

CHAPTER 4

ANALYSIS AND DESIGN

4.1 Analysis

Basketball is a sport that requires a proportional height to be able to play optimally. Because of course if short players are dealing with tall players, short players will play less than optimally. In basketball, the position of players is divided into 5 main positions, namely point guard, shooting guard, small forward, power forward, and center [11]. The reason this research was made is to provide suggestions for playing positions in basketball based on height. to determine the position of players in this project using the DBSCAN algorithm and in this section, it will be explained in narrative and table form.

4.1.1 Data Collection and Data Usage

To analyze the position of basketball athletes, it takes 4 columns of data from the dataset whose contents are player_height which identifies the athlete's height then there are 3 performance columns whose contents are pts, reb, ast and this is an explanation of the contents of the columns taken from the dataset:

Table 1.1 : Attribute Data Taken

Attributes	Information
player_height	Height of player
pts	Points that player scores per game in one season
reb	Rebounds that player scores per game in one season
ast	Assist that player scores per game in one season

4.1.2 DBSCAN algorithm

DBSCAN algorithm is an algorithm can find clusters of arbitrary shape by also identifying noise or outliers, the weakness of the DBSCAN algorithm is that it is difficult to get optimal epsilon parameters and minimum points, and also DBSCAN will be difficult to read if the distance between clusters is small [1]. Epsilon is the maximum distance of the circle radius of two data between clusters then minimum points is the minimum number of data in epsilon then noise or outliers is data that in epsilon does not have core points and does not have a specified minimum number of points.

4.1.3 Rule Base

The rule base which is set in the grouping of basketball athlete positions based on height. There are five main positions in basketball, namely point guard, shooting guard, small forward, power forward, and center [11]. The first position there is a point guard that the point guard does is attacking running and usually, he is the player with the best dribble and passes on the team so this position is more in charge of creating assists then players with shooting guard positions are usually the players with the best shooting abilities on the team so the shooting guard is more in charge of scoring points then the small forward also focuses on scoring points because the small forward player is in charge of going around the field and scoring points from far and near the ring then the power forward position is not much different from the center power forward playing near the basketball ring to do rebounds and hold tall players but sometimes the power forward also shoots then the last one is the center this player is usually the tallest player on a team and plays near the basketball hoop this player is usually tasked with blocking shots from opponents and doing rebound

Table 1.2 : Rule Base

Position	Points	Rebound	Assist
Point Guard	no	no	yes
Shooting Guard	yes	no	no
Small Forward	yes	no	no
Power Forward	no	yes	no

Center	no	yes	no
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1.5 Design

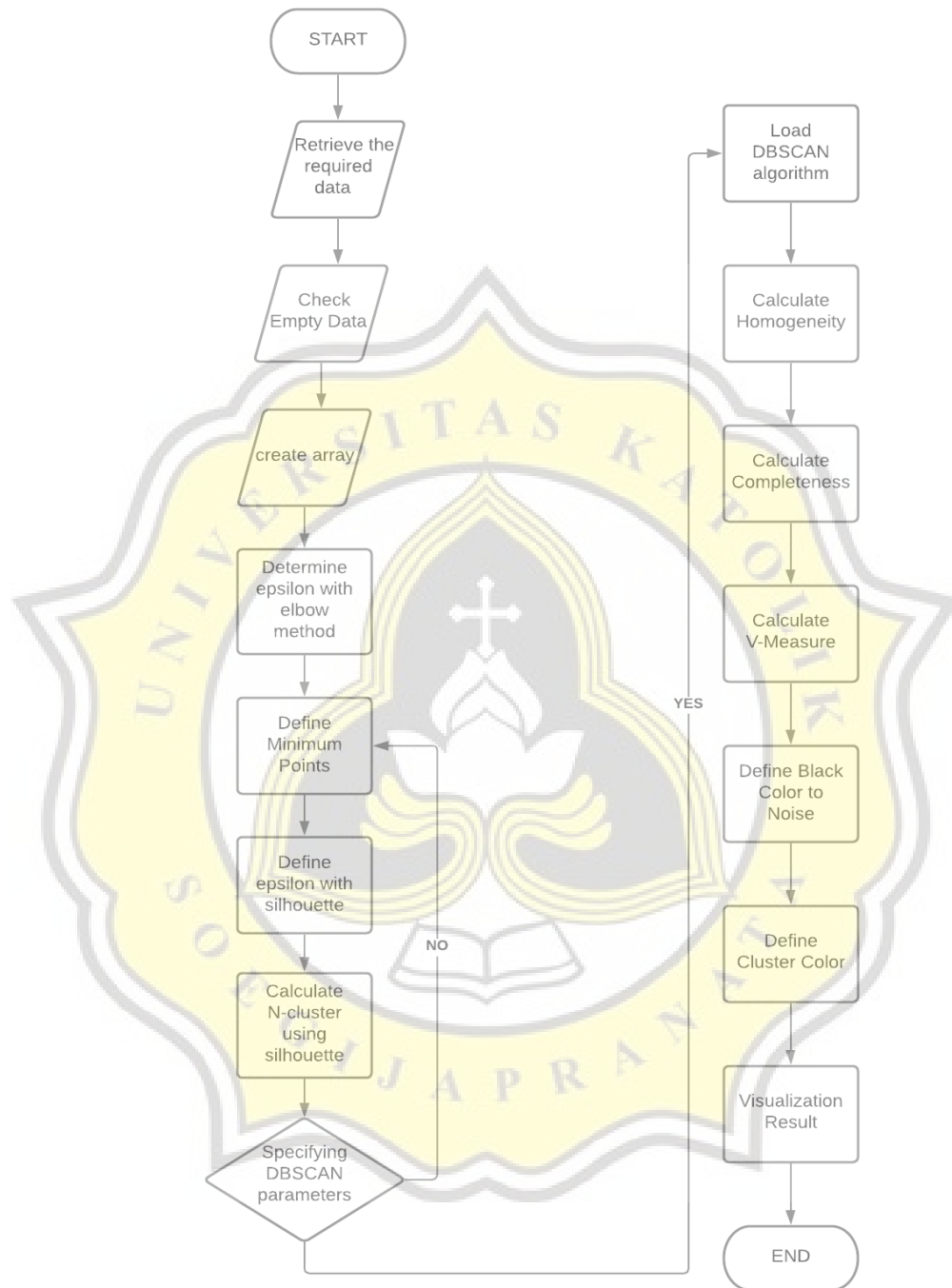


Figure 1.1 Flowchart

Figure 1.1 describes the flow of this project. Starting from taking the data used and then checking for empty data, then an array is made and the data needed to be processed. After having the data, the next step is to find the required parameters by using the elbow method to find epsilon and then proceed to determine the minimum points and check the accuracy of epsilon with the silhouette. After the parameters are found, DBSCAN is run, after that calculates the resulting cluster performance by calculating homogeneity, completeness, and v-measure and in the last stage data visualization to conclude.

