

**SOFTWARE QUALITY
INPUT DOMAIN MODELING
CLUSTERING HOMEWORK**

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GITHUB LINK:

<https://github.com/NancyEmanuel/sofe3980clusterhomework/tree/main>

1. Note you will use the same method signature to do the clustering ... in spite of a different algorithm being employed? Can you tell why???

The same method signature is being employed to do the clustering because they all share the same interface provided by the clusterer class from the javaml package. I choose the algorithms kmeans, farthestfirst, and kmedoid to evaluate in this assignment, and they all utilized the same interface provided by the clusterer class from the javaml library. We use the same clusterer interface/method signature because it ensures that each algorithm is being clustered and evaluated in the same way, to ensure the evaluation results are consistent. Using the same method signature is beneficial as it allows us to employ various algorithms with ease.

2. Did you use the same method signature to evaluate as well? Why?

Yes I did use the same methods to evaluate for each algorithm. I utilized the gamma method and sumofsquared method to do my cluster evaluation of each algorithm as I wanted to maintain the same method signature so when evaluating I would be able to compare the scores of all 3 algorithms and assess which evaluation methods work better for which algorithms, and to see how they all compare. I was able to note through my results that Farthest first performed best in the gamma method, with a score of 0.42356959863364646, which means that a moderate level of agreement exists, the sumofsquared score for farthest first was quite low meaning that its clusters were close together and well defined. It seems that the farthest first clustering algorithm performed the best out of these 3 when evaluated using gamma and sumofsquared.

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[INFO] --- exec:3.2.0:java (default-cli) @ ClusterHomework ---
Gamma Cluster evaluation resulted in the Gamma Score of : 0.3405867970660147 for Algorithm KMeans
Sum of squared evaluation resulted in the Score of : 114.9465465309897 for Algorithm KMeans
KMeans Clusters(Output) are :
[5.5, 2.3, 4.0, 1.3]
[5.7, 2.8, 4.5, 1.3]
[4.9, 2.4, 3.3, 1.0]
[5.2, 2.7, 3.9, 1.4]
[5.0, 2.0, 3.5, 1.0]
[5.9, 3.0, 4.2, 1.5]
[6.0, 2.2, 4.0, 1.0]
[5.6, 2.9, 3.6, 1.3]
[5.6, 3.0, 4.5, 1.5]
[5.8, 2.7, 4.1, 1.0]
[5.6, 2.5, 3.9, 1.1]
[6.1, 2.8, 4.0, 1.3]
[5.7, 2.6, 3.5, 1.0]
[5.5, 2.4, 3.8, 1.1]
[5.5, 2.4, 3.7, 1.0]
[5.8, 2.7, 3.9, 1.2]
[5.4, 3.0, 4.5, 1.5]
[6.3, 2.3, 4.4, 1.3]

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Gamma Cluster evaluation resulted in the Gamma Score of : 0.4235695986336466 for Algorithm FarthestFirst
Sum of squared evaluation resulted in the Score of : 149.65020779220816 for Algorithm FarthestFirst
FarthestFirst Clusters(Output) are :
[7.0, 3.2, 4.7, 1.4]
[6.4, 3.2, 4.5, 1.5]
[6.9, 3.1, 4.9, 1.5]
[6.5, 2.8, 4.6, 1.5]
[5.7, 2.8, 4.5, 1.3]
[6.3, 3.3, 4.7, 1.6]
[6.6, 2.9, 4.6, 1.3]
[5.9, 3.0, 4.2, 1.5]
[6.0, 2.2, 4.0, 1.0]
[6.1, 2.9, 4.7, 1.4]
[6.7, 3.1, 4.4, 1.4]
[5.6, 3.0, 4.5, 1.5]
[5.8, 2.7, 4.1, 1.0]
[6.2, 2.2, 4.5, 1.5]
[5.9, 3.2, 4.8, 1.8]
[6.1, 2.8, 4.0, 1.3]
[6.3, 2.5, 4.9, 1.5]
[6.1, 2.8, 4.7, 1.2]
[6.4, 2.9, 4.3, 1.3]
[6.6, 3.0, 4.4, 1.4]

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Gamma Cluster evaluation resulted in the Gamma Score of : 0.34558823529411764 for Algorithm Kmedoids
Sum of squared evaluation resulted in the Score of : 133.9397469781237 for Algorithm Kmedoids
Kmedoids Clusters(Output) are :
[7.0, 3.2, 4.7, 1.4]
[6.4, 3.2, 4.5, 1.5]
[5.5, 2.3, 4.0, 1.3]
[6.5, 2.8, 4.6, 1.5]
[5.7, 2.8, 4.5, 1.3]
[6.3, 3.3, 4.7, 1.6]
[4.9, 2.4, 3.3, 1.0]
[6.6, 2.9, 4.6, 1.3]
[5.2, 2.7, 3.9, 1.4]
[5.0, 2.0, 3.5, 1.0]
[5.9, 3.0, 4.2, 1.5]
[6.0, 2.2, 4.0, 1.0]
[6.1, 2.9, 4.7, 1.4]
[5.6, 2.9, 3.6, 1.3]
[6.7, 3.1, 4.4, 1.4]
[5.6, 3.0, 4.5, 1.5]

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