Solution to Homework 10

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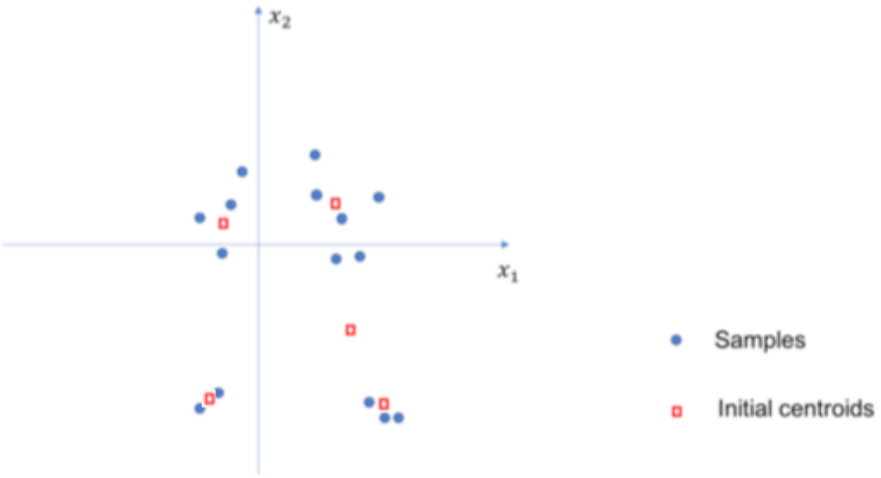
1.



2.

Since we already have K known means, for each testing sample, we have to compute the distance to any mean, which would take $K \times D$ computations. So generally, for N samples, $K \times D \times N$ computations are needed.

3.

For each new sample, first we need to classify it into one of the cluster, which is similar to the previous problem, taking $K \times D$ computations. For all new samples, this step would take $K \times D \times N$ computations in total. Then in each loop, a new mean will be computed and updated, which takes K computations. Hence, $(K \times D \times N + K) \times T$ computations are needed in total.