

THE EFFECTIVENESS OF DBSCAN METHOD IN GROUPING COORDINATE POINT AND CHARACTERISTICS OF EARTHQUAKES IN INDONESIA

By : Khairunnisa Nur Aulia

Statistics Study Program, Faculty of Math and Science

Universitas Islam Indonesia

ABSTRACT

An earthquake is a natural phenomenon which occurs frequently in Indonesia due to its geographic location which is surrounded by three major plates: Pacific Plate, Australian Plate and Eurasian Plate. In 2017, there were 5.841 earthquakes recorded in Indonesia, and this high number of earthquakes had created major damages and destruction. Therefore, in this research, the researcher will create a clustering of regions prone to earthquakes. In analysing these regions, there will be two clustering processes. The first process will apply two variables which are Latitude and Longitude which will be analysed using DBSCAN and DMDBSCAN method. From the clustering of these two methods, the results signify that the DBSCAN method is better in clustering since the standard deviation value is smaller which is 0.199516, created 6 clusters and 3 data noise. Furthermore, the second clustering process will apply several variables which are earthquake frequencies, depth and magnitudes, and these variables will be analysed using DBSCAN method and Complete Linkage method. After comparing the result of these two methods using standard deviation, the ratio of the standard deviation in Complete Linkage method was revealed to be smaller which is 0.292973, and four clusters were created. Following the profiling results, regions which are the most prone to earthquakes belong to cluster 4, and the lesser ones belongs to cluster 3, 2 and 1 respectively.

Keywords: Cluster, Spatial, DBSCAN, DMDBSCAN, Complete Linkage