

ABSTRACT

ADISTI DAYO, 2026. *COMPARISON OF THE PERFORMANCE OF THE ORDERING POINTS TO IDENTIFY THE CLUSTERING STRUCTURE AND HIERARCHICAL DENSITY-BASED SPATIAL CLUSTERING OF APPLICATIONS WITH NOISE ALGORITHMS (Case Study: Clustering of the Level of Ownership of Population Administration Documents Among Villages in Bone Bolango Regency in 2024).* **UNDERGRADUATE THESIS.** Gorontalo. Study Program of Statistics. Department of Mathematics. Faculty of Mathematics and Natural Sciences. Universitas Negeri Gorontalo.

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Population administration plays an important role in public services and development planning. However, the equitable distribution of ownership of population administration documents among villages remains a problem in Bone Bolango Regency. The characteristics of the data, which are heterogeneous, contain outliers, and exhibit density variation, cause classical statistical analysis to be less capable of clearly revealing distribution patterns. Therefore, this study applies a clustering approach by comparing two density-based algorithms, namely Ordering Points to Identify the Clustering Structure (OPTICS) and Hierarchical Density-Based Spatial Clustering of Applications with Noise (HDBSCAN), in grouping villages based on the level of ownership of population administration documents. The data were obtained from the Department of Population and Civil Registration of Bone Bolango Regency in 2024, covering the number of ownership of Birth Certificates, electronic Identity Cards (KTP-el), and Family Cards across 165 villages. The results showed that both algorithms successfully formed two main clusters representing villages with relatively high and low levels of ownership of population administration documents. Based on internal validation, OPTICS yielded Silhouette Coefficient, *Davies-Bouldin Index*, and *Calinski-Harabasz Index* values of 0.825, 0.245, and 1196.803, respectively, while HDBSCAN yielded 0.787, 1.210, and 750.896, respectively. It can be concluded that OPTICS produces better cluster structure quality and can serve as a basis for formulating policies for equitable population administration services.

Keywords: Population Administration Documents, Clustering, Internal Validation, OPTICS, HDBSCAN.



LEMBAR PENGESAHAN

Skripsi yang berjudul **"PERBANDINGAN PERFORMA ALGORITMA ORDERING POINTS TO IDENTIFY THE CLUSTERING STRUCTURE DAN HIERARCHICAL DENSITY-BASED SPATIAL CLUSTERING OF APPLICATIONS WITH NOISE (Studi Kasus: Klasterisasi Tingkat Kepemilikan Dokumen Kependudukan Antardesa di Kabupaten Bone Bolango Tahun 2024)"**

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