers
2: for  $iter = 1$  to  $MaxIter$  do
3:   for each data point  $x$  in  $D$  do
4:     Assign  $x$  to the nearest cluster center
5:   end for
6:   for each cluster  $C$  in  $K$  do
7:     Update the center of cluster  $C$  to be the mean of all points in the
      cluster
8:   end for
9:   if cluster centers do not change then
10:    break
11:  end if
12: end for
13: return Cluster assignments and cluster centers
```
