Example: Decision Tree and Logistic Regression Models

In this question, we will use the dataset of banknote authentication [1]. The dataset were extracted from images that were taken from genuine (1) and forged banknote-like specimens (0). For digitization, an industrial camera usually used for print inspection was used. The final images have 400x 400 pixels. Due to the object lens and distance to the investigated object gray-scale pictures with a resolution of about 660 dpi were gained. Wavelet Transform tool were used to extract features from images. There are 4 features which are:

1. variance of Wavelet Transformed image (continuous)
2. skewness of Wavelet Transformed image (continuous)
3. kurtosis of Wavelet Transformed image (continuous)
4. entropy of image (continuous)

The target values are 1 (genuine) and 0 (forged banknote).

1. **We will start by training our data. Please split the dataset into 80 % of train data and 20 % of test data.**
2. **Using all 4 features to train the decision tree and make predictions for the test data.**
3. **Create the table to present the precision and recall rates. Interpret the results carefully.**
4. **Now, estimate with the logistic model to solve the problem. Compare the performance between these two models.**