Enhancing the Performance of K-Means Clustering by using Fuzzy Partitioning Matrix

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Authors:
Ahtesham Husain Shaikh, Manoj E. Patil

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Abstract

Clustering hast two approaches, Hard clustering and soft clustering. The hard clustering restricts that the data object in the given data belongs to exactly one cluster. The problem with hard K-Means (KM) clustering is that the different initial partitions can result in different final clusters. Soft clustering which also known as fuzzy clustering forms clusters such that data object can belong to more than one cluster based on their membership levels. But sometimes the resulting membership values do not always correspond well to the degrees of belonging of the data. So to overcome the problems in hard Fuzzy K-Means clustering, the improved Fuzzy K-Means (FKM) clustering approach is proposed. The proposed improved Fuzzy K-Means clustering assigns membership to an object inversely related to the relative distance of the object to cluster prototype. Fuzzy K-Means clustering assigns membership levels which indicate the degree to which the data elements belong to the clusters, and then using them to assign data object to one or more clusters. These indicate the strength of the association between that data object and a particular cluster. The proposed work also compares the execution time and required memory of Proposed Fuzzy K-Means (FKM) to that of existing Fuzzy K-Means
clustering.

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