This research proposes an algorithm that has an ability to determine a suitable form of the membership function in fuzzy logic. The classification is used for data sets that have continuous value attributes. The graph of membership function defines the membership value for an attribute which is significant to fuzzy logic. Generally, the process needs to be analyzed by specialists who can decide the suitable form of membership function. This requires experience, time, and experiment to receive the appropriate membership function that can achieves the highest performance of the classification.

Our approach applies data distribution and uses multi-linear regression techniques to evaluate the slopes for choosing a suitable form of membership function in each attribute. We investigate two kinds of membership functions which are triangular shape and bell-curve in order to automatically classify data for Wines and Breast Cancer data set. Considering the performance on Wines data set, the result shows that the average performance of our approach is 95.01%. whereas the classification uses only triangular membership function gets 91.08%, bell-curve gets 93.30%. For Breast Cancer data set, the performance on triangular membership function is 93.85%, and 94.91% in bell-curve. The average performance is 95.47%

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