

***Clustering of Police Jurisdiction Areas Based on Crime Case Indicators Using
the K-Medoids Method***

(Case Study: Jember Regency)

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ABSTRACT

Crime Statistics Data 2022–2024 indicate that assault and motor vehicle theft are among the types of crimes with high and fluctuating on a national level. Based on data from the Jember Resort Police for the 2022–2024 period, cases of motor vehicle theft and aggravated assault have increased and occurred across various police sector jurisdictions with varying numbers. These differences in case intensity across regions necessitate the clustering of areas to support the formulation of more targeted handling strategies. This study aims to cluster police sector jurisdictions in Jember Regency based on the number of motor vehicle theft and aggravated assault cases using the K-Medoids method, including feature scaling using Robust Scaler, determining the optimal number of clusters using the Silhouette Coefficient, and visualizing the results in a web-based Geographic Information System (GIS). The clustering process was conducted using 3 clusters and 10 iterations. The results show that the obtained Silhouette Coefficient value is 0.45, which falls into the weak category. Furthermore, the clustering results are labeled to classify the level of vulnerability into 3 categories, namely high, moderate, and safe. Based on these results, the first cluster is categorized as moderate, the second cluster as high, and the third cluster as safe. The GIS visualization successfully displays the distribution of clusters on the map of Jember Regency interactively, presenting the vulnerability level of each cluster and providing detailed information for each cluster, thereby supporting data-driven analysis and decision-making.

Keywords: *Geographic Information System, K-Medoids, Silhouette Coefficient, Clustering, Robust Scaler*