ABSTRACT

Competition is an important aspect of education. One of the main functions of participating in competitions is to measure personal abilities. In addition, competitions have various benefits, namely creating new innovations in solving a problem, providing new experiences, and recognizing/understanding competition between participants. Competition participants in the educational field cannot be separated from the support of universities that offer all facilities in many aspects. To better recognize the development of competition participants in a university, data analysis is needed that can provide new ideas. An effective data analysis technique is the data mining approach, specifically clustering. Clustering has many variations of algorithms with one example being K-Modes that can handle categorical data such as competition data. As a university with numerous achievements and one of the best private universities in Indonesia, Telkom University is an interesting subject for the implementation of the K-Modes algorithm. This study aims to conduct K-Modes clustering on Telkom University Student competition data and couple with the Silhouette Score and Davies-Bouldin Index methods to help determine the optimal number of clusters. The results showed that the optimal number of clusters was 13 clusters with a Silhouette Score of 0.23 (value range -1 to 1) and a Davies-Bouldin Index of 1,95 (value range from 0 to positive number). Furthermore, this research provides visualization of K-Modes clusters from the Principal Component Analysis (PCA) method calculation and identification results in the form of analysis information for each clusters.

Keywords: Davies-Bouldin Index, K-Modes, Clustering, PCA, Silhouette Score, Telkom University