Human beings have the ability to make logical decisions. Although human decision - making is often optimal, it is insufficient when huge amount of data is to be classified. Medical dataset is a vital ingredient used in predicting patient's health condition. In other to have the best prediction, there calls for most suitable machine learning algorithms. This work compared the performance of Artificial Neural Network (ANN) and Decision Tree Algorithms (DTA) as regards to some performance metrics using diabetes data. WEKA software was used for the implementation of the algorithms. Multilayer Perceptron (MLP) and Radial Basis Function (RBF) were the two algorithms used for ANN, while RegTree and LADTree algorithms were the DTA models used. From the results obtained, DTA performed better than ANN. The Root Mean Squared Error (RMSE) of MLP is 0.3913 that of RBF is 0.3625, that of RepTree is 0.3174 and that of LADTree is 0.3206 respectively